

Nov. 1, 1960

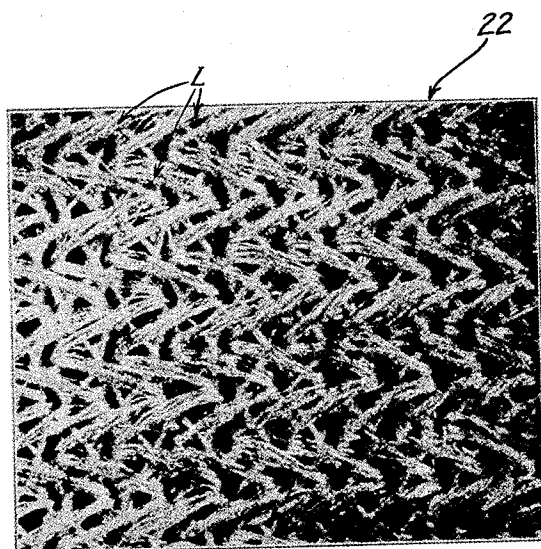
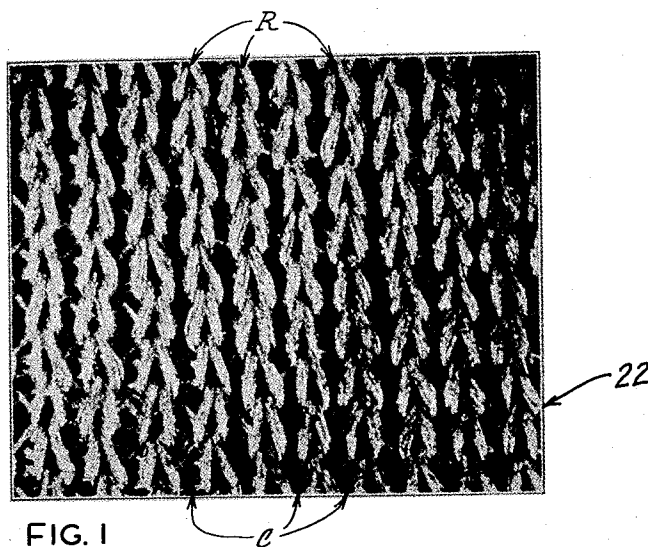
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2,958,146

