Feb. 1, 1944. C. DICKS 2,340,514

MEANS AND METHOD OF PRODUCING PAINTED DESIGNS

Filed Feb. 17, 1941

Fig. 1.

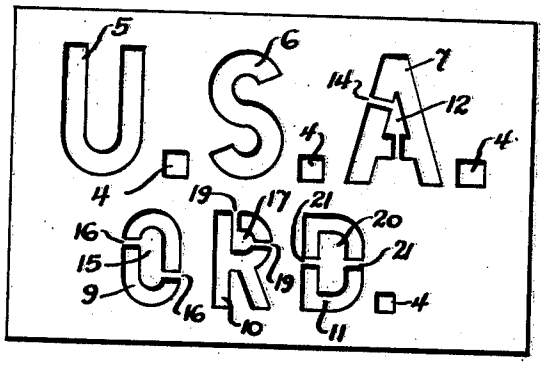


Fig. 2.

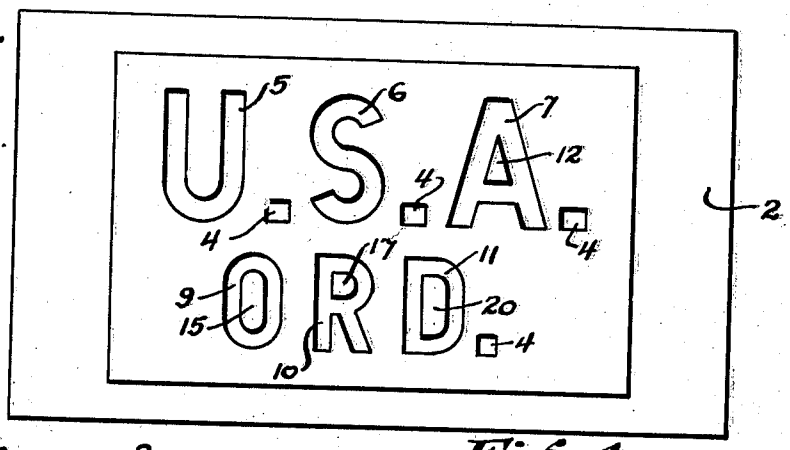


Fig. 3.

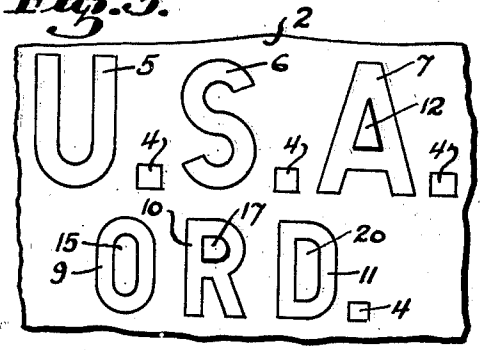


Fig. 4.

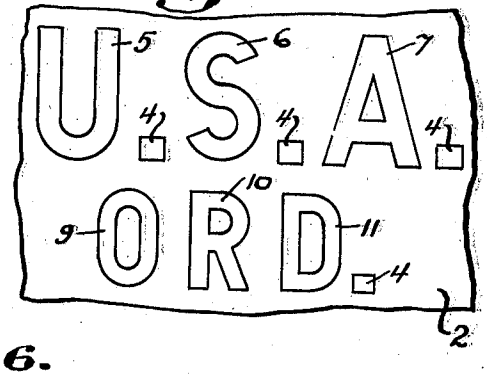


Fig. 5.

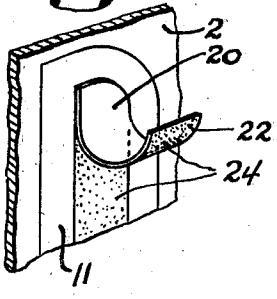
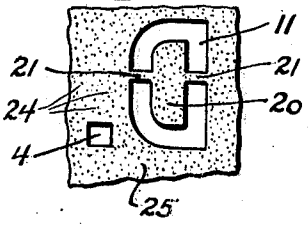


Fig. 6.



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MEANS AND METHOD OF PRODUCING PAINTED DESIGNS

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Application February 17, 1941, Serial No. 379,212

5 Claims. (Cl. 101—128.1)

This invention relates to the application of designs, letters, insignia, and the like, to a surface through the use of pre-formed stencils, and particularly to improvements in the process set forth in the prior patent, No. 2,013,194, issued September 3, 1935, to Albert E. Vaughn and entitled "Method of producing painted designs, characters, letters and the like."

The present invention embodies the direct application of a gummed-back stencil to a specially-prepared surface, by a preferred form of adhesive applied in a particular fashion whereby the use of such stencils is enhanced and whereby after their removal, the texture of the specially painted surface underneath will not be stained or altered.

The military and aircraft industries are using a dull finish, non-reflecting so-called camouflage paint of lusterless enamel-like flat wall paint.

