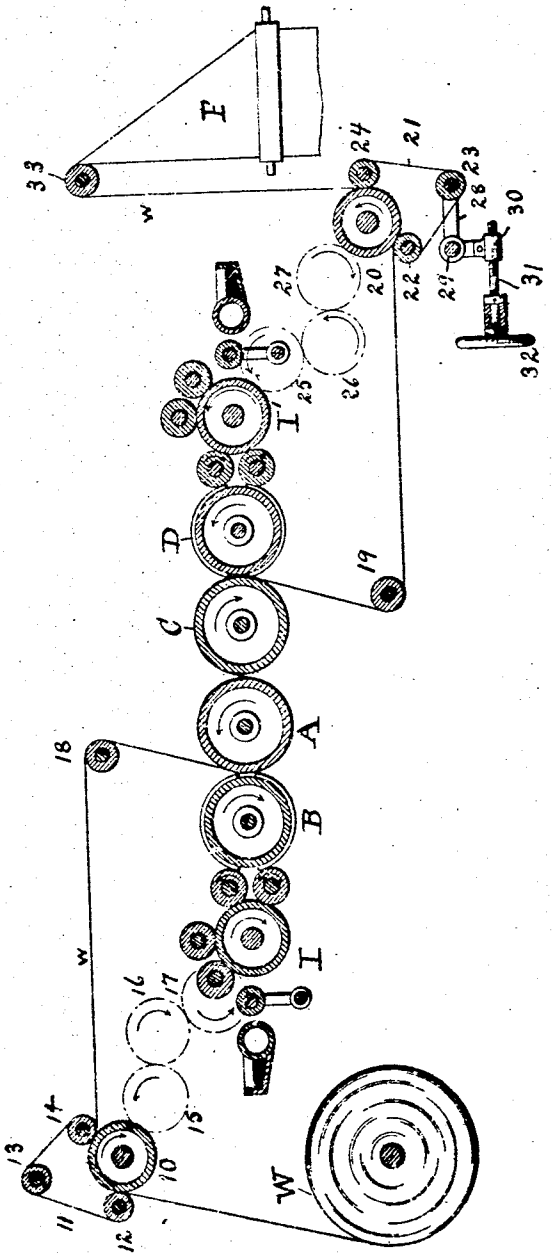
No. 870,210. PATENTED NOV. 5, 1907

H. A. W. WOOD.

ROTARY WEB PERFECTING PRINTING MACHINE.

APPLICATION FILED OCT. 16, 1897. RENEWED DEC. 28, 1903.



Witnesses.

W. J. Baldwin

E. M. Healy

Inventor.

H. A. W. Wood

By Smithgate & Smithgate

Attorneys.

UNITED STATES PATENT OFFICE.

HENRY A. WISE WOOD, OF NEW YORK, N. Y., ASSIGNOR TO CAMPBELL PRINTING PRESS & MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

ROTARY WEB-PERFECTING PRINTING-MACHINE.

No. 870,210. Specification of Letters Patent. Patented Nov. 5, 1907.

Application filed October 16, 1907. Serial No. 396,330. Renewed December 28, 1903. Serial No. 186,923.

To all whom it may concern:

Be it known that I, HENRY A. WISE WOOD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Improvement in Rotary Web-Perfecting Printing-Machines, of which the following is a specification.

The aim of this invention is to improve the operation of rotary web perfecting printing presses. In machines of this character, it is the present practice to set the plates on the two printing cylinders so that their margins will not register, that is, so that the margin between the plates will not come opposite the impression cylinder of each couple at the same time. The result of this operation is that there is always a constant bite on the web between at least one impression cylinder and plate, so that the web is bodily fed forward by the printing couples. This is true both in press in which two separate couples are used and also in a press in which a single couple of double the width of the web is used with a web-reverser and transferrer.

