UNITED STATES PATENT OFFICE.

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STENCIL.

1,355,542. Specification of Letters Patent. Patented Oct. 12, 1920.

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To all whom it may concern:

Be it known that I, WILLIAM L. DECKER, a citizen of the United States, and resident of Great Kills, in the county of Richmond and State of New York, have invented certain new and useful Improvements in Stencils, of which the following is a specification.

This invention relates to stencil sheets for use in the reproduction of typewritten matter impressed therein, and my improvement refers particularly to certain novel combinations of constituent elements employed by me in the treatment of paper adapted for stencil use; to the steps of the process comprehending the treatment, and also to the new product which is the result of such treatment.

While the art involved in the manufacture of stencils has made considerable progress, certain disadvantages are still experienced with the products at present in the market, viz: that the treatment applied to the sheets takes a very long time to approach the state of dryness suitable for stencil use; and that if left supple enough for the production thereon of good stenciling impressions, the surfaces of the sheets are prone through their moist and tacky condition to adhere to the platen or types of the machine by which the impressions are created therein. Generally speaking, also, I have found stencil sheets which are purchasable to be lacking in strength or toughness, and others having a tendency to harden to a point where they do not efficiently receive type impressions.

Therefore, the objects of my invention are to prepare stencil sheets in such a way that they will dry to a usable state within a few hours after treatment, or even in considerably less time than that; that when so dried the sheets will have and retain a high degree of strength or toughness, the treatment adding to the original tenacity of the sheet comprising the base of the stencil, which may be yoshino or other suitable material; and still further, that the produced stencil will have and maintain the quality of extreme suppleness, with a smooth, velvety surface that is quite devoid of tackiness, while the structure of the stencil is impervious to ink and oil.

With these and other objects in view, I prepare a solution of shellac, gum turpentine and soda, which is devised in the proportions of approximately an ounce each of the shellac, gum turpentine and soda, to a pint of water. This mixture is boiled for about ten minutes or until the stated ingredients are completely dissolved. Then, while the above solution is still boiling I add thereto a solution of fish isinglass, and continue to boil the combined solution for another five or ten minutes. It will be understood that the isinglass solution had been prepared in readiness for its incorporation at the proper time in the first named solution. Said isinglass solution consists of from one half ounce to one ounce of fish isinglass to a quarter pint of warm water.

When the combined solution has been boiled for the stated period, I then allow it to cool off to a moderate temperature, when it will be in a condition to receive the admixture of casein powder and borax. These new elements have first been mixed together in a dry state, in the proportions of approximately four ounces of casein and five drams of borax, which have been dissolved in a pint of luke-warm water. In properly dissolving the mixed casein and borax the dry mixture is very gradually added to the water and is well stirred therein. If instead the whole bulk of the mixed casein and borax should be placed at once in the water the particles of powder would coalesce and form insoluble lumps. But, when the powder has been dissolved, I add about six ounces of glycerin to that solution and stir the whole mixture well together.

There have thus now been produced two separate solutions, the one, which I will call solution No. 1, including shellac, gum turpentine, soda and fish isinglass, and the other, which I will call solution No. 2, including casein, borax and glycerin; and the next step in the process consists in pouring solution No. 2 into solution No. 1 while the latter is still hot, though moderated in temperature after having been boiled. These united solutions Nos. 1 and 2, which together I will call solution No. 3, are then stirred or shaken violently together until thickened or emulsified, after which solution No. 3 is

allowed to stand and cool off for a time, when it will resolve into substantially the consistency of milk. If necessary, water should be added to solution No. 3, to give it this consistency.

Before making use of solution No. 3 in the preparation of stencil sheets, I cause it to be heated up to a temperature of about 100° F., then allowing it to cool off slightly, say to about 80° F., by which time a scum will be found to have formed upon the surface of the solution. This scum is then to be removed, which is easily accomplished, because it is in the form of a skin or gelatinous film, and can be taken off in a single piece.

