BEST AVAILABLE COPY

Dec. 31, 1940. J. W. KELLY ET AL 2,227,139

PLASTIC PROCESS FOR MAKING PRINTING PLATES

Filed Oct. 18, 1937

Fig. 1.

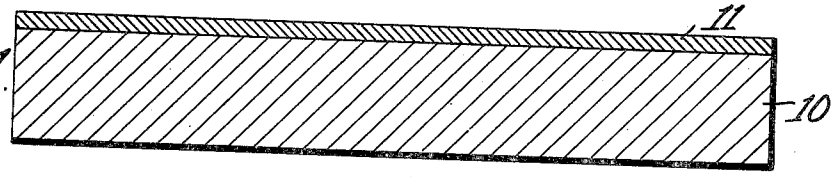


Fig. 2.

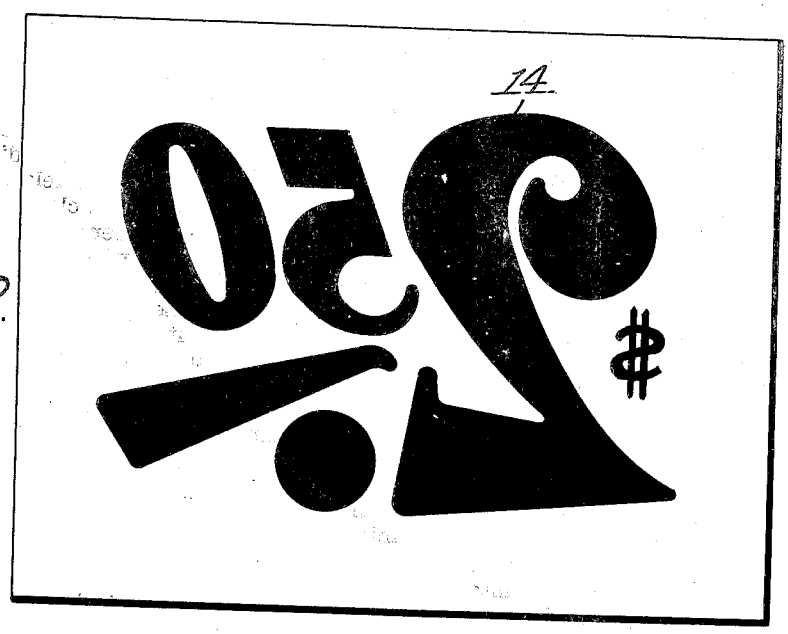


Fig. 3.

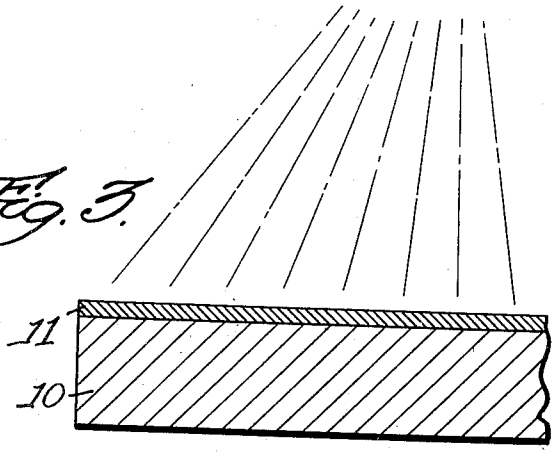
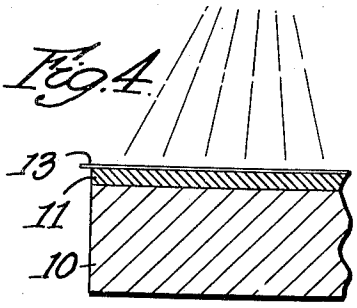


Fig. 4.



Inventors
John W. Kelly
Daniel J. Kelly.
By attorney
O'Neill

Witness
C. F. Wilson

Patented Dec. 31, 1940

2,227,139

UNITED STATES PATENT OFFICE

2,227,139

PLASTIC PROCESS FOR MAKING PRINTING PLATES

John W. Kelly and Daniel J. Kelly, Leominster, Mass., assignors to Activated Process Corporation, Leominster, Mass., a corporation of Massachusetts

Application October 18, 1937, Serial No. 169,652

4 Claims. (Cl. 101—401)

This invention relates to a thoroughly hardened plastic plate having a surface of different construction from the base and being of a special value when used as a printing plate.

The principal objects of this invention are to provide such a plate with a strong back which is very hard and resistant to wear; to provide a top surface cohering to the top surface of the back in such a manner that they are entirely inseparable from each other; to provide a front surface which can be provided with a design in intaglio without having to use pressure or a high heat in the formation of the surface; to provide such a surface by use of moderate heat for the purpose only of helping to harden that surface in certain areas only; to provide a construction in which the durability for making impressions will be greatly increased over any other plate whether of zinc, lead, or the like, and to provide a plate involving the elimination of much make-ready, thus reducing the cost.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawing, in which:

Fig. 1 is a cross sectional view of an intaglio printing plate constructed in accordance with this invention;

Fig. 2 is a front view of such a plate showing the surface composed of a non-metallic material all over it and the utilization of reflection of light from that surface for the purpose of making the intaglio design;

Fig. 3 is a sectional view showing the carrying out of the process, and

Fig. 4 is a modification similar to Fig. 3 showing the use of a photographic negative or decalcomania transfer.

