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E. BRINKMANN

MULTICOLOR PRINTING ON ROTARY PRESSES

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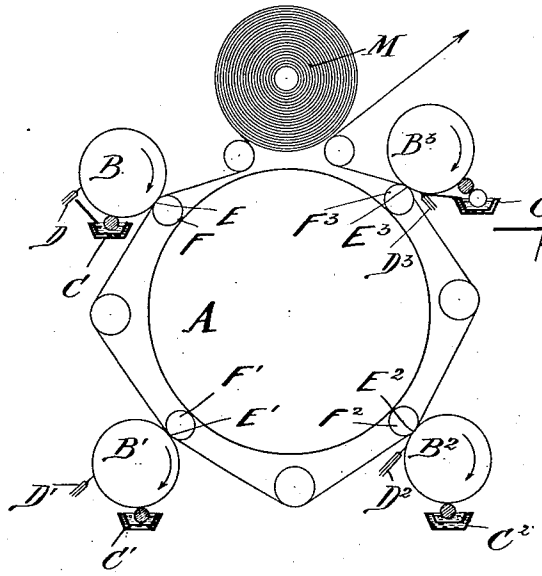

FIG. 1.

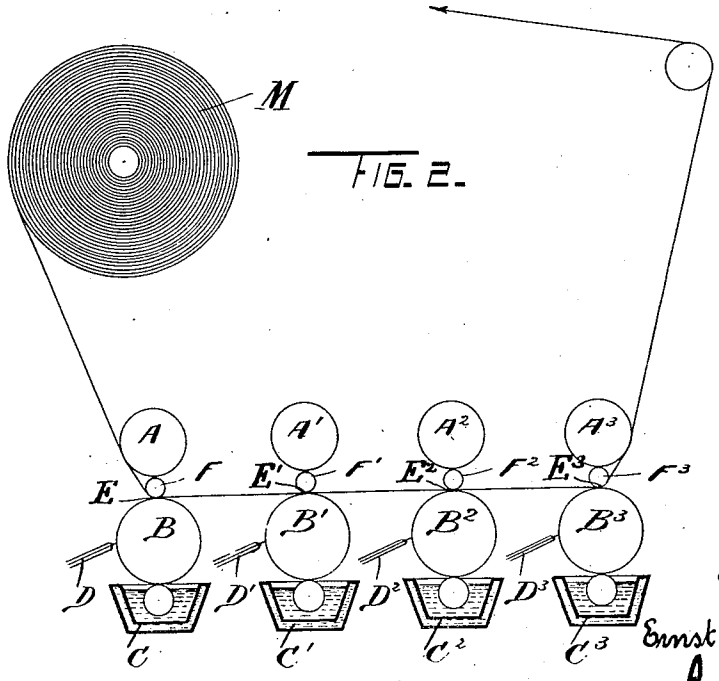

FIG. 2.

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UNITED STATES PATENT OFFICE.

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MULTICOLOR PRINTING ON ROTARY PRESSES.

Application filed March 21, 1923, Serial No. 626,656, and in Germany March 18, 1922.

My invention relates to multicolor printing on web and other rotary presses and more particularly to the printing of three color intaglio illustrations combined with a text and to the products obtained thereby. It is an object of my invention to facilitate the production and to improve the quality of the products.

Up till now three color intaglio illustrations combined with a continuous intaglio text for large circulation in the form of prospectuses, newspapers, journals or periodicals and the like, have not yet been produced on web presses, but the illustrations and the text have been printed in one color, both simultaneously and from the same form cylinder. This manner of proceeding is impracticable in the case of multicolor intaglio printing as it is not possible, especially with large form cylinders to transfer the very fine type on all form cylinders so accurately that they are in perfect register when printed upon one another. However, absolute accuracy is indispensable if a clear, purely black and easily readable type shall be obtained. If any of the separated colors, for instance, with the three-color process, the red or the yellow ink, project in one direction, the composition looks unsteady and indistinct. A printed sheet showing an unclear print, difficult to read would not find favor with the public in spite of excellent multicolor illustrations. The idea of printing the types in any of the separated colors is impracticable, inasmuch as, apart from the fact that a colored text could not be read as easily as a black one, the respective color would be taken off by all of the high, non-engraved parts of all subsequent form-cylinders, and other detrimental consequences would be met with, as shall be described hereinafter.

Besides the difficulty of transferring the print on the form cylinders with perfectly registering contours, also other inaccuracies in the registration may occur during the printing caused, for instance, by stretching in the material to be printed on which cannot always be obviated or removed by means of a drying device, such as a drying drum inserted between the reel (web) and the first form cylinder, and therefore a special form cylinder for the text is indispensable. Although this idea seems obvious it has not proved feasible if the procedure is carried through in the manner hitherto practiced in monochrome intaglio, viz, printing first the illustrations in intaglio and thereafter the text in letter press, this mode of proceeding is not possible in multicolor intaglio. If the text cylinder is inserted as last form cylinder, no clean illustration printing can be attained as with the succesive imprints of the several part colors which are printed one above the other within a few seconds, frequently even in a fraction of a second, the finished multicolor print would not be dried sufficiently, in spite of the drying device, before coming in contact with the text form cylinder, whereby the finished illustration print would be blotted, and quashed by the projecting non-engraved parts of the text form cylinder. Furthermore, the color inks of the illustration prints remaining on the text form cylinder would mix with the text ink whenever the cylinder were freshly inked whereby the ink would be spoilt in the course of time. Although this might seem tolerable to a certain degree as regards text printing, such mixing of colors would prove very troublesome if the text form cylinder were used at the same time for the printing of monochrome illustrations, either for the sake of economy or in order to save time in the case of latest illustrations arriving at the last moment or for the sake of variety in order to enhance the effect of the colored illustrations by monochrome pictures distributed therebetween.

