

A. H. SMITH.  
 METHOD OF MAKING MULTICOLOR PRINTS.  
 APPLICATION FILED MAY 13, 1915.

1,294,718.

Patented Feb. 18, 1919.

Fig. 1.

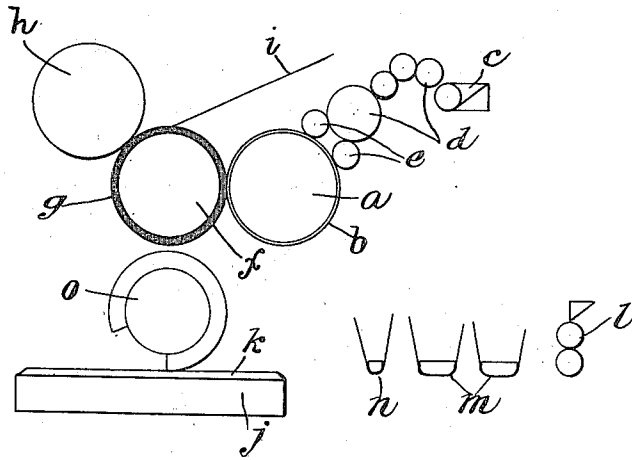
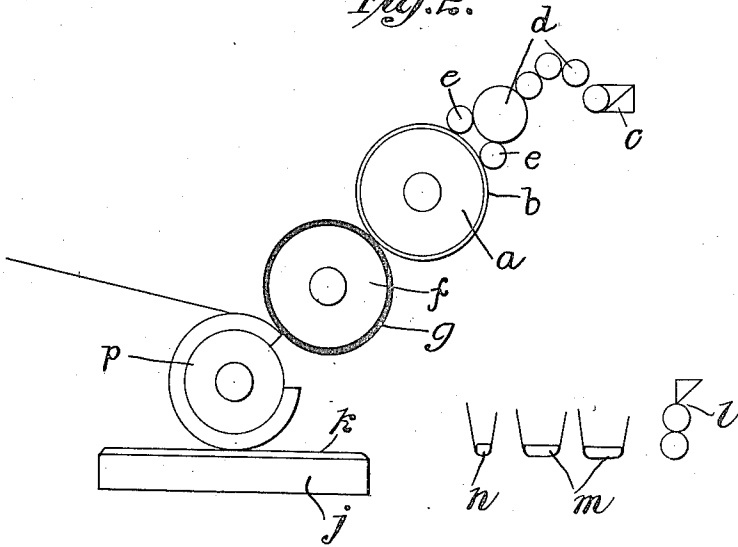


Fig. 2.



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# UNITED STATES PATENT OFFICE.

AMOS H. SMITH, OF NEW YORK, N. Y., ASSIGNOR TO AMERICAN BANK NOTE COMPANY,  
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## METHOD OF MAKING MULTICOLOR PRINTS.

1,294,718.

Specification of Letters Patent. Patented Feb. 18, 1919.

Application filed May 13, 1915. Serial No. 27,773.

*To all whom it may concern:*

Be it known that I, AMOS H. SMITH, a citizen of the United States, residing at the borough of Bronx, city of New York, county of Bronx, and State of New York, have invented certain new and useful Improvements in the Methods of Making Multicolor Prints, of which the following is a specification, reference being had therein to the accompanying drawings, which form a part thereof.

My invention relates to a method of making multi-color prints and more particularly to a method by which certain effects secured by different printing methods may be secured during a single run of the sheet to be printed.

My invention is particularly adapted for producing work having a background tint and matter superimposed thereon in a contrasting tone or color. Heretofore the commercial practice in producing work of this character has been to first make an impression upon the paper from a planographic or cameo printing surface, bearing thereon a design having a tint effect, or from a transfer surface upon which the design of such tinted plate has been offset. Where the printing has been directly from the tinted planographic surface, dampened sheets of paper have been used but when printing from an offset surface or from a cameo printing surface, dry paper has been used. After this impression of the tint has been made upon the paper, the paper is allowed to stand until the ink is dry and subsequently it was run through a second press having a printing surface consisting of an engraved, intaglio or undersurface printing plate. This class of work is usually employed in the production of "safety" papers, such as bank-notes, checks, bonds, stock certificates, drafts, coupons and other negotiable instruments.

When the tint effect is printed upon dry paper, it has been necessary to dampen this paper before making the impression thereon from the engraved, intaglio or undersurface printing plate; and when the tint

effect is impressed upon the paper by a planographic surface, it has been necessary to re-dampen the paper before making an impression thereon by means of the engraved, intaglio or undersurface plate. Hence, by the old method, each impression upon the paper was made under different conditions and in making the impression from the engraved, intaglio or undersurface plate great care was necessary to secure accurate register, and uniformity, in the product.

