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COLORED SURFACE COATING

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2 Claims. (Cl. 204—1)

My invention relates to the surface treating of materials, preferably metals such as copper, steel and brass and the purpose of my invention is to surface treat such materials to color them to shades and tints heretofore not obtained with such metals and to shades and tints heretofore not obtained with any metals or in any colorings.

In one phase of my invention, it relates particularly to copper and a consideration of the invention in copper will illustrate the more general character of the invention.

There has long been an appreciation of and preference for copper as a material for works of art. Copper is relatively easy to form and yet is relatively strong. Copper is relatively heavy, in this respect resembling bronze.

It has been recognized as desirable to color copper for ornamental effects. However copper is a dark substance and the coloring so far produced has been of a character darker than the copper itself. It has been confined essentially to dark red, dark brown and dark green. Lighter tints are preferred for a majority of effects. However the naturally dark character of copper has been an impediment to the obtaining of lighter colors.

To obtain the desired result, I apply a coating on the copper of a different metal, lighter in original color and apply the coloring to the lighter metal, preferably by using the covered copper as an anode in the electrolysis of a suitable solution whereby an oxide is formed adapted to retain dye.

I have found aluminium to be a suitable coating metal. The application of the aluminium to the copper I obtain by spraying the aluminium on the copper in molten state. The aluminium is of lower boiling point than copper and condenses on the copper providing a complete covering. I have found that it is important that no copper be exposed when the article is treated electrolytically. The aluminium may be sprayed on the copper by means of a so-called Schoop gun in which the aluminium is fused by an electric current or by an oxyhydrogen flame and a blast of air causes the atomization and spraying onto the copper.

It is advantageous that the copper be cleaned prior to the spraying and preferably the copper has an etched or in any event unpolished surface.

It has previously been known to produce an integrally united coating on aluminium. For example, U. S. Patent No. 1,869,041 discloses one process for obtaining this result in which the coating contains Al_2O_3, SO_3 and H_2O in proportions corresponding to a sub-sulfate and is produced by making the article an anode in sulfuric acid of a specific gravity between 1.5 and 1.7 with a low voltage current. So far as I am aware processes of this nature have been applied only to aluminium and aluminium alloys in sheet or equivalent form.

By spraying the molten aluminium on the copper, I have found that there are two distinct differences over anodic dyeing of plain aluminium. I obtain a different texture of the surface, even after buffing. The surface seems to be more porous and holds dye more readily. I can obtain variations of surface not heretofore obtained, as a ripple or bubble surface. The other difference is that the color is different even when using the same dye. I cannot explain this phenomenon except to say that I believe that a different crystalline structure is obtained by the spraying of the aluminium on the copper than when sheet aluminium is color treated anodically. It may be that the crystals are not worked into a given direction in the sprayed aluminium and that this gives the unusual result.

My invention should not be limited to electrolytic treatment as set forth, for example, in the above patent and Patent No. 2,022,798, the disclosures of which may be considered as incorporated herein to show examples of the coloring step. The sprayed material may be directly, or after buffing, polishing or like operations, treated by dye salts in a solution.

I realize that the Schoop gun method of spraying aluminium is known and for the step of my novel method, reference may be had to U. S. Patent No. 1,128,058 of February 9, 1915, to Schoop. However, I believe that I am the first to discover that the application of the method to color treatment as described gives new, unusual and unexpected results.

My invention is particularly beneficial where strength of material is desired. For example, tacks for upholstered furniture made of aluminium are not satisfactory. Cases for typewriters, cash registers, etc., generally will not stand up if made of thin sheet aluminium. Copper, steel or other heavier metal treated according to my invention would be suitable for these applications. Other applications include jewelry, hardware and store fronts.

It is not necessary to treat an entire article according to the invention. Parts may be masked by greasing or waxing so that the aluminium spray will not take or can be removed.

Several stages may be advisable or necessary in the dyeing operation. For example, to produce a red tray with a gold design on it, the tray is first dyed yellow and the second dyeing is red.

It will be understood that many variations are possible within the spirit and scope of the invention.

What I claim is:

1. The method of producing an ornamental or decorative article which comprises forming a heavy metal such as copper to substantially the ultimate shape, spraying molten aluminum on the metal in a manner to provide an uneven porous surface, utilizing the aluminum covered metal as an anode in an electrolytic bath to superpose an anodic oxide film on the surface produced by spraying, and applying dye-containing solution to the treated surface whereby variegated coloring is produced due to the character of the surface.

2. An ornamental or decorative article including a heavy metal such as copper formed to substantially the ultimate shape, a covering on said metal formed by spraying molten aluminum thereon in a manner to provide an uneven porous surface, said porous surface having thereon an anodic oxide film and a variegated dyed surface produced by applying a dye-containing solution to the anodic oxide film.

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