

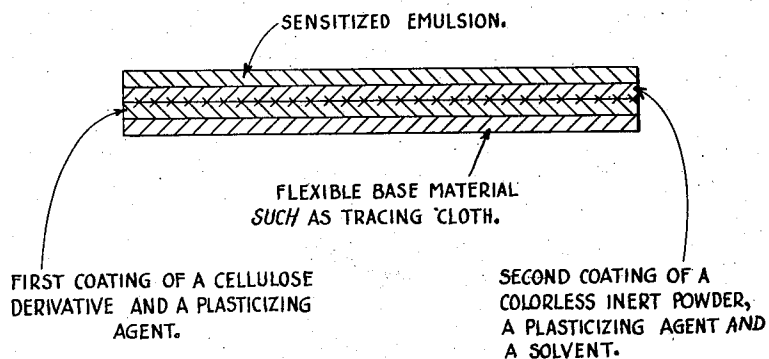
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PHOTOGRAPHIC LINE PRINTING

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PHOTOGRAPHIC LINE PRINTING

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6 Claims. (Cl. 95—8)

This invention relates to improvements in processes for preparing suitable flexible base materials such as ordinary commercial standard tracing cloth for use in photographically reproducing thereon tracings and drawings. Such reproductions are usually called black line prints on tracing cloth, the latter material being the one most commonly used. The object of the invention is to provide a superior sensitized tracing cloth as an article of manufacture whereby a more perfect dull surface is obtained for the use of ink or pencil on the finished print for purposes of alterations or additions thereto, and whereby the printed lines will adhere more closely to the tracing cloth and can only be removed with difficulty. Another object of the invention is to provide a novel process for black line photographic printing on tracing cloth. The term tracing cloth will be used herein as a convenient designation of the flexible base material.

The usual methods of making prints on tracing cloth include waterproofing the cloth before sensitizing, then printing and developing. Some of these methods or processes do not result in entirely satisfactory prints. Often the surface of the finished print is found to be more or less glazed thus rendering the use of ink or pencil thereon difficult. In some cases it has also been found that the printed lines are too easily removed by washing or chipping, for instance when a print is subject to hard usage.

The present invention contemplates subjecting the tracing cloth to a pre-sensitizing treatment after it has been waterproofed for the purpose of destroying the glaze inherent in many waterproofing coatings and obtaining a clearer and more beautiful finished print having an even dull and smooth surface which readily takes ink or pencil marks. Concerning the use of the word glaze, it is to be observed that the object of the pre-sensitizing or second coating is not primarily to destroy the glaze which commonly appears or is present in the waterproofing coating. The latter may not result in an objectionable glaze. But inasmuch as the waterproofing coating in and of itself repels to a greater or lesser degree the sensitizing coating, the second coating is employed or put on to destroy this repellent action or feature inherent in the waterproofing coating. If the latter results in a glaze, then of course the glaze is destroyed, but the glaze is merely a symptom or surface indication of the waterproofing. The accompanying drawing illustrates diagrammatically the invention herein. The novel treat-

ment also causes the printed lines to adhere far more closely to the tracing cloth surface.

In carrying out this invention the procedure is as follows: Ordinary tracing cloth is coated on one or both sides with a coating of suitable waterproofing solution which is deposited on the tracing cloth in the form of a film. Any suitable apparatus may be used for this purpose. For instance, the tracing cloth may be passed through a bath. Thereafter the tracing cloth is dried in a suitable drying apparatus. The waterproof solution dries on the tracing cloth into a uniform, glossy, transparent film on each side of the cloth.

The waterproofing solution may be made according to the following formula:

Dibutyl phthalate.....	19 lbs. 8 oz.
Butyl propionate.....	14 lbs. 8 oz.
Ethyl lactate.....	8 lbs. 12 oz.
Butanol.....	3 lbs. 8 oz.
Lacquer.....	50 gallons
Acetone.....	24 gallons

Dibutyl phthalate is a plasticizer, and may be replaced wholly or partially by diamyl or diethyl phthalates, tricresyl or triphenyl phosphates, dibutyl or diethyl tartrates, triacetin, or other known plasticizers or mixtures thereof.

Butyl propionate and ethyl lactate are high-boiling solvents, and may be replaced wholly or partially by diacetone alcohol, tetrachlorethane, furfural, xylol, ethyl acetoacetate, ethyl benzoate, or other known high boilers or mixtures thereof.

Butanol is a medium-boiling solvent, and may be replaced wholly or partially by butyl or amyl acetates, diethyl carbonate, ethyl butyrate, amyl alcohol, toluol, or other known medium boilers or mixtures thereof.

Lacquer is a low-viscosity nitro cotton in acetone solution, the viscosity of the solution being 117-125 as determined with a MacMichael viscosimeter. It may be replaced by a solution of cellulose acetate.

Acetone is a low-boiling solvent, and may be replaced wholly or partially by methyl or ethyl acetates, ethyl propionate, anhydrous ethyl alcohol, isopropyl alcohol, methanol, benzol, dichloromethane, or other known low-boilers or mixtures thereof.

Thereafter the dry waterproofed tracing cloth is subjected to the pre-sensitizing treatment by passing the cloth over a coating roller which dips into a bath of the special treating solution in a well known manner and applies a thin film of uniform coating to the cloth on one face thereof.

The treating solution is made from a paste of the following typical composition.

Superfloss.....	12 oz.
Dibutyl phthalate.....	1 lb. 2 oz.
Alcohol (Formula 30).....	1 pint

From 12 oz. to 1 lb. 8 oz. of this paste is mixed with sufficient alcohol (Formula 30) to obtain one gallon of pre-sensitizing solution.

