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H. B. NICOLAS ET AL

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METAL PRINTING ROLLER AND PRINTING PLATE

Filed May 12, 1927

FIG 1



FIG 2

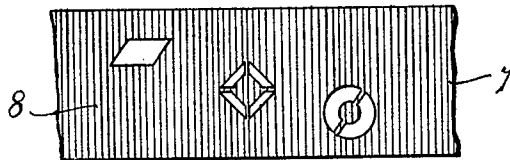


FIG 3

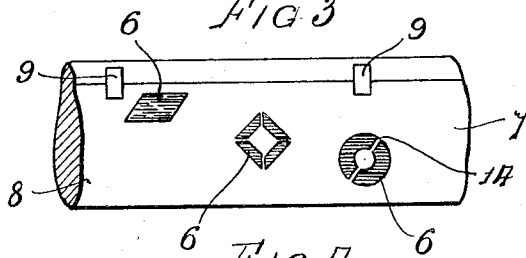


FIG. 4.

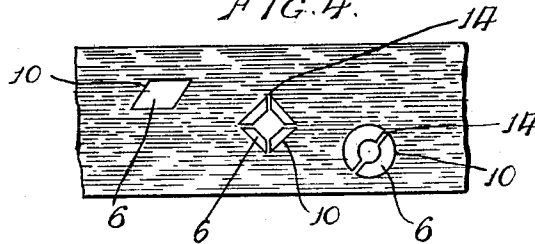
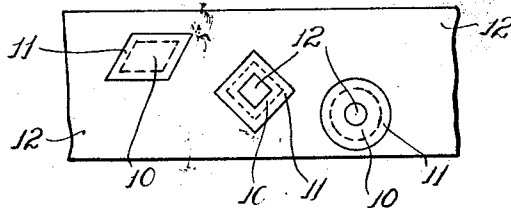


FIG. 5.



INVENTORS:

Herbert Bevan Nicolas

Thomas Robinson Fothergill

BY: Lutz, Boye & Bahler

ATTORNEYS.

UNITED STATES PATENT OFFICE

HERBERT BEVAN NICOLAS, OF CHORLTONVILLE, MANCHESTER, AND THOMAS
ROBINSON FOTHERGILL, OF ROSSENDALE, ENGLAND

METAL PRINTING ROLLER AND PRINTING PLATE

Application filed May 12, 1927, Serial No. 190,961, and in Great Britain May 26, 1926.

This invention has reference to metal printing rollers and printing plates for use in printing textile fabrics and has for its object to provide means whereby a pattern or design may be given to rollers or printing plates more effectively and cheaply than has hitherto been possible, and whereby better effects having a great depth and gradation of colour particularly over large surfaces may be obtained.

According to this invention patterns, designs or the like are produced on the surface of metal printing rollers, and printing plates for use in printing textile fabrics, by preparing the surfaces by varnishing and by lining or scratching the varnish without affecting the metal for treatment by an etching medium; applying to the surface a stencil cut in reverse, applying to the exposed parts a medium resistant to the etching medium to be subsequently used, and then applying the etching medium to the parts of the surface temporarily covered or protected during the previous operations.

The invention is described with reference to the accompanying drawings wherein—

Fig. 1 shows a portion of a surface to which a design is to be applied;

Fig. 2 shows part of a stencil with the pattern cut in reverse;

Fig. 3 shows the stencil applied to a printing surface;

Fig. 4 shows part of the printing surface ready for printing; and

Fig. 5 shows a further stencil used for obtaining a graduation of effect.

In imparting a design or pattern to a metal printing roller or plate the surface on which the design or pattern is to be marked is varnished or coated with an acid resistant and the coating is marked with lines 6 in such a manner as to remove lines of the varnish or coating without affecting the metal but leaving the metal exposed. The purpose of these lines is as follows: When the surface has been covered with varnish, it is known that some parts of that surface will have to be acted on by the acid which is later applied, but of course it is not known just which parts. Consequently, the lines are marked over that area

of the varnished surface where the metal is to be exposed for use if required, the lines providing a foundation on which the etching medium will "bite".

The design or pattern is made on a flat stencil 7 of paper or other suitable material whose dimensions correspond with those of the surface to be marked, the reserved portions 8 of the stencil and shown in shaded lines in Fig. 2 showing the pattern which is to be printed. The stencil so made is applied to the metal surface as shown in Fig. 3 and is conveniently held in place by adhesive paper fastenings 9 which may be easily broken and re-joined into alignment.