If one attempted to letter on such a surface by the use of methods commonly used with stencils, this dull finish enamel will be stained and adhesion will not be good. If one attempted to brush onto this dull-finish paint the adhesive commonly employed in connection with this sort of work, it would leave a stain when the stencil-mask was removed. Therefore, in order to apply the system, it is necessary to prepare a special adhesive mixture, as hereinafter described.

The invention has been developed more especially in connection with the need for marking great fleets of trucks and other vehicles with numbers and various indicia where it is essential not only to guard against any impairment of the surface treated, as by staining, but where the work can be done rapidly and on a large line-production scale without interruption or delay.

It is to be understood that the methods, materials and proportions are exemplary of the invention and may be modified in detail without departing from the spirit of the invention as set forth in the appended claims.

The invention has been illustrated in the accompanying drawing, in which:

Fig. 1 shows a stencil applied to the surface on which the design is desired;

Fig. 2 shows the stencil after the removal of the ties;

Fig. 3 shows the surface after the removal therefrom of the main body of the stencil, leaving the separated interior parts of letters still affixed;

Fig. 4 shows the completed design after removal of the masking portions shown in Fig. 3;

Fig. 5 illustrates a portion of the masking stencil partially removed from the position shown in Fig. 3 to reveal the character of the adhesive connection; and

Fig. 6 illustrates a preliminary step in the preparation of the stencil, the latter being shown fragmentarily.

In the drawing, the process of application of a stencil to a surface has been illustrated in detail in order to show the full usefulness of the adhesive mixture to be fully described hereafter.

In Fig. 1 a pre-cut stencil has been shown secured to the surface 2 on which the characters are to be painted by means of the preferred adhesive. I prefer to use stencils cut from a rubberized or pre-coated long-fibered kraft paper, long fibered paper being preferred since it gives the tensile strength required during the removal operation. A rubberized priming or filler coat is required on one side of the paper. This gum-backed paper is commercially available and well known in the art.

The adhesive solution is "spattered" onto this pre-coated paper by using a low pressure spray gun with a type of nozzle which will produce a large number of spaced small globules or "islands." It is essential that this distribution of the adhesive solution be obtained, since if a continuous layer adhesive were applied between the stencil and the surface, the stencil could not be pulled away without tearing.

It has been explained above that ordinary adhesives can not be used, since they may stain or alter the surface to which they are applied. Particularly is this so in such applications as the aircraft industry where dull finish or "camouflage" paint is used. The need for a tightly gripping adhesive which will yet allow quick removal on the production line has been indicated.

The nature of the adhesive solution is of great importance, since it must be very "tacky," or highly adhesive but must not take a permanent set. The bond must be strong but capable of rupture when force is properly applied to remove the stencil.

It has been found most satisfactory to use a mixture of ordinary rubber cement with certain proportions of a commercially known solution of rubber with synthetic resins added. The latter is commercially known as "Mixture No. 609–C" and is manufactured by the Goodyear Tire and Rubber Co. It consists of a solution of a high grade water white rosin, either plain or hydrogenated in petroleum naptha. The base cement consists of first grade rubbers with gas black for color and zinc oxide for making it opaque, and is made up with a petroleum naptha.

The proportions which have been found satisfactory are substantially 40% of the 609–C mixture to 60% of regular commercial rubber cement. For certain uses the proportions have been varied to a mixture on the order of 20% of 609–C mixture to 80% of rubber cement.

Fig. 6 shows a fragmentary view of the precoated side **25** of the stencil **1**, onto which the globules **24** are spattered, as distinguished from an even and uniform film deposit. This spatter or globule effect is produced in practice by means of a comparatively low air pressure of about ten pounds per square inch, together with a spray nozzle of the type known commercially as a "De Vilbis #37," with a De Vilbis Model C. F. spray gun and a pressure type cup. The viscosity or fluid consistency of the adhesive should be such as to allow fifty square feet of surface to be sprayed from one pint of the solution, with "island" coverage as above. It has been found that spray pressures of this order are necessary, since at greater pressures, for example the usual fifty pounds per square inch, the solution becomes stringy, forming "spider webs" and the "island" distribution can not be obtained. The size and spacing of the globules or "islands" may be varied as desired by changing the pressure and nozzle size slightly from the values given.

After this operation, the adhesive is allowed to dry for eight to ten minutes, and the stencil **1** may then be applied to the surface **2**, as in Fig. 1. This drying period is sufficient to produce a very tacky surface, but one which will permit the stencil to be slid around on the surface **2** until the exact position desired is obtained and all parts are smoothly seated. The adhesive used as above described prevents discolorations or changes in the character of the surface **2**.

In applying the stencil **1**, care is taken to press all portions into close contact with the surface **2**, particularly along the edges of the characters **5**, **6**, **7**, **9**, **10** and **11** in order that the outline of the finished letters may be sharp and distinct. The stencil ties **14**, **16**, **19** and **21** are then cut out, using a sharp knife or similar instrument, with care not to cut through the protective coating on surface **2**. In cases where the design is very intricate, the masking member or stencil may be indented along the lines to be followed in cutting the ties. This may be done during the stencil-cutting operation by methods well known to those skilled in the art.

