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D. GESTETNER

PRINTING AND DUPLICATING

Filed Dec. 9, 1919

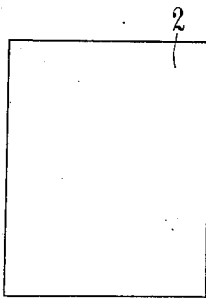


Fig. 1

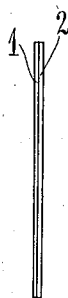


Fig. 2

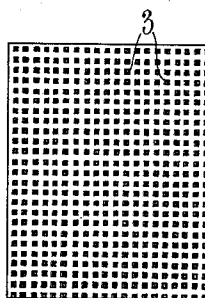


Fig. 3

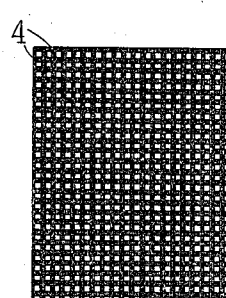


Fig. 4



Fig. 5

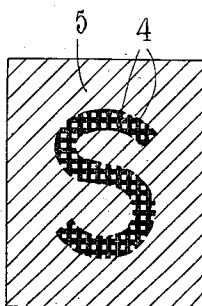


Fig. 6

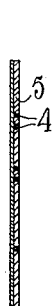


Fig. 7

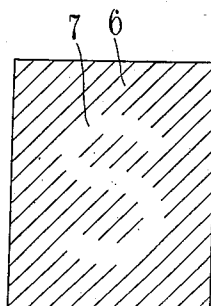


Fig. 8

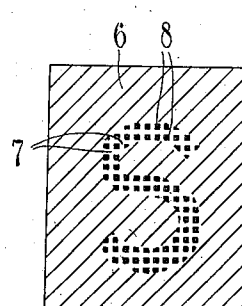


Fig. 9

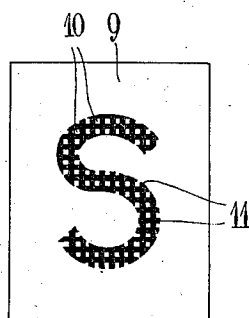


Fig. 10

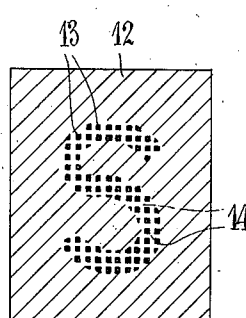


Fig. 11

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UNITED STATES PATENT OFFICE.

DAVID GESTETNER, OF LONDON, ENGLAND, ASSIGNOR TO D. GESTETNER, LIMITED, OF LONDON, ENGLAND.

PRINTING AND DUPLICATING.

Application filed December 9, 1919. Serial No. 343,662.

To all whom it may concern:

Be it known that I, DAVID GESTETNER, a subject of the King of Great Britain and Ireland, and residing at Neo Cyclostyle Works, Tottenham Hale, London, N. 17, England, have invented certain new and useful Improvements in and Relating to Printing and Duplicating, of which the following is a specification.

This invention relates to printing or duplicating with the aid of stencils produced upon Yoshino or like paper or on a suitable textile fabric such as bolting cloth, by the employment of a photographic process of the kind in which the action of light is made use of for changing the solubility of a composition as, for instance, bichromated gelatine in regard to a solvent liquid used as a developer.

Processes of this kind are described in the specification of United States patent to Waters No. 1,327,931, January 13, 1920, and in the specification accompanying my prior United States Patent No. 1,354,478, granted October 5, 1920.

In the operation of such processes, it is found that where inked surfaces of relatively considerable width or area are formed in the printing operation, there is a pronounced tendency for the ink to spread on the impression receiving surface or for the oily medium of the ink to spread outwards owing to the capillary attraction of the material of which the impression receiving surface consists, thus forming a border of oil about the heavily inked portion which naturally detrimentally affects the appearance of the reproduction.

The invention consists broadly in breaking up what would be the solidly inked portion of the reproduction so as to provide portions therein which do not receive ink directly but only as the result of the spreading of the ink passing through the open portions in the stencil coating, and leaving the ground intervening between what would be the solidly inked portions free from ink.

Thus in accordance with the invention the stencil may be formed or be provided with dots, lines or reticulations which will resist the passage of ink through the stencil at what would normally be the open portions thereof, while the remaining portion of the stencil is entirely impervious to the ink.

These dots, lines or reticulations may, in

accordance with the invention, be formed by treating the layer of composition to be employed in the production of the stencil, as by exposure to light, so as to form thereon dots, lines or reticulations constituted by portions of the composition which have been rendered insoluble.

Thus, for instance, the layer of composition on a suitable support which may be of the character of the "carbon tissue" employed in the carbon process, is exposed to light under a screen provided with opaque or light resisting dots, lines or reticulations.

A dotted screen adapted for use in accordance with the invention may be formed by exposing a photographic plate behind a half tone screen and developing and fixing the photographic image thus produced.

The layer of composition on the support after treatment in the manner indicated is ready for use in the production of stencils, by exposure to light under suitable positives or negatives and by such further treatment as is described in the patents mentioned, after which treatment the stencils may be used in accordance with the description contained in such patents in the production of prints or impressions.

According to another phase of the invention the sensitized plate employed in producing the negative of the matter to be reproduced is exposed in order to produce on the plate in succession an image of the matter to be reproduced and an image of a screen formed with lines, dots or reticulations.

The image of the matter to be reproduced, or of the screen may be formed first on the plate, after which the image of the screen, or of the matter to be reproduced may be formed thereon, the negative thus produced being then used in making a positive which in turn is used in making the stencil.

