UNITED STATES PATENT OFFICE.

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PRINTING ELEMENT AND PROCESS OF PRODUCING THE SAME.

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The primary object of this invention is to provide an improved printing device and process of producing the same.

The specific object is to provide a printing device of the general character of an intaglio plate which may be made of any suitable height (i.e., thickness), and very strong.

A further specific object is to provide a printing element suitable for use in printing a pattern, such as wood graining on a hard surface, such as a metal panel, and a process of economically producing the same.

The process follows to some extent the well known photogravure process with modifications which constitute the subject matter of this application.

In general, the process, as preferably practiced, includes, as a first step, making a suitable photographic negative film, and printing through this onto a suitably treated sheet, known in the art as a carbon resist. The carbon resist will be a positive print. A suitable metal plate is then etched to produce the pattern of the carbon resist in negative, that is, a print made from this plate would be a negative in the photographic sense. I then deposit a thin shell of metal onto the etched plate, and finally back the surface of the shell opposite that lying adjacent the plate with suitable material, such as lead, which may be made type-high so that the resulting structure may be mounted in an ordinary printing chase, and printed form. After the shell has been stripped off the etched plate, the latter may again be used as a master to form other shells.

Referring to the drawings, Fig. 1 is an enlarged sectional perspective of a suitable pattern, the design of which is to be reproduced as on a metal panel; Fig. 2 is a diagrammatic cross sectional illustration of a film produced by photographing the pattern; Fig. 3 is a view similar to Fig. 2 of a carbon resist and suitable screen; Fig. 4 is a diagrammatic cross sectional view showing the carbon resist applied to the plate to be etched; Fig. 5 is a diagrammatic cross sectional illustration very much enlarged showing the cross sectional contour of the etched plate and showing the shell in place thereon; Fig. 6 is a view similar to Fig. 5 of the finally resulting printing element.

Referring in detail to the drawings, 1 is the panel bearing the original pattern. Assuming the pattern to be a piece of wood, this is suitably treated, to bring out the light and dark areas in sharp contrast. For the purpose of clearly illustrating the invention, it will be assumed that the dark areas 1, 1, simulating the grain lines, are entirely black and the other areas 1, entirely light. Obviously, this would not be true on any natural pattern. The tone effects may, of course, be reproduced without modification of the process, as herein set forth.

In Fig. 2 the film 2 has light areas 2, corresponding to the dark areas 1, on the pattern, and dark areas 2, corresponding to the light areas on the pattern.

It is desirable to break up what will eventually be the low spots on the finished printing element, and this may be done by printing the film onto a carbon resist, see Fig. 3, having a paper body 4 and sensitized layer 5 thereon to receive light treatment through the film 2. The screen 6 may be of any well known construction, such that the dark areas 5 transferred to the sensitized layer through the screen are broken up by minute light areas as governed by the pattern of the screen.

In Fig. 4, the plate to be etched is shown at 7 with the carbon resist in place thereon, and in Fig. 5, the character of the plate after etching is brought out. Here it will be seen that the portions of the plate corresponding to the dark areas 1, on the pattern are represented by raised closely adjacent projections 7, while those portions of the plate which correspond in position to the light areas 1, on the pattern are comparatively wide depressions 7.

It will be understood that in etching the plate any suitable checking solution is used after the etching solution is applied. The small depressions 7, between the portions 7, are therefore of substantially constant depth, this being mainly because the screen reproduces solid black and light on the resist.

The metal shell 9 may be applied to the etched plate either by electrolytic action or mechanical pressure, and after this shell has been deposited, a suitable backing of convenient height is cast onto the shell, after which the backing and shell may be removed.
from the plate, the final result being illustrated in Fig. 6.

If pigment is applied to the surfaces shown at the right hand side of Fig. 6, then scraped with a doctor blade, and finally transferred to a panel, the resulting transfer will be a comparatively accurate copy of the original panel. Any suitable transferring method may be used.

From the foregoing it will be quite clear to those skilled in the art that I produce a photogravure electrotype printing surface from an original or master photogravure surface, the latter surface being a reverse to the usual photogravure printing surface, that is, the screen plate or roll has screen grooves instead of ridges, and by making an electroplate from this reverse master, I eliminate the necessity for making two electrotypes in order to get the desired photogravure electrotype printing surface, thus clearly preserving quarter-tone, half-tone details otherwise lost when the intermediate step of making a reverse electrotype shell is resorted to.

I claim:

1. The process of forming a printing plate, comprising photographing in negative the panel to be reproduced, printing a resist sheet from the negative, applying the sheet to a plate, etching the plate, coating the plate with a shell of metal and finally placing backing metal in intimate contact with the shell surface opposite that adjacent the plate.

2. A process of producing a printing plate, comprising photographing in negative the pattern to be reproduced, printing the negative through a screen onto a suitable resist, applying the resist to a metal plate, etching the plate through the resist, coating the plate to form a shell and finally strengthening the shell by casting metal thereon of the desired thickness.

3. The process of the character described, which includes etching a plate from a positive resist sheet, depositing thin sheet metal in intimate contact with the etched plate and finally backing the shell with a heavy sheet of metal and removing the shell from the etched plate, leaving the same on said metal backing.

In testimony whereof, I hereunto affix my signature.

ALBERT R. GOLRICK.