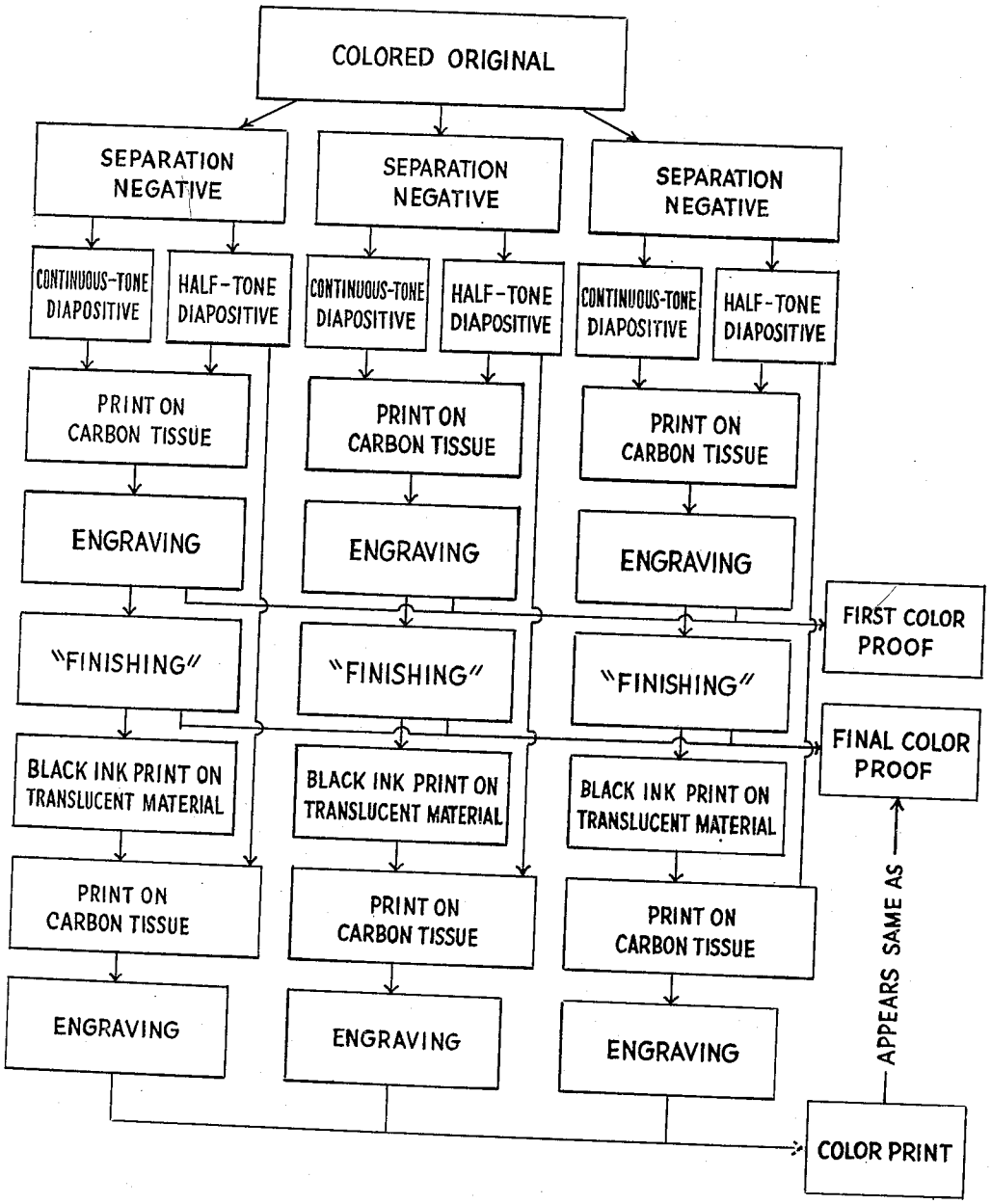
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METHOD OF MAKING INTAGLIO ENGRAVINGS

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METHOD OF MAKING INTAGLIO ENGRAVINGS

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This invention relates to a method of making intaglio engravings, and more particularly to the duplication of intaglio engravings which have been corrected.

