G. F. READ.

PRINTING MACHINE.

APPLICATION FILED MAR. 5, 1909.

974,431.

Patented Nov. 1, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

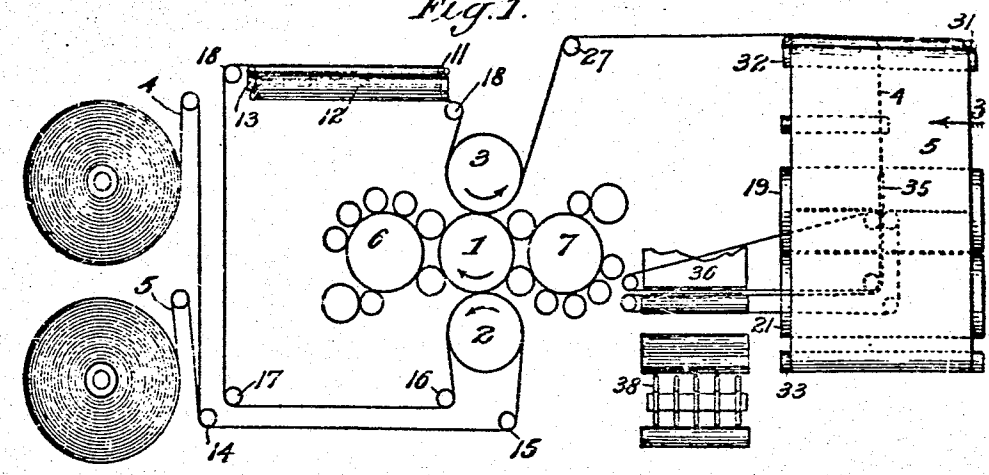
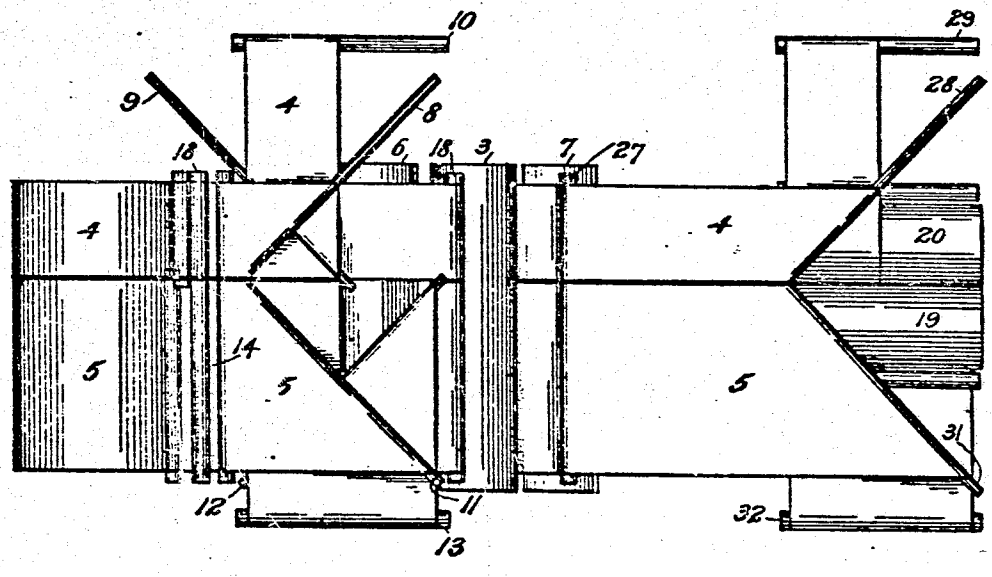


Fig. 2.



Witnesses

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by his Attys:

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2 SHEETS—SHEET 2.

Fig. 3.

