Patented Aug. 2, 1949

2,478,070

UNITED STATES PATENT OFFICE

2,478,070

DEVELOPING INKS

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No Drawing. Application March 10, 1945, Serial No. 582,176.

5 Claims. (Cl. 106—248)

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In lithography, developing inks are applied to the light-sensitive colloidal surface of a lithographic plate after exposure for the formation of the image to be reproduced, and before the development operation. Thus, the developing ink remains on the areas of light-hardened colloid after development, its functions being to protect the colloid of the image from the moisture and etching materials used on the plate preparatory to and during printing, and to make the image areas attractive or receptive to the ink applied by the press during printing. In accordance with the present invention, developing inks may be had with greatly augmented ink-attractiveness of image areas treated therewith, so that superior printing, and improved resistance of the image to attack by etching and dampening fluids is obtained. The present composition adheres also more tenaciously to the colloidal surface of the plate, and is also more repellent to aqueous solutions of gum arabic when employed to protect the non-image areas of the plate during storage. Other objects and advantages will appear from the following description.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described, and particularly pointed out in the claims, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principle of the invention may be employed.

In general, the invention involves a finely divided metal in a developing ink composition, and the latter may be of known suitable ingredients. Developing inks, as well-known, are not printing inks or drying compositions, but are non-drying (Research Bulletin No. 6, page 107, published by Lithographic Technical Foundation, Inc., 1945) and involve a water-repellent base material, and this may be, for instance, a fatty oil, particularly of non-drying type, and other water-repellent or fatty materials may be included for bodying and increased effectiveness, and thus, oils such as cotton seed oil, and fats such as tallow, also asphaltum, etc., may be compounded together, and all such are referred to hereinafter as "water-repellent materials." And, a pigment such as carbon black is included, also a volatile thinner, such as turpentine, and advantageously a soap, such as sodium oleate. In particular, the present invention applies in the composition a finely divided metal. The particle size may vary somewhat, and should not be so coarse as to impair the quality of the printing, and a small size is preferred by reason of the greater surface area provided thereby, and lesser tendency to settle out upon standing. Materials of colloidal dimensions have been found particularly desirable. While the reason for the remarkable action of developing inks containing finely divided metal is not clear, and I am not limiting the matter to any particular theory, there is reason to believe that the free surface residual valence of the finely divided metal greatly increases the attraction on the components of the printing ink subsequently used on the developed plate, and it adsorbs more completely, and has superior repulsion on the aqueous dampening and etching fluids which are also applied. Certain finely divided or colloidal metals may be employed, viz. lead, iron and copper, and for conciseness these are referred to hereinafter as "colloidal metals from the class having a valence of 2 and consisting of copper, lead and iron." The metal may be introduced in desired amount in range for instance from about 2 to about 25 per cent of the total ink ingredients. A satisfactory amount is around 5 per cent generally.

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As indicated, the water-repellent ingredients of the ink may vary considerably in their detail character, but in all cases, with the water-repellent and thinner ingredients there is incorporated the component of the finely divided metal. As an example of developing ink employing colloidal lead containing 72 per cent particles 0–15 microns in diameter and 28 per cent particles larger than 15 microns, the following is cited:

	Parts by weight
Cotton seed oil	35
Asphaltum	10
Tallow	5
Sodium oleate	5
Carbon black	35
Turpentine	100
Colloidal lead	10

In general the fatty oil component may be 17–19%, asphaltum 3–8%, tallow 1–3%, sodium oleate ½–3%, carbon black 17–19%, and turpentine 50–60%.

Some metals are somewhat more active than others, and some variation may be had also in accordance with the fineness of division of the metal.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the

features stated in any of the following claims or the equivalent of such be employed.

I therefore particularly point out and distinctly claim as my invention:

1. A composition of matter, consisting of water-repellent lithographic developing ink incapable of firm drying, comprising an oily liquid of substantially non-drying fatty material as the principal constituent and thinner, with the addition of about 2–25 per cent of colloidal metal from the class having a valence of 2 and consisting of copper, lead and iron.

2. A composition of matter, consisting of a water-repellent lithographic developing ink incapable of firm drying, comprising an oily liquid of substantially non-drying fatty material as the principal constituent and volatile thinner, with the addition of about 2–25 per cent of colloidal lead.

3. A composition of matter, consisting of a fatty oil water-repellent lithographic developing ink incapable of firm drying, comprising cotton seed oil 17–19 per cent, asphaltum 3–8 per cent, tallow 1–3 per cent, sodium oleate ½–3 per cent, carbon black 17–19 per cent, turpentine 50–60 per cent, and about 2–25 per cent of colloidal lead.

4. A composition of matter, consisting of a water-repellent lithographic developing ink incapable of firm drying, comprising an oily liquid of substantial non-drying fatty material as the principal constituent and thinner, with the addition of about 2–25 per cent of colloidal copper.

5. A composition of matter, consisting of water-repellent lithographic developing ink incapable of firm drying, comprising an oily liquid of substantially non-drying fatty material as the principal constituent and thinner, with the addition of about 2–25 per cent of colloidal iron.

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