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3,579,394

SOFT GROUND ETCHING METHOD

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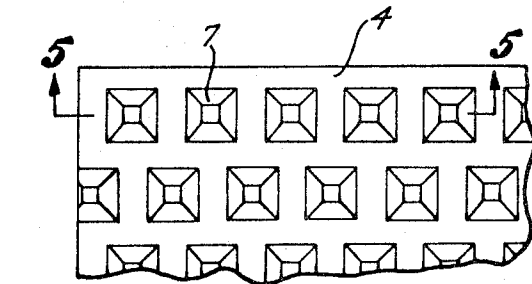
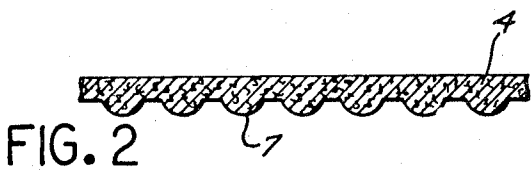
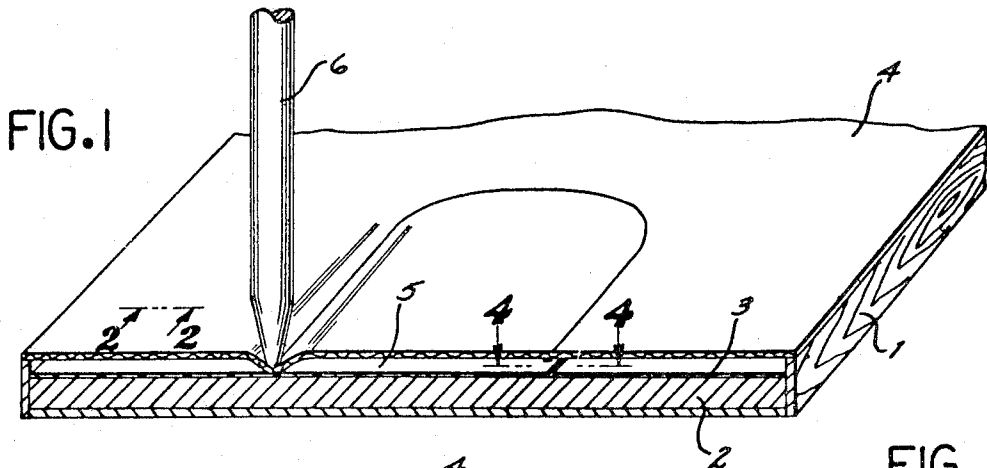


FIG. 4

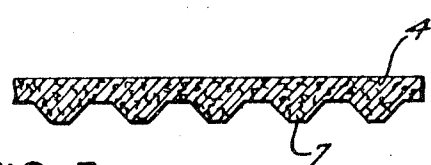
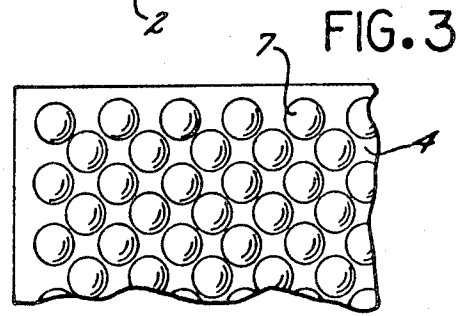


FIG. 5

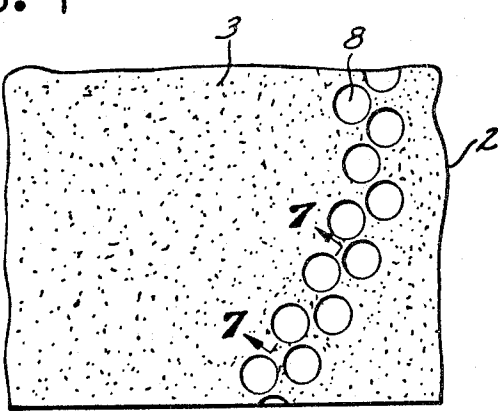


FIG. 6

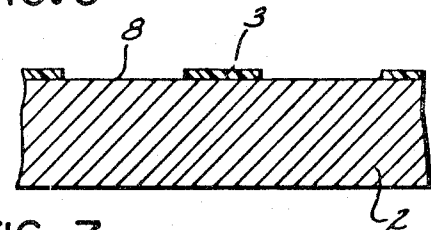


FIG. 7

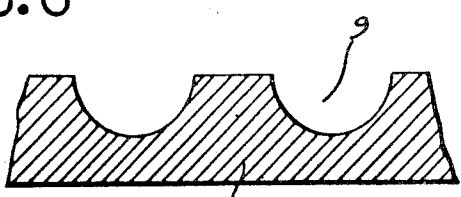


FIG. 9

FIG. 8

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SOFT GROUND ETCHING METHOD

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6 Claims

ABSTRACT OF THE DISCLOSURE

In preparing a metal plate to produce a desired picture or other designs, a resistant material covers the plate against the action of acid, and these resistant materials, called soft ground, are picked off to bare the metal plate so that the plate will be etched by the acid. The soft ground is a sticky substance which will adhere to the pattern on a cover sheet extending over the metal plate, which is called the resist. The pattern on the cover sheet may be formed in many shapes, and the protruding pattern of the sheet will pick off spots or areas of the soft ground when the sheet is pressed into engagement with the soft ground by means of a manually operated stylus. Subsequent treatment of the metal plate with a suitable acid will etch the areas picked off by the sheet and thus form the outlines of the picture or other subject.