By the method of printing according to the present invention all the above-mentioned difficulties are obviated. The novel method consists in using for the text a special form cylinder and placing it in the printing press in such a manner that it prints the text first, before the multicolor illustrations are printed from the following illustration form cylinders.

This method of first printing the text from a special cylinder can be used as well in connection with printing presses having different form cylinders arranged around one impression cylinder, as with high-speed presses where the printing sets are arranged in series and each form cylinder co-operates with an impression cylinder of its own. It can, however, be employed also in connection with all other methods of printing of text and multicolor illustrations, such as offset printing, where similar conditions prevail.

In presses with one impression cylinder

the arrangement of the text form cylinder in front of the illustration cylinders presents the further advantage that this printing device which, owing to the position of its inking mechanism and doctor-knife, is located unfavorably with respect to the place of printing is not used for a part-color of the multicolor illustrations, as on the long way between the doctor-knife and the place of impression a partial drying of the ink in the engraving is unavoidable, whereby the quality of the print is of inferior value. In contradistinction thereto the ink for printing the text can be prepared in such a manner that the long way between the doctor-knife and the place of impression has no influence on the quality of the work, water colors being best suited for the purpose. The consistency of the printing inks for the part-color-form-cylinders must, however, be approximately the same; this is best attained if oil colors are used.

In order to prevent the printing ink from undergoing changes during the printing procedure, for instance if the inks show a tendency of thickening in case the drying devices act too rapidly, it is preferable to use ink basins of a size not larger than absolutely necessary, and to provide for a continuous ink supply from larger ink reservoirs regulated automatically according to the working of the press, the basins being further provided with a double-walled bottom for the circulation of water in order to prevent an undesirable increase of the temperature of the contents.

Two different kinds of presses arranged for carrying out the invention are shown diagrammatically by way of example in the accompanying drawing in which

Figure 1 is a side view of a press with one impression cylinder, and

Figure 2 is a side view of a high speed printing machine according to this invention.

Referring to Figure 1, A is the impression cylinder, B is the text form cylinder, B_1, B_2, B_3 are the illustration form cylinders, C, C_1, C_2, C_3 are the double walled ink basins, D, D_1, D_2, D_3 are the doctor-knives, E, E_1, E_2, E_3 are the places of impression, F, F_1, F_2, F_3 are resilient, intermediate cylinders, M is the roll of material to be printed on.

Referring to Figure 2, A, A_1, A_2, A_3 are the impression cylinders, B is the text form cylinder, B_1, B_2, B_3 are the illustration form cylinders, C, C_1, C_2, C_3 are the double walled ink basins, D, D_1, D_2, D_3 are the doctor-knives, E, E_1, E_2, E_3 are the places of impression, F, F_1, F_2, F_3 are resilient intermediate cylinders and M is the roll of material to be printed on.

The above shows that, according to the present invention, all kinds of printed matter designed for large circulation, such as the illustrated Sunday supplements of daily newspapers, illustrated periodicals, prospectuses and the like can be produced on rotary web presses as well as on sheet fed machines by pure intaglio printing of both the text and the multicolor and more especially tricolor illustrations, in contradistinction to mixed intaglio and letter-press printing as hitherto proposed.

The invention is further applicable not only to one-sided printing, but also to the first and perfecting impression.

I wish it to be understood that I do not desire to be limited to the exact sequence of operations nor to the details of construction above described, for obvious modifications will occur to a person skilled in the art.

I claim:

1. Rotary press for multicolor printing comprising in combination a particular intaglio text form cylinder, a water ink supply therefor, and a plurality of intaglio illustration form cylinders for the part-colors, said text form-cylinder being arranged in front of said separate color cylinders with respect to the web.

2. Rotary press for multicolor printing comprising in combination a particular intaglio text form cylinder, a water ink supply therefor, and a plurality of intaglio illustration form cylinders for the separate colors, oil ink supplies therefor, said text form cylinder being arranged in front of said color cylinders with respect to the web.

3. In the art of multicolor intaglio printing, the printing of the text by the intaglio method, and thereafter separately printing the illustrations in multicolor by the intaglio method.

4. In the art of multicolor intaglio printing, the printing of the text by the intaglio method in one color, and successively thereafter the illustrations in tricolor by the intaglio method.

5. In the art of multicolor intaglio printing, the printing of the text first by the intaglio method in one type of ink, and thereafter printing the illustrations in multicolor by the intaglio method in an ink repellent to that used for the text printing.

6. Rotary press for multicolor intaglio printing comprising in combination a particular intaglio text form cylinder and a plurality of intaglio illustration form cylinders for the separate color, said text form cylinder being arranged in front of said color cylinders with respect to the web.

In testimony whereof I affix my signature.

ERNST BRINKMANN.