

April 4, 1944.

J. J. ORMOND

2,345,989

ETCHING PROCESS

Filed Sept. 24, 1941

Fig. 1.

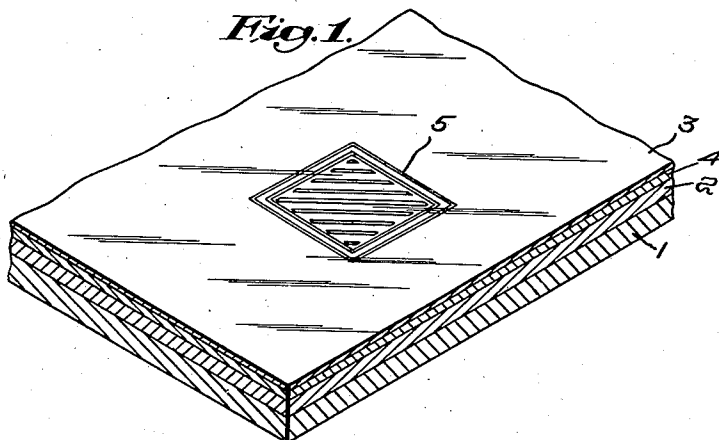


Fig. 2.

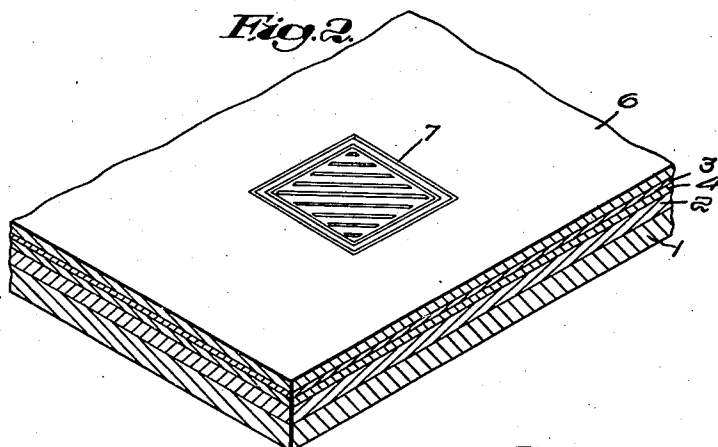


Fig. 3.

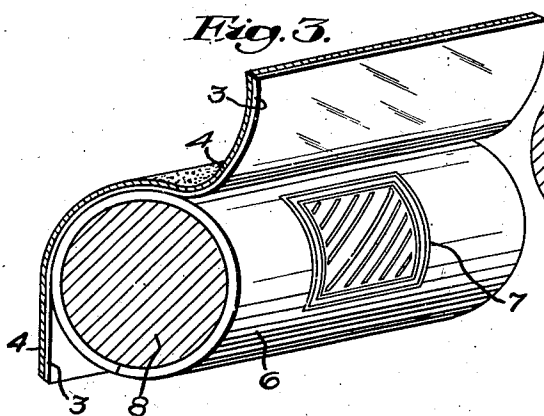
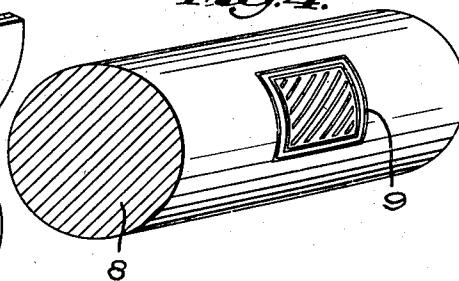


Fig. 4.



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UNITED STATES PATENT OFFICE

2,345,989

ETCHING PROCESS

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2 Claims. (Cl. 41—43)

This invention relates to a method of etching and more especially to a method of etching copper rolls for use in textile printing.

An object of the invention is to improve methods of etching and to devise procedures for rapidly and cheaply applying relatively large amounts of heavy resist material of strongly acid-resisting character during the etching of rolls for use in textile printing.

The nature of the invention and its objects will be more fully understood from the following description of the drawing and discussion relating thereto.

In the accompanying drawing:

Fig. 1 is a fragmentary perspective view illustrating steps in the method of the invention;

Fig. 2 is another fragmentary perspective view illustrating a further step in the method referred to;

Fig. 3 is a perspective view illustrating still another step in the method; and

Fig. 4 is a perspective view of a roll etched in accordance with the method of the invention.

In etching copper rolls, for use in textile printing, it is necessary to obtain etched lines or areas of varying depths. Some of the lines or areas are required to be much deeper than other portions. For example, it is customary to provide relatively deeply etched outlines and relatively lightly etched ground lines for certain types of subject matter to be reproduced.

