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J. D. COE

PHOTOGRAPHIC STENCIL AND METHOD FOR MAKING SAME

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Fig. 1.

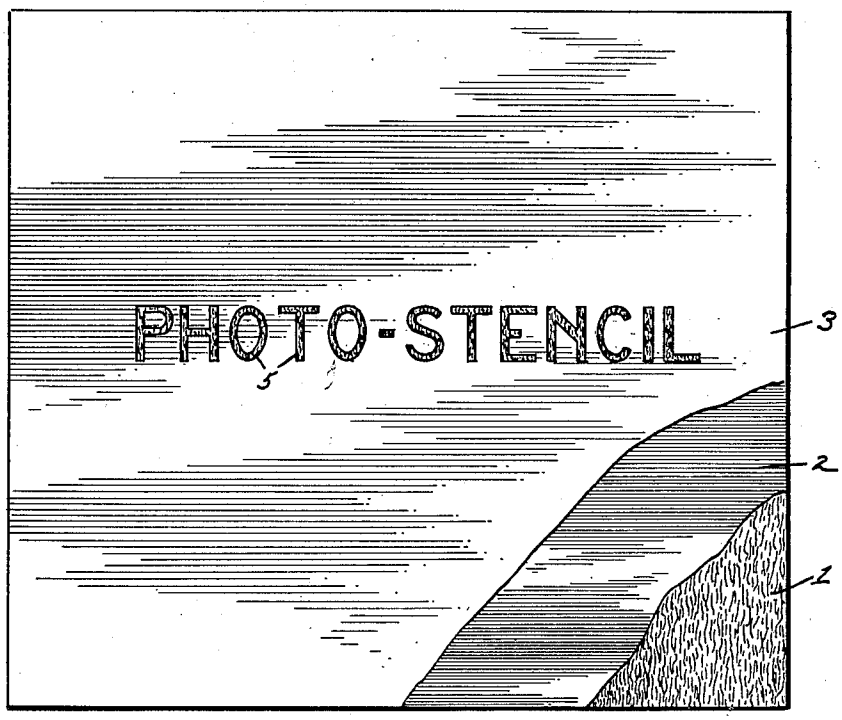
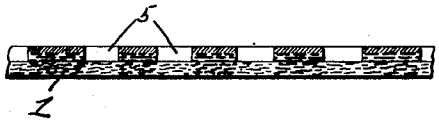


Fig. 2.



Fig. 3.



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PHOTOGRAPHIC STENCIL AND METHOD FOR MAKING SAME.

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To all whom it may concern:

Be it known that I, JOHN D. COE, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented a new and useful Improvement in Photographic Stencils and Methods for Making Same, of which the following is a specification.

My invention relates to stencils for the printing of multicopy reproductions whereby a photographic imprint made upon a normally impermeable web of fibrous tissue is etched to render portions unexposed to light permeable to ink for printing.

The primary object of my invention is to provide an improved stencil for printing multicopy reproductions.

Another prime object of my invention is to provide an improved process for preparing stencils for multicopy printing.

Another object is to provide improved means for sensitizing a stencil web to light to permit a photographic imprint to be made thereon.

Another object is to provide improved means for rendering unexposed portions of a stencil permeable to ink for printing.

A still further object is to provide an improved process whereby the ordinary stencil web arranged to receive a typewritten impression for reproduction is sensitized and a photographic imprint of any device made thereon, said imprint being adapted for etching to render unexposed portions of the web defining the device permeable to ink to permit the printing of multicopy reproductions therefrom.

My invention relates particularly to the making of stencils for use with the mimeograph machines in common usage. As is well known in the art, stencils made for use with this type of machine are made by cutting an impression upon a web of fibrous tissue with a hard instrument, the web having been previously treated with a coating of a suitable substance forming a surface which is normally impermeable to ink, but which is displaced or broken by pressure to render the web permeable upon all points along the impression. Commercial preparations, well known in the art, having glycerin and gum as their chief constituents, are commonly used in preparing the stencil webs, but other substances of either a viscous or a gelatinous character are often successfully used. In the present practice stencils are most generally formed by cutting a typewritten impression upon the stencil, the letters upon the type bars breaking the impermeable surface coating to render the web permeable along the mark made by the type. In all instances the stencil is limited to the reproduction of subject matter which may be typed, or which may be drawn or written directly upon the stencil web with a pencil, stylus, or other hard instrument. The reproduction of devices of irregular outline or complex design is obviously impractical by this method.

As the advantages of making multicopy reproductions by the present method is well recognized, it is highly desirable that the field of utility be extended to include the reproduction of devices other than ordinary typing or such simple designs as may be drawn or written upon the stencil. To accomplish this I have devised the improved stencil and process hereinafter described by which a device of any shape or character may be formed upon a stencil web and printed in the ordinary manner.

