H. F. BECHMAN.

ROTARY CYLINDER WEB PRINTING PRESS.

APPLICATION FILED MAY 2, 1907.

916,408.

Patented Mar. 30, 1909.

2 SHEETS—SHEET 1.

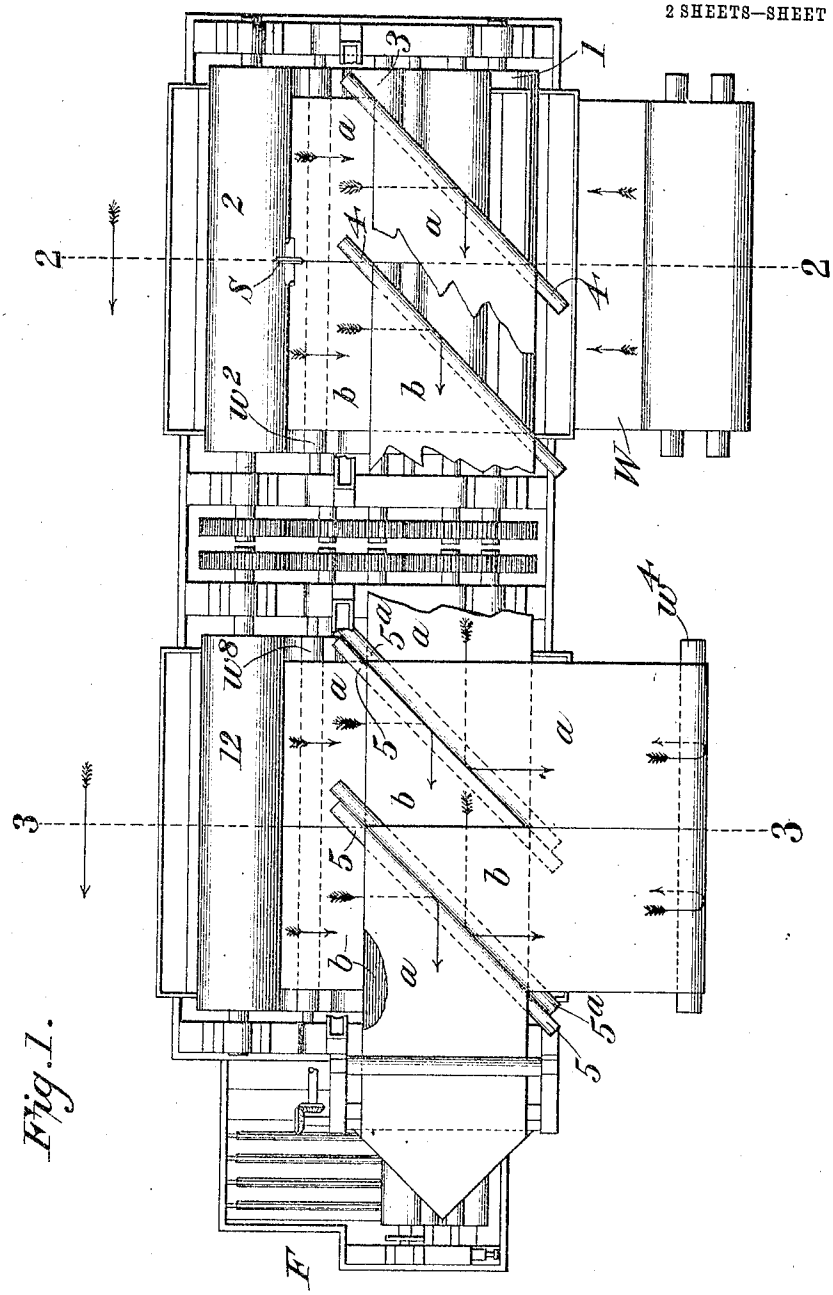


Fig. 1.

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Fig. 2.

