

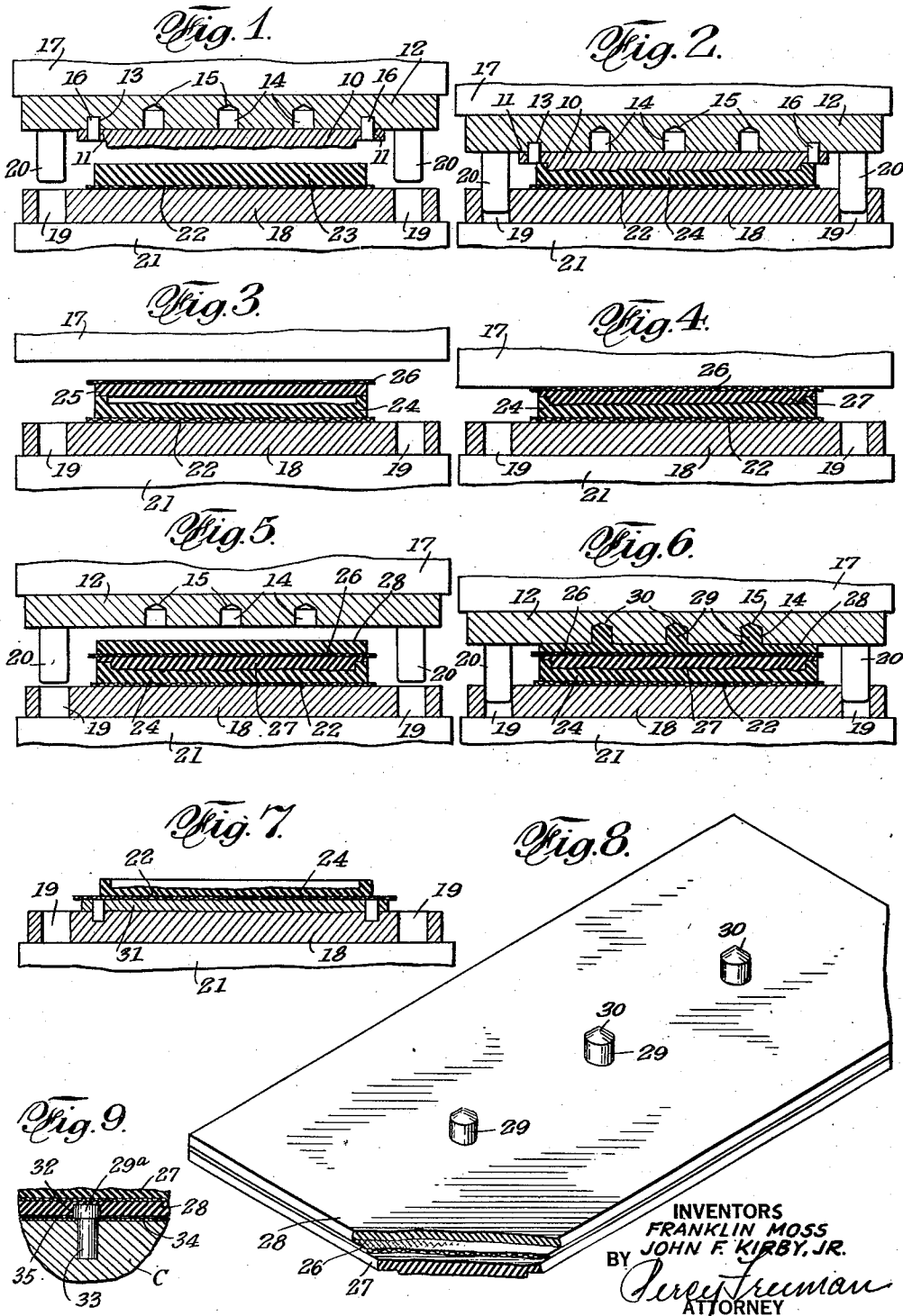
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METHOD OF MAKING RUBBER PRINTING PLATES

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METHOD OF MAKING RUBBER PRINTING PLATES

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9 Claims. (Cl. 101-401.1)

This invention relates to a method for producing printing plates of rubber or like material.