My improved stencil is illustrated in the drawings forming a part of the present specification wherein like characters of reference are used to designate similar parts throughout said specification and drawings and in which Fig. 1 is a plan view of a stencil web, parts being broken away to show the manner in which successive coatings are applied upon the web; Fig. 2 is a broken enlarged section showing a portion of a web after exposure; and Fig. 3 is a similar section showing the portion after etching.

In my present practice I prefer to use a stencil web of the character in common usage wherein a fibrous tissue web is treated with a gelatinous mixture, the chief constituents of which are glycerin and gum, to form a coating 2, which is normally impermeable to ink. To this impermeable coating I apply a coating 3 of a reagent sensitive to light whereby a photographic image of the device may be imprinted upon the web. This sensitized coating consists preferably of a saturated solution of potassium bichromate in a mixture of water, glycerin and gum, the glycerin and gum serving as a bonding agent by virtue of which the solution may be applied uniformly upon the surface of the web either by floating the web upon a quantity of the solution, or by flow-

ing the solution onto the web by means of a brush or other spreading device. The web is then permitted to dry, and if desired, additional coats of the sensitized solution may be applied to obtain the desired character of coating.

A photographic image of the device to be reproduced is made upon the sensitized web when thoroughly dried by exposing the same to a strong light transmitted to the web through a positive print of the device whereon the device itself is made opaque upon a transparent or translucent web which may be paper, glass, or other suitable meaterial, the web being held in contact with the print as in ordinary contact photographic printing. The light is thus transmitted to all portions of the sensitized stencil web except such portions as are covered by the opaque configuration of the device. The action of light upon the sensitized coating is to cause the same to be altered in such a manner as to become insoluble.

The exposed web is now washed with water, thereby washing out the senitizing agent from those portions of the web covered by the opaque device. The web is next dried and treated with an etching solution consisting preferably of a diluted solution of sodium hydroxide through which chlorine gas has been bubbled. The etching solution dissolves away the impermeable coating and bleaches the dye commonly applied to the web from those portions of the web not coated with the now insoluble sensitizing agent, thereby rendering the imprinted design permeable, the fibrous tissue being exposed at all points initially covered by the opaque design when exposed to the light.

When the web has been sufficiently etched the stencil is thoroughly washed with water to remove the etching solution to prevent further etching and possible weakening of the tissue.

The stencil is then dried after which it may be applied to the mimeograph and utilized for making copies in the usual way, the exposed fibre being highly permeable so that the ink is absorbed and transferred in the ordinary manner well known in the art.

The exposure to light is made in the manner commonly followed in making blue prints and the like whereby a clear and distinct image is formed, which, upon washing, becomes permanent, as the sensitizing agent not affected by exposure is washed away leaving only the insoluble residue marking the image of the device in sharp distinct lines. The subsequent etching when carefully carried out removes the impermeable coating without damaging the fiber and without reacting with the portions covered by the insoluble sensitizing agent and without impairing the clear-cut configuration of the image, the sensitizing agent constituting a screen during the etching process to prevent the etching of the web upon all points other than the points of the device to be printed, and combining with the impermeable coating to prevent absorption of ink during the printing process.

In Fig. 2 I have illustrated a portion of a web after exposure, the portions of the coating 3 which have been rendered insoluble by exposure to light being indicated by heavy section lining as at 4. In Fig. 3 the same portion is shown after the washing and etching operations whereby the unexposed portions of the coating 3 and the underlying impermeable coating 2 are washed and etched away as at 5 to expose the fibrous permeable web along all portions of the imprinted design as shown in Fig. 1 of the drawing.

From the above description it is easily seen that any subject matter or design capable of production in opaque marks upon a light transmitting element may be transferred to my improved stencil web in the manner I have described to permit the printing of multicopy reproductions therefrom.

While I have mentioned potassium bichromate as being the sensitizing agent I prefer to use in the commercial preparation of my improved stencil, I do not limit myself to this precise compound as many other reagents sensitive to light may be substituted without departing from the spirit of my invention. In similar manner, the bonding agents for applying the sensitizing coating, and the etching solution may be replaced by any other substance capable of performing the function described without departing from the spirit of my invention. The separate application of the impermeable and sensitizing coats may likewise be altered and the two coats combined to form a single sensitized coating of impermeable character adapted to receive a photographic image and to be etched in the manner above described. I, therefore, do not restrict myself specifically to the precise elements enumerated and the specific procedure described, but wish to avail myself of all such modifications and substitutions as fall within the scope of the appended claims.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. A process for preparing stencils for multicopy reproduction consisting of applying a coating of substance sensitive to light and adapted to be rendered insoluble upon exposure to light upon a fibrous web provided with a coating impermeable to ink; exposing the sensitized web to light transmitted through a print of the device to be reproduced; and dissolving the imper-

meable and sensitized coatings upon the portions of the web not exposed to the light to render said portions permeable to ink for printing purposes.