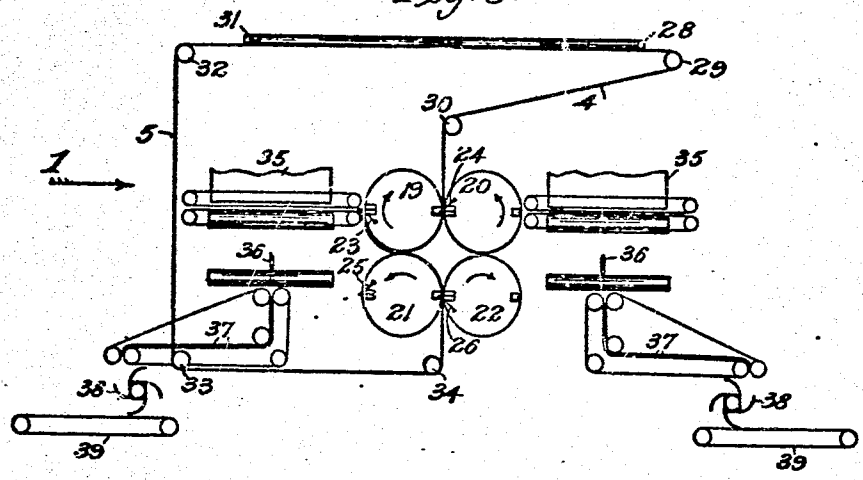


Fig. 4.

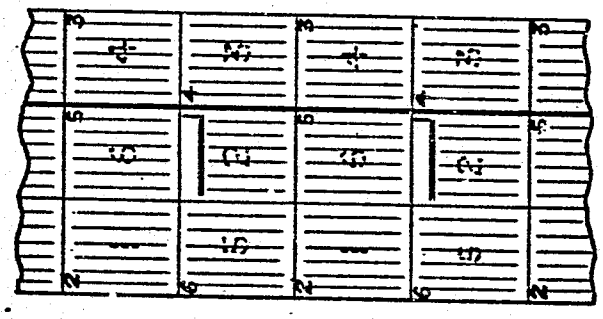
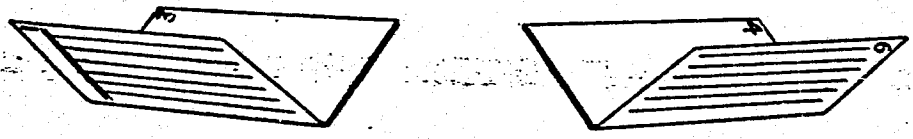


Fig. 5.



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UNITED STATES PATENT OFFICE.

GEORGE F. READ, OF LONDON, ENGLAND, ASSIGNOR, BY MESNE ASSIGNMENTS, TO R. HOE AND CO., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

PRINTING-MACHINE.

974,431. Specification of Letters Patent. Patented Nov. 1, 1910.

Application filed March 5, 1909. Serial No. 481,373.

To all whom it may concern:

Be it known that I, GEORGE F. READ, a citizen of the United States, residing at London, county of Middlesex, England, have invented certain new and useful Improvements in 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.

Certain classes of printing machines, such, for instance, as newspaper printing machines which print on webs, as ordinarily arranged, deliver products consisting of four pages or multiples of four. In some cases, however, it is desirable to produce products which do not consist of multiples of four pages, such, for instance, as six or ten page products, these products being ordinarily referred to as products having "inset sheets".

It is one of the objects of this invention to produce an improved printing machine which shall be capacitated to furnish inset products when desired, and to do this by mechanism which is simple, effective and cheap in construction.

A further object of the invention is to produce an improved delivery mechanism which shall be capacitated to produce inset products when desired and also produce products having four pages or multiples of four pages.

With these and other objects not specifically referred to 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 accompanying drawings—Figure 1 is a diagrammatic side elevation of a printing machine illustrating the invention. Fig. 2 is a plan view of the construction shown in Fig. 1. Fig. 3 is an end view of the construction shown in Fig. 1, the position of the observer being indicated by the arrow 3 in Fig. 1. Fig. 4 is a diagrammatic view of a section of a perfected web produced by the machine. Fig. 5 is a perspective view of the product in two positions.