The cut ties are next removed from the surface **2** and the stencil **1** by slipping a knife blade under one edge and pulling them loose. With the adhesive mixture above described, it has been found easy to "peel" the ties away from the surface. This operation leaves the stencil as illustrated in Fig. 2, the desired characters **5**—**7** and **9**—**11** being unobstructed by ties and ready for the application of paint.

The characters are then transferred to the surface **2** by spraying or brushing paint over the stencil **1**. When sufficiently dry, the stencil is peeled off, leaving the design on surface **2**, as shown in Fig. 3. The center or detached stencil portions **12**, **15**, **17** and **20** of characters **7**, **9**, **10** and **11**, respectively, are still attached to the surface **2** at this point in the operation.

It is desirable, in using spray gun paint application, to provide additional masking of the surface **2** surrounding the body of stencil **1**. Such masking need not be described in detail, since it is well known in the art. In case such additional masking is used, it may be removed at the same time as is stencil **1**.

Next, the portions **12**, **15**, **17** and **20**, masking the detached central portions of the characters **7**, **9**, **10** and **11**, are removed. This step is illustrated in Fig. 5. It has been found that a slow, steady pull, in a plane nearly parallel to the surface **2**, will detach the stencil without any difficulty, although if it were jerked normal to that surface the stencil body might tear before the adhesive released its grip. Sufficient tensile strength is obtained in long-fibered kraft papers to allow successful use of the above method, even using very thin, light-weight paper stock.

For purposes of illustration, a fragment of the central masking portion **20** of the character "D," shown at **11** in Fig. 4, is shown in Fig. 5 undergoing removal. On the rear or applied side **22** of the masking portion **20** may be seen the "islands," or minute globules **24** of adhesive solution still adhering to the mask. A few of these adhesive particles **24** may remain on the surface **2**, but they are so small as to be indistinguishable at a casual inspection and may be left on the surface without further attention for all ordinary purposes. If it is necessary to clean the surface, they can be picked off with a rubber roller which has been previously coated with rubber cement.

The process is now completed and the stencil may be discarded. It will be apparent that by utilizing an adhesive which permits "peeling off" the stencil, it is possible to accomplish a substantial saving in handling time and labor cost.

In summary, it will be seen that the present invention provides a rapid, direct method of applying characters and the like to a surface. The peculiar properties of the adhesive solution permit it to be applied at production line tempo, and allow the subsequent removal of the stencil with similar rapidity. It may be applied directly to the desired surface without altering the character of the surface or staining it, and is peculiarly suited to use with "camouflage" paints used by the armed forces of the United States.

The application of the adhesive solution described is not limited to use with stencils, but may be used in any case requiring a firm but removable connection between surfaces, as will occur to those familiar with the art, and controllable degrees of adhesion may be obtained by varying the size and spacing of the adhesive particles.

In the claims, the term "design" has been used to include any and all characters, numerals, insignia, letters, and the like, which are to be defined through the use of stencils.

What I claim is:

1. A stencil, comprising a body of high tensile strength, cut-out portions defining a design to be applied to a surface, and an impermanent bond-forming tacky adhesive having the properties of not staining and not altering the character of said surface, spattered in spaced islands on the portion of said stencil body to be pressed against said surface.

2. A stencil, comprising a sheet body of long-fibered paper having a priming coat on one side thereof, cut-out portions defining designs and the like to be applied to a surface, and an adhesive spattered over said priming coat in minute, spaced islands comprising from 60% to 80% of rubber cement mixed with from 40% to 20% of a solution of resin.

3. The method of producing an adhesive layer for the application of stencils to a surface, which

comprises spraying under pressure of approximately ten (10) pounds per square inch a mixture of from 60% to 80% of rubber cement solution with from 40% to 20% of resin in solution onto said stencil in isolated minute islands, allowing the mixture so applied to dry for approximately eight to ten minutes sufficiently to produce a tacky surface, and positioning the stencil on said surface.

4. The method of preparing a stencil for use upon a dull finish, non-reflecting, lustreless surface, which comprises the steps of spattering by means of a spray gun under pressure of approximately ten (10) pounds per square inch an adhesive, characterized as a rubber-resin cement, upon a rubberized or precoated long fibre craft paper pre-cut stencil, whereby islands of adhesive are formed in contrast to a continuous layer of adhesive and allowing the adhesive islands so formed to dry for from eight to ten minutes before applying the stencil to said surface.

5. The method of preparing a stencil for use upon a dull finish, non-reflecting, lustreless surface, which comprises spattering an adhesive, characterized as a rubber-resin cement, upon a rubberized or precoated long fibre craft paper pre-cut stencil by means of a spray gun at a pressure of approximately ten (10) pounds per square inch, whereby islands of adhesive are formed in contrast to a continuous layer of adhesive, the fluid consistency of the adhesive being such as to allow approximately fifty square feet of surface to be sprayed from one pint of solution.

CLARENCE DICKS.