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LITHOGRAPH PLATE

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My invention relates to a plate adapted to be used in lithography, either offset or direct.

Heretofore such plates have been made of stone or of metal such as zinc or aluminum.

The object of my invention is to make a plate of paper which shall have the properties necessary for successful commercial use in place of the more expensive stone or metal plates. Such a paper plate must be strong and pliable and preferably of a light color so that the ink impressions thereon will be conspicuous. Its surface should be such as to stand drawing, printing, typing or painting. The surface may desirably be sensitized so as to receive photographic impressions. The surface should be such that all marks can be readily erased or otherwise corrected.

In the practice of my invention I first take a sheet of waterproof paper, that is, the paper must be sufficiently waterproofed so that it will not expand when wet even to the very small extent which would be deleterious in its use as a plate for lithography. Sheets of such waterproof paper may be prepared in many ways. A preferred sheet comprises two layers of water-repellent paper stuck together by an intermediate layer of asphaltum. Such a composite sheet I have found very satisfactory for my purpose. A single sheet of paper, that is sufficiently waterproof by reason of chemical treatment or otherwise, will, however, answer the purpose.

I then apply to one or both surfaces of this paper sheet, which is waterproof as above described, a coating of a material such that the surface of the coated paper will have a substantially equal affinity both for the water (which may or may not be chemically treated) used in lithography and for the grease comprised in the marking materials commonly used in preparing lithographic plates and in the ink used in lithography. I refer herein to such water as "lithography water" and to such grease as "lithography grease".

While various mixtures or compositions of materials may be used for coating the surface of the paper plate and imparting to it the desired affinity for lithography water and grease, I have found that one very satisfactory coating, which I give by way of example, consists of a mixture of silica or clay (aluminum silicate) or other suitable filler, a binder such as casein, starch or glue, and a waterproofing compound such as formaldehyde or aluminum acetate. I have found a coating consisting, for example, of 40 parts by weight of 10% alkaline casein solution or a true solvent solution of casein, 55 parts of powdered clay and 5 parts of 40% commercial formaldehyde solution to be entirely satisfactory. This somewhat viscous material may be applied as a coating to the plate in any well known way, as by a brush coating machine.

It may be desirable under some circumstances to add to the coating mixture some metallic salt, such as chloride of zinc, or other chemical that will assist in causing the unmarked portion of the surface of the paper plate to repel the ink on the inking roll, in conjunction with the well-known chemicals, which are used in lithographic repellents, such as phosphoric acid for example.

The plate is then dried.

The clay or silica or like material provides an even texture or "grain" on the surface of the paper plate, which is necessary for the best results in receiving and retaining the applied marking material. The surface of the thus coated paper plate contains a multitude of tiny depressions which receive the marking material used in preparing the plate and help this marking material to adhere tenaciously to the plate.

The size and character of such depressions may be controlled by rendering that surface alkaline to redissolve or soften the binder, as by treatment with ammonia, and/or regulating the temperature and rate of drying. Formaldehyde or any suitable acid may then be applied to the coating to render it insoluble in the water or repellents used in lithography.

I have found that a paper, so waterproofed as not to expand deleteriously when wet in the lithographing process in which it is used, and coated with a coating such as above described, which provides a surface of substantially equal affinity for lithography water and grease makes a satisfactory plate having the qualities and properties necessary for successful practical use.

I have said that the surface of the coated paper plate of my invention has a substantially equal affinity for lithography grease and water. By that I mean that it has the following properties with respect to such grease and water. The initial greasy marking material, applied to the plate, forms a uniform and continuous coating over the areas marked, which coating adheres to the plate with such tenacity that it will not be displaced by the lithography water which is applied over the entire surface of the plate. The unmarked surface of the plate has a like affinity for the lithography water which adheres to the sheet so strongly that it is not displaced by the ink used in the lithographing operation. The substantially equal affinity of the surface of

the plate for the lithography water and grease secures the important result that neither such water nor grease materially displaces the other. If it did, a blurred impression would result after an undesirably few impressions has been taken. The affinities of the surface of the plate to the lithography water and grease need not be exactly equal, but are so nearly equal that the impressions will not become blurred in the normal use of the plate in commercial lithography.

In order to make the plate photo-sensitive I may add to the coating any of the well-known photo-sensitive chemicals so that the plate will take photo impressions which may be developed on exposure to light in the manner well-known to the art.

I prefer to coat the paper on both sides. In such case I have found it advantageous to attach to each side of the coated plate, preferably by embossing, a sheet of thin paper, such as tissue paper, which protects the coated surface when the plates are assembled in a pile as they would conveniently be for practical use. The attached paper is also advantageous in providing a means for holding in place a sheet from which marks are to be reproduced on the surface of the plate, such as a sheet of carbon paper.

I claim:

1. A plate for use in lithography comprising a water-repellent paper base coated with a coating comprising casein, silicious clay and formaldehyde, said coating possessing an affinity for lithography water and grease such that said water or grease, when applied to the plate, is not displaced by the subsequent application of the other material.

2. A lithographic plate comprising a plurality of layers of water-repellent paper separated by and adhering to an intermediate layer of asphaltum and forming a base sheet, said base sheet being coated on at least one side with a coating comprising casein, silicious clay and formaldehyde, said coating possessing a substantially equal affinity for water and for lithographic marking materials.

3. A lithograph plate comprising a paper backing sheet which is substantially non-stretching when subjected to the lithographing process, and a flexible coating comprising a filler, casein and formaldehyde firmly adhering to said sheet, the surface of said coating having lithographic properties.

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