PLANOGRAPHIC PRINTING

Filed April 22, 1955

2 Sheets-Sheet 1



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FIG. 3

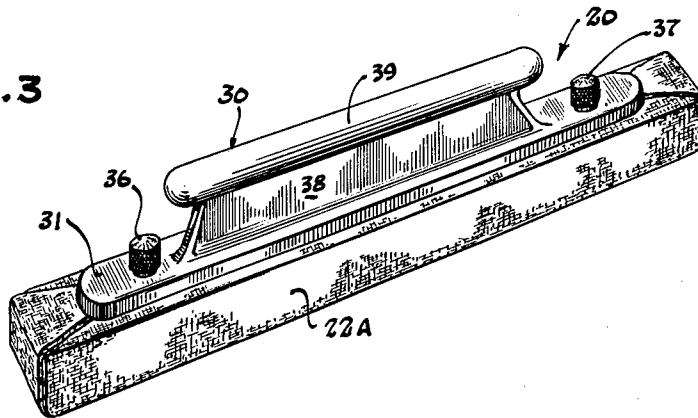


FIG. 4

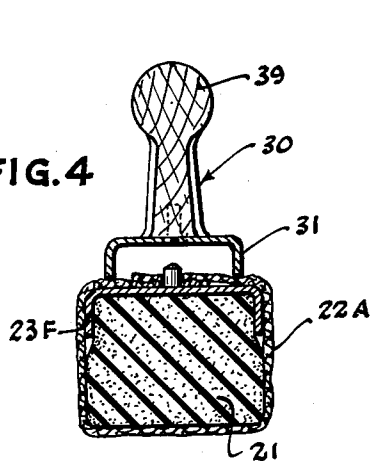


FIG. 5

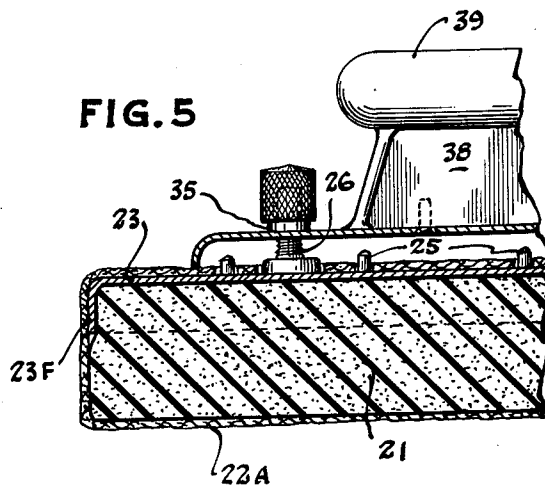
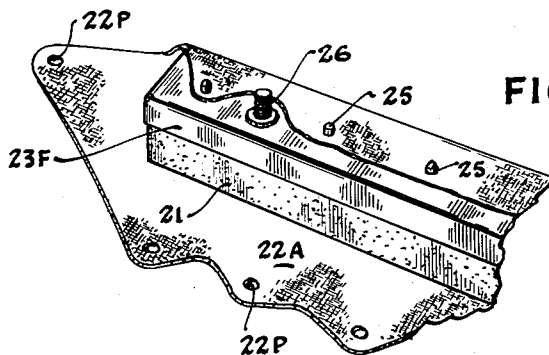


FIG. 6



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PLANOGRAPHIC PRINTING

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4 Claims. (Cl. 41—9)

This invention relates to an applicator for applying the initial dampening or so-called etch solution to lithographic printing plates bearing lithographic images of the usual kind.

During the course of preparing lithographic plates bearing images for printing, it is necessary to apply an initial or so-called etch solution to the face or image side of the printing plate to maintain the non-image or background areas of the plate ink-repellent in nature and to sharpen up the image itself. This solution is acidic in nature, as is well known in the art, and heretofore has usually been applied with a cotton or molleton cloth, but it has long been known that such application is harsh in nature, does not account for a uniform application of the etch solution and tends to smear freshly applied images particularly in the case of so-called direct image plates. Because of this, repeated use of a cotton or molleton cloth causes ink picked up from previous applications to redeposit in streaks back on to other areas or other plates.

A sponge rubber pad is another known form of applicator for etch solutions of the above kind used in conjunction with lithographic printing plates, and while sponge rubber does not always cause objectionable smearing of the image, it does tend to absorb the image, that is pick the image off the plate. This phenomenon is probably due to the fact that sponge rubber is known to have a high affinity for the imaging materials used to delineate the image on the plate, or in other words is oleophilic in nature.

One of the primary objects of the present invention is to apply etch solutions to lithographic printing plates in such a manner that the solution is applied evenly as a thin film over the background areas for the intended purpose without adversely affecting the image and without displaying a tendency to redeposit ink from any previous treatment of another plate.

A further object of the present invention is to make available an applicator for applying etch solutions to lithographic printing plates including a fabric cover for the solution which is of such nature as to effect delicate, uniform and even application of the etch solution over the background areas of the plate without smearing or weakening the image and consequently without any tendency to redeposit ink on the plate.

Etch solutions of the foregoing kind are applied in some instances with an applicator in the form of a cotton swab, but this is accompanied by lint depositing on the plate such that the lint then tends to be picked up in the ink train during printing runs of the plate thus interfering with ideal inking conditions. A further object of the present invention is to provide an applicator for etch solutions that does not tend to deposit lint or the like on the lithographic plate.

It is a well known phenomenon to lithographers that the amount of etch applied initially to the plate to prepare the plate for printing should be only enough, and

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no more, to render the plate ink-repellent in the background. Any amount of etch over and above this minimum or ideal quantity can be picked up in the ink train and cause undesired emulsions to form on the inking rollers, and moreover excessive amounts of etch on the plate tend to "blind" the image, so that weak copies are produced. It will be recognized that where the etch solution applicator is of such nature as to readily absorb and become soaked with an excessive quantity of the etch solution, the above conditions are likely to arise. This is particularly true of cotton fabrics or swabs as well as sponge rubber, all of which provide cells, tubes and interconnected cavities that may be filled with excessive amounts of the etch solution. On the other hand, if the applicator is caused to absorb an insufficient amount of the etch solution then the area of the plate first contacted receives most, if not all of this quantity and the remainder of the plate receives little or none. A further primary object of the present invention is therefore, to eliminate problems of control such as the foregoing by making available an etch applicator embodying a highly resilient and preferably porous backing member having a fabric facing or cover thereon of a particular kind which by nature does not tend to absorb excessive quantities of the etch solution, but rather the etch solution merely clings to or is adsorbed on the surface of the fabric facing serving to meter controlled quantities of the etch solution for application to the printing plate.