Intaglio engravings—especially those to be used for color printing—have heretofore been corrected by a process known as finishing which consists in re-etching parts of the plate to deepen the cavities and burnishing parts of the plate to make the cavities shallower. This method of correcting has proved much more successful than attempts to correct by retouching the transparencies used in making the resist for the plate.

In printing of advertising matter which is to appear in a number of different publications, it is desirable to duplicate a corrected intaglio engraving to provide engravings which may be used in many different printing plants without correcting. Prior to my invention, there has been no method for accurately duplicating a corrected intaglio engraving.

In accordance with my invention, a resist for etching a duplicate of a corrected intaglio engraving is made by using an ink print from the engraving in direct association with a carbon tissue to control the depths of the cavities in the new engraving, while at the same time making use of other means to make the pattern and area of the cavities correspond with those of the corrected engraving.

Intaglio engravings in which both the depth and the area of the cavities vary with the tones of the original are recognized as most desirable for printing and also as best adapted for correction by re-etching and burnishing. A special advantage of my invention is that it provides for making accurate duplicates of corrected intaglio engravings of this type.

To make the practice of my invention plain to those skilled in the art, I will describe in detail a specific method embodying it which is illustrated in the flow diagram of the accompanying drawing.

Color-separation negatives are made from a colored original, and from each negative a continuous-tone diapositive and a half-tone diapositive are made. The continuous-tone and half-tone [1] diapositives for each color are printed in succession on a carbon tissue, and copper plates are engraved from the developed carbon tissues in the usual manner. The plates are then corrected by so-called "finishing" which involves re-etching parts of them to increase the depth of the cavities in these parts and burnishing parts of them to reduce the depth of the cavities in these parts. Superimposed colored ink prints are made from the plates as the correcting progresses until the desired color effect has been obtained.

My method is applied to provide additional intaglio engravings accurately duplicating each of the color-corrected engravings. It involves the following steps with respect to the corrected engraving for each color:

An ink print is made from the corrected engraving on a transparent sheet. In this step, it is best to use black ink printed on a plastic sheet. To obtain good adherence, the ink should contain a solvent for the plastic. Printing on acetate sheets with an ink containing acetone is satisfactory.

An ink print from an intaglio engraving, unlike an ink print from a relief or letterpress engraving, does not reproduce the design in the plate from which it is printed. The design in an intaglio plate consists entirely of separated cavities, while in a print from such a plate the ink from the deeper cavities spreads into a continuous film of varying thickness, so that the design of the cavities is preserved only in the light areas of the print which contain ink from the shallowest cavities. Since the thickness of the ink varies with the tone in such a print, the effect of the print on light passed through it is very similar to that of a photographic diapositive in which the differences in tone are represented by differences in density.

With the ink print is used a transparency having separated opaque dots of uniform density representing the pattern and the areas of the cavities in the corrected engraving. Since the making of corrections by "finishing" changes the depth of the cavities without much change in their areas, this transparency may be the half-tone diapositive which was used in making the original engraving which has been corrected, or a photographic duplicate thereof.

A carbon tissue is exposed in succession to light passing through the ink print and light passing through the half-tone diapositive, and a plate is engraved from a resist made from the developed tissue. This plate contains cavities whose pattern and areas correspond to the half-tone diapositive. The ink print determines the depth of the cavities and has no effect on the pattern of the cavities except in the very light tones where the pattern of the cavities has been preserved in the ink print. It is extremely difficult to make this pattern exactly register with the pattern in the light tones produced by the half-tone diapositive, and lack of register may lead to moiré or other objectionable effects.

I have incorporated in my method, in its most desirable form, a step for making exact register unnecessary. This consists in diffusing the pattern contained in the light areas of the ink print. Since the pattern is contained only in the light areas and is composed of very thin dots of ink, the usual methods of diffusing half-tone dots are not required. It is sufficient to place a diffusing screen either over or under the ink print in the printing frame in which the carbon tissue is exposed to light through this print. The diffusing screen may consist of an acetate sheet having a ground surface, placed between the print and tissue.

In order to insure diffusion of the pattern in the light tones of the ink print, I have devised a new article. This is an acetate sheet ground on one surface and having an ink print from an intaglio plate on its smooth surface. When this article is placed in the printing frame with a carbon tissue, it insures an exposure similar to that obtained from a continuous-tone diapositive. The new article may be made by printing on other types of translucent sheets which have at least one smooth surface.