2. A process for preparing stencils for multicopy reproduction consisting of applying a coating containing potassium bichromate adapted to be rendered insoluble upon exposure to light upon a fibrous web previously treated with a gelatinous coating; exposing the sensitized web to light transmitted through a print of the device to be reproduced; and separately dissolving the gelatinous and sensitized coatings upon the portions of the web unexposed to the light to render the fibrous tissues of said portions permeable to ink for printing purposes.

3. A process for preparing stencils for multicopy reproduction consisting of applying a coating impermeable to ink upon a fibrous tissue web; sensitizing said web after application of the impermeable coating with a reagent adapted to render said coating insoluble upon exposure to light; exposing the sensitized web to light transmitted through a print of the device to be reproduced; and dissolving the impermeable coating upon the portions unaffected by light to render the fibrous tissue of said portions permeable to ink for printing purposes.

4. A process for preparing stencils for multicopy reproduction consisting of treating a web of fibrous tissue with a gelatinous coating to render said tissue impermeable to ink; applying a coating upon the web of a reagent adapted to render said coating insoluble upon exposure to light; exposing the web to light transmitted through a print of the device to be reproduced to make a photographic print of said device upon the web; and dissolving the sensitized and gelatinous coatings upon the portions unaffected by light during exposure to render said portions permeable to ink for printing purposes.

5. A process for making stencils for multicopy reproduction consisting of treating a web of fibrous tissue previously made impermeable to ink by the application of a coating of a gelatinous substance, with a solution of potassium bichromate to render the web sensitive to light; exposing the web to light transmitted through a print of the device to be reproduced to make a photographic print of said device upon said web; and dissolving the sensitized and gelatinous coatings upon the portion of the web unexposed to the light during exposure to render said portions permeable to ink for printing purposes.

6. A process for the preparation of stencils for multicopy reproduction consisting of sensitizing a web of fibrous tissue having a gelatinous coating to render the tissue impermeable to ink, with a solution of potassium bichromate; exposing the web to light transmitted through a print of the device to be reproduced to make a photographic print of said device upon the web; washing the web to remove bichromate from the exposed portions thereof; and dissolving the impermeable coating from the portions of the web from which the bichromate has been washed to render said portions permeable to ink for printing purposes.

7. A process for the making of stencils for multicopy reproduction consisting of sensitizing a web of fibrous tissue, having a coating thereon impermeable to ink, with a solution of potassium bichromate; exposing the web to light to make a photographic print of the device to be reproduced; washing the web to remove the bicromate from the unexposed portions of the web; and removing the impermeable coating upon those portions from which the unaffected bichromate has been washed by treatment with a chlorinated solution of caustic alkali to render the fibrous tissue of said portions permeable to ink for printing purposes.

8. The step in the process of making stencils for multicopy reproduction which consists in sensitizing an impermeable stencil web by applying thereon a coating of light sensitive material adapted to receive a photograhpic image of a device to be reproduced by exposure to light.

9. The step in the process of making stencils for multicopy reproduction, which consists in applying upon a stencil web previously treated to render the same impermeable to ink a gelatinous coating of potassium bichromate whereby a photographic image of a device to be reproduced may be imprinted thereon.

10. The step in the process of making stencils for multicopy reproduction, which consists in applying a coating of a solution of potassium bichromate upon a stencil web having a gelatinous coating impermeable to ink, said bichromate being applied in a solution to which glycerine and gum have been added as bonding agents.

11. The step in the process of making stencils for multicopy reproduction by photographic stencil webs, which consists in etching a stencil web having a gelatinous coating impermeable to ink with a chlorinated solution of caustic alkali to render portions of said web permeable to ink for printing purposes.

12. The step in the process for making stencils for multicopy reproduction which consists in the treatment of a stencil web having a gelatinous coating impermeable to ink with a chlorinated etching solution adapted to render portions of said web permeable to ink for printing purposes.

13. The product of a process for making

stencils comprising a web having a gelatinous coating impermeable to ink and a sensitized coating adapted to be rendered insoluble upon exposure to light superimposed upon the gelatinous coating to receive a photographic imprint thereon, said gelatinous coating and sensitized coating being adapted to be separately dissolved away from portions unexposed to light to render the web permeable to ink for printing purposes.

In witness whereof I hereunto set my signature.

JOHN D. COE.