Other and further objects of the present invention will be apparent from the following description and claims, and are illustrated in the accompanying drawings which, by way of illustration, show a preferred embodiment of the present invention and the principles thereof and what we now consider to be the best mode in which we have contemplated applying these principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

Fig. 1 is an enlarged photograph showing one side of the type of fabric cover included in the applicator of the present invention;

Fig. 2 is an enlarged photograph of the reverse side of the fabric cover having the same orientation as in Fig. 1;

Fig. 3 is a perspective view of an applicator constructed along the lines of the present invention;

Fig. 4 is a lateral section sectional view of the applicator shown in Fig. 3;

Fig. 5 is a fragmentary longitudinal sectional view of the applicator shown in Fig. 3;

Fig. 6 is a fragmentary detail view showing a stage of assembly.

Under and in accordance with the present invention, there is afforded an applicator for applying etch solution to lithographic printing plates that comprises a fabric cover which in the preferred form consists of tricot-knitted Nylon 66 (polyhexamethylene adipamide), Rayon (cellulose acetate type) or Dacron (polyethylene terephthalate) synthetic fibers or filaments. The nature of polyhexamethylene adipamide, cellulose acetate, and polyethylene terephthalate and processes for producing fibers or filaments from these synthetics are well known.

No explanation is presently apparent to us regarding the exact nature of the phenomena accounting for the performance of these three preferably tricot-knitted fabrics which we have found to be the preferable embodiments of the present invention. Possibly there is something in the chemical nature of synthetic fibers of this

group which desirably influences the results attained. For instance, Nylon 66, Dacron and cellulose acetate all display a good hydrophilic-oleophilic balance or equilibrium in contrast to cotton which is highly hydrophilic, and sponge rubber which is highly oleophilic, and the acidic nature of the etch solution to be carried by the fabric faced applicator of the present invention is well known. On the other hand, there is present at the same time the purely mechanical difference between a tricot knit and other known weaves, and as will be pointed out below there is present the additional phenomenon that one side of the specific tricot knit fabric is better adapted to the uniform application of the etch solution than the reverse side.

The chemical nature of acetate rayon, Dacron and Nylon 66 is well known and is described in numerous patents and publications. Hence, since the nature of these materials and fabrics prepared therefrom are well known in each instance, further description in this regard need not be set forth herein, and attention is directed for example to United States Patent 2,639,488, patented May 26, 1953 which generally discloses knitted fabrics of cellulose acetate or Nylon 66 filaments.

Another aspect of the invention which is of primary importance is that in any event the fabric applicator must be backed up by a highly resilient backing member if acceptable results are to be achieved. Such eliminates harsh effects on the image of the plate as noted above. A backing member of this kind is afforded by soft rubber, preferably porous sponge or foam rubber as will be described.

In Fig. 1 there is shown what in the art is designated as the "stitch" side of a tricot-knitted fabric 22, and in Fig. 2 there is shown what is similarly designated the "lap" side of the same fabric. It will be noted from Fig. 1 that the stitch side of such fabric comprises tightly knitted, spaced, parallel raised ribs R or so-called "wales" consisting of a row of stitches, and these ribs define between them longitudinally extending channels C, whereas the lap side of the same fabric, as shown in Fig. 2, appears as somewhat matted in appearance, consisting of V-shaped laps L serving to connect the aforesaid stitches, and which are also arranged in clearly discernable rows that run at right angles to the aforementioned ribs R or wales on the other or stitch side of the fabric 22. We have discovered that the stitch side of the fabric as 22 rather than the lap side is preferably to be arranged to face outwardly so as to engage the printing plate during application thereto of the etch solution carried by the tricot-knitted synthetic fabric with the aforementioned stitched ribs R arranged longitudinally of the applicator, that is transversely relative to the direction of movement of the printing plate on the printing cylinder or the like.

Fabrics prepared from tricot-knitted nylon filaments are not new, and United States Patent 2,608,079 is an example of a specific disclosure in this regard, and for purposes of complete disclosure herein, the precise nature of a tricot-knit pattern is described in United States Patents 2,289,302, patented July 7, 1942 and 1,513,066, patented October 28, 1924, as well as in the publication "Warp Knitting and Glove Manufacture" by G. R. Merrill (Brogdon, Lord and Nagle, 1925).

While as noted above, a tricot knit is the preferred form of the synthetic fabric applicator facing, we have determined that other weaves of the foregoing synthetics which possess an oleophilic-hydrophilic balance or equilibrium produce satisfactory results.

In Figs. 3 to 6 the present invention is illustrated as embodied in an applicator 20 of a kind which may be conveniently handled manually by the operator of the lithographic printing machine. The applicator 20 includes a highly resilient backing member 21 of natural or synthetic sponge or so-called foam rubber, and of the synthetics polyurethane foam rubber is an example.