Machines constructed in accordance with the invention will usually contain a single printing couple the character of which may vary. In the particular construction which has been selected to illustrate the invention, the printing couple comprises a printing cylinder 1 with which coöperate two impression cylinders 2 and 3. The printing couple illustrated is capacitated to simultaneously print two webs 4, 5, the web 5, as shown, being a double wide web, and the web 4 a single wide web. As shown, the cylinder 1 is provided with one set of plates capacitated to produce six printed pages, the plates being arranged so that the columns run around the cylinder, and the plates and cylinder being of such size that the surface of the cylinder is fully covered by the plates. The plates on the cylinder may be inked in any suitable manner, as, for instance, by inking mechanisms diagrammatically illustrated and marked 6 and 7. According to the preferred form of the invention, and as illustrated, the webs after being printed are turned over and again presented to the couple side by side, so as to be perfected. The reversing of the webs may be effected by any suitable mechanism, such, for instance, as the usual turner bars. In the construction illustrated, the bars for the web 4 are marked 8, 9 and 10, and the bars for the web 5 are marked 11, 12 and 13. It will be understood that the plates are so imposed upon the cylinder and the webs are so presented thereto that the impression produced by one set of plates, referring to the plates arranged side by side lengthwise of the cylinder, as a set, is backed by the impression produced by the other set of plates. This arrangement will be understood by reference to Fig. 4 in which the impression produced by the first set of plates on one side of the web is marked 2, 5, 3, in full lines, and the impression produced by the other set of plates on the same side of the web is marked 6, 1, 4 in full lines, whereas the impression produced on the other side of the web by the plates is indicated by the dotted line numbers. It will be observed that the impression from what may be termed the first set of plates, as, for instance, the plates printing pages 2, 5, 3, is backed by the impression from the other set of plates, viz., the plates printing pages 1, 6, 4.

In the particular construction illustrated, the webs are led side by side from the web rolls over guides marked 14 and 15 between the printing cylinder and the impression cylinder 2, after which the webs are led by

guides 16 and 17 over the respective web reversers. After being turned over by the reversers, the webs, in the particular construction illustrated, are led over a guide 18, between the printing cylinder and the impression cylinder 3. After being printed, the webs are led to a mechanism by which the webs are converted into sheets, the sheets being associated into a properly paged product. While the mechanism referred to may be varied, in the particular machine illustrated, this mechanism includes two pairs of cutting cylinders, the cylinders of one pair being marked 19, 20, and the cylinders of the other pair 21, 22. Each of these cylinders, in addition to the usual cutting device, is provided with a set of pins, the pins on the cylinder 19 being marked 23, those on the cylinder 20 being marked 24, and those on the cylinders 21 and 22 being marked 25 and 26 respectively.

In the particular machine illustrated, the webs, after being perfected by the cylinders 1 and 3, are led over a guide 27 after which the web 4 is, by means of guides 28, 29 and 30, led to the pair of cylinders 19, 20. The web 5, after leaving the guide 27, is, by means of guides 31, 32, 33 and 34, led between the cylinders 21, 22.

It will be observed that the pins 23, 24 on the cylinders 19 and 20 are so arranged as to take alternate sheets from the web 4 and that the pins 25, 26 on the cylinders 21, 22 are also arranged to take alternate sheets from the web 5. The pins will be further arranged so that the pins on the cylinders of one pair will deliver to the pins on the corresponding cylinders of the other pair. In the particular construction illustrated, the pins 26 on the cylinder 22 will deliver to the pins 24 on the cylinder 20, and the pins 25 on the cylinder 21 will deliver to the pins 23 on the cylinder 19.

