

UNITED STATES PATENT OFFICE

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PROCESS FOR THE PRODUCTION OF PRINT
PICTURES ON PRINT BODIES

Egon Herbert Schwarz, Zurich, Switzerland

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4 Claims. (Cl. 101—149.2)

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Offset printing, at the present time, is the most successful method for mass printing and mass quality printing. In practically all the processes known until now, the printing picture parts are formed of colloidal varnishes on metal plates composed mostly of zinc.

It is the object of the present invention to produce metallic printing bodies which are given excellent color receptive properties by means of a special, very fine and equalizing varnish application.

According to the process of the present invention, the plates which are composed of metal or have a surface of metal, such as aluminum and its alloys or zinc, are first subjected to a preliminary treatment by immersion in a lye bath. Then, a sensitized layer is applied to the metal surface and, after copying and developing of the desired pictures, the plates are painted with a solution of a salt of a metal the position of which in the displacement series is below that of the metal of the printing surface, said metal salt being capable of forming an ink receptive metal deposit is covered with a thin coating of equalizing varnish, having the properties of adhering firmly to the metal salt deposit and of taking up the printing colour especially well.

The first stage of the process according to the invention consists therein, that the plate of metal or having a metal surface, especially of aluminum or aluminium alloys, is dipped into a lye-bath, whereby it obtains a surface condition which is essential for the whole of the further procedure, and permits of a lengthy storage of the unused plates.

The pretreated plates are covered with a layer of a sensitizing emulsion.

After application of the layer, exposing and developing, the plates are painted over with a metallizing substance consisting of an alcoholic solution of metal salts, which form a combination with the ground-plate, or at least a part chemical combination, so that the above mentioned firmly adhering layer is created. Suitable metal salts are the chlorides, sulfides, sulfates and oxides of copper and of antimony. Solutions of these salts dry very quickly and artificial drying is unnecessary.

In order to make the combination between the metal picture body and the printing color especially reliable, it is recommended, after metallizing has been carried out, to apply a thin coating of an equalizing varnish, especially receptive for color, such as for instance an alcoholic solution of a suitable resin or synthetic resin.

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The emulsion is now removed by lightly brushing in lukewarm water, whereupon a clear metallic ground-picture of excellent color receptive properties, generally in dark grey or black stands out from the silvery glimmering lower part of the plate, in a purity unknown until now, and at this stage the plate is now ready for printing.

The last part of the process according to the invention, consists in the removal of the picture for the purpose of putting the plate to use again, whereby according to the invention, a so-called regenerator is to be used, apart from the usual grinding and dissolving mediums, such as pumice meal, nitric acid, etc. This regenerator may be composed of the same substances as the pretreatment lye mentioned at the beginning, if desired with addition of chromic acid, nitric acid or hydrochloric acid or mixtures thereof.

It is to be pointed out, that the process mentioned not only excludes all graining, whereby considerable expenses and mistakes are avoided, but also the moisture water requirements, and therewith the color consumption are reduced to a minimum.

The pre-treatment lye of the process according to the invention consists of a lye which is to be composed of at least one member of each of the groups soda, cyanide of potassium, and calcium chloride on the one hand, and on the other hand, potassium hydrate, and sodium hydrate; i. e., for instance, of potassium hydrate, soda and cyanide of potassium or of potassium hydrate and calcium chloride.

Printing plates which have been produced in the manner described, and possessing a picture body to the extent of tissue paper thinness composed of a metal layer together with an equalizing thin varnish coating in accordance with the invention, show apart from extraordinary precision, the greatest durability.

The process is in fact not only destined for direct work from the diapositive, but also for transfer, and by means of practical adaptation, for intaglio.

Example

Below a few details are given for the composition of the substances used according to the invention.

The lye serving for pre-treatment, may consist of a mixture of potassium hydrate, sodium sulphate, soda and cyanide of potassium, where-in the potassium hydrate portion predominates in

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weight. A mixture of the following compositions gave good results:

	Grams
Potassium hydrate -----	150
Soda -----	40
Sodium sulphate -----	20
Cyanide of potassium -----	10

The emulsion may contain a mixture of:

Water -----	cubic centimeters	1200
Gum arabicum -----	grams	240
Colouring matter -----	do.	10
Formalin -----	cubic centimeters	40

to which should be added some calcium chloride or calcium hydrosulphite. This main solution is now mixed with 1/2 a liter of the usual chromated ammonium solution.

For the metallizing substance equal weight of each of the following may be taken:

Copper oxide
Copper chloride
Antimony pentasulfide

which are dissolved in alcohol until saturation has taken place.

According to the purpose of application a part amounting to half of the antimony pentasulfide may be replaced by ammonium sulphite, and a part of the ordinary alcohol by one of greater value.

The regenerator can advantageously be composed of the following ingredients:

Nitric acid -----	volume parts	2
Hydrochloric acid -----	do.	1
Chromic acid -----	do.	1
Water -----	do.	8
Calcium chloride -----	grams	50

What I claim and desire to secure by Letters Patent is:

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1. A method of producing print pictures on metallic printing surfaces comprising the steps of treating the metallic surface on which the picture is to be produced with a lye, applying to the surface a layer of sensitized emulsion, copying the desired picture on the sensitized surface, developing the picture, and coating the surface carrying the picture with a solution containing a salt of a metal the position of which in the displacement series is below that of the metal of the printing surface, said metal salt being capable of forming an ink receptive metal deposit.

2. A method, as claimed in claim 1, in which the metal salt coated surface is coated with a thin layer of a varnish capable of taking up printing color.

3. A method, as claimed in claim 1, in which said metal salt solution contains at least one metal salt selected from the group consisting of the chlorides, sulfides, sulfates and oxides of copper and of antimony.

4. A method, as claimed in claim 1, in which said lye is a mixture containing at least one substance selected from the group consisting of potassium hydrate and sodium hydrate, and at least one second substance selected from the group consisting of soda, cyanide of potassium and calcium chloride.

EGON HERBERT SCHWARZ.

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