It is a general object of the invention to provide a method for making rubber printing plates whereby the resultant product may be employed to give good printing results and whereby perfect printing register may be obtained among a plurality of such plates when used for multi-color printing. Another object of the invention is to provide a method whereby a printing plate is produced which is non-shrinkable and non-distortable so that true reproduction of the subject matter to be printed, may be obtained.

Another object of the invention is to provide a method for producing rubber printing plates which are provided with means whereby exact positioning of said plate upon a press may be obtained so that hair line register in multi-color printing may be obtained.

The invention also seeks to provide a novel form of printing plate of laminated construction to obviate stretch and shrinkage, and which is provided with means for obtaining accurate registry location of said plate in a printing press.

The foregoing objects and the features and advantages of the invention will be hereafter more clearly pointed out or will become apparent from the following detailed description of the invention, said description having basis on the accompanying drawing which illustrates a preferred embodiment as at present conceived.

In the drawing:

Figs. 1-6 inclusive are cross-sectional views illustrating the steps of the method for obtaining a printing plate such as contemplated herein.

Fig. 7 is a similar view illustrating an alternate step in the method.

Fig. 8 is a broken perspective view of a printing plate produced by the method shown in Figs. 1-7.

Fig. 9 is a fragmentary detail sectional view illustrating an alternate form of means for mounting the printing plate upon a press cylinder.

In that form of the invention which is illustrated in Figs. 1 to 6, a metal photo-engraving is produced in the usual way from a drawing or photograph, and is represented at 10. These plates, usually of zinc, are preferably provided with standard Vandercook or similar register marks as may be well understood. In the present instance, it is preferred to drill the holes 11 at the center of these register marks.

The zinc plate thus provided is then placed upon a moulding plate such as 12, and the holes 11 employed to guide the forming of similar registering holes 13 therein. The zinc plate 10 is then removed and the new holes 13 are used to guide the drilling of holes 14. The latter holes are preferably drilled to obtain the conical end seats 15 and are preferably located along a line drawn through the centers of the holes 13.

The zinc plate 10 is then replaced upon the moulding plate 12 and secured thereto as by pins 16 in the registered holes 11 and 13 and the assembly thus provided placed in a press and preferably secured to the ram 17 thereof.

A second moulding plate 18 is provided for association with a moulding plate 12, one of said moulding plates being provided with openings 19 and the other with cooperating pins 20 so that telescopic engagement therebetween may be had. The plate 18 is then mounted in the press and preferably on the platen 21 thereof.

The two moulding plates and the zinc plate 10 are first employed for forming a matrix which represents the reverse of the material on the zinc plate. In the present instance, the matrix is preferably formed of plastic material such as Bakelite and is accomplished in the following manner:

A bonding sheet 22 is cemented to the moulding plate 18 and thereupon a matrix sheet 23, preferably of a phenolic resin compound, is placed. The press is then closed to cause the zinc plate 10 to impress its image in the matrix sheet. This is best seen in Fig. 2 wherein, in addition to pressure, heat is also applied. The matrix 24, being now formed, and the matrix sheet bonded to the bonding sheet 22 by the mentioned heat and pressure, the press is opened.

After the matrix 24 is formed, the upper moulding plate 12 is removed leaving the moulding plate 18 with the matrix thereon. A sheet of rubber 25 is then placed over the matrix to cover the same and a fabric sheet 26 superimposed on said rubber sheet as shown in Fig. 3. Press pressure and heat are then applied to cause the rubber sheet to be forced into the matrix to be formed into the printing sheet 27. This condition is shown in Fig. 4.

