This invention relates to a method of forming a colored anticoercive film layer of aluminum on the surface of aluminum the object thereof being to form a colored acid proof and alkali proof film layer on the surface of aluminum or its alloys for acid proof and alkali proof.

On the surface of aluminum, a colored and anti-corrosive film is formed by anodic oxidation and hydrolysis. The anodic oxidation is achieved by subjecting the aluminum to an electrolyte solution containing a mordant, such as an ammonium salt of an acid, and then applying an electric current to the surface of the aluminum. The mordant is required to penetrate the porous film structure of aluminum or its alloys and combine with their substances to form aluminum acetate.

2Al + 6CH₃COOH → (CH₃COO)₂Al + 3H₂O

The above glutinous ammonium acetate adsorbing and combining with the dyestuff forms an insoluble color lake layer of aluminum oxide. The reason why acetic acid is added to the mordant is to cause it to act upon the glutinous aluminum hydroxide produced in the oxidized film layer in the initial electro-chemical anodic treatment and thus to furnish said film layer with strong absorbing power for a dyestuff.

Next, expose it to superheated steam for about 30 minutes, and then the dyestuff will be turned into lake and at the same time the porous oxidized film layer may be changed into an oxidized and water proof film layer of characteristic colors.

The surface of aluminum is colored in an acid-proof and alkali-proof (anti-corrosive) manner. The article manufactured according to this invention is not only anticoercive, but also has an endurable color which does not fade easily. It may be used mainly as building materials, for example, ceiling boards, and the cases of elevators, inner side boards of cars, table wares, furniture and other articles for domestic use, and industrial art work.

I claim:

1. In the method of forming an anti-corrosive oxidized and colored film layer on the surface of an aluminum by first forming an oxide coating on the aluminum and then treating the oxide coating with a dye, the features comprising subjecting the aluminum to electro-chemical anodic treatment in an electrolyte including an aqueous solution of a substance capable of producing the oxide, being of the class consisting of oxalic, sulfurous, boracic, silicate and chrome acids and the salts thereof, and in addition to the electrolytic promotion of the aluminum oxide simultaneously producing a glutinous aluminum hydroxide, then while applying direct dyestuff to the aluminum in order to color it, using said glutinous aluminum hydroxide as a mordant for the dye, and subjecting the aluminum thus treated to heat and pressure in a superheated steam for about one half hour so as to obtain a compact oxidized film layer of characteristic colors.

2. In the method of forming an anti-corrosive oxidized and colored film layer on the surface of...
aluminum by first forming an oxide coating on the aluminum and then treating the oxide coating with a dye, the features comprising subjecting the aluminum to electro-chemical anodic treatment in an electrolyte including an aqueous solution of oxalic acid, and in addition to the electrolytic production of the aluminum oxide simultaneously producing a glutinous aluminum hydroxide, then while applying direct dyestuff to the aluminum in order to color it, using said glutinous aluminum hydroxide as a mordant for the dye, and subjecting the aluminum thus treated to heat and pressure in superheated steam for about one half hour so as to obtain a compact oxidized film layer of characteristic colors.

3. In the method of forming an anti-corrosive oxidized and colored film layer on the surface of aluminum by first forming an oxide coating on the aluminum and then treating the oxide coating with a dye, the features comprising subjecting the aluminum to electro-chemical anodic treatment in an electrolyte including an aqueous solution of oxalic acid, and in addition to the electrolytic production of the aluminum oxide simultaneously producing a glutinous aluminum hydroxide, then while applying direct dyestuff to the aluminum in order to color it, using said glutinous aluminum hydroxide as a mordant for the dye and compressing and heating the aluminum thus treated in superheated steam for about one half hour so as to obtain a compact oxidized film layer of characteristic colors.

KENZO NAGATA.