To obviate the difficulties of the existing practices, it has been suggested that paper of this character be printed at a single impression, this proposed method or art involving the offsetting of the tinted design upon the non-printing surface of the engraved, intaglio or undersurface plate and the making of a single multi-color impression from this plate upon the paper. While this method has its advantages as compared with the methods usually practised, it is subject to the criticism that it entails the practice of different printing methods under those conditions particularly adapted to but one of these methods. The conditions surrounding the printing from an engraved, intaglio or undersurface plate differ radically and fundamentally from the conditions present in printing from an ordinary cameo printing surface or from a planographic surface, not only as to pressures and speeds but as to the nature of the ink employed. Hence, the best results cannot be secured by means of this proposed method.

By extensive experiments, I have determined that it is not essential in producing the so-called "safety" papers to allow the tint impression to dry before making the superimposed impression thereon from the engraved, intaglio or undersurface plate, nor to make these impressions simultaneously; but that paper of this character can be successfully produced by a continuous method wherein the tinted background is impressed upon dampened paper conditioned for use in connection

with an engraved, intaglio or undersurface plate and the impression from an engraved, intaglio or undersurface plate is superimposed thereon immediately thereafter. By this method the background may be printed under those conditions particularly adapted to the printing method employed in making the background impression, and the impression from the engraved, intaglio or undersurface plate may be made under those conditions particularly adapted for this method of printing. At the same time, although, impressions under the two methods are made successively, the time element is identical with that of the single impression method, and has the same advantages over the methods now practised, as a single impression method would.

By my present invention, I make the impression of the tint design in a manner to preclude possibility of any excess quantity of ink upon the paper, by the utilization of a printing surface upon which the tinted design is offset. By this method, I secure all the advantages of the offset method of printing and avoid likelihood of the surface bearing the tint design picking fibers from the paper or otherwise disturbing its surface.

The invention consists primarily in the method or art of making multi-color prints consisting in inking a surface having a tint design thereon, offsetting said tint design from said surface to an elastic printing surface, preparing a printing surface having a design thereon to be superimposed upon said tint design, and making impressions upon the paper, first from said elastic surface, and immediately thereafter from said other inking surface; and in such other novel steps and practices as are hereinafter set forth and described and more particularly pointed out in the claims hereto appended.

In the accompanying drawings, I have shown diagrammatically two forms of apparatus which may be used in the practice of my method or art.

Referring to the drawings:—

Figure 1 is illustrative of one form of apparatus capable of use in the practice of my method or art wherein the printing surface bearing the tint design, and the other printing surface, each has associated therewith, an independent impression cylinder or D-roll;

Fig. 2 is a modification thereof wherein a single D-roll or impression cylinder, common to both of the printing surfaces, is used.

Like letters refer to like parts in both of the said views.

In both forms of the apparatus illustrated, I have shown the engraved, intaglio or undersurface printing surface as being a flat plate, although if desired, a curved plate

upon a form cylinder may be used instead of this flat plate and the horizontally movable bed.

In the practice of the method or art of this application, I first ink a plate bearing a tint design and then offset this design upon an elastic printing surface. I then prepare a second printing surface which is preferably an engraved, intaglio or undersurface plate by inking, wiping and polishing said plate. The inks used may be of contrasting colors or tones and the character of the ink used upon the elastic printing surface and upon the other printing surface should be that required for the particular method of printing in connection with which each of said printing surfaces is used. When the elastic printing surface and the other printing surface have been thus prepared an impression is made upon a dampened sheet of paper first from the said elastic printing surface and immediately thereafter from the engraved, intaglio or undersurface printing plate without removing the paper from the apparatus or allowing it, or the ink of the first impression, to dry sufficiently to allow such shrinkage of the paper as to require redampening thereof before making the second impression.

In this manner the register in the two impressions results from the make ready of the machine and is not dependent in any way upon the condition of the paper.

I have found that by making the tinted impression first, the desired delicate background may be secured and the subsequent impression from the undersurface printing plate does not in any way interfere with the tinted impression. If desired, the design upon the tinted printing surface may be such as to leave blank spaces for the matter to be superimposed thereon.

These conditions result from the well-known fact that in making a tinted impression, the surface of the paper remains perfectly smooth which is not the case when printing from an undersurface plate.

By making consecutive impressions, the tinted impression may be made with comparatively light pressures while the impression from the undersurface printing plate, may be made with a relatively greater pressure such as is required in this method of printing.