It is well known that stereotype plates vary in size and condition. Hence, the feeding function which is performed in the rotary presses, as built to-day, will vary. For example, if the plates should be a thirty-second of an inch larger than normal, for every thirty-two papers printed, there would be an inch of slack web created between the printing mechanism and the folding mechanism. On the other hand, if the plates should be a thirty-second of an inch too small, for every thirty-two papers printed there would be an inch of tautening of web between the printing mechanism and the folder. This setting of the margin between the plates out of register, therefore, commonly causes either an increasing flood of paper to descend on the folder, or a drought of web to be supplied to the folder, the former greatly interfering with the production of accurately folded papers, and the latter keeping the folding mechanism cutting short sheets in which long and ugly pin-tears appear. I have found that this evil can be remedied by setting the margins of the plates on the cylinders to register, that is, so that when one printing cylinder presents the margin between the plates to its impression cylinder, the other printing cylinder will be in the same position. Then, by using a forwarding device between the printing mechanisms and the folder, the evil before referred to is overcome.

A forwarding device is also preferably used between the web-roll and the printing mechanism. With this arrangement, the margins between the plates of both cylinders registering, the web will be permitted to equalize itself at every half turn of the printing cylinders. Thus, the web between the forwarding devices becomes merely a passenger, and the printing cylinders act only in their proper function of printing elements, and not as continuous feeding elements. By this construction, if the plate should be too large or too small, the error is corrected at every half turn of the cylinders.

Referring to the drawing, I have shown in section enough of one common form of rotary web printing press to illustrate the application of my invention, so that a skilled printing press builder will be able to practice the same.

In detail, A represents the first impression cylinder; B, the first printing cylinder; C, the second impression cylinder, and D the second printing cylinder of an ordinary rotary web perfecting press. The two impression cylinders A and C are slightly separated so that the web is not forcibly nipped between the same.

Coacting with the printing cylinder B is arranged any of the usual inking apparatuses I, and a similar apparatus I^1 is arranged to coact with the printing cylinder D.

As shown, the semi-cylindrical plates placed on the two printing cylinders B and D are so set that the margins between the plates will register.

W represents the web-roll, from which the web w is drawn. The same passes first around a feeding-in drum 10, coacting with which are tapes 11, which run around tape-pulleys or rollers 12, 13 and 14.

The feeding-in drum 10 and its coacting tapes may be positively driven, as by means of the gearing 15, 16 and 17, indicated in dotted lines, from any suitable part of the machine; for example, as from the ink-drum of the inking apparatus I

From the feeding-in drum 10, the web passes around a suitable guiding roller 18, then between the first printing couple A B, then between the second printing couple C D, then around a guide roller 19 to a feeding-out drum 20.

Coacting with the feeding-out drum 20 is a set of tapes 21, which run around the tape-pulleys or rollers 22, 23 and 24.

The feeding-out drum and its tapes may be driven from any suitable part of the machine, as from the ink-drum of the inking apparatus I^1 by means of the gears 25, 26 and 27 indicated in dotted lines.

The tape-roller 23 is preferably mounted in suitable arms 28, which are mounted on a shaft 29 extending from which is a nut 30, in which is tapped a screw 31 journaled in a suitable framing, and having a hand-wheel 32. By this arrangement, the tension of the tapes 21 can be regulated to secure any desired bite on the paper.

From the feeding-out drum 20, the web passes up around a roller 33, and then to any suitable folding apparatus F, which may be a subsequent transverse

cutting and web-manipulating mechanism, as is well understood.

The invention can be easily applied to other forms of rotary web printing machines, as for example, to one in which a single printing couple of double width is used in connection with a web reverser or turner and transferrer. Thus all variation imparted to the web by the varying sizes and surfaces of the printing plates can be avoided.

The positively driven forwarding device 20 is so arranged that it will supply the proper length of web to the folder in the continuous operation of the machine, and is preferably adjusted to run slightly faster than the feeding-in drum 10, so as to keep a slight tension on the web between the said drums 10 and 20.

If any of the plates on the printing cylinders are a trifle too large, during the printing contact of the plates, a slight excess of tension will be put upon the web between the drum 10 and impression cylinders, and a slight decrease of tension between the impression cylinders and drum 20. This error will be compensated when the printing cylinders simultaneously present the margins between the plates to the impression cylinders by a slight adjustment of the web between the feeding-in drum 10 and the forwarding drum 20. On the other hand, if any of the plates should be slightly under size, the web between the feeding-in drum 10 and the impression cylinders will be put under a little less tension, and the web between the impression cylinders and forwarding drum 20 will be put under a little greater tension during the printing. This unequal tension will be rectified when the printing cylinders simultaneously present the margins between the plates to the impression cylinders by a slight adjustment of the tension between these two parts of the web. Thus errors caused by variances in the size of the plates will be corrected during the short non-impression periods. Thus any error can never become cumulative, and a constant supply of web to the folder is always maintained by the forwarding drum 20, independently of the irregularities in the size of the plates.