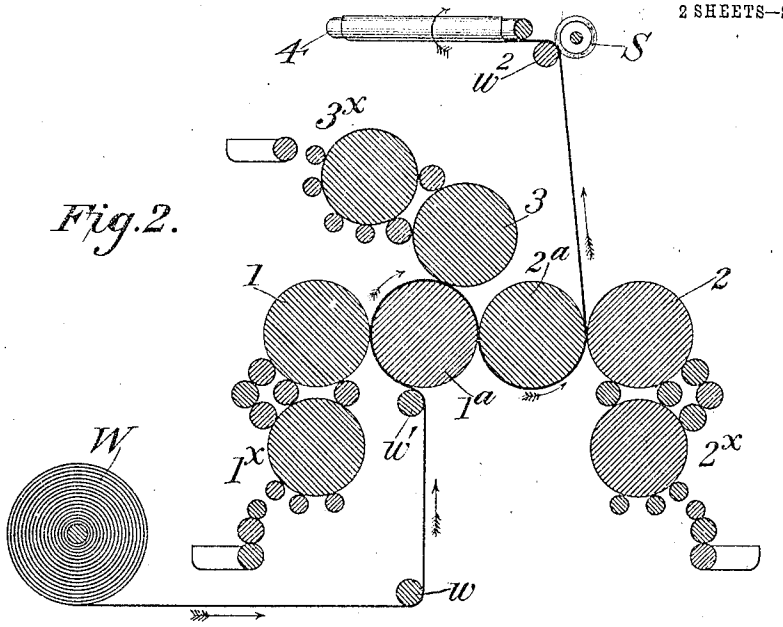
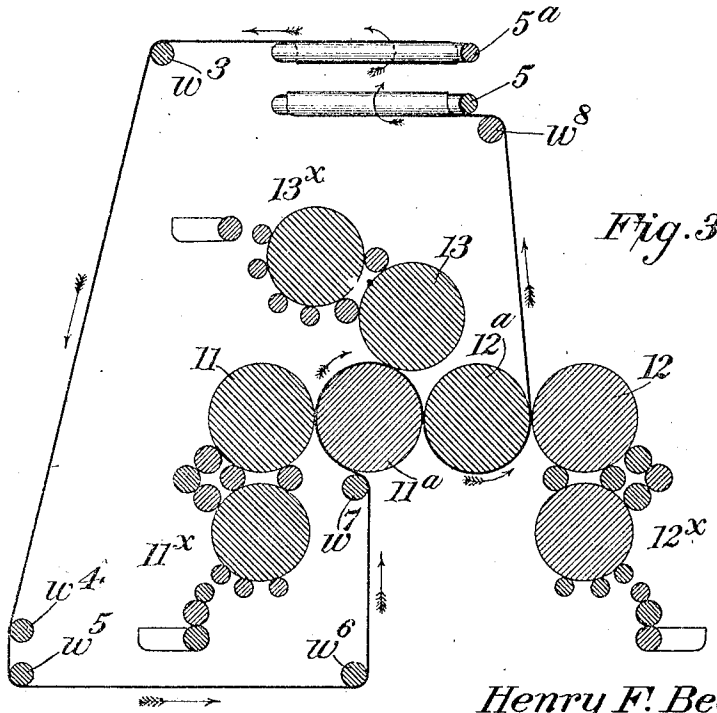


Fig. 3.



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UNITED STATES PATENT OFFICE.

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ROTARY-CYLINDER WEB-PRINTING PRESS.

No. 916,408. Specification of Letters Patent. Patented March 30, 1909.

Application filed May 2, 1907. Serial No. 371,490.

To all whom it may concern:

Be it known that I, HENRY F. BECHMAN, of Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Rotary-Cylinder Web-Printing Presses; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is an improvement in rotary cylinder web printing presses, and relates particularly to the press shown in my Patent No. 814,510, dated March 6, 1906, the object of the present invention being to enable such presses to produce multi-colored papers. A press of the size shown in my said patent if equipped with my present invention, can produce one 8-page or one 16-page paper with both sides printed in color, and by the addition of two extra plate cylinders and inking mechanisms it can produce one 8-page, or one 16-page, paper one side of which can be printed in three colors in addition to the black, and the other side of which can be printed in one color and black. The capacity of the press can be varied by varying the length of the plate cylinders, so that the invention is not limited to one 8-page, or a 16-page, press, and I simply mention that number of pages for convenience of explanation. The number of pages produced will depend entirely upon the number of plates that the cylinders are adapted to carry, and whether the plates are arranged for "straight run" or "collecting" methods of printing, and also upon the number of printing sections in the press. In the example shown the press has two such sections and I will now describe the invention with reference to the drawings which will enable the same to be clearly understood; and I refer to the claims for summaries of the arrangements and constructions of parts for which protection is desired.