After the ink print, preferably with slight diffusion, and the half-tone diapositive have been printed on a carbon tissue, the tissue is stripped, reversed and washed in the usual manner and the new intaglio engraving is made by multiple etching through this resist.

A set of new intaglio color plates made by this method from color corrected intaglio engravings will be found to duplicate very closely the corrected engravings. Thus, color prints produced from the new set of plates differ in appearance very slightly, if at all, from the color print or proof obtained from the original engravings after the corrections had been completed.

It should be noted that, while the original corrected engravings may be made on flat plates to facilitate the making of corrections and the taking of proofs, the duplicate engravings may be made on cylindrically curved plates for application to printing cylinders. My method thus provides a method for making cylindrically curved intaglio engravings which duplicate corrected flat intaglio engravings.

In the practice of my method, it is not essential that the half-tone diapositive used be the same diapositive which was used in making the original engraving. If preferred, a new half-tone diapositive may be made from the ink print by using a half-tone screen. This will have a dot pattern substantially the same as the cavity pattern of the corrected engraving.

It is not essential to my method that a carbon tissue be used as the resist for engraving the duplicate plates.

[1] The half tones used in resists for intaglio engravings differ from those used in letterpress or relief engravings in that they have separated dots in their deepest tones like those in a middle tone of the half tones used in relief engravings.

Other types of sensitive stripping tissues for intaglio resists, such as those containing silver salts, may be used instead of carbon tissue if preferred. The words "sensitive stripping tissue" are used herein to comprehend such resist materials as well as carbon tissue.

Besides providing the first means for duplicating corrected intaglio engravings, my method has the advantage of introducing an economy, as the intaglio ink prints on light-pervious sheets may be produced at much less expense than photographic diapositives.

What I claim is:

1. In the duplication of a corrected intaglio engraving which has been etched through a resist made by developing and stripping on a sensitive stripping tissue which as the result of two exposures contains a continuous-tone image and a half-tone image of the original, the method which comprises making an ink print from the corrected engraving on a light-pervious sheet and exposing a sensitive stripping tissue successively to the ink print and to a half-tone diapositive having opaque dots substantially corresponding in pattern and area with the pattern and area of the cavities of the corrected engraving, to provide a resist for the etching of a duplicate engraving.

2. In the duplication of a corrected intaglio engraving which has been etched through a resist made by developing and stripping on a sensitive stripping tissue which as the result of two exposures contains a continuous-tone image and a half-tone image of the original, the method which comprises making an ink print from the corrected engraving on a transparent sheet and exposing a sensitive stripping tissue successively (1) to the ink print and a diffusing element and (2) to a half-tone diapositive having opaque dots substantially corresponding in pattern and area with the pattern and area of the cavities of the corrected engraving, to provide a resist for etching a duplicate engraving.

3. In the duplication of a corrected intaglio engraving which has been etched through a resist made by developing and stripping on a sensitive stripping tissue which as the result of two exposures contains a continuous-tone image and a half-tone image of the original, the method which comprises making an ink print from the corrected engraving on a translucent sheet and exposing a sensitive stripping tissue successively to the ink print and to a half-tone diapositive having opaque dots substantially corresponding in pattern and area with the pattern and area of the cavities of the corrected engraving, to provide a resist for etching a duplicate engraving.

4. In the duplication of a corrected intaglio engraving which has been etched through a resist made by developing and stripping on a sensitive stripping tissue which as the result of two exposures contains a continuous-tone image and a half-tone image of the original, the method which comprises making an ink print from the corrected engraving on a light-pervious sheet, making a half-tone diapositive from the ink print by means of a half-tone screen, and exposing a sensitive stripping tissue successively to the ink print and to the half-tone diapositive, to provide a resist for the etching of a duplicate engraving.

5. The method of making duplicate corrected intaglio engravings, which comprises successively printing a continuous-tone diapositive and a half-tone diapositive on a sensitive stripping tissue, developing and stripping the tissue to form a resist, etching a metal plate through the resist to make an intaglio engraving, correcting the plate, making an ink print from the corrected plate on a light-pervious sheet, exposing another sensitive stripping tissue successively to said ink print and to a half-tone diapositive having opaque dots substantially corresponding in pattern and area with the opaque dots of said half-tone diapositive, developing and stripping said tissue to make a resist, and etching a second metal plate through said resist to make a duplicate engraving.

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