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ENGRAVING PROCESS AND ETCHING RESIST

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4 Claims. (Cl. 41—43)

My present invention is a novel, speedy and economical contribution to the art of photo-engraving, having for its main object complete elimination of need for powdering, either with dragon's blood or bitumen, and for burning in the resist to prevent excessive side action of the half tone dots during the process of etching with electricity, acids or caustics.

The preliminary steps in securing an image on a metallic plate in an acid resisting medium is conventional in the photo engraving art. Coating on development has either dot or line areas which cover the metal beneath and coordinate interspaced areas of bare metal which is attacked in the "first bite" of the etching acid.

Any well known "enamel" coated zinc half-tone plate is given a first bite. This may be carried to a depth of approximately .003 inch in the highlights and middletones. The tops of the dots are protected by the acid resistant "enamel" coating first applied, as mentioned in the preceding paragraph, which may be bichromatized fish glue, shellac, etc. This coating forms no part of the present invention. My improvement resides in the subsequent single treatment of a plate that has received its "first bite" and it is this single added treatment which distinguishes my invention from the conventional plurality of "bites" required to produce a finished half-tone zinc plate for newspaper printing.

The plate so etched is rolled up with an initially acid resistant composition which, through the pressure of the roller, spreads downward along the sidewalls of the dots that have been formed in the usual way by the "first bite", but it does not cover the bottom of the half-tone cavities.

The unique feature of the invention resides in the important fact that the mordant which freely attacks the zinc, at the same time does not attack the rolled on resist but it makes it more acid resisting than it was in its initial or first state, thus completely protecting the delicate dots of the highlight against being etched away, without having recourse to the usual four-way powdering that is required in ordinary zinc etching in preparation for the second, third and fourth bites.

It is well known that carbon compounds are reduced by hydrogen in the presence of zinc, copper, brass and magnesium, and that reduction may be hastened in the presence of finely divided metallic salts. However, oxidization decomposition may also be used to advantage and the two functions of decomposition by reduction and oxidization of a complex carbon compound may take place at the same time, as for instance when zinc is etched with nitric acid, giving up oxygen, so as to bond a resist of carbon or hydrocarbon compounds about the sides of a dot or line rolled up in the manner above described.

As there is no powder to fill the bottoms of highlights or middletones, this process permits etching of a 65-line screen halftone on zinc to a depth of .009 of an inch in the highlights and .008 of an inch in the middletones. The process provides for warming the plate to assist the rollup if desired, but it eliminates the use of any temperature that would distort the molecular structure of zinc such as is used in powdering.

Examples by weight of carbon and hydrocarbon compounds suitable to serve as rollup compositions among others are:

(*a*) Resin 1; carbon 3; mineral oil 2; cobaltous oleate 1.

(*b*) Linseed oil 1; resin oil 1; powdered asphaltum 2; benzol 1; carbon 2; lead manganese oleate 1.

(*c*) Shellac 4; glue 1; sodium metasilicate ¾; water 4; carbon 2.

Viscosity may be regulated by the addition agents of carbon and thinner. Any suitable filler may be used as a substitute for carbon. The thinners may be varied. The additional mineral salts contribute to speedy oxidization, but are not necessary. This process permits zinc to be used for multicolor printing plates, as not enough heat is used in setting the compound to distort registry or even burn the hand.

I claim:

1. An engraving process which includes the well-known step of selectively covering portions of a metallic plate with an adherent acid resisting coating, and etching the plate at the interspaces between the coating by a suitable mordant to constitute a first bite, associated with the rolling up of the relief lines or dots so formed with an initially acid-resistant carbon compound, and in increasing the acid-resisting qualities of the compound by the application of the etching acid.

2. A powderless engraving process which includes the well-known step of etching a first bite into a metal plate, and thereafter rolling the plate with a carbon compound to deposit the compound along the edges of the etched areas, and in bonding or hardening the film of compound by repeated applications of an etching acid.

3. A process of the class described which includes the well-known step of giving a first bite of an etching agent to a metallic plate at selective areas conforming to a pictorial subject, in applying an initially acid resistant carbon compound

through a rolling action to the upstanding bordering edges of the etched areas, in subjecting the applied compound to a moderate temperature without structurally destroying the physical properties of the plate, and in increasing the acid resisting quality of the compound by successive applications of the etching agent.

4. A powderless engraving process which includes the well known step of etching a first bite into the metal plate, in warming the plate, and thereafter rolling the plate with an acid resistant compound to deposit the compound along the edges of the etched areas, and in bonding or hardening the film of compound by repeated applications of an etching acid.

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