The press parts are again separated, the moulding plate 12 replaced, and a second rubber sheet 28 placed upon the fabric sheet 26, as seen in Fig. 5. The press is again closed and the second sheet 28 will be compressed to become bonded to the fabric sheet 26 and so that portions of said sheet 28 will be forced into the holes

14 in the moulding plate 12, to form projections 29 having conical ends 30 formed by the conical end seats 15. Fig. 6 shows this condition.

The printing plate thus produced comprises the printing sheet or layer 27, a backing sheet or layer 28, and an intermediate fabric sheet 26, bonded to each other by the heat and pressure applied by the press. The fabric sheet 26 is provided to prevent undue shrinkage of the plate thus formed during curing thereof and provides an article which may be easily handled without danger of undue distortion. The projections 29 formed on the backing sheet 28 provide means for obtaining perfect hair line registration and location of the printing plate thus formed on any roller or bed provided with holes for their reception. The conical ends 30 allow for easier insertion of the projections into the holes in the press. Should these provisions not be made in a press, then a jig in which such holes are formed, may be employed for mounting the printing plate on a press.

The moulding plates 12 and 18 may now be used for making other printing plates for registering colors of a multi-color printing job. Thus, starting with a new zinc plate 10, a matrix for the new color plate may be formed, and then the color plate itself. Each new plate will be provided with projections 29 and assurance is had that when mounted in a printing press, the impressions of all of the plates will have perfect register.

It will be noted that the matrix 24 is bonded to the moulding plate 18. In order to facilitate ready removal thereof, and perhaps for future use, an adapter plate 31 may be interposed as shown in Fig. 7. This latter plate may be removably mounted on the moulding plate 18 in a manner similar to the mounting of the zinc plate 10 on the moulding plate 12. The matrix may now remain with the adapter plate when removed.

The invention may be practiced in other ways. For instance, as shown in Fig. 9, the rubber sheet 26, instead of the projections 29, may be formed with seats 32 by projections on the moulding plate 12. The keying means for the cylinder or bed C may comprise metal pins 33 which may be removably set in seats in the cylinder or bed and have projecting portions 29^a for engagement in the seats 32. The pin seats 33 are prepared in the following manner.

A sheet 34 of double faced adhesive sheet is wrapped about the cylinder C or applied to the bed of the press. The adhesive sheet, at the selective seats, is punched through and the pins 33 inserted therein. The printing plate is then set upon the pin projections 29^a by matching the seats 32 with said projections and pressing the plate down firmly to adhere it to the adhesive sheet 34. For greater accuracy and to prevent undue spreading of the sheets 34, they may each be reinforced by a fabric disc or washer 35.

If desired, the metal pins 33 may be moulded with the rubber plate 28 so that they are inseparable therefrom to insure against relative movement between said pins and the plate 28.

As can be well understood, the cylinder or bed may be formed with a plurality of pin seats 33 which may be selectively employed for positioning either one printing plate or a number of smaller individual printing plates. By the use of the adhesive sheet 34 and at least two pins for each printing plate, all of said plates may be mounted

in the press with assurance that they will remain as positioned.

From the foregoing it is readily apparent that a novel and efficient method has been provided for producing a rubber printing plate of novel form. While the steps of the method illustrated are at present preferred, they may be varied within the principles of the invention without departing from the general spirit and scope of the invention as defined in the appended claims.

What we claim as new and desire to secure by Letters Patent, is:

1. The method for making a printing plate which consists in providing a moulding plate with a plurality of holes, some of which are registry holes, mounting a photo-engraving on said moulding plate by means of pins in the registry holes, forming a matrix from said photo-engraving and adhering said matrix to a second moulding plate, forming a printing plate in said matrix and simultaneously bonding a non-shrink sheet to said printing sheet, and then bonding a backing sheet to said non-shrink sheet and simultaneously forming projections on said backing sheet by forcing portions thereof into the mentioned holes in the moulding plate.

