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METHOD OF REPRODUCING DRAWINGS.

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This invention relates to a new and useful method of making drawings and more particularly of reproducing drawings.

It is the object of the invention to provide a method of preparing drawings and particularly tracings at a relatively low expense and in a manner not materially different from the usual method, which will permit the speedy and inexpensive reproduction of these tracings a large number of times.

As well known, drawings are usually prepared on tracing cloth and are then reproduced by some photographic, e. g., the blueprinting process.

Transparent tracing cloth is used, first, because otherwise positive prints could not be directly obtained and it would be necessary in each case to prepare first a negative; and, second, because it permits the ready transferring or copying of pencil or other drawings placed below the tracing cloth. The objections to this method of preparing drawings reside chiefly in the slowness and therefore the expensiveness of the blueprinting and other photographic processes. No matter how efficient the blueprinting, photostating, etc., machine, only one print can be taken off at a time and special sensitized paper must be used. The prints must be washed and dried before they can be used. Furthermore, the tracings get worn if the printing process is often repeated. A further objection to blueprinting is that their continued reading is hard on the eyes.

In order to avoid these drawbacks, in accordance with my invention tracings are prepared and reproduced in accordance with the so-called planographic process. The tracing is prepared on a transparent medium and the negative or positive reproduction thereof in dark lines on a light background may be repeated a large number of times at a relatively small cost and great speed, as compared with the blueprinting or photographic processes.

In order more clearly to set forth the nature of the present invention, a preferred embodiment thereof will now be described.

1. A sheet of thin transparent medium is used for the drawing. This may be in the form of a thin sheet of celluloid or linen surfaced with celluloid or cellulose acetate or other transparent cellulose derivative. Transparent and water-proofed tracing cloth may also be used. A flexible, thin sheet of, or a sheet coated with, gelatine or casein may also be used. However, in the selection of the water-proofing medium care must be taken to insure resistance to acids used in the process and proper affinity to the etches and inks.

2. The surface of this sheet must now be prepared so that it be smoothly roughened and porous to hold the tracing ink and the etch. Preferably, this is done by scouring the celluloid sheet with pumice or blowing finely powdered pumice thereon. Fine sand or any other abrasive would also do, the essential requisites being that the roughness of the surface consist of fine pits and scratches all over the surface, but of such a sharp nature that the surface be, to a certain limited depth, absorbent and mechanically anchor the fatty tracing ink (called also tusche) as well as the etch, which is a mixture of gum arabic, water and an acid.

3. The dust of pumice, sand, broken celluloid and the like, is now removed, preferably by a clean dry air blast, or a fine brush, so as to insure that the ink and the etch do not get their anchorage on stuff that will be gradually dislodged.

4. The drawing is now traced on this roughened surface with a fatty tracing ink, such as the usual tusche sold for this purpose in the planographic and lithographic trade. Instead of tusche, a water or spirit solution of bosh may be used. Bosh is a cake of slightly saponaceous fat mixed with pigment and is a well known article of commerce. It is desirable to have a tusche or solution of bosh that will dry quickly. However, the type of ink used forms no part of the present invention and will vary depending on the particular requirements.

In preparing the tracing great care should be taken to remove all finger marks or any greasy spots on the surface of the sheet.

5. The tracing should now be washed over or flowed over evenly with an ordinary gum arabic etch such as is used also in the planographic process on zinc. Such an etch may consist of pure water slightly acidulated, as by one or two per cent of sulphuric acid, and having in solution sufficient gum arabic to be of the consistency of thin cream, i. e., just enough so the viscosity is greater than of water. It should be noted in this connection that those skilled in the planographic art have each their preferred composition and

consistency of etch. Any gum arabic etch that can be used on zinc will do.

This etch will not wet the lines on the tracing which were drawn with the fatty ink, but will tenaciously adhere to the roughened areas not covered with the tusche.

6. The tracing is now permitted to dry while stretched or held flat, whereupon it will be in condition for reproduction.

7. In order to reproduce the tracing, it is first moistened with etch, which may be thinner than the etch formerly used; or water may be used, in which case an occasional application of etch is advisable.

8. With proper means to support and hold the sheet flat (e. g., stretched over the cylinder of a press) it is rolled over with an ink roller so as evenly to coat it with a suitable lithographic ink. This ink is also fatty, will adhere only to the areas coated with tusche, and will be repelled by the water in the etch with which the intervening areas are coated.

9. For direct reproduction, giving a negative or rather a reversed picture of the tracing, the paper to be printed on is pressed in contact with the sheet, inked as above described.

10. For offset reproduction, giving a positive or not reversed copy of the original, a soft roller or cylinder, usually of rubber, called the offset roller, is rolled over the inked sheet, whereby ink from the inked lines is transferred to the surface of this soft roller and this soft roller is then rolled over the paper to transmit the lines.

After every copy is taken or after every time the inked tracing is rolled against the offset roller, the tracing is remoistened with water or etch and steps 8 and 9 or 8 and 10 are repeated.

To preserve the tracing after use, it is thoroughly coated with etch and dried flat before storing.