Irregularities in any one or more of the plates will be corrected by the above operation.

It will be noted that the web forwarding device has a fixed speed ratio with the printing machine whereby said forwarding device will furnish web at proper speed for further manipulation, and the corrections or adjustments will take place between the device which feeds the web to the printing mechanism and said web forwarding device. The web forwarding device is positively geared to keep this accurate and definite speed ratio with the printing machine.

The web-forwarding device can be arranged at any point in the travel of the web beyond the printing mechanism to supply the web for further manipulation at a correct and proper speed.

The web-forwarding device is usually placed between the folder and the printing machine, although part of the folding machine, as, for example, the positively geared nipping and drawing rolls at the nose of the former, can be used for this purpose.

The only requisite of the web-forwarding device is that it shall have a definite speed ratio with the printing machine and shall bite on the web beyond the printing machine in such manner as to correct the errors, in the way previously described, and to pass the web on at proper speed for further manipulation and that the web shall be led freely through the machine from the supply, that is, from the web feeding-in device (when that is used) to the web forwarding device, so that when the margins of the plate register the web will be released, so that the adjustment of the web previously described can take place.

Having thus fully described my invention, what I claim and desire to secure by Letters-Patent is:—

1. The combination with a rotary web-perfecting printing press in which the plates are set so that the margins will register and in which the web is led freely through the press so that when the margins of the plates register the web will be released, of a web forwarding device having a fixed speed ratio with said printing machine arranged to bite on the web coming from the printing machine and to forward the same for further manipulation at a constant speed.

2. The combination with a rotary web-perfecting printing machine in which the plates are set so that the margins will register and in which the web is led freely through the press so that when the margins of the plates register the web will be released, a folder, and a web forwarding device arranged between the printing machine and folder and having a fixed speed ratio with said printing machine and folder, whereby said forwarding device will furnish the web at proper speed to the folder.

3. The combination with a rotary web printing machine in which the plates are set so that the margins will register, of a folder, a web-feeding device between the web-roll and printing machine, and a web-forwarding device arranged between the printing machine and folder and having a fixed speed ratio with said printing machine and folder whereby said forwarding device will furnish the web at proper speed to the folder.

4. The combination with a rotary web-perfecting printing machine in which the plates are set so that the margins will register and in which the web is led freely through the machine so that when the margins of the plates register the web will be released, and a positively geared web forwarding device arranged between the printing machine and folder and having a fixed speed ratio with said printing machine and folder.

5. The combination with a rotary web perfecting printing machine in which the plates are set so that the margins between the same will register, of a folder, and a web-forwarding device consisting of a cylinder and co-acting tapes arranged between the printing machine and folder, said cylinder being geared to have a fixed speed ratio with said printing machine and folder.

6. The combination with a rotary web-perfecting printing machine in which the plates are set so that the margins will register, of a folder, a positively geared feeding-in device for feeding the web forward from the web roll to the printing machine, and a positively geared web forwarding device between the printing machine and folder.

7. The combination with a rotary web-perfecting printing press in which the plates are set so that the margins will register, a folder, a feeding in device for feeding the web forward from the web roll to the printing machine, and a web forwarding device for forwarding the web from the printing machine to the folder, the web passing freely from the web feeding device to the web forwarding device so that when the margins of the plates register the web will be released and adjusted between the web feeding device and web forwarding device.

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

P. A. WISE WOOD.

Witnesses:
HENRY W. COZZENS, Jr.
LOUISE PECKHAM.

870,210

Correction in Letters Patent No. 870,210.

It is hereby certified that in Letters Patent No. 870,210, granted November 5, 1907, upon the application of Henry A. Wise Wood, of New York, N. Y., for an improvement in "Rotary Web-Perfecting Printing Machines," an error appears in the printed specification requiring correction, as follows: In the heading to the specification the words and figures "Application filed October 16, 1907," should read *Application filed October 16, 1897*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 2nd day of June, A. D., 1908.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.