The stencil and the exposed parts of the varnished and lined surface indicated by the shaded or lined portion in Fig. 3 are next coated with a suitable varnish or protecting medium after which the stencil is removed leaving the varnished lined surface previously covered by the reserved portions of the stencil exposed. The roller or plate is then treated with an etching medium which will act on the metal by passing through the lines in the varnish leaving the parts shown shaded in Fig. 4 standing up from the face.

After this etching process is completed a further stencil or stencils may be applied in a similar manner and the same treatment carried out. Any depth of etching may be obtained by subsequent action of the etching medium and gradations of depth may be obtained by applying various stencils having the pattern suitably cut and etching afterwards.

In Fig. 5 a second stencil is shown in which the original pattern is shown by dotted lines for convenience in comparison.

It will be seen that when the stencil shown in Fig. 5 is applied to the surface to be etched the whole areas enclosed will be over parts covered by the resistant medium, and the remainder when the stencil is removed will be exposed to the etching medium.

The whole of the surface outside the dotted lines in Fig. 5 has however been already etched once, but after the removal of the second stencil only the parts outside the full lines are etched a second time, consequently there is a gradation between the parts within

the dotted lines which have not been etched at all and the parts outside the full lines which are etched twice, that is to say, the parts 10 are not etched at all, the parts 11 are etched once and the parts 12 are etched twice.

It will be seen that further gradations may be made by continuing the same operations. The stencils after removal from the first roller or plate may be applied to other rollers and plates where a plurality of rollers or plates is required for printing in several colours.

If several colours are to be used in the printing a plurality of rollers will of course be necessary each for its own colour and each roller will have the design or pattern made upon it in the manner already set forth.

Instead of using the same stencil for each of a plurality of rollers a master stencil may be prepared and may be placed on a sheet of paper, the whole being sprayed with a colouring medium so that the design will be reproduced exactly and may be cut out, thus several rollers may be under treatment for the same design at the same time.

It is clear that every stencil must have exact pitch marks indicated so that absolute and perfect alignment of the pattern or design may be obtained on every roller to which the stencil is applied and during any series of operations which may be made on any one roller.

By connecting the adjacent ends of the stencil together around the roller by means of thin pieces of adhesive paper as above described, when it is desired to remove the stencil these strips of paper can be easily broken and it is found that in this way the alignment of a stencil taken from one roller and applied to another is very easily obtained, because the jagged edges of the adhesive paper caused by removing the stencil from the first roller may be fitted together exactly when applying the stencil to another roller, the broken edges of the paper thus forming replacement guides indicating the proper position of the stencil on the second roller.

In preparing a design which has isolated portions such as the centre of a letter O or a leaf, it is necessary that in the stencil such portions should be held in position and this is effected by a necessary number of connecting pieces 14 of strips left in the stencil, such connecting pieces being as thin as possible and being conveniently always parallel so that when the stencil is removed from the roller small lines left covered by these connecting pieces may be easily seen and blocked out, or painted out with varnish or resistant.

It sometimes occurs that the lines or effects to be produced are so fine that it is impractical to cut them into the paper stencil, because the latter would break. In such cases, we treat the stencil with a pigment, such as common lead white, to indicate such lines or

effects on the surface of the stencil which is to contact with the varnished metal. After removing the stencil the impression left on the varnished metal must be scratched to remove the resistant and then etched up to the required depth.

By means of this invention any gradation of colour required to produce shaded effects in the print, particularly over larger surfaces may very easily be obtained at a cost which is very much less than the cost which would be incurred by known methods of engraving, and at a speed which is very much greater, and by using the same stencils on different rollers two or more exactly similar rollers may be made for use in multiple colour printing.

In making printing rollers and plates it is well known to use an etching process, the etching medium being applied to a surface on which the design or pattern has been marked or to which it has been transferred by printing ink, or by putting a pattern such as lace on the surface, and thereafter treating the surface so that certain portions only can be etched, thus producing the desired pattern upon the surface; it has also been proposed to use stencils in the preparation of glass rollers for printing purposes, but the known processes are not satisfactory for the purpose of this invention as they are elaborate and complicated in comparison and involve the use of steps which are eliminated in the present invention.

What we claim as our invention and desire to secure by Letters Patent is:—

The process of producing patterns on metal surfaces for multiple reproduction, which consists in varnishing the surface to be treated, forming lines in the varnish thereby to expose the metal, and subjecting said surface to repeated applications of a stencil of the design in reverse, treating the exposed parts at each application of the stencil with a medium resistant to etching and on removal of the stencil applying an etching medium to the surfaces previously covered by the stencil, thereby to produce gradations and variations in the depth of etching.

In testimony whereof we have signed our names to this specification.

HERBERT BEVAN NICOLAS.
THOMAS ROBINSON FOTHERGILL.

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