The invention will be described in detail, and by way of example, with reference to the accompanying drawings, in which:—

Figures 1 and 2 are views respectively in plan and section of a support 1 provided with a layer of light sensitive composition 2.

Figure 3 is a plan view of a dotted screen in which 3 represents opaque dots on the screen. Beneath this screen the coated support is exposed to the action of light.

Figure 4 is a plan view and

Figure 5 a section of the coated support

after exposure to light according to one mode of carrying the invention into effect, the lines 4 thereon representing the portions of the light sensitive composition which have
5 been rendered insoluble.

Figures 6 and 7 are similar views of the coated support after it has been exposed to light behind a diapositive of the letter S to be reproduced, the hatched portion 5 representing the insolubilized composition formed
10 as the result of such exposure. On development the white portions intervening between the lines 4 will be washed away and in use, as will be understood, this stencil will only
15 allow ink to pass through the parts of the support from which the soluble matter has been removed with the result that the representation formed with the aid of the stencil will be composed of dots arranged to
20 form the letter S.

Figure 8, 9, 10 and 11 illustrate another mode of carrying the invention into effect, Figure 8 being a plan view of a sensitized plate, that is to say, a photographic plate
25 of the usual kind which has been exposed in order to produce on the plate an image of the letter S, the hatched portions 6 thereon indicating the light affected portions of the plate and 7 the portions which have not been
30 affected by light.

Figure 9 is a plan view of the plate after it has been again exposed under a lined screen, such exposure causing the formation of dots 8 on the portion of the plate which
35 had not in the previous exposure been acted upon by light. After development in the usual way this plate is arranged over a glass plate coated with an emulsion such as is used in making lantern slides, the whole being
40 then exposed to the action of light in a printing frame or the like with the result that a diapositive, as illustrated in Figure 10 in which 9 represents the surrounding portions of the plate which have not been
45 affected by light, 10 the portion thereof in the form of dots which have also not been affected by light, and 11 the lines intervening between such portions, is obtained. The diapositive thus produced is then employed
50 in making the stencil by arranging the same over a support provided with a coating of bichromated gelatine such as is illustrated in Figures 1 and 2. On exposure a print will be obtained, as indicated in Figure 11, in
55 which 12 represents the portion of the field surrounding the image which will constitute ink impermeable areas, the representation of the matter to be reproduced forming ink permeable foraminous areas of which 13
60 represents ink resisting elements in the form of dots and 14 ink permeable spaces in the form of lines between said dots.

The present invention, it may be pointed out, extends not only to the production of
65 stencils in the manner indicated and to the

use of such stencils but also consists in a support provided with a layer of light sensitive composition which has been provided with lines, dots or reticulations which will resist the passage of ink through the stencil
70 at what would normally be the open portions thereof, such lines, dots or reticulations being formed, for example, on the light sensitive surface by photographic action.

While in the above description reference
75 has been made to bichromated gelatine as the light sensitive composition, it is to be understood that other light sensitive compositions of the character indicated, as for instance bitumen, may be employed.

In conclusion it may be pointed out that it is of the essence of the invention that the stencilled reproduction shall have pure
80 "whites", that is to say shall have, for instance, a ground which receives no ink and is therefore distinguished from the ground which would be produced by means of a
85 "half tone" negative or positive and an image or impression constituted by an inked surface which is broken up or an inked
90 ground which is broken up and an image or impression thereon in pure "white" that is to say an image or impression constituted by a surface which receives no ink.

Having now particularly described and
95 ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. The process of forming stencils for use in duplicating, which comprises producing
100 by the agency of light a photographic image of the matter to be reproduced and an image of a screen in superposition on a layer of composition which is rendered insoluble in a developer by the action of light
105 and treating the layer of composition with a developer to remove the still soluble portions thereof.

2. The process of forming stencils for use in duplicating which comprises exposing
110 a layer of bichromated gelatine to the action of light to form in succession an image of the matter to be reproduced and an image of a screen in superposition and developing the exposed layer with warm water
115 to remove the portions thereof which have not been affected by light.

3. The process of forming stencils for use in duplicating which comprises exposing a
120 layer of bichromated gelatine coated on a temporary support to the action of light to form an image of the matter to be reproduced and an image of a screen in superposition, developing the exposed layer with warm water to remove the portions thereof
125 which have not been affected by light and transferring the developed image on to a sheet of porous flexible material.

4. The process of forming stencils for use
in duplicating which comprises exposing a
130

layer of bichromated gelatine coated on a temporary support to the action of light to form an image of the matter to be reproduced and an image of a screen in superposition, developing the exposed layer with warm water to remove the portions thereof which have not been affected by light and transferring the developed image on to a sheet of Yoshino paper.

10 5. A stencil comprising a porous flexible support, an ink resisting material distributed thereover and forming thereon ink impermeable areas and foraminous areas adapted to permit the passage of ink in
15 using the stencil.

6. A stencil comprising a porous flexible support, a coating of a composition rendered insoluble by the action of light ad-

hering thereto, said layer being constituted by ink impermeable areas and foraminous areas constituted by a plurality of smaller areas of said composition spaced apart and adapted to permit in using the stencil the passage of ink through the spaces intervening between the smaller areas.

7. A stencil comprising a porous flexible support, a light affected bichromated gelatine composition distributed thereover to form foraminous and non-permeable areas equivalent respectively to the normally solidly inked portion of the reproduction and the spaces intervening between such portions.

In testimony whereof I have signed my name to this specification.

DAVID GESTETNER.