Patented Oct. 31, 1922. 1,433,806

UNITED STATES PATENT OFFICE.

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PREPARATION OF PLATES FOR PRINTING BY GREASY INK.

No Drawing. Application filed March 30, 1921. Serial No. 457,029.

To all whom it may concern:

Be it known that I, MARIANO DE' SPERATI, a subject of the King of Italy, residing at Turin, Italy, have invented certain new and useful Improvements in the Preparation of Plates for Printing by Greasy Ink, of which the following is a specification.

This invention relates to a process for the preparation of plates to be used for printing by means of greasy ink, use being made of typographic, lithographic, phototypic and similar presses and machines, and it consists in converting the images of ordinary photographic negatives obtained either directly in the camera or by enlargement, into a surface suitable for printing with greasy ink.

This invention allows, therefore, of obtaining plates by enlargement when negatives of smaller size are available, as it is sufficient to print by contact a diapositive and by means of the latter to obtain by projection in an enlargement apparatus a negative image on a film sensitized by means of silver bromide.

Anyhow, this advantage is obtained that the sensitized layer of an ordinary film is used as the layer on which the image, to be used for ink printing, is formed, the said layer being in the best conditions as to adherence and uniformity because it is mechanically applied.

Another advantage of this process consists in this that plates can be obtained on a flexible support in such a manner that they are suitable for printing under any conditions and also on curved surfaces.

After a photographic negative is obtained by exposing in a photographic apparatus a plate or film coated with an emulsion of silver bromide, the said plate or film being developed and fixed in the ordinary manner, care being taken to obtain a supple and well-detailed image, said negative may be converted into a plate for printing with greasy ink, according to this invention, in proceeding in the following manner:—

After a thorough washing, the image is intensified by means of a treatment with mercuric chloride and ammonia, according to the well known method, in such a manner that the metallic silver that forms the negative image is replaced by silver-ammonium chloride, mercury and mercury-ammonium chloride.

A greater opaqueness is thereby given to the dark portions (corresponding to the light portions of the positive), the thickness of all portions which orignally contained metallic silver is increased and a greater capacity for absorbing moisture and for rejecting greasy ink is given to the light portions and to the details.

After said treatment the negative is immersed in a 2% bath of ammonium bichromate in order to become sensitized, in which bath it is maintained for about five minutes with continuous stirring. Instead of being immersed in the sensitizing bath directly after the intensifying treatment, the negative may be wiped off after said treatment and then be sensitized at any desired time.

The negative is finally dried in a dry, dark place, or in a place lighted with a red light, and protected from any dust.

Such a negative well dried is afterwards exposed in a frame to natural light during 16 to 60 minutes according to the intensity of the light, the layer of sensitized gelatine containing the negative image being kept in contact with a sheet of white paper, and the back of the support in contact with the glass.

The surface to form the plate is in this manner exposed from the back, because the light reaches more or less the surface of the bichromated sensitized layer according to the opaqueness of the negative image, and the chromatization takes place in a rational manner, this ensuring any shade of halftones and sparing the light portions.

The negative is afterwards washed in running water or in five or six waters for freeing it entirely from the soluble bichromate, and it is afterwards carefully wiped off. If kept in a dry place and protected from the air, it may be indefinitely conserved, and when it is desired to proceed with the ink printing, it is sufficient to immerse it for at least one hour, in a solution containing 200 c. c. of water, 300 c. c. of glycerine of very good quality and three or four drops of ammonia. This bath is kept at a temperature between 35 and 80° C. according to the nature of the work.

The plate is wiped off and mounted on a suitable support, and may then be utilized in any printing machinery provided with good inking devices.

The zones of the surface of the plate upon which the light has acted, become more or

less unpolished according as they have been acted on more or less by the light, and they retain more or less the ink according as they are more or less unpolished; the zones which have not been subjected to the action of the light are on the contrary more or less polished and more or less saturated with moisture and they reject greasy ink owing to the absorbed moisture.

When negatives of small size are available, and it is desired to have copies of a large size, a diapositive is printed from the negative and this diapositive is projected in an enlargement machine upon a film sensitized with silver bromide, which film is afterwards converted into a plate in the manner above described.

If several plates are to be obtained from one single negative, a diapositive is obtained by means of which the desired number of negatives is printed by contact, each of the said negatives being afterwards converted into a plate by the method above described.

The said method will be used with advantage more especially when the original negative has to be kept intact or when it should be retouched.

The images obtained by the printing of plates prepared according to the present process, are of a fineness equal to that obtained by photography owing to the absence of any visible grains or nets.

In the case where a large number of copies should be printed, it may, however, be useful to have dotted negatives which allow of going further with the chromatization, and, therefore, of obtaining a greater resistance.

The dotted negative may be obtained either directly in the photographic apparatus by proceeding in a similar manner to that used in autotyping, or by means of an enlargement apparatus by inserting the net at a suitable distance between the diapositive and the film to be exposed; it is also possible to transform elementary negatives obtained according to the process of three-color photography, into plates, which may be utilized for trichrome printing.

What I claim as my invention and desire to secure by United States Letters Patent is:—

1. A method of producing plates for printing with greasy ink, consisting in exposing, developing and fixing a gelatino-silver haloid sensitized layer to obtain an image thereon; intensifying the image; sensitizing said layer by a bath of an alkali bichromate; exposing the layer to light from the back to render insoluble the bichromated gelatin in the zones acted no by the light during such exposure; and washing said layer.

2. A method of producing plates for printing with greasy ink, consisting in exposing, developing and fixing a gelatino-silver haloid sensitized layer to obtain an image thereon; intensifying the image; sensitizing said layer by a bath of an alkali bichromate; exposing the layer to light from the back to render insoluble the bichromated gelatin in the zones acted on by the light during such exposure; washing said layer; and treating it with a glycerine bath.

3. A method of producing plates for printing with greasy ink, consisting in exposing, developing and fixing a gelatino-silver haloid sensitized layer to obtain an image thereon; treating said layer with mercuric chlorid and then with ammonia to partly replace the metallic silver of the image by a mercurous compound; sensitizing said layer by a bath of an alkali bichromate; exposing the layer to light from the back to render insoluble the bichromated gelatin in the zones acted on by the light during such exposure; and washing said layer.

4. A method for producing plates for printing with greasy ink, consisting in exposing, developing and fixing a gelatino-silver haloid sensitized film to obtain an image thereon; treating said film with mercuric chlorid and then with ammonia to partly replace the metallic silver of the image by a mercurous compound; sensitizing said film by a bath of an alkali bichromate; exposing the film to light in a printing frame with its support against the frame glass and with a white layer against its sensitized layer, to render insoluble the bichromated gelatin in the zones acted on by the light during such exposure; and washing said film.

In testimony whereof I affix my signature.

MARIANO DE' SPERATI.