Aug. 28, 1945. B. RUDNICK 2,383,566

PHOTO-MECHANICAL NEGATIVE

Filed Feb. 13, 1943

Fig. 1

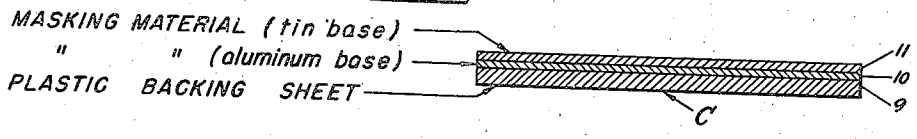


Fig. 2

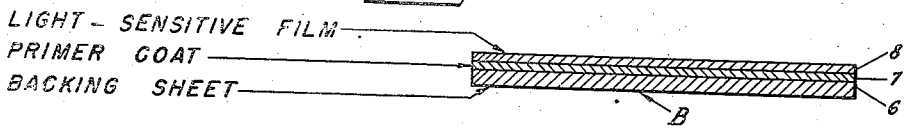


Fig. 3

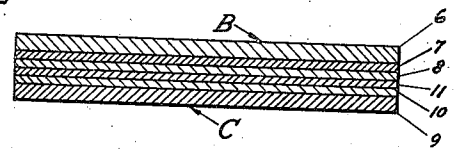
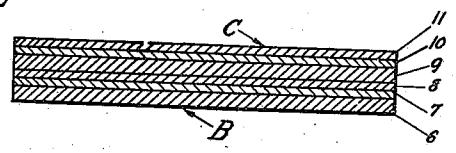


Fig. 4



INVENTOR:
BENJAMIN RUDNICK;
BY:
Robert C. Rasche,
ATTORNEY.

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PHOTOMECHANICAL NEGATIVE

Benjamin Rudnick, Huntington, N. Y., assignor to Republic Aviation Corporation, a corporation of Delaware

Application February 13, 1943, Serial No. 475,736

8 Claims. (Cl. 41—46)

This invention relates to photo-mechanical negative; and particularly aims to provide such to be used for the photo-mechanical reproduction of drawing sheets, mechanical layouts, templates, etc.

More particularly, the invention aims to provide a photo-mechanical negative which can be used in connection with the method of line reproduction disclosed in my Patent No. 2,321,249, issued June 8, 1943, and is a division of my Patent No. 2,321,046 issued June 8, 1943.

The general object of the invention is to provide a photo-mechanical negative on which any kind of line drawings may be readily marked, corrected or completed, by means of a stylus so as to form a master pattern which may be repeatedly used for the preparation of new drawings or the localized correction of old drawings. The use of this photo-mechanical negative is not, however, limited to this reproduction of drawing sheets, and as will become clear hereinafter, will indeed find great utility in machine and sheet metal shop practice in transferring mechanical layouts or templates as they come from the drafting table, directly onto the work to be machined, metalsmithed or otherwise operated upon.

Other objects and advantages will become apparent from the following detailed description of the preferred mode of realization of my invention, reference being had to the annexed drawing in which:

Figure 1 is a cross-sectional view of a photo-mechanical negative prepared according to said preferred mode;

Figure 2 is a cross-sectional view of a copy sheet which is preferably used in combination with this negative in order to obtain a positive reproduction thereof;

Figure 3 shows the preferred manner in which the negative of Figure 1 and the copy sheet of Figure 2 are arranged during their exposure, and

Figure 4 shows an alternative manner in which the negative according to present invention and the copy sheet of Figure 2 may be arranged during their exposure.

In Figure 1 of this drawing is illustrated a photo-mechanical negative or pattern sheet C comprising a backing sheet 9 made of any suitable transparent plastic material and two coatings, 10, 11 of opaque masking material.

Preferably, this negative is prepared with a clear plastic sheet .01 to .015 thick, coated with said opaque masking material consisting of the two separate layers 10, 11 of different metallic lacquers. These layers of metallic lacquer are of such consistency and are so applied that they can be scribed off or cut away by means of a pointed tool such as a stylus without scratching or cutting into the plastic backing sheet 9. The first coating 10 is prepared by mixing a quantity of finely ground aluminum powder into a liquid nitro-cellulose lacquer so as to form a thick paste. This latter is then thinned by means of a suitable mixture of solvents to the desired consistency and is applied to the surface of the plastic sheet 9. This coating 10, when dry, renders the plastic sheet 9 opaque but adheres thereto so lightly that it can readily be removed with a few strokes of a stiff brush or of a soft eraser. The material for the second coating 11 is prepared by mixing thoroughly a quantity of metallic powder, which consists mainly of tin, to a greater amount of nitro-cellulose lacquer than was used in the first coating 10. To this mixture is then added a smaller amount of the same mixture of solvents than was used in said first coating 10 in order to thin to the desired consistency. The liquid lacquer thus obtained is substantially more adherent than the one used for the first coating 10. A thin layer 11 of said lacquer is then applied over the first layer 10. Upon drying, this second coating 11 acts as an additional opaque mask and as a protective binder for the first coating 10.