Superfloss is a finely-ground siliceous powder which may be purchased in the open market. It may be replaced wholly or partially with other finely-ground siliceous powders, diatomaceous earth, kieselguhr, tripoli, silicagel, barium sulfate, or other suitable inert powders or mixtures thereof.

Dibutyl phthalate is plasticizer, and has already been referred to.

Alcohol (Formula 30) is specially denatured alcohol, made by adding 10 gallons of methanol to 100 gallons of ethyl alcohol.

The effect of this treatment is to exert a mild solvent action on the waterproof film to the extent of destroying its glossy finish and then upon drying to leave deposited on the surface a matte, but transparent, layer of re-deposited nitro cotton mixed with a fine inert solid powder and plasticizer, the two latter being derived from the treating mixture. The special treating solution has no chemical action on the waterproofing film; the action is physical. The treating solution partially dissolves the cellulose nitrate and dibutyl phthalate in the surface of the waterproof film and upon application of heat, the solvent alcohol evaporates, re-depositing this cellulose nitrate and dibutyl phthalate mixed with more dibutyl phthalate and superfloss from the treating solution.

The object of this treatment is to make the waterproof surface of the cloth so receptive to the sensitizing solution that the printed line resulting therefrom can be erased or chipped off only with the greatest difficulty; and also to make the surface more receptive to ink and pencil.

Thereafter the treated face of the cloth is coated with a light sensitive emulsion, by passing it over a coating roller which in rotating dips into a tank of the emulsion and carries up and applies to the face of the cloth a thin, uniform layer of the emulsion. After this coating has been applied in this fashion, the cloth is dried by passage thru a drying box.

A typical formula for the sensitizing emulsion follows:

Glue.....	110 grams
Potassium bichromate.....	12 "
Silver nitrate.....	90 "
Potassium chloride.....	40 "
Alcohol (Formula 30).....	360 c.c.
Ammonium hydroxide 58%.....	7 c.c.
Water to make 1 liter	

The sensitized tracing cloth is now a finished article of manufacture which may be stored, shipped and used in the trade in the same manner as other similar sensitized layers are handled and used commercially.

The process thereafter of making a print is carried out as follows. The negative which is obtained in the usual manner is placed against the sensitized face of the tracing cloth, exposed to light and a print is made. Thereafter the print on the sensitized tracing cloth is washed with water to remove the sensitized coating from the unexposed portions of the print. That is, the

coating which was under the opaque portions of the negative is washed away. Swabbing with a wad of wet absorbent cotton hastens this operation and insures its completeness. The next step in the process is the developing of the print which is done by placing the print in a developing bath which may consist of

Sodium carbonate (soda ash).....	4 oz.
Sodium sulfite.....	4 oz.
Hydroquinone.....	3/4 oz.
Monomethylparaminophenol sulfate.....	1/4 oz.

The latter chemical is sold under a variety of trade names such as metol, pictol, rhodol, and others.

After having been developed the print is again washed to remove all surplus developer and then dried.

The finished print is waterproof and the tracing cloth regains its natural appearance and characteristics. It is a black line positive print on tracing cloth having a superior appearance and all the characteristics of an ordinary tracing on tracing cloth.

I claim:

1. As a new article of manufacture, a flexible sensitized photographic line print sheet comprising a flexible base material; a coating thereon consisting of a cellulose derivative and a plasticizing agent; a second coating on said first coating, said second coating consisting of an inert powder and a plasticizing agent and a sensitizing coating on said second coating.

2. As a new article of manufacture, a flexible sensitized photographic line print sheet having a matte receptive surface comprising a flexible base material; a coating thereon consisting of a cellulose derivative and a plasticizing agent; a second coating on said first coating, said second coating consisting of an inert powder and a plasticizing agent and a sensitizing coating on said second coating.

3. As a new article of manufacture, a flexible sensitized photographic line print sheet comprising a flexible base material; a coating thereon consisting of a cellulose derivative and a plasticizing agent; a second coating on said first coating, said second coating consisting of an inert powder and a plasticizing agent and a sensitizing coating on said second coating consisting of a glue-bichromate mixture impregnated with a silver salt.

4. The method of preparing a suitable flexible base material for photographic line printing which consists in placing on said base material a first coating including a cellulose derivative and a plasticizing agent whereby to waterproof the same; placing a second coating on the first coating, said second coating consisting of a colorless inert powder, a plasticizing agent and a solvent whereby to partially dissolve said first coating; applying heat to cause the said partially dissolved portion of the said first coating to be redeposited in admixture with the said inert powder and plasticizing agent to render said material receptive to a light sensitive coating and finally placing a light sensitive coating on said second coating.

5. The method of preparing a suitable flexible base material for photographic line printing which consists in placing on said base material a first coating including a cellulose derivative and a plasticizing agent whereby to waterproof the same; placing a second coating on the first coating, said second coating consisting of a color-

less inert powder, a plasticizing agent and a solvent whereby to partially dissolve said first coating; applying heat to cause the said partially dissolved portion of the said first coating to be redeposited in admixture with the said inert powder and plasticizing agent to render said material receptive to a light sensitive coating and finally placing on said second coating a light sensitive coating consisting of a glue-bichromate mixture impregnated with a silver salt.

6. The method of preparing a suitable flexible base material to receive a light sensitive coating for photographic line printing which con-

sists in placing on said base material a first coating including a cellulose derivative and a plasticizing agent whereby to waterproof the same; placing a second coating on the first coating, said second coating consisting of a colorless inert powder, a plasticizing agent and a solvent whereby to partially dissolve said first coating and applying heat to cause the said partially dissolved portion of the said first coating to be redeposited in admixture with the said inert powder and plasticizing agent.

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