Sept. 19, 1944. H. R. HELGESON 2,358,710

SANDBLAST STENCIL AND METHOD OF MAKING THE SAME

Filed June 27, 1941

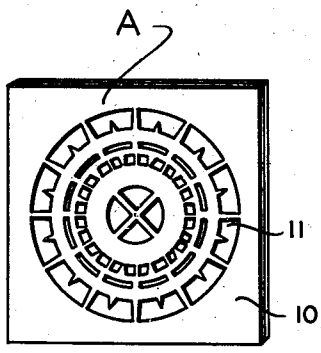

FIG. 1.

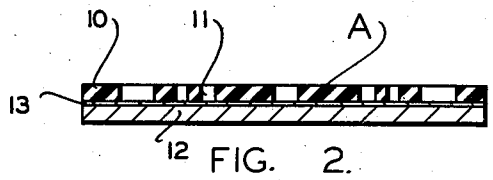

FIG. 2.

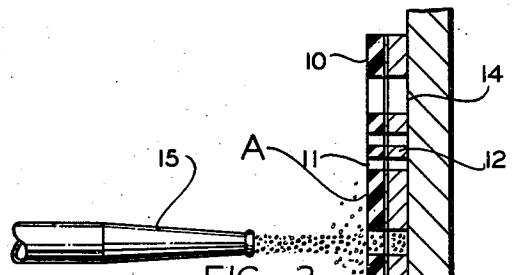

FIG. 3.

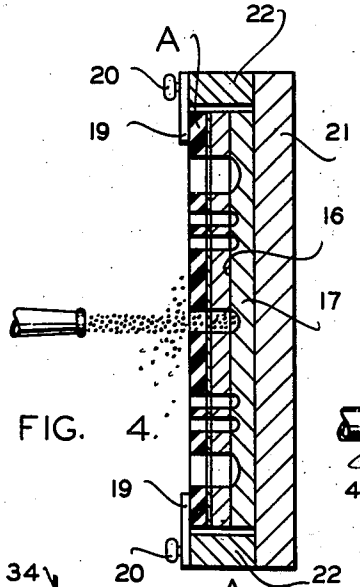

FIG. 4.

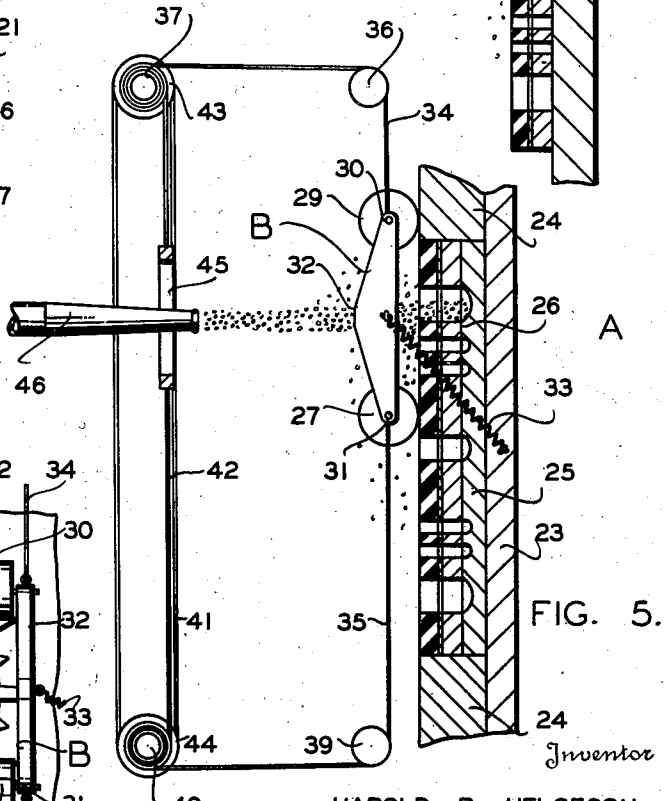

FIG. 5.

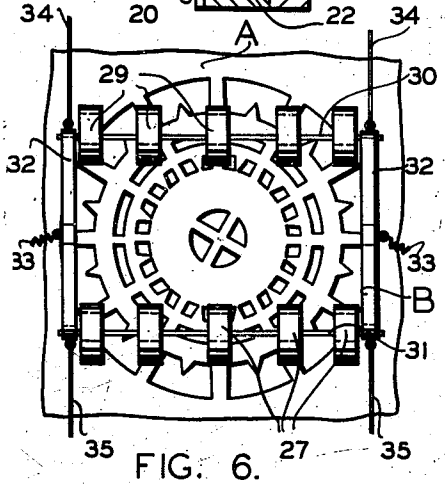

FIG. 6.

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SANDBLAST STENCIL AND METHOD OF MAKING THE SAME

Harold R. Helgeson, St. Paul, Minn.