To secure the variation in depth of etching noted, different weights or kinds of acid-resisting material must be resorted to, or the resist material must be applied in varying thicknesses. A common practice is to utilize heavy asphaltum during some etching steps and to employ a very light asphaltum for other etching procedures. In applying heavy asphaltum, it is necessary to resort to hand methods of application, due to the stiff, tacky character of heavy asphaltum. As a result, much time and labor are consumed and the cost of etching of rolls of this type is greatly increased.

In accordance with the invention, a method of applying a relatively heavy acid-resisting material is provided without resorting to hand methods of application. This procedure saves time and labor, and may improve the quality of the etched subject matter. This result is accomplished by applying wax on a translucent medium, cutting the wax in accordance with a desired outline, and then transferring the wax to the surface of a copper roll to be etched.

Referring more in detail to the drawing, illus-

trating the method of the invention, numeral 1 denotes a base element which may be formed of any suitable material and preferably is of a flexible character. Over the base 1 is disposed a sheet 2 which contains a design or picture 5 of subject matter to be reproduced in an etched copper roll. The sheet 2, in turn, is covered over by a translucent element 3, and the translucent sheet element is preferably detachably secured above the sheet element 2 by the use of a permanently tacky cement layer 4 which is also of a substantially translucent character.

One example of a suitable translucent sheet element is Cellophane. Other substances of a similar character may be resorted to. A permanently tacky cement of suitable character is a permanently tacky rubber cement formed from a latex base. Other suitable adhesive means may be desired to be employed.

Over the translucent sheet element 3 is coated a layer 6 of hot wax of some desired thickness. This layer of wax is allowed to cool, and when it has set to a suitably solid state, a stylus, or other instrument, is employed to trace through the wax the outline 5, or portions thereof, of the subject matter of the underlying sheet 2, thus forming an outline 7 cut all the way through the wax.

Thereafter the translucent sheet 3 and the layer of wax 6 are separated from the sheet 2 and the base 1, and the remaining translucent sheet 3 and wax layer 6 are brought into rolling contact with the surface of a copper roll 8 to offset the wax layer 6 thereon. As the wax is transferred to the surface of the roll, the translucent sheet 3 is peeled from the wax, leaving a surface of acid-resisting material in accordance with the outline 7 of the subject matter to be reproduced. The roll 8 is then etched to form a design 9, as illustrated in Fig. 4.

An important feature of the invention is the method of transferring relatively thick acid-resisting material, such as wax, to the surface of a copper roll in an accurate and rapid manner. Combining the translucent supporting sheet with a wax coating, and superimposing this assembly above subject matter to be reproduced so that tracing may be carried out, allows these results to be obtained.

Another feature of the invention is the step of securing a translucent sheet with a tacky cement which holds this sheet in accurate register with the original subject matter, so that a faithful reproduction can be obtained in the wax layer, and thereafter the translucent sheet may be

peeled from the wax, allowing it to be transferred to the surface of a copper roll in any desired thickness.

The wax referred to constitutes a very strong acid-resisting medium comparable to heavy asphaltum, and thereby furnishes a satisfactory medium through which a relatively deep etching action may be carried out at certain points, without the etching reagent cutting through the resist at adjacent points. If desired, the procedure noted may be varied in various ways and combined with other conventional etching operations, utilizing other resist materials as light asphaltum.

In place of the rubber cement noted, other translucent, permanently tacky adhesive media may be resorted to, and similarly, other materials in place of the Cellophane and wax may be utilized, in accordance with the procedure outlined.

It will be seen that the method of applying the wax allows a more accurate etching action to be carried out, since the resist material is not painted in by hand, as is now the case in applying heavy asphaltum in making of textile rolls. The wax also may be varied to give different thicknesses and acid-resisting strengths. The entire procedure may be rapidly carried out, without the use of skilled hand work, and a cheap and efficient method of etching rolls is provided.

While I have shown a preferred embodiment of my invention, it should be understood that various changes and modifications may be resorted

to, in keeping with the spirit of the invention as outlined by the appended claims.

I claim:

1. That improvement in methods of etching a copper roll which comprises attaching with a permanently tacky cement a translucent sheet element upon a sheet of subject matter desired to be etched on the roll, coating the translucent sheet element with wax, tracing through the wax an outline corresponding to the outline portions of the said subject matter, removing the translucent element and wax from the sheet of subject matter, supporting on a pressure roll the translucent element and wax, and rolling the wax against the copper roll to transfer wax to the copper roll while maintaining the translucent element in contact with the pressure roll thereby to separate the translucent sheet element from the wax at the time it is applied to the copper roll.
2. That improvement in methods of etching a copper roll which comprises detachably securing over a sheet of subject matter a layer of Cellophane, coating the Cellophane with hot wax, cutting into the wax an outline corresponding to the underlying subject matter, removing the Cellophane and wax from the sheet of subject matter, mounting the Cellophane about a pressure roll, rolling the wax against a printing roll while maintaining the Cellophane in contact with the pressure roll, thereby to separate the wax and Cellophane at the time of application to the printing roll.

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