The invention, I remark, embodies a novel method of and means for threading the press, and other novel details which will be hereinafter referred to.

In the drawings—Figure 1 is a plan view of the complete machine threaded, the web being broken away in parts to more clearly indicate the leads of the webs; Fig. 2 is a diagrammatical transverse-section of the press on the line 2—2, Fig. 1; and Fig. 3 is a similar section on the line 3—3, Fig. 1.

As shown the press has two main sets of perfecting mechanisms, each comprising two plate cylinders and co-acting impression cylinders which are arranged side by side at a substantially horizontal plane, all the cylinders extending longitudinally of the press and the cylinders in the adjacent perfecting mechanisms being arranged end to end and extending longitudinally of the press, as in my patent aforesaid. Above and co-acting with one of the impression cylinders in each perfecting mechanism is a third plate cylinder.

The plate cylinders in what I term the first perfecting mechanism are designated as 1, 2 and 3, and the impression cylinders are designated by 1^a and 2^a, the plate cylinders 1 and 3 co-acting with the impression cylinder 1^a. The plate cylinders in the second perfecting mechanism are designated by 11, 12 and 13, and the impression cylinders by 11^a, 12^a; the plate cylinders 11 and 13 both co-acting with the impression cylinder 11^a. Each plate cylinder is provided with an inking-system, designated by 1^x, 2^x, 3^x, 11^x, 12^x and 13^x; these inking mechanisms are preferably constructed as shown and described in my Patent No. 823,098, dated June 12, 1906, and need no particular description herein, they being adapted to supply ink to the plates on the respective plate cylinders. Above the first perfecting mechanism are arranged a pair of angle-bars 4, while above the second perfecting mechanism are placed a duplicate set of angle-bars 5 and 5^a, the bars 5^a being parallel with and directly above bars 5.

All the cylinders should be intergeared and driven in unison, substantially as in my patent aforesaid, and it will facilitate understanding the arrangement of the web guides in the multi-color press by referring to Figs. 2 and 3, and following the course of the webs through the press as shown therein. The web W is led in, from a roll at one side of the machine, over the stationary guide w below the first perfecting mechanism, then up over the guide w' and between cylinders 1, and 1^a, and 1^a, and 3; then down between cylinders 1^a and 2^a; up between cylinders 2, and 2^a; then over

guide w^2. The web, it will be observed, being printed twice on one side by cylinders 1, and 1^a and 3, and 1^a, and then perfected on the opposite side by cylinders 2, and 2^a. If cylinders 1 and 2 print in black, the cylinder 3 may supply a color so that the product of the first perfecting mechanism could be an 8-page or a 16-page paper perfected in black and with one color additional on one side.

The web is preferably divided longitudinally by a slitter S located adjacent the guide w^2, and is led from said guide to and over the angle-bars 4 by which the halves of the web are given a quarter-turn and brought into line and are then led longitudinally of the press, to and over the second perfecting mechanism; or, if desired, they could be led directly to a folder F, which is shown in this instance as located at the end of the press.

Assuming that more colors are desired on the paper, the split halves (a, b,) of the web after being led to and above the second perfecting mechanism are turned over upper angle-bars 5^a, and led out over a guide roller w^3, down over guides w^4 and w^5, beside the second perfecting mechanism, and then led in under said mechanism to and over guides w^6 and w^7, and then passed between cylinders 11 and 11^a; then between cylinders 11^a and 13: then down between cylinders 11^a and 12^a: then up between cylinders 12 and 12^a to a guide roller w^8, and then to and over lower angle-bars 5, and thence passed, longitudinally of the press, to the folder, as indicated in Fig. 1. In passing through the second perfecting mechanism, the previously printed webs (a, b,) may receive two more impressions on one side in colors from the plate cylinders 11 and 13, and another impression in color on the opposite side from the plate cylinder 12, so that in the arrangement shown, 8 pages or 16 pages could be printed in black and three colors on one side, and in black and one color on the opposite side.

The foregoing arrangement of black and colors is based upon the assumption that the fountains 1^x and 2^x supply black ink and the other fountains different colors; but other desired arrangement of colors may be impressed upon the webs by supplying colored inks to the fountains as desired.