Application June 27, 1941, Serial No. 400,129

1 Claim. (Cl. 41—39)

My invention relates to an improvement in stencils and more particularly that type of stencil used in sandblasting work, and also relates to the manner in which the stencil is prepared for use.

In forming stencils for sandblasting designs upon work surfaces and the like, it has been common practice to coat the surface of the work either with a stencil sheet formed of sandblast resistant material, or to coat this surface with a coating of glue or the like which is resistant to the force of a sandblast so that a design may be formed by cutting away portions of the glue.

It is a feature of the present invention to provide a stencil which is formed of sandblast resistant material and yet which is sufficiently rigid so that the stencil may be merely held in place by clamps or other suitable means during the sandblast operation to obviate the necessity of carving the stencil upon the work or adhering the carved stencil to the work. Thus in forming a series of panels or the like having similar designs, it is possible to carve a greater number of designs in a given amount of time due to the elimination of the previously necessary steps of carving numerous stencils or of attaching the stencil to the work.

The applicant has produced a method of forming rigid stencils which consists in carving a stencil sheet in the ordinary way, mounting this stencil upon a rigid backing sheet, either before or after the cutting operation, and sandblasting the rigid backing sheet through the stencil design to remove the exposed portions of the backing sheet visible through the stencil. Thus a rigid stencil is formed which may be used a great number of times, the rigid body which is relatively non-resistant to sandblast being protected by the resistant stencil sheet coating. With such a stencil a great number of duplicate designs may be carved in a small amount of time as it is only necessary to hold the rigid stencil firmly against the work being carved during the sandblasting operation.

It is a feature of my invention to provide a stencil comprising a layer of material resistant to sandblast and a layer of material which is relatively nonresistant to the sandblast and to form the stencil by cutting the resistant portion of the stencil and by sandblasting the nonresistant portion of the stencil. Thus a rigid stencil may be formed with virtually as great ease as a nonrigid stencil, and for all practical purposes this rigid stencil is as resistant to sandblast as a stencil formed entirely of resistant material.

It is a feature of my invention to provide a means of forming duplicate designs by clamping the rigid stencil against the work to be carved and sandblasting the work through the clamped stencil thus supported. This clamp may be of various forms, and may be of a type which engages the stencil about the peripheral edge of the same, or may be of a type which engages against the particular area of the work being sandblasted at any one time. This latter type of clamping means may be so arranged as to move over the surface of the work as the sandblasting nozzle is raised or lowered so that the clamping means remains in operative relation to the sandblasting nozzle.

These and other objects and novel features of my invention will be more clearly and fully set forth in the following specification and claim.

In the drawing forming a part of my specification:

Figure 1 is a perspective view of a stencil upon completion thereof.

Figure 2 is a cross-sectional view of the stencil during the forming process of the same.

Figure 3 is a cross-sectional view similar to Figure 2 showing the stencil after the rigid backing sheet thereof has been cut through by the sandblasting process.

Figure 4 illustrates the stencil clamped in place showing the operation of sandblasting a surface through the stencil.

Figure 5 is a diagrammatic cross-sectional view through a stencil and sandblast curtain illustrating the manner in which the clamping means for the stencil moves with the sandblasting nozzle.

Figure 6 is a view taken within the curtain shown in Figure 5 and looking toward the stencil and the clamping means therefor.

In the preparation of the stencil A, I provide a stencil sheet 10 formed of rubber or other similar resilient material resistant to a sandblast. A desired design 11 is cut into the sheet 10, which design is to be sandblasted upon any desired working surface. The resistant sheet 10 is secured to a rigid backing sheet 12 by any suitable means such as the adhesive 13. The sheet 10 may be applied to the rigid backing sheet either before or after the stencil has been cut. The rigid backing sheet may be of any suitable material such as pressed wood or any type of artificial or natural wood or pulp product which is rigid in form and which is relatively nonresistant to the sandblast.

After the desired design 11 has been cut into the stencil sheet 10, as illustrated in Figure 2 of

the drawing, the stencil A is placed against a rubber surface 14 to which the backing sheet 12 may be attached, and the stencil is subjected to a sandblast as indicated by the sandblast nozzle 15. This sandblast acts to carve away the portions of the backing sheet 12 exposed by the cut away portions of the stencil sheet 10. Thus after the sandblasting operation shown in Figure 3 of the drawing, the stencil A is cut completely through and is relatively rigid because of the rigid reinforcing sheet 12. The covering of resistant stencil material formed by the sheet 10 protects the portions of the reinforcing board 12 over which it extends, and thus a rigid stencil is provided which may be formed virtually as quickly as the original stencil sheet 10 may be cut, as the sandblasting operation shown in Figure 3 requires an extremely short period of time.

