

UNITED STATES PATENT OFFICE

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PRESERVATIVE FOR PHOTOLITHOGRAPHIC PLATES

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2 Claims. (Cl. 106—205)

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The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to us of any royalty thereon.

This application is a division of our application number 577,827 filed 14 February 1945 and entitled "Photolithographic plate and process."

This invention pertains to paper and plastic photolithographic plates of the type described in the above noted application and more particularly to a process for preserving the plates from deterioration.

One object of the present invention is to provide a preservative for lithographic plates of paper or the like which will permit repeated use of such a plate over long periods of time without deterioration or loss of sharpness.

Another object of the present invention is to provide a preservative for paper lithographic plates which will fix the ink on the plate and provide a substantially air impervious protective film.

In order to better understand the present invention reference is made to the parent application Serial No. 577,827. In that application we have described our photolithographic plate for which the present preservative described in this application is particularly well suited although it is by no means limited to use with our plates but may be used with any plate of similar characteristics.

The plate described in application Serial No. 577,827 utilizes a base of parchmentized paper or of plastic upon which is coated one or more layers of a dichromated albumen solution which comprises preferably a substantially homogeneous water solution containing one part by volume of a saturated solution of ammonium dichromate mixed with one part by volume of an egg albumen solution of 6° Baumé density. The dichromated albumen solution is applied to the plate by means of a swab and wiped to a uniform layer and a second layer, similarly applied, is added when the first layer is partly dry. The prepared plate is permitted to dry and is then placed in a printing frame in contact with the plate or film that carries the material to be printed and is exposed to a suitable light source which hardens the dichromated albumen. The plate is developed by the application of an asphaltum developing ink and then washed with a solution comprising a saponifying agent and a colloid such as sodium bicarbonate and acacia gum.

The prepared plate may then be inked and used in the usual manner or may be preserved for fu-

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ture use. It may be preserved either immediately upon preparation or it may be first used and then preserved for re-use in a manner that will be explained.

Prior to the completion of the development work from which the present invention has been perfected, but a fraction of the maximum service of paper or plastic plates could be obtained therefrom due to the deterioration of the residual dichromated albumen that remained upon the image bearing side of the plates, and the spreading and creeping of the developing ink outwardly from the image spoiling the plate for subsequent use.

The improved preserving solution comprises a hardening means for limiting and retarding the spreading or creeping of the printing ink, a bleaching or reducing agent for maintaining the areas on the plate that are not occupied by the image thereon free from smudging or discoloration, and a protective film for covering the plate and for substantially sealing the image bearing side of the plate against the access of air thereto.

The preserving solution that is favored preferably comprises a solution that contains as a hardening agent one of the ink hardening reagents, such as an alum or the like, of which potassium alum may be taken as being illustrative; a suitable bleaching agent such as sodium sulphite or the like; and a protective film providing agent, such as a satisfactory gum or the like, of which gum acacia may be taken as being illustrative.

The bleaching agent may be omitted if preferred, but at the expense of quality in the subsequently printed image and in a lesser measure in the appearance of the plates, since upon standing the residual dichromated albumen darkens noticeably and results in an unattractive and scummy print. If preferred, a suitable material for softening the paper and imparting improved flexibility thereto, such as glycerin or the like, may be applied to the backs of the paper plates.

An illustrative example of a preserving solution that forms a part of the present invention comprises eight ounces of gum acacia, one ounce of potassium alum, one ounce of sodium sulphite and sufficient water to make one quart of solution. In this example the gum forms a thin, air impervious, protective surface coat over the printing face of the plate, the alum serves to harden residual ink on the printing image at the end of a printing run after the excessive printing ink has been removed, as by withdrawing the inking rolls from contact with the printing image and passing a few sheets of clean paper thru

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the printing press, or the like, and the bleaching agent serves to maintain substantially permanently the clearly defined contours of the printing image and the clean appearance of the plate. The preserving solution should be re-applied after each printing use of the plates.

The paper plates and preserving process that form parts of the subject matter of application Serial No. 577,827 are well adapted for use in the modified known direct image process, whereby the material to be printed is typed directly upon sheets of photolithographic paper using a special oil bearing ribbon upon the typewriter, and the sheets inserted directly into the printing machine.

The direct image process has the limitation that the sheets printed from the plate are substantially illegible after two thousand copies have been produced because of the failure of the oil images upon the plate. The service life of direct image process plates is materially increased if the ink hardening preserving solution is applied to the direct image plate and permitted to set before the plate is used for printing. The application of the preserving solution to the direct image plate does not, however, result in a plate that is capable of the prolonged life of the plates that carry the light hardened dichromated albumen images thereon, and particularly after having been treated with the preserving solution that is disclosed herein.

The paper plates and preserving process that is contemplated hereby is also applicable to the use of a positive instead of a negative in the exposure of the process, as in the production of blue prints, brown prints, ozalid, and similar plates where white characters appear upon a colored field in the finished product, or blue line or brown line prints where a blue, brown, or other colored line or character appears upon a white field in the finished product. In this adaptation of the process, the preparation of a photographic film or plate is omitted which thereby materially decreases the production costs of the finished product.

In the process wherein a positive replaces the photographic negative in the exposure step of the process, the paper plate bearing a surface coating of dichromated albumen has placed thereupon in the printing frame, a positive of opaque characters upon carbon backed vellum, tissue, tracing cloth or similar translucent paper, plastic, cloth or the like, or a negative of transparent characters upon an opaque field, as preferred. The image is transferred from the positive to the dichromated albumen surface of the plate by the action of the actinic rays in light that is applied thereto as though the positive were a photographic negative. In this exposure step in the process the actinic light rays pass thru the more transparent part of the positive to harden the dichromated albumen thereunder and make it print subsequently in the printing machine. The light is prevented from being applied to the dichromated albumen beneath the opaque parts of the positive by the opaque parts thereof. The developing ink is then applied to the plate, the unbonded ink removed

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therefrom by the washing solution, the preserving solution applied thereto if preferred and the plate used for printing in the usual manner, as described earlier herein where a negative is used in the process.

In this application of the present invention, where the characters upon the positive are opaque and the field of the paper transmits actinic light rays, then the plate prints white characters upon a dark field, as in blue prints or the like. Where, however, in the production of blue line or brown line prints the characters upon the translucent paper are analogous to those on a photographic negative and transmit actinic light rays and the field is opaque thereto, then the plate prints dark characters upon a light field, as in the photographic process but wherein the translucent paper with opaque figures thereon replaces the film or plate.

The processes and solutions that have been described herein have been practiced using different grades and brands of paper and plastic surfaced or all plastic plates. It has been found that the processes serve satisfactorily upon a good quality laminated parchmented paper or other well calendered or processed paper. Many papers of this type are available upon the market, of which a duplimat paper produced under the U. S. Patents numbered 2,134,165 and 2,205,993 is representative.

It is understood that the specific compounds used herein have been presented as examples of a satisfactory embodiment of the present invention and that similarly operating modifications, alterations and changes may be made without departing from the spirit and scope of the present invention as defined by the appended claims.

What we claim is:

1. A composition for preserving paper photolithographic plates consisting of the ingredients and proportions as follows: 3 ounces of gum acacia, 1 ounce of potassium alum, 1 ounce of sodium sulphite and sufficient water to make one quart of solution.

2. A composition for preserving paper photolithographic plates consisting of the ingredients and proportions as follows: 8 ounces of gum acacia, 1 ounce of potassium alum, and sufficient water to make one quart of solution.

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REFERENCES CITED

The following references are of record in the file of this patent:

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