A plate can be made in accordance with this invention which is entirely hard and durable for use in publishing houses and which is capable of being used in advertising where its practical indestructability is of value. A plate is shown comprising a solid back 10 of ⅞'' thickness, or thereabout, formed of entirely non-metallic material compounded in such a manner that it would not only be strong as regards blows directly applied to it but also as regards long continued use of it as a printing plate.

As a printing plate, the front surface 11 is of fine texture but one capable of resisting high pressure in the printing press and extremely durable. It is also capable of other uses than printing. The base 10 is compounded preferably of asbestos and Portland cement, or the like. The two materials, with water, are mixed in any usual way, dried to a certain extent, and then compressed to form a flat base.

On the top of the base 10 is provided a printing surface. This printing surface is made of a filler of approximately 60% English clay and 40% Paris white, by weight, to which is added about 6% additional animal glue in a dissolved state. English clay is a granitic and felspathic non-vitreous yellowish white natural clay. The glue constitutes a temporary binder to bind together the English clay and Paris white either wet or dry. For certain purposes, if twenty-five pounds of this material were used, five gallons of hot water would be added to it. This mixture is not ready for use at this time because, instead of five gallons of cold water which would have a tendency to set the mixture, five gallons of hot water and 10% in volume of a "synthetic varnish," as for example phenol, formaldehyde, and tung oil, are added to the filler. Together they constitute a gum which can be mixed thoroughly by a paint mixer, for example. It is to be understood that these latter materials except the base may be of any metallic or non-metallic materials suitable for that purpose. The animal glue is dissolved to constitute a temporary binder. The "synthetic varnish" does not contain any metal or alloy.

The preferred method of manufacture is to lay the paste on the block 10 about ⅛'' thick, then let it dry and set for five days. During this time the powder and glue have dried but the "synthetic varnish" or gum has not dried to its final state but is still of such a nature as to admit of its being sanded down to make a smooth, even surface.

Now the design is applied either by hand, decalcomania transfer, or photographic negative, or stencil 13, or any standard transfer, or the like, may be used. Those parts which are to be in intaglio are covered by some reflecting surface 14 while those not to be changed are left exposed. The protection is in the form of a reflecting surface on all the surfaces to be eventually in intaglio but this reflecting surface may be coated with black paint, or the like. Now heat is applied by the use of a light or heating unit at a temperature of not more than 250° F. which hardens and sets the gum which acts now as a binder so that the whole mixture becomes hardened. The light or heat is allowed to play on the whole surface and it is obvious that that light or heat which plays on the protected sur-

faces will be reflected back, as by a mirror, and the light or heat which plays on the unprotected surfaces will be absorbed by the material exposed at those points. At about that time the "synthetic varnish" or gum exposed to the heat or light will become plastic and comparatively insoluble.

The next step is to remove the reflecting coverings on the surface mechanically and then the under surfaces and material can be removed by the application of hot water, or the like to provide an intaglio printing surface. To remove surfaces from the design water can be sprayed on from below, the plate being held with the printing surface down.

A photographic negative 13, decalcomania transfer, or stencil can be used.

It is found in practice that this plate and its surfaces are durable for a great many impressions, up to 400,000 for example, so that in spite of its lower cost of manufacture compared to an acid etched metallic plate used extensively in this field it has qualities commending it in preference to the orthodox printing plate now used.

Another important feature is the elimination almost entirely of the press "make-ready" employed heretofore in printing plants, for practically every plate produced. This is very expensive because it requires the most expensive workman in the crew and practically nothing else can be done in regard to this plate while he is working on it. It frequently takes many hours, which involves an important delay. In other words, the plate is ready when this process is finished and need not be tampered with ordinarily. The "make-ready" also involves considerable expense not required in this process. As a matter of fact, the hard and tough body is not reshaped after it is all made. Of course, the reason for this is the use of cement and asbestos which is finely mixed with the Portland cement.

In place of phenol, formaldehyde and tung oil used to form the gum, other well known varnishes and the like can be used, but this is a very suitable one for use in this process.

Having thus described our invention and the advantages thereof, we do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what we claim is:

1. As an article of manufacture, a printing plate having a durable base and a printing surface of mixed non-metallic ingredients including a temporary binder and a gum-forming material, for the purpose described.

2. As an article of manufacture, a printing plate having a durable base and a printing surface of mixed non-metallic ingredients including English clay, Paris white, animal glue, and a gum-forming material.

3. As an article of manufacture, a printing plate having a durable base provided with a printing surface of mixed non-metallic ingredients including English clay, Paris white, animal glue, and a synthetic varnish having an intaglio design thereon.

4. A non-metallic printing plate having a hard non-metallic durable base of material thickness, a relatively thin layer adhering thereto comprising English clay, Paris white, a dissolved animal glue, and a synthetic varnish having an intaglio design thereon.

JOHN W. KELLY.
DANIEL J. KELLY.