2. The method of making a printing plate which consists in applying heat and pressure to a fabric-backed rubber sheet disposed between a moulding plate provided with a matrix and a moulding plate formed with a plurality of holes to form a printing sheet having a bonded fabric back, separating the moulding plates, placing a second sheet of rubber on the fabric back, and again applying heat and pressure to bond said second sheet to said fabric back and to force some of the material of said second sheet into the holes in the mentioned moulding plate.

3. The method of making a printing plate which consists in first forming a printing sheet of rubber having a bonded fabric back, and then bonding a rubber backing sheet to said fabric back and simultaneously forming a plurality of projections on said latter sheet.

4. The method of making a printing plate which consists in providing a first moulding plate with registry holes transferred from a photo-engraving and with a plurality of holes in register with said registry holes, mounting the mentioned photo-engraving on said first moulding plate by means of pins in the registry holes, placing the photo-engraving mounted moulding plate in a pressure machine, placing a second moulding plate in said pressure machine in cooperative relation with the first moulding plate, placing matrix material upon said second moulding plate and applying heat and pressure to cause a matrix carried by the second moulding plate to be formed, removing the first moulding plate and the photo-engraving from the pressure machine, placing a sheet of rubber on the matrix, superimposing a fabric sheet on said sheet of rubber and applying heat and pressure to impress the matrix on the sheet of rubber and to bond the fabric sheet thereto, replacing the first moulding plate in the pressure machine, placing a second sheet of rubber on the fabric sheet and applying heat and pressure to bond said second rubber sheet to the fabric sheet and to force portions of said second rubber sheet into the holes in said first moulding plate.

5. In a method for making rubber printing plates, the steps of transferring the registry marks of a photo-engraving to a moulding plate, and forming a plurality of projection-forming

holes in said moulding plate in registering relation to the transferred marks, and of utilizing the said holes to form keying projections on the backs of the printing plates.

6. In a method for making rubber printing plates, the steps of transferring the registry marks of a photo-engraving to a moulding plate, forming a plurality of projection-forming holes in said moulding plate in registering relation to the transferred marks, mounting the photo-engraving with its registry marks in register with the transferred marks on the moulding plate, and forming a matrix of said photo-engraving.

7. The method of making a printing plate which consists in applying heat and pressure to a fabric-backed rubber sheet disposed between a moulding plate provided with a matrix and a second moulding plate to form a printing sheet having a bonded fabric back, then separating the moulding plates, placing a second sheet of rubber on the fabric back, substituting for the second moulding plate one having pins projecting from the surface thereof, and again applying heat and pressure to bond said second sheet to said fabric back and to form keying seats in the second sheet.

8. The method of making a printing plate which consists in first forming a printing sheet of rubber having a bonded fabric back, and then bonding a rubber backing sheet to said fabric back and simultaneously forming a plurality of keying means on said latter sheet.

9. The method of making a printing plate which consists in providing a first moulding plate with registry holes transferred from a photo-engraving, mounting the mentioned photo-engraving on said first moulding plate by means of pins in the registry holes, placing the photo-engraving mounted moulding plate in a pressure machine, placing a second moulding plate in said pressure machine in cooperative relation with the first moulding plate, placing matrix material upon said second moulding plate and applying heat and pressure to cause a matrix carried by the second moulding plate to be formed, removing the first moulding plate and the photo-engraving from the pressure machine, placing a sheet of rubber on the matrix, superimposing a fabric sheet on said sheet of rubber and applying heat and pressure to impress the matrix on the sheet of rubber and to bond the fabric sheet thereto, substituting for the first moulding plate in the pressure machine a moulding plate having pins projecting from the surface thereof, placing a second sheet of rubber on the fabric sheet and applying heat and pressure to bond said second rubber sheet to the fabric sheet and to form keying seats in the second rubber sheet by the mentioned pins in the last mentioned moulding plate.

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