In the use of the stencil A, this stencil may be supported overlying a surface 16 of a body of material 17 upon which the sandblast design is to be carved. Clamping fingers such as 19 may overlie the marginal edges of the stencil A and may be held in place by the clamping screws 20. Thus by means of the clamping means 19 and 20, the stencil A is held closely adjacent the surface 16 of the work body 17 and it is not necessary to adhere the stencil to the work surface.

As shown in Figure 4 of the drawing, the bodies of material 17 which are sandblasted, may be of substantially uniform size and may fit within a clamping arrangement including the back board 21 and the sides 22 to which the clamping fingers 19 are attached by the clamping screws 20. In order to sandblast the surface 16 it is thus only necessary to insert the body of material 17 in place, to apply the stencil A over the surface 16, and to clamp the stencil in place by means of the clamping fingers 19 and the screws 20. When the sandblasting operation has been completed, the work 17 may be as quickly removed by loosening the clamping members 19 and 20 and removing the stencil A and the work body 17.

In Figures 5 and 6 of the drawing, I disclose a modified form of clamp which is adjustable in combination with the sandblasting curtain and the nozzle used in conjunction therewith. In this form of construction which is diagrammatically illustrated, the backing member 23 is provided with supports 24 of any type by means of which the material 25 to be sandblasted may be supported. The supports 24 may be adjustable on the backing wall 23, or the work 25 may be supported in any convenient manner upon the backing member 23. The stencil A is placed over the surface 26 of the material 25 and is held against material to be carved by a series of sets of rollers 27 and 29. The rollers 29 as indicated in Figure 6 are mounted upon a shaft 30, while the rollers 27 are mounted upon a shaft 31. A pair of connecting links 32 support the shafts 30 and 31, and the rollers 29 and 30 are urged against the stencil A by means of springs 33 which urge the links 32 toward the backing member 23.

In order to raise and lower the clamping means indicated generally by the letter B, I provide ropes or cables 34 secured to the upper extremity of the links 32 and ropes or cables 35 secured to the lower extremity of the links 32. The ropes or cables 34 extend over the pulleys 36 and are wound upon a drum or roller 37. The cables or ropes 35 pass over the pulleys 39 and are wound upon the drum or roller 40. A belt or chain 41 connects sprockets 43 and 44, respectively, rotatable with the rollers 37 and 40 to move these rollers in unison so that as the cable 34 is wound upon the drum or roller 37, the rope or cable 35 is unwound from the drum or roller 40. Similarly when the cable 35 is wound upon the drum 40, the cable 34 is unwound from the roller 37.

A sandblasting curtain 42 is wound upon the roller 37 or a concentrically mounted roller. This curtain extends down and is wound upon the drum or roller 40 or a concentrically mounted roller movable therewith. As the drum 37 moves in a clockwise direction, the curtain 42 will be unwound from the roller 37 and will be wound upon the drum 40. As the roller 37 moves in a counterclockwise direction, the curtain 42 will be wound upon this roller 37 and will be unwound from the roller 40.

The curtain 42 is provided with a nozzle aperutre 45 through which the sandblasting nozzle 46 may extend. The aperture 45 is directly opposite the space between the spaced shafts 30 and 31. Thus the sandblast from the nozzle 46 is directed against the area of the stencil A between the two sets of rollers 27 and 29.

In operation, after the work 25 and the stencil A have been placed in position and the rollers 27 and 29 have been mounted to move over the surface of the stencil, the sandblast nozzle 46 is inserted through the aperture 45 and the area of the stencil between the shafts 30 and 31 is subjected to a blast of sand. As the work 25 is cut or carved by the sand to the proper depth, the curtain is moved downwardly, the rollers 27 and 29 moving downwardly simultaneously so that the area between the shafts 30 and 31 is always opposite the nozzle 46. Thus the entire area of the stencil may be sandblasted, and the stencil is clamped by the rollers 27 and 29 firmly against the work surface at all times.

In accordance with the patent statutes, I have described the principles of construction and operation of my stencil and the method of forming and using the same; and while I have endeavored to set forth the best embodiments thereof, I desire to have it understood that obvious changes may be made within the scope of the following claim without departing from the spirit of my invention.

I claim:

A method of forming stencils and sandblasting designs which consists in forming in a sandblasting resistant plate a series of openings comprising a fiure, permanently securing a rigid backing plate to the stencil plate, directing a sandblast upon the stencil sheet and the openings therethrough, whereby the backing plate is perforated in exact duplication of the design cut in the stencil plate, thereafter locking the stencil assemblage upon a plate in which the design is to be cut, subjecting the stencil plate and said last named plate to the action of the sandblast, and releasing the stencil plate combination and applying it again to a plate wherein the design is to be cut.

HAROLD R. HELGESON.

CERTIFICATE OF CORRECTION.

Patent No. 2,358,710. September 19, 1944.

HAROLD R. HELGESON.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, second column, line 57, claim 1, for "fiure" read --figure--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 5th day of December, A. D. 1944.

Leslie Frazer

(Seal) Acting Commissioner of Patents.