In order to preserve the lines of the drawings, after step 6, the whole may be covered with a solution of asphalt and turpentine. The turpentine will remove the tusche lines and they will be replaced by the asphalt which will adhere to the sheet. Before the reproduction starts, the tracing is wiped over with a damp cloth, removing the asphalt which covers the etched surface, but not the asphalt which clings to the sheet. The asphalt lines will provide a more stable base for the lithographic ink than the tusche lines. Otherwise the process continues in the same manner as above described.

What I claim is:

1. The method of reproducing writings and other representations which consists in tracing with ink the representation on a transparent medium, coating said medium with etch and then using said medium as a planographic surface.

2. The method of reproducing writings and other representations which consists in tracing the representation on a flexible transparent medium having a roughened surface, coating said medium with etch, drying said medium, and then using said medium as a planographic surface.

3. The method of reproducing writings and other representations which consists in tracing the representation on a thin sheet of transparent and flexible material and then using said sheet as a planographic surface.

4. The method of reproducing writings and other representations which consists in tracing with a non-metallic medium the representation on a thin sheet of transparent water-proofed medium, coating said medium with gum arabic etch, and then using said sheet as a planographic surface.

5. The method of reproducing writings and other representations which consists in tracing the representations on a thin sheet of flexible transparent water-proofed medium, coating said medium with etch, and then using said sheet as a planographic surface.

6. The process of reproducing writings and other representations consisting in first, placing a transparent sheet of material over the representation to be reproduced; second, tracing the representation on said sheet with a water-repellent marking substance; third, coating the surface of said sheet with an adherent, water-soluble, fat-repellent preparation; fourth, treating the marked and coated surface with a weak acid preparation; fifth, washing the surface; sixth, dampening the surface when dried; seventh, inking the surface while damp with a water-repelled marking substance; and finally pressing the surface against the surface on which the reproduction is desired.

7. The process of reproducing writings and other representations consisting in first, placing a transparent sheet of material over the representation to be reproduced; second, tracing the representation on said sheet with a water-repelled marking substance; third, coating the surface of said sheet with an adherent, water-soluble, fat- and grease-repelled preparation; fourth, treating the coated and marked surface with a weak acid preparation; fifth, washing the surface; sixth, drying the surface; seventh, again coating the surface with a water-soluble, adherent fat and grease-repelled material; eighth, dampening this surface when dried; ninth, inking the surface while damp with a water-repelled marking substance, and finally pressing the surface against the surface on which the reproduction is desired.

8. The process of reproducing writings and other representations consisting in first, placing a transparent sheet of material over the representation to be reproduced; second,

tracing the representation on said sheet with a water-repelled marking substance; third, coating the surface of said sheet with an adherent, water-soluble fat and grease-repelled preparation; fourth, treating the marked and coated surface with a weak acid preparation; fifth, washing the surface; sixth, dampening the surface when dried; seventh, inking the surface while damp with a water-repelled marking substance; eighth, pressing the inked surface into intimate contact with a smooth non-absorbent surface retentive of the last mentioned marking substance; and finally, pressing this last mentioned surface against the surface on which the reproduction is desired.

9. The process of reproducing writings and other representations consisting in first, placing a flexible, transparent sheet of material over the representation to be reproduced; second, tracing the representation on the said sheet with a fatty lithographic marking substance; third, coating the surface of said sheet with an adherent water-soluble fat and grease-repelled preparation; fourth, treating the marked and coated surface with a weak acid preparation; fifth, washing the surface; sixth, drying the surface; seventh, again coating the surface with a water-soluble, adherent, fat and grease-repelled preparation; eighth, dampening this surface when dried; ninth, inking the surface while damp with a water-repelled marking substance; tenth, pressing the inked surface into intimate contact with a smooth, non-absorbent surface retentive of the last mentioned marking substance; and finally, pressing this last mentioned surface against the surface on which the reproduction is desired.

10. The process of reproducing writings and other representations consisting in first, placing a transparent flexible waterproof sheet of material over the representation to be reproduced; second, tracing the representation on said sheet with a fatty lithographic ink; third, thinly coating said sheet with a solution of gum arabic; fourth, treating the marked and coated surface with a weak acid preparation; fifth, washing the surface; sixth, drying the surface; seventh, again coating the surface with a water-soluble, adherent fat- and grease-repelled preparation; eighth, dampening this surface when dried; ninth, pressing onto the surface while damp a water-repelled ink or similar substance; tenth, pressing the inked surface of said sheet against an offset surface; eleventh, repeating steps eight, nine and ten as often as may be necessary to establish full lines of ink on said offset surface, maintaining in each repetition an exact registry between the lines on said sheet and the lines established by the tenth step on said offset surface; and finally, pressing said offset surface against the surface on which the reproduction is desired.

11. The method of producing a planographic surface which comprises tracing a figure with ink on a transparent medium and then coating said medium with etch.

In testimony whereof, I have signed my name to this specification this 4th day of February, 1924.

ARTHUR H. ADAMS.