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ALIEN PROPERTY CUSTODIAN

PROCESS FOR THE ELECTROLYTIC PRODUCTION OF OPAQUE LAYERS, SIMILAR TO ENAMEL, ON ALUMINIUM AND ITS ALLOYS

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The invention relates to a process for the electrolytic production of opaque layers, similar to enamel, on aluminium and its alloys, wherein a continuous and alternating current is used.

Many processes for producing protection layers on aluminium and its alloys are already known, which are based on baths of anodic oxidation, containing salts of various metals, as for inst. titanium. But it should be remarked, to this purpose, that the titanium salts, as titanium oxalate, titanium phosphate, etc., on the temperature and electrochemical operation conditions, in an oxidation bath, and particularly in the anodic oxidation zones, are extremely unstable, and the bath can only operate on normal conditions, for a short time.

It is known from other part, that the bleaching and the opacity of the layer are due to the titanium oxhydrates deposit, which are to be transformed into anhydres, also by means of thermal treatments. This confirms the probability of a progressive depletion of the bath and hence the necessity of rigorous and continuous controls, in order to obtain a production uniformity.

According to the invention, these inconvenients are avoided and it is allowed to form protection oxide layers, having a white-opaque colour on aluminium and its alloys, by using the formation of such crystalline types of aluminium oxide, as to make entirely opaque its surface.

These layers may also be apt to take different colourings when immersed in colour baths, or when a reaction of the same with special chemical agents takes place.

The invention is substantially characterised by the fact, that the bath is fundamentally constituted by aqueous solutions of magnesium or zinc chromates, separately or joined with other soluble and stable salts of aforesaid metals, containing chromic acid in such sufficient quantity as to entirely keep into solution said salts.

It was already noted, on special conditions, that the aqueous solution of chromic acid, without other addition, succeeds in giving a layer of half-opaque white oxide on aluminium articles being connected with the positive pole of a source of continuous current and immersed in the aforesaid bath. The magnesium and zinc salts allow the bath to always produce such a layer of

white-opaque oxide as to bring off from the surface any metallic appearance.

The layers being formed on the hereinafter mentioned conditions, is very fire proof and does not crack as the oxide layers being formed by the ordinary processes, when the same are submitted to a high temperature. Moreover, this layer is hard, very much corrosion—abrasion—and wearproof.

The bath, according to the characteristics required for the layer, may have compositions comprised within the following limits:

Zinc chromate or other simple or compound zinc salts: from 0,5% to 20%;

Chromic acid: from 5% till saturation in distilled water, or

Magnesium chromate, or other simple or compound magnesium salts: from 0,5% to 20%;

Chromic acid: from 5% till saturation in distilled water, or

Zinc chromate or other simple or compound zinc salts: from 0,5% to 20%;

Magnesium chromate or other simple or compound magnesium salts: from 0,5 to 20%;

Chromic acid: from 5% till saturation in distilled water.

These zinc or manesium salts may be added together or separately, and, for certain purposes, the solution of chromic acid in water will be used with the addition of smallest quantity (5%) of magnesium as well as of zinc salts. The same are intended to operate on the following conditions of tension, current density and temperature:

Alternating and continuous current at the tension from 10 to 25 Volts;

Current density: from 1,8 to 2,5 Ampère p. square decimetre

Temperature: from 20° to 80° C.

The invention comprises of course also the layers obtained by the before described process and the articles provided with such layers; and it is understood that the particulars for actuating the invention may vary, without departing from its limits.

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