An object of my invention is to provide a novel method and product whereby a resilient paper or like product can be stretched over a treated plate, termed a resist, to provide a bared outline on the plate which can be etched to produce the outline of a particular subject.

Another object of my invention is to provide a novel means of picking up the soft ground on the plate by pressing a stylus against a resilient or stretchable sheet to produce the required outline.

Still another object is to provide a novel printing or etching method and product in which the pattern on the overlying sheet is in the form of resilient or compressible shapes, which will compress and expand under pressure in an amount dependent upon the amount of pressure exerted on a stylus by the user.

Other objects, advantages and features of invention may appear from the accompanying drawing, the subjoined detailed description and the appended claims.

In the drawing:

FIG. 1 is a perspective view of the etching method and product in use.

FIG. 2 is an enlarged sectional view taken on line 2—2 of FIG. 1.

FIG. 3 is a fragmentary bottom plan view of the overlying sheet.

FIG. 4 is a fragmentary bottom plan view showing another type of pattern or protrusion on the overlying sheet.

FIG. 5 is a sectional view taken on line 5—5 of FIG. 4.

FIG. 6 is a fragmentary plan view of the metal plate, termed resist, after being acted upon by the overlying sheet.

FIG. 7 is a sectional view taken on line 7—7 of FIG. 6.

FIG. 8 is an enlarged vertical sectional view of the metal sheet after being etched.

FIG. 9 is an enlarged vertical sectional view of the etched sheet and with the resist layer removed.

Referring more particularly to the drawing, the numeral 1 indicates a tray or box in which the metal plate 2 is placed which is to be treated and acted upon, as subsequently described. The metal plate 2 has its upper surface coated with a layer of sticky or tacky material 3, which is termed a soft ground. The soft ground will pull away from the upper surface of the metal plate 2 by any object which touches it, and thus will expose the

metal. The soft ground may consist of grease, tallow, or a petroleum oil, providing that it has the proper stickiness and will adhere lightly to the top surface of the metal plate 2, and will also adhere to the cover sheet, as will be subsequently described, so that the metal is bared after the operator manipulates the stylus. A sheet 4 is stretched over the metal plate 2 and across the open top of the box or housing 1. The sheet 4 may be formed of paper or any other material which is resilient and will stretch under pressure. The sheet 4 is spaced from the top of the plate 2 and above the soft ground 3 by the space 5, which may be about a 1/8 of an inch more or less. The sheet 4 will stretch or bend under pressure so that it will come in contact with the soft ground 3, as shown in FIG. 1. The pressure necessary to depress the sheet 4 is obtained by the stylus 6 which is manipulated by the operator who follows the particular lines, characters, or other subject on the sheet 4.

The bottom surface of the sheet 4 is formed with a protruding pattern or design 7 which may be in various shapes or designs, such as protruding hemispheres, pyramids, trihelicals, etc. These protrusions are very small and are much exaggerated on the drawing so that they will be visible. These protrusions are set very close together and are formed of a substance which will distort or compress under pressure, thus providing a large or small spot or area when the soft ground is picked off of the metal plate 2. The particular contour of the projections from the surface of the sheet 4 is determined by the particular product which is being produced on the metal plate 2, and also whether large or small areas of the metal plate 2 are to be exposed.

FIGS. 4 and 5 illustrate the areas which are picked off on the plate 2 by the protrusions 7, and these bare areas of the metal plate are indicated at 8. After the design has been traced by the stylus 6 the sheet 4 is removed and the metal plate 2 is now treated with a suitable etching acid or the like to provide the depressed areas 9, as is common in gravure work and the like. Since the protrusions 7 on the bottom surface of the sheet 4 are resilient or compressible they will distort in all directions under pressure, and will thus produce either a large or small bared area on the metal plate 2. As previously stated, the protrusions 7 are very small and a large number of protrusions are required to produce a line on the metal plate 2, but under pressure these same small protrusions will distort in all directions and produce quite an appreciable sized picked off area or bared area on the metal plate 2.

My etching method may also be employed with a hard ground surface on the metal plate 2. By hard ground is meant a coating which includes very small bubbles or droplets which when broken will release a substance to dissolve the coating and expose the surface of the metal plate for subsequent etching. The bubbles or droplets in the hard surface material may be broken under pressure by the protrusions 7 and under pressure of the stylus 6, as previously described. The bubbles or droplets in the hard ground are very minute and are comparable in size to the protrusions or designs 7.

Having described my invention, I claim:

1. An etching method consisting of coating one surface of a metal plate with a covering material of a petroleum wax, then placing a flexible sheet formed of paper and having a protruding pattern thereon on the surface opposite the covering material, said protruding geometrically shaped pattern on the flexible sheet engaging the covering material when pressure is applied to the flexible sheet with a stylus to pick up an area of the covering material and expose the bare metal of the metal plate, removing the sheet with the removed covering material thereon, and etching the exposed plate.

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2. An etching method as recited in claim 1, and said flexible sheet being spaced from the covering material when no pressure is applied to the top surface of the sheet with a stylus.

3. An etching method as recited in claim 1, and said protrusions of the pattern being compressible to distort when engaging the covering material. 5

4. An etching method as recited in claim 1, said flexible sheet being spaced from the covering material when no pressure is applied to the top surface of the sheet, and said protrusions of the pattern being compressible to distort when engaging the covering material. 10

5. An etching method as recited in claim 1, and said covering material on the metal plate consisting of a soft ground.

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6. An etching method as recited in claim 1, and said covering material of the metal plate consisting of a hard ground.

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JACOB H. STEINBERG, Primary Examiner

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