The solution No. 3 may be put into service either while still warm, or when cold. It is applied to the yoshino or other like paper either by dipping the sheet in the solution or by spraying the solution over the sheet, or in other known manner. I find that if the solution is applied while warm it more thoroughly penetrates the interstices of the sheet material; but good results are also obtainable with the solution cold.

The saturated stencil sheets may be hung up to dry, the drying operation occupying not over two or three hours, and sometimes a much shorter period, depending upon the state of the atmosphere.

In some instances the drying process may be hastened, by passing the stencils between rubber rollers, wet with a drying solution, which I will call solution No. 4, and which consists of sugar of lead, alum, glycerin and water, in the approximate proportions of sugar of lead 10%, alum 10%, glycerin 20% and water 60%. To this solution No. 4, when formed, I may add acetic acid in the proportion of one ounce of acetic acid to a pint of said solution, comprehending a final drying solution which I will call solution No. 5.

Excellent drying results have been obtained by me with each of the solutions Nos. 4 and 5.

As a modification of the above described process, wherein solution No. 3 is first applied to the paper in the production of a stencil, I may make a combined bath of solutions Nos. 3 and 4, and treat the paper therewith in a single operation; or, instead, I may make a combined bath of solutions Nos. 3 and 5, with which to treat the paper in a single operation.

When either of these combined solutions is employed the treatment should be applied to the paper within a relatively short period from the time of their preparation, in order that the reactions which occur either when solution No. 4 is added to solution No. 3, or when solution No. 5 is added to solution No. 3 may not have had time to neutralize the surfacing influence of either solution No. 4 or solution No. 5 with respect to solution No. 3.

It will be understood that of the several component elements employed by me to constitute the new treatment for loose fibered paper like yoshino, for the production of new stencil sheets, the casein comprises the filler element, the binding agent is a composite of shellac, gum-turpentine and isinglass, soda being employed as a solvent for the shellac and gum-turpentine, and the drying agent is represented either by the alum or a composite of alum and sugar of lead; the glycerin being included to import into the product the quality of suppleness or softness, and the borax acts as a preservative.

I claim:—

1. The new stencil which consists of loose fibered paper containing casein as a filler, and a binding agent.

2. The new stencil which consists of loose fibered paper containing casein as a filler, and a preserving agent.

3. The new stencil which consists of loose fibered paper containing casein as a filler, and a drying agent.

4. The new stencil which consists of loose fibered paper containing casein as a filler, a binding agent, a preserving agent, and a drying agent.

5. The new stencil which consists of loose fibered paper containing casein as a filler, a binding agent, a preserving agent, a softening agent, and a drying agent.

6. The new stencil which consists of loose fibered paper containing casein, borax, shellac, gum-turpentine, soda, and fish isinglass.

7. The new stencil which consists of loose fibered paper containing casein, borax, shellac, gum-turpentine, soda, fish isinglass, sugar of lead, alum, and glycerin.

8. The method of making stencils which consists in treating a sheet of loose fibered paper with a filling solution of casein, and with a binding agent, a preserving agent, a softening agent, and a drying agent, substantially as herein set forth.

9. The method of making stencils which consists in preparing a solution of shellac and gum turpentine, boiling said solution and adding thereto a solution of fish isinglass, allowing the combined solution to cool off, and, when at moderate temperature, adding thereto a solution of casein powder, borax and glycerin, emulsifying the resulting compound solution, subsequently treating a sheet of loose fibered paper with said solution, and finally drying said sheet.

10. The method of making stencils which consists in preparing a solution of shellac and gum turpentine, boiling said solution and adding thereto a solution of fish isinglass, allowing the combined solution to cool

off, and, when at moderate temperature, adding thereto a solution of casein powder, borax and glycerin, emulsifying the resulting compound solution, allowing said compound solution to stand and cool off until a skin or film is formed on its surface, removing said skin or film, subsequently treating a sheet of loose fibered paper with said solution, and finally drying said sheet.

Signed at Great Kills in the county of Richmond and State of New York this 25th day of July A. D. 1919.

WILLIAM L. DECKER.