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METHOD OF PRODUCING PRINTING FORMS FROM COLLOIDS

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The present invention relates to a method of producing printing forms from colloids in which, from diapositives and letterpress to be printed a screened copy in known manner is first prepared on a colloid film, which is then transferred to a printing form carrier, and is developed and dried after the removal of the film carrier.

According to the invention the colloid film is applied to a smooth film carrier and copied through to the positions on the screen and in white as far as the base. The film carrier has to be separated from the colloid film by means of a liquid, which dissolves the film carrier without any part of the colloid film being also dissolved. In this way a printing form is obtained whose screen cross-lines lie in one plane with the white and are of a uniform height so that the doctor blade can wipe off the ink uniformly. The gelatine film may merely show in the screen naps themselves, differences in high lights and low lights and the gelatine film then forms a relief corresponding to the matter to be printed.

The possibility of carrying out the method according to the invention is thus restricted to the possibility of copying-through as far as the film carrier the screen cross-lines uniformly in black and in white, so that after removing the film carrier by means of a liquid that does not attack the colloid film itself the upper edges of the screen cross-lines all lie in one plane. Celluloid foil, or foil of similar material, is suitable as film carrier of this kind. The actual film carrier may be applied subsequently upon a layer of paper. The dissolving of the film carrier from the colloid film may be effected by means of an etheric liquid as for example ethyl ether or acetone, or like liquids, which have a good capacity for dissolving the film carrier without on the other hand parts of the colloid film being also dissolved.

It has already been proposed to make use of intaglio printing forms of gelatine or asphalt without however the particular working conditions which form the condition for the realization of this proposal being mentioned and recognized. When ordinary carbon paper is used, it is certainly not possible to obtain printing surfaces of colloid films with uniformly high screen cross-lines, since when copying-through, the illuminated parts of the gelatine adhere so that the separation of the paper without damage to the colloid film is quite impossible. It has furthermore been proposed to apply to the surface of the roller for photo-chemical etching,

an uncopied film that is light-sensitive or that is to be made light-sensitive later (the film being applied to a base film for the purpose of obtaining a smooth surface), in such manner that the base film then forms an outer protective film which is to be dissolved by a solvent and which does not attack the colloid film itself. Apart from the fact that this method is described only in conjunction with photo-chemical etching, it would prove to be entirely unsuitable for producing an intaglio printing form from the colloid film since, when the film is being copied after it has been applied to the surface of the roller, development is no longer possible because when copying from the surface the insoluble relief is at the top while the unilluminated parts and therefore the soluble parts lie on the surface of the roller, so that when hot water is applied, dissolving of the base film from the roller would be unavoidable. A sharp relief in the screen naps with uniformly high screen cross-lines cannot therefore be secured in accordance with the matter to be printed.

The invention is hereinafter more fully described by reference to an example:

For intaglio printing the printing form is produced in the following manner: As in the case of copper intaglio printing, a diapositive is prepared from the original to be printed, the diapositive being copied upon a light sensitive colloid film. For copying purposes a film is used $\frac{1}{100}$ mm. thick, the film being applied to a smooth film carrier—in the present case to Celluloid foil. The copying period must be so determined that copying-through is effected in the white and on the screen cross-lines as far as the film carrier. After being damped the copy is applied with its film side on the printing form carrier, in the present case upon a printing roller. The film carrier now covering the colloid film is dissolved by treatment with an acetone solution and thereby removed. All the colloid film left on the roller is then treated with hot water of a temperature between 50 and 60° C., whereby the unilluminated parts of the colloid film are washed away, the copied matter and the screen cross-lines remaining in relief. After being dried the form is ready for printing. For special cases the colloid film may be subjected to subsequent dressing for example with chrome alum. The printing surface consists, just as in the case of copper intaglio printing, of more or less deep screen naps, which in the present case however are formed by the colloid film itself. The printing form carrier can, after printing always be used again, after

the printing form consisting of the colloid film has been removed by simple washing.

In the same way are produced the printing forms for printing in relief, except that no screen naps are formed but more or less large raised screen points of colloids, in which case the matter to be printed is photographed with the screen and this photograph is copied upon the colloid film. After the copy has been transferred, developed and dried, the printing form in relief is ready for printing.

The method described has the great advantage that not only is the use of copper eliminated but there is substantial simplification in the technical operation in connection with the production of the printing form and therefore a considerable lowering in working expenses, since when the process of the invention is employed, whole working stages, such as etching, grinding of the copper, and the application of new copper layers, are completely eliminated. The elimination of etching is of considerable importance because etching demands very great skill and experience to produce good printing results, while even in the case of an experienced etcher faulty etchings are commonly produced. By reason of the complete elimination of the etching, which is dependent upon correct observation and understanding, the process of the invention is far superior to the known method; the process of the invention is, unlike the known method, completely mechanical, whereby the production of

the printing form is made possible without previous knowledge. In no single working stage is the product solely dependent upon the individual capacity and skill of a single person. By this means the difficulties are avoided which are involved in three-colour printing.

I claim:

1. The process of producing a printing form comprising preparing a screened layer of photosensitive colloid which on exposure to light becomes water insoluble upon a sheet of soluble material, printing on the uncovered side and fixing to and entirely through said colloid the image from a diapositive of the matter to be printed, applying the free side, said colloid supported on sheet material to a printing form carrier with said colloid contacting said carrier, removing said sheet material with a solvent for that only, and washing unexposed portions of said colloid from said carrier.

2. The process of producing an intaglio printing form comprising forming a laminated sheet of Celluloid coated with a screened light sensitive colloid, fixing an image of the matter to be printed in and entirely through said colloid by exposing the uncovered side of said colloid to a diapositive of said matter, applying said sheet to a printing form carrier with the colloid layer thereagainst, dissolving said Celluloid with a solvent for the Celluloid only, and washing unexposed portions of said colloid from said carrier.

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