The pairs of cutting cylinders will be arranged to deliver to suitable delivery mechanism. In the construction shown, two delivery mechanisms are employed, one of these mechanisms taking sheets from the cylinder 19 and the other from the cylinder 20. These mechanisms comprise ordinary blade folders 35, 36, these folders delivering in any usual way, such, for instance, as by tapes 37, to an S-fly 38 which lays the folded sheets on a traveling belt 39. With this construction it will be understood that alternate sheets cut from the wide web will be taken by the pins 25, 26, and alternate sheets will, in the same way, be taken from the narrow web 4 by the pins 23, 24. The pins 23 will also pick up the wide web sheets from the cylinder 21, and the pins 24 will pick up the wide web sheets from the cylinder 22, so that the cylinders 19 and 20 will alternately have upon them an associated product consisting of a sheet from the wide web and a sheet from the narrow web, these sheets being delivered to the folder 35. The cutting cylinders, therefore, alternately deliver a six page product to the folding mechanisms, two views of this product being shown in Fig. 5. It will be further seen that the sheets are so arranged in this product that the pages fall in their proper order.

The particular machine illustrated has the special advantages that the product is produced by means of a single printing cylinder and a single set of plates. The construction furthermore, does not require any part of the machine to run at half speed, as is the case with certain machines which have been heretofore employed for producing products having inset sheets.

It is of course apparent that mechanism constructed in accordance with the invention may be employed for producing other than a six page product by means of obvious modifications. For instance, by increasing the length of the cylinders of the couple, the same mechanism might be employed for producing a ten page product, or an eight page product.

Other changes which will suggest themselves to those skilled in the art may be made without departing from the invention. The invention is not, therefore, to be limited to the specific construction hereinbefore described and illustrated in the accompanying drawings.

What is claimed is:—

1. The combination with a rotary printing couple the printing cylinder of which carries a single set of plates said plates covering practically the entire circumference of the cylinder and having their columns running around the cylinder, of means for directing a plurality of webs through the couple side by side, means for reversing each of the webs and again presenting them to the couple whereby the webs are perfected, and means for converting the webs into a page product with the pages in proper order.

2. The combination with a printing couple, of a plurality of web reversers whereby webs presented to the couple may be turned over and again presented thereto, two cutting mechanisms, two delivery mechanisms, and means for causing an associated product from the two cutting mechanisms to be alternately sent to the delivery mechanisms.

3. The combination with a printing couple, of a plurality of web reversers whereby webs printed on the couple may be turned over and again presented thereto, two pairs of cutting cylinders, sheet taking devices on said cylinders, the sheet taking devices on one cylinder of one pair operating alternately with those of the other cylinder of the pair and the sheet taking devices of one pair delivering to those of the other pair,

and two delivery mechanisms to which the sheet taking devices deliver associated sheets.

4. The combination with a pair of cutting cylinders, of means for directing a printed and perfected web thereto, a second pair of cutting cylinders arranged beneath the first pair, means for directing a printed and perfected web thereto, sheet taking devices on each cylinder of the first pair, the devices on one cylinder acting alternately with respect to the devices on the other, sheet taking devices on each cylinder of the second pair, the devices on one cylinder acting alternately with respect to the devices on the other cylinder, the sheet taking devices of each cylinder of one pair being arranged to transfer the sheets taken thereby to the corresponding cylinder of the other pair for association with the sheet thereon, and folding devices to which the associated sheets are delivered.

5. The combination with means for printing and perfecting a plurality of webs, of two pairs of cutting cylinders to which the webs are led, sheet taking devices on said cylinders, the sheet taking devices on one cylinder of each pair operating alternately with those of the other cylinder of the pair and the sheet taking devices of one pair delivering to those of the other pair, and two delivery mechanisms coöperating with said cylinders, associated sheets from the pairs being successively sent to the delivery mechanisms.

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

GEORGE F. READ.

Witnesses:
ALFRED S. BISHOP,
H. D. JAMESON.