The drawing to be reproduced (not shown) is drawn on this surface 11 by means of a pointed instrument which cuts through or detaches locally said top layer 11 of masking and binding material, making it possible to brush or rub out simultaneously all the tin powder thus detached and all the aluminum powder 10 lying directly underneath the lines of said drawing and covering the transparent plastic backing 9.

This is now used as a photographic negative C; it is then, in this instance, placed in contact with a light-sensitive copy sheet B, such as the one shown in Figure 2, comprising a backing sheet 6 of metal, fabric, paper, glass, synthetic plastic, wood or any other suitable material, a coating of priming material 7 made preferably of zinc chromate in a carrier selected with consideration to the nature of the material composing the backing sheet 6 and a light sensitive film 8, consisting, for instance, of an emulsion of silver nitrate suspended in a gelatinous vehicle.

After the negative C is placed in contact with said copy sheet B (Figure 3), it is exposed to artificial light for a predetermined time. The light rays pass through the transparent portions of the plastic negative C, i. e., through the design to be reproduced, and react on the light-sensitive salts

of the copy sheet B. The exposed copy sheet B is then processed in the usual photographic solutions. The resulting reproduction appears as a sharply defined black line on a clean contrasting background.

Should the draftsman make a mistake in initially laying out the drawing, this may be readily corrected by painting over, and thus blacking out the incorrectly placed lines with a black lacquer corresponding in composition to that of the masking material 11, the correct lines afterwards being added when this lacquer has dried.

If an aluminum alloy is used as the backing 6 of the copy sheet B, the light-sensitive emulsion 8 can be applied directly on the metal by first cleaning the surface in a sodium hydroxide solution and then dipping in a diluted nitric acid bath to neutralize the caustic action.

An outstanding advantage in the use of this plastic negative C is the fact that either a right hand or left hand reproduction can be obtained accurately by merely placing the coated surface 11 of the plastic negative C (to produce a copy in reverse of the design as drawn) in direct contact with the light-sensitive copy plate B (as shown in Figure 3) or by placing the backing 9 of the plastic negative C in direct contact with the light-sensitive copy plate B (as shown in Figure 4).

Manifestly, various other modifications in the foregoing mode of preparing the photo-mechanical negative of the present invention may be made by those skilled in the art with departing from the spirit of my invention as defined in the following claims.

I claim:

1. A photo-mechanical negative for reproducing designs, comprising: a transparent, plastic, backing member; an opaque first layer of a metallic lacquer prepared of a mix of finely ground aluminum powder in nitro-cellulose lacquer to form a thick paste subsequently thinned with a mixture of solvents to a suitable consistency for application over the plastic backing to form a readily-brushable, opaque and pulverulent layer; and a second layer of an opaque, metallic, lacquer overlying the first layer, said opaque layers constituting a masking material for the plastic backing member and being of a thickness and composition such as to be readily penetrable by a stylus.

2. A photo-mechanical negative, for reproducing designs, comprising: a transparent, plastic, backing member; a first-layer of a mixture of aluminum powder with a nitro-cellulose lacquer supported upon said backing member; and a second coating of an opaque masking material overlying said first layer of aluminum lacquer, said coating consisting of a mixture of a quantity of metallic powder, consisting mainly of tin, to an amount of nitro-cellulose lacquer greater than the amount used for the first layer, subsequently, thinned with a solvent to the desired consistency and applied over the first layer, for which it then acts as a binder, said opaque coating being of a thickness and composition such as to be readily penetrable by a stylus.

3. A photo-mechanical negative, comprising a backing member, a first layer of a friable or readily brushable, opaque composition thereon, and a second, opaque, stylus-penetrable layer on said first layer and comprising, mainly pulverulent tin, a nitro-cellulose lacquer, and a thinning solvent.

4. A photo-mechanical negative comprising a transparent base member, an opaque masking layer of finely powdered aluminum lightly cohered by a binder deposited on the surface of the member, and a binding layer overlying said masking layer.

5. A photo-mechanical negative comprising a transparent base member, finely powdered aluminum deposited on said member with a binder lightly cohering the aluminum particles and as lightly adhering them to the member to form a friable opaque masking layer, and a binding layer having greater adhesive qualities than the masking layer and overlying said masking layer.

6. A photo-mechanical negative comprising a transparent backing member, a masking layer deposited thereon consisting mainly of powdered metal loosely bonded by a relatively small quantity of lacquer, and a binding and protecting layer consisting mainly of lacquer overlying said masking layer.

7. A photo-mechanical negative comprising a transparent backing member, a masking layer deposited thereon consisting of a relatively large quantity of powdered metal and a relatively small quantity of binder, and a scribable outer layer overlying said masking layer consisting mainly of the same binder as employed in the masking layer.

8. A photo-mechanical negative comprising a transparent backing member, a masking layer deposited thereon consisting mainly of powdered metal mixed with a relatively small quantity of binder, and an outer layer consisting mainly of binder mixed with a relatively small quantity of pigment.

BENJAMIN RUDNICK.