Referring to Fig. 1 of the accompanying drawings, *a* represents a form cylinder carrying a printing surface *b* having thereon a tinted design which may be made by means of a pantographic machine, photo-engraving or any other desired or well-known method. Preferably this design will present a cameo printing surface inked from an inking mechanism comprising an inking fountain *c*, distributing rollers *d* and inking rollers *e*.

At *f* I have shown a second cylinder having thereon an elastic surface *g* from which the design upon the plate *b* is offset. Co-operating with the elastic printing surface *g* is an impression cylinder *h* adjacent which is a feed shelf *i*.

At *j* I have shown a support for an engraved, intaglio or undersurface printing plate *k* which support has associated therewith an inking mechanism *l*, a wiping mechanism *m* and a polishing mechanism *n*.

Also associated with the support *j* and adapted to cooperate with the plate *k* thereon is a D-roll *o* adapted to receive the paper from the elastic printing surface *g*, after the first impression has been made thereon, and bring said paper in contact with the plate *k*.

In the modification shown in Fig. 2 the printing surfaces and the mechanisms for preparing them are the same as that shown in Fig. 1, the sole difference being that in the apparatus used in the practice of the method or art shown in Fig. 2, a single D-roll or impression cylinder *p* cooperating with both the elastic printing surface *g* and the plate *k* is employed.

In both forms of apparatus shown, however, it will be observed the paper is printed by a continuous method; that multi-color prints are secured by a single run of the paper through the machine and that the impressions will be made under exactly the same conditions as to the paper. By using a D-roll or impression cylinder *o* for removing the paper from the elastic printing surface *g* instead of from the impression cylinder or D-roll *h*, the succeeding impressions are superimposed one upon the other without the necessity for reversing the sheet.

I am aware that in some three-color methods, successive impressions have been made from a plurality of photoengraved plates upon succeeding cylinders, but in this type of work but one printing method is employed and the conditions are not such as are found in high class commercial printing.

My invention is distinguished from the ordinary three-color printing method, in that I am enabled to secure multi-color work by means of radically and fundamentally different printing methods and under conditions which are not found in the ordinary three-color methods, such as differences in the character of the ink, in the character of the printing surface and in the pressures to which the paper must be subjected to secure the desired character or impression.

By my invention, I am enabled to produce, by a continuous method, a completed print having a tinted background, the qualities of which will equal that produced by the methods now being used and which have been referred to above. By this method I avoid all likelihood of a loss of register and

am enabled to produce completed work in much less time than that required by the methods at present practised.

It is not my intention in the present application to broadly claim the method or art of making tinted multi-color impressions consisting in first making the tinted impression and then immediately thereafter superimposing thereon an impression from an engraved, intaglio or undersurface printing plate, such being made the subject matter of an application filed simultaneously herewith Serial No. 27,772.

Having described the invention what I claim as new and desire to have protected by Letters Patent is:—

1. The method or art of making multi-color prints consisting in inking a surface having a tint design thereon, offsetting said tint design from said surface to an elastic printing surface, preparing an engraved, intaglio or under-surface printing plate having a design thereon to be superimposed upon said tint design, making impressions upon the paper, first under light pressure from said elastic surface and immediately thereafter under relatively greater pressure from, said printing plate.

2. The method or art of making multi-color prints consisting in inking a surface having a tint design thereon, offsetting said tint design from said surface to an elastic printing surface, inking, wiping and polishing an engraved, intaglio or undersurface plate having a design thereon to be superimposed upon said tint design and making impressions upon the paper, first under light pressure from said elastic surface and immediately thereafter under relatively greater pressure from said engraved, intaglio or undersurface printing plates.

3. The method or art of making multi-color prints, consisting in inking a cameo printing surface bearing a tint design thereon, offsetting said tint design from said plate to an elastic printing surface, inking, wiping and polishing an engraved, intaglio or undersurface printing plate and making impressions upon the paper, first from said elastic printing surface bearing the tint design and immediately thereafter from said engraved, intaglio or undersurface printing plate, the said paper being subjected to different pressures when making said impressions respectively, the pressure upon the last named impression being relatively greater than upon the first impression.

4. The method or art of making multi-color prints consisting in inking a surface having a tint design thereon, offsetting said tint design from said surface to an elastic printing surface, preparing an engraved, intaglio or under-surface printing plate having a design thereon to be superimposed

upon said tint design, making impressions upon the dampened paper, first under light pressure from said elastic surface and immediately thereafter under relatively greater pressure from said printing plate.

5 In witness whereof I have hereunto affixed my signature in the presence of two sub-

scribing witnesses, this 23d day of April, 1915.

AMOS H. SMITH.

Witnesses:  
 JUDITH PARDEE,  
 CLARICE FRANK.