The backing member 21 is adapted to be retained in a U-shaped casing 23, and the channel of this casing is preferably of less width than the backing member 21 so that the backing member 21 will be gripped at the sides and at either end by the peripheral flange 23F of the casing 23 as shown in Figs. 4 and 5.

A substantial portion of the sponge rubber backing member 21 extends beyond the casing 23 and a piece 22A of the fabric facing or cover 22 of the foregoing nature is wrapped about the exposed portion of the sponge rubber backing member. What constitutes the sides and the ends of the fabric cover includes openings as 22P and are folded upwardly about the sides and ends of the casing 23 so that the openings 22P embrace plastic retainer pins 25 which are held by friction in the casing 23.

A pair of spaced apart mounting screws 26 are afforded on the back of the casing 23, and these are used to anchor a handle member 30 to the casing. Thus, the handle member 30 includes a relatively long base 31 formed at either end with apertures through which the aforementioned mounting screws are adapted to pass. Washers as 36 are assembled on the exposed ends of the screws 26 so as to repose on the upper face of the base 31 of the handle, and knurled nuts 36 and 37 are then threadedly mounted on the free portions of the mounting screws to clamp the back of the casing 23.

The handle member is preferably of molded plastic material, and is formed with a vertical web portion 38 integral with the base 31 and the upper edge of the web is molded with a rounded bead portion 39 constituting the portion of the applicator that is to be held in the hand of the operator.

As we have pointed out above, in those instances where the fabric facing 22A of synthetic fiber having a hydrophilic-oleophilic balance consists of a tricot knit, the arrangement is preferably such that the stitch side faces outwardly of the backing member 21 to bear against the printing plate, with the ribs R running parallel to the longitudinal dimension of the resilient backing member 21.

In preparing the applicator 20 for use, the handle is gripped and the applicator dipped in the supply of etch solution so that the sponge 21 is caused to soak up some of the etch solution through the openings in the fabric cover 22A. The operator's fingers remain free of the solution, and when the applicator is pressed against the lithographic printing plate, the etch solution adsorbed on the outer face of the cover 22A is metered evenly and uniformly on to the background areas of the plate, and the sponge 21 serves to make available a continuous supply of etch solution for application in this manner.

It will be appreciated that the applicator 20 shown in Figs. 3 to 5 represents but one embodiment of an acetate Rayon, Dacron or Nylon 66 fabric facing and a highly resilient and preferably porous backing member of sponge or foam rubber adapted to apply etch to the face of a lithographic printing plate. The cover 22 of the kind described above adsorbs substantial quantities of solution such that a porous backing member is not essential as long as the backing member is of such resilience as not to impair the image while the cover 22A is pressed against the printing plate.

Hence, while we have illustrated and described the preferred embodiment of our invention, it is to be understood that these are capable of variation and modification, and we therefore do not wish to be limited to the precise details set forth, but desire to avail ourselves of such changes and alterations as fall within the purview of the following claims.

We claim:

1. A method for applying a solution to the imaged face of a lithographic printing plate comprising, dampening a fabric facing selected from the group consisting of tricot knitted polyhexamethylene adipamide and poly-

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ethylene terephthalate and cellulose acetate Rayon, carried on a highly resilient backing member, with said solution and wiping the imaged face of the plate therewith.

2. A method for applying solution to the imaged face of a lithographic printing plate comprising, dampening a fabric facing of synthetic fibers having a hydrophilic-oleophilic balance, carried on a highly resilient backing member, with said solution and then wiping the imaged face of plate therewith, the fibers composing the said fabric being selected from the group consisting of polyhexamethylene adipamide, polyethylene terephthalate and cellulose acetate Rayon.

3. An applicator for applying etch solution to the imaged face of a lithographic printing plate and comprising a handle member including a flat base, a highly resilient backing member secured on one side to said base and having an elongated, flat rectangular surface opposite the side secured to said base, and a facing on said surface of said backing member consisting of tricot knitted fabric selected from the group consisting of cellulose acetate Rayon, polyhexamethylene adipamide and polyethylene terephthalate, said fabric facing being arranged on the backing member with the stitch side faced outwardly in position to engage the printing plate.

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4. An applicator for applying etch solution to the imaged face of a lithographic printing plate comprising a handle member, a highly resilient backing member of sponge rubber attached on one side to said handle member serving as an absorbent body for the etch solution to be applied to said plate, said backing member having an elongated flat rectangular surface opposite the side thereof secured to said handle member, and a tricot knitted fabric facing on said surface of said backing member selected from the group consisting of cellulose acetate Rayon, polyhexamethylene adipamide and polyethylene terephthalate.

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