The folder is, for convenience, located at the end of the press, but obviously it could be located elsewhere, at the side of the press if desired, and the web could be easily led in a reverse direction over guides w^8 to a folder at the side of the press, if desired.

Obviously by the described means and method of threading the web through the press, a paper could be printed in black and in two colors without using the cylinders 3 and 13, and when it is not desired to print to the full capacity of the press in colors, one or more of the plate cylinders can obviously be put out of effective operation by omitting the plates and ink.

Each section of the press could be used to print a paper in black and one color by threading each section as shown in Fig. 2 and running the web directly to the folder. It is obvious that with the construction shown in the drawings a great variety of multi-colored papers can be produced at each operation of the machine.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. The combination of a plurality of perfecting mechanisms, each comprising a plurality of plate cylinders and co-acting impression cylinders arranged longitudinally of the press, the perfecting mechanisms being arranged substantially end to end and closely adjacent, a folding mechanism, a slitter and web guides and angle-bars adjacent each mechanism, whereby a web of paper may be led successively between the plate and impression cylinders in one mechanism and then slit and its halves directed to and between the plate and impression cylinders of the adjacent mechanism, and then to the folder.

2. In a rotary printing press, the combination of a plurality of perfecting mechanisms, arranged end to end each comprising three plate cylinders and two impression cylinders coacting with the plate cylinders, all the cylinders being arranged longitudinally of the press; a folding mechanism; a slitter angle-bars arranged above each perfecting mechanism, and web guides whereby a web of paper may be directed successively between the plate and impression cylinders in each perfecting mechanism to be printed twice in muti-color, substantially as set forth.

3. The combination of two sets of perfecting mechanism arranged end to end, all the cylinders extending longitudinally of the press, a folding mechanism, web guides for directing a web of paper through the first perfecting mechanism, a slitter angle-bars above the first perfecting mechanism whereby the slit web is directed to the second perfecting mechanism, angle-bars above the second perfecting mechanism whereby the slit web is directed to one side of the said second perfecting mechanism, guides for leading the deflected slit web back into and through the second perfecting mechanism, and guides for leading the twice printed web from the second perfecting mechanism to the folding mechanism.

4. The combination of two sets of printing mechanisms arranged end to end, all the cylinders extending longitudinally of the press; and a folder with web guides for

directing a web of paper through the first printing mechanism, a slitter and angle-bars above the first printing mechanism whereby the web is slit and directed longitudinally of the press to the second printing mechanism, angle-bars above the second printing mechanism whereby the slit web is directed to one side of the said second printing mechanism, guides for leading the deflected slit web back into and through the second printing mechanism, and a second set of angle-bars above the second printing mechanism by which the twice printed slit web is directed to the folder.

5. In a multi-color rotary printing press, the combination of a plurality of multi-color printing mechanisms, arranged end to end and each comprising plate cylinders and co-acting impression cylinders; with guides for directing a web of paper to and between the cylinders in the first printing mechanism, a slitter and angle-bars above the first printing mechanism over which the slit web can be given a quarter-turn and led to the second printing mechanism, a set of angle-bars above the second printing mechanism over which the slit web may be given a quarter-turn and led to one side of such mechanism, guides for directing the deflected web back to and through the second printing mechanism, and a second set of angle-bars above the second printing mechanism over which the twice printed web can be turned and directed to the folder, and a folder at the end of the press.

6. In a multi-color rotary printing press, the combination of two sets of printing mechanisms each comprising three plate cylinders and two co-acting impression cylinders, all the cylinders being arranged longitudinally of the press, and the printing mechanisms being closely adjacent; with guides for directing a web of paper to and between the cylinders in the first printing mechanism, means for slitting the web, angle-bars above the first printing mechanism over which the slit web can be given a quarter-turn and led to the second printing mechanism, a set of angle-bars above the second printing mechanism over which the web may be given a quarter-turn and led to one side of such mechanism, guides for directing the deflected web back to and through the second printing mechanism to be printed in colors, a second set of angle-bars above the second printing mechanism over which the twice printed web can be turned and directed to the folder, and a folder at the end of the press.

In testimony that I claim the foregoing as my own, I affix my signature in presence of two witnesses.

HENRY F. BECHMAN.

Witnesses:
F. W. DUNNING,
GUY H. FENN.