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TREATMENT OF RESINS

Warren R. Hanson, Arlington, N. J., assignor, by mesne assignments, to E. I. du Pont de Nemours & Company, Wilmington, Del., a corporation of Delaware

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1 Claim. (Cl. 260—4)

This invention relates to the treatment of resins and, more particularly, to a method of treating the surface of heat-hardened phenol formaldehyde resins to obtain ornamental effects.

An object of the present invention is to provide a simple and economical method of obtaining various ornamental surface effects on heat-hardened phenol formaldehyde resins. Other objects of the invention will be apparent from the description given hereinafter.

The above objects are accomplished according to the present invention by subjecting a heat-hardened phenol formaldehyde resin to an aqueous alkali metal hydroxide solution and then subjecting same to water.

The concentration and temperature of the alkali metal hydroxide solution and the time of subjecting the phenol formaldehyde resin to it, as well as the temperature of the water and the period to which the resin is subjected to it, may be varied considerably and in so doing different ornamental effects may be obtained.

In a preferred form of the invention a piece of heat-hardened phenol formaldehyde resin is dipped for a period of ¼ minute to 10 minutes into an alkali metal hydroxide solution, the concentration of said solution being between that of saturation and 0.5% and the temperature of the solution being from 20–100° C., and the resin is then dipped into hot water, preferably from 60–100° C., for 5 to 15 seconds, and thereafter rinsed with cold water. In general, it is preferred that the time of immersion of the resin in both the alkali metal hydroxide solution and the water be relatively shortened as the temperature of the solution or the water is increased or as the concentration of the solution is increased. The time of immersion, however, is also influenced by the type of ornamental effect desired.

When the process is carried out as above with the final step a rinsing of the resin in cold water, a pink color is imparted to the resin. This is chiefly noticed in the light colored resins. To prevent this, a final neutralizing rinse in a cold weakly acidic solution may be used instead of rinsing the resin in cold water.

The type of surface ornamentation obtained upon the resin is dependent upon the conditions employed. With the more dilute alkaline solutions and longer treatment, there is obtained a cracked surface resembling the appearance of alligator hide, whereas with more concentrated alkali and shorter treatment, a frosted effect is obtained.

Either a whole piece of resin, such as an article, or only a part of the surface thereof, may be subjected to the treatment. When it is desired to leave certain portions of the surface untreated, these may be covered with a protective coating or else, when possible, only those portions to be treated may be dipped into the treating baths. Examples of material satisfactory for use as protective coatings include candelilla wax, Brazil wax, and opal wax.

In order to illustrate the present invention, the following specific examples are given, wherein concentrations of the alkaline solutions are given on a weight basis:

Example 1.—A piece of heat-hardened phenol formaldehyde resin is immersed for 5 minutes in a 1% potassium hydroxide solution at 80° C. The resin is then successively dipped into hot water and cold water for approximately 5 seconds each. There is thus produced on the piece of resin an irregularly cracked surface resembling the appearance of alligator skin. The resin has a slightly pink color as a result of the treatment.

Example 2.—A piece of heat-hardened phenol formaldehyde resin is dipped into a 50% potassium hydroxide solution at 40° C. for 2 minutes and then dipped into hot and cold water for approximately 5 seconds each as in Example 1. A frosted effect is produced upon the surface of the resin and a pink color is obtained.

Example 3.—A piece of transparent, substantially colorless heat-hardened phenol formaldehyde resin is treated as in Example 1, with the substitution of a 1% acetic acid solution for the final cold water rinse. A surface effect similar to that obtained in Example 1 results but the resin remains substantially colorless.

Example 4.—A piece of heat-hardened phenol formaldehyde resin is dipped into a 10% sodium hydroxide solution at 70° C. for 1 minute. The resin is then immersed in water at 20° C. for 5 minutes. A very uniform frosted effect is obtained.

Example 5.—A stencil is applied to a rod of heat-hardened phenol formaldehyde resin and the rod dipped into molten candelilla wax and thereafter the rod is immersed in a 50% sodium hydroxide solution at 70° C. for approximately 40 seconds. The rod is then immersed in boiling water for 5–10 seconds, which completely removes the wax, and then placed in a cold water bath for 1 minute. This procedure gives a rod having a uniform frosted effect on the portion of its surface defined by the stencil and not covered by the wax.

It will be understood that the above examples are merely illustrative and that the present invention broadly comprises treating the surface of a heat-hardened phenol formaldehyde resin with an aqueous alkali metal hydroxide solution and then treating the resin with water, preferably hot water. Although the preferred ranges of solution, concentration, times of immersion of the resin, and temperatures have been given, these may be varied and will be varied to give the different desired ornamental effects. Although acetic acid has been given in the examples to illustrate a suitable acid for acidifying the rinse water, obviously other acids which do not have a deleterious effect on the resin may be employed. The water, even if acidified, will not contain any very appreciable amount of acid.

An advantage of the present invention is that it gives a very simple and easy method of quickly producing highly attractive, ornamental surfaces on heat-hardened phenol formaldehyde resins. A further advantage is that the process of the present invention can be carried out without the use of expensive equipment and will not adversely affect the mechanical properties of the treated resin.

As many apparently widely different embodiments of this invention may be made without departing from the spirit and scope thereof, it is to be understood that the invention is not limited to the specific embodiments thereof except as defined in the appended claim.

I claim:

Method of producing a surface ornamentation on a piece of heat-hardened phenol formaldehyde resin comprising immersing same for about two minutes in an approximately 50% potassium hydroxide solution, the temperature of said solution being about 40° C., and then dipping same into hot water for about five seconds and then into cold water.

WARREN R. HANSON.