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METHOD OF ETCHING ALUMINUM

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2 Claims. (Cl. 41—42)

This invention relates to a method of etching aluminum for producing on its surface designs, characters or other irregularities.

According to this invention, desired figures, designs or characters are represented, on the surface of an article made of aluminum or of material containing aluminum as an essential component, by means of amalgamation, and the parts amalgamated in this manner are etched by oxidation with the use of an organic oxidizing agent or agents, with the aid of catalytic action of mercury.

One object of the invention is to render