

1

3,388,050

ANODIZED ALUMINUM ALLOY PRODUCT

Eugene Wainer, Shaker Heights, Ohio, assignor to
Horizons Incorporated, a corporation of New Jersey
No Drawing. Filed Sept. 7, 1965, Ser. No. 485,630
6 Claims. (Cl. 204—58)

This invention relates to anodized materials having a semi-porcelain finish and a pleasing appearance which renders them suitable as architectural materials, e.g. as building panels.

More particularly, it relates to the products obtained when articles having surfaces consisting of aluminum alloys containing between 1 and 4% of a metal selected from the group consisting of Ti, Zr, Nb, Ta and Th as essential constituents and between 0.01 and 0.1% of a metal selected from the group consisting of Ag, Au, Pd and Pt as an optical constituent are anodized and then sealed in the usual way. The anodized, sealed products of this invention are characterized by a semi-white porcelain like finish which is suitable, before sealing, for the reception of decorative or other impregnants.

The alloys to which the invention applies are obtained by induction melting suitable starting materials, e.g. ingot aluminum and a binary master alloy of aluminum containing about 50% of the desired alloying element and then after the melt has reached the proper fluidity and uniformity, casting it into shapes suitable for working to the desired structural product such as sheet or plate.

To achieve the desired finish it is preferred to anodize the articles after they have been cleaned and degreased by conventional techniques using one of the following:

(1) A 1% sulfuric acid electrolyte, prepared by adding 1 gram of 98% sulfuric acid to 99 cc. of water, is utilized at a temperature of 50° C., a voltage of 20 to 25 volts, a current density of about 16 to 18 amperes per square foot for about 20 to 30 minutes.

(2) An oxalic solution containing 3 to 5 percent oxalic acid by weight and optionally up to 3% of a sodium or potassium oxalate, utilized at a temperature of 50 to 55° C. for about 30 minutes, at a voltage of 40 to 50 volts and a current density of 10 to 15 amperes per square foot.

(3) An oxalic acid electrolyte as in 2 and containing 2 to 4 percent of an alkali metal double oxalate of Ti, Zr or Th, operated at 20 to 30 amperes per square foot, about 120 volts, and at a temperature of 50° C. for 20 to 40 minutes, the pH being kept between 1.6 and 3.0.

(4) An oxalic acid electrolyte as in 2 and containing 2 to 4 percent of at least one oxalate from the group tantalum hydrogen oxalate and niobium hydrogen oxalate

2

and optionally 2 to 4 percent of an alkali metal double oxalate of Ti, Zr or Th, operated at about 50–55° C. at 40 to 60 volts and 14 to 16 amperes per square foot for about 30 minutes.

The anodizing processes are carried out in the usual manner described in many patents and in the text "Finishing of Aluminum" by S. Wernick and R. Pinner published 1959 in England, but the invention resides in the anodizing of the specific aluminum base alloys described above to obtain a novel product not heretofore available.

Preferably sealing of the anodized surface is accomplished in a boiling solution containing 0.5% nickel acetate, 0.5% cobalt acetate and 1% boric acid, or in any other convenient sealing composition.

I claim:

1. Aluminum articles having at least one anodized surface formed of an alloy consisting essentially of between 1% and 4% of metal selected from the group consisting of Ti, Zr, Nb, Ta and Th; between 0.01 and 0.1% of a metal selected from the group consisting of Tg, Au, Pd, and Pt; and the balance substantially all Al.

2. Aluminum articles as in claim 1 which have been anodized in a 1% sulfuric acid electrolyte.

3. Aluminum articles as in claim 1 which have been anodized in an oxalic acid electrolyte.

4. Aluminum articles as in claim 1 which have been anodized in an electrolyte comprising oxalic acid and at least one additional oxalate.

5. Aluminum articles as in claim 1 which have been anodized in an electrolyte containing tantalum hydrogen oxalate.

6. Aluminum articles as in claim 1 which have been anodized in an electrolyte containing niobium hydrogen oxalate.

References Cited

UNITED STATES PATENTS

1,912,382	6/1933	Nock	75—138
1,946,150	2/1934	Tosterud	204—58 XR
2,050,587	8/1936	Ruben	75—138 XR
2,056,604	10/1936	Guertler	75—138
2,231,373	2/1941	Schenk	204—58 XR
2,260,278	10/1941	Schenk	204—58
2,262,967	11/1941	Schenk	204—58
2,272,779	2/1942	Sarbey	75—138 XR
2,798,037	7/1957	Robinson	204—58 XR
2,966,735	1/1961	Towner et al.	75—138 XR
2,966,736	1/1961	Towner et al.	75—138 XR

JOHN H. MACK, Primary Examiner.

G. KAPLAN, Assistant Examiner.