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TREATING ALUMINUM SURFACES

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4 Claims. (Cl. 204—38)

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This invention relates to the treating or coating of the surface of articles; and it is among the objects of the invention to provide on aluminum, alloys thereof, and the like, a surface having not only improved texture, but also remarkable properties as affecting moisture receptiveness and retentiveness.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described, and particularly pointed out in the claims, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative however, of but a few of the various ways in which the principle of the invention may be employed.

The surfaces to be treated, as for instance plates, sheets, rollers or shaped articles as desired, are, in accordance with the invention, provided with a facing bonded with the metal as to be in practical result durably united thereto. In the practice of my process, a surface or article of aluminum or the like is activated by treating in an electrolytic bath, being connected as anode therein, the bath being of suitable composition providing an abundance of oxygen available at the anode. While customary plating amperages and operating conditions with relatively plain water thus yield oxygen, addition of a small per cent of an acid, as sulphuric, oxalic, chromic, etc., increases the conductivity and rate of action. In some cases bath compositions as known in the ordinary anodizing of aluminum may be employed. The electrolytic treatment is applied for a few minutes, more or less, according to the nature and size of the surface and extent of action desired, the surface thereby being activated for the next operation which is the subjection to a hot bath of organic hydrophilic colloid dissolved in water. Acid or alkali may be added to effect solution, where advantageous. The temperature of this treatment is desirably around 100° C., but may be lower. At lower temperatures the action proceeds with diminished effectiveness, being undesirably so below 50° C., and with increasing effectiveness with rise in temperature thereabove, up to boiling point, and in general it is undesirable to exceed the boiling point. The anode-prepared article is immersed in such bath for a period of for instance ten to thirty minutes, depending up the extent of action desired.

The organic hydrophilic colloids employed are polyacrylic compounds, such as polyacrylic acid, polymethacrylic acid, salts and partial esters of these acids. Applied under the conditions noted,

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this coating provides a distinctive and particularly strong bond. The resulting surface is the reaction product of such compound and the oxidized aluminum and is highly receptive and retentive for moisture, and possesses high mechanical strength.

The concentration of colloid is not critical, and should be sufficient to provide enough for reaction with the surface involved, and in general the concentration need not exceed 15 per cent.

Lithographic plates, dampening rollers for lithographic printing, and the like, thus prepared have a surface of particular durability and desirable texture, coupled with a remarkable ability to attract and carry water in evenly distributed manner. Similarly, humidifier plates for air-conditioning apparatus, humidor cans for photographic film and other materials requiring storage in moist atmosphere, as well as aluminum articles of every description where surfacing of such characteristics is desired, may thus be prepared.

This application is a continuation-in-part of my application Serial No. 430,772 filed February 13, 1942, now adandoned, which in turn was a continuation, in part and as to common subject matter, of my application Serial No. 195,362, filed March 11, 1938, now abandoned.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in any of the following claims, or the equivalent of such, be employed.

I therefore particularly point out and distinctly claim as my invention:

1. A process of treating an aluminum surface, which comprises subjecting the aluminum surface connected as an anode to electrolytic anodic treatment in aqueous acid solution providing oxygen at the anode, and then subjecting the so-treated surface to polyacrylic acid in aqueous medium at a raised temperature not substantially above 100° C.

2. A process of treating an aluminum surface, which comprises subjecting the aluminum surface connected as an anode to electrolytic anodic treatment in aqueous acid solution providing oxygen at the anode, and then subjecting the so-treated surface to polyacrylic acid in aqueous medium at a temperature of 50–100° C.

3. A process of treating an aluminum surface, which comprises subjecting the aluminum surface connected as an anode to electrolytic anodic treatment in aqueous acid solution providing oxygen at the anode, and then subjecting the so-

treated surface to polymethacrylic acid in aqueous medium at a raised temperature not substantially above 100° C.

4. A process of treating an aluminum surface, which comprises subjecting the aluminum surface connected as an anode to electrolytic anodic treatment in aqueous acid solution providing oxygen at the anode, and then subjecting the so-treated surface to a polyacrylic compound in aqueous medium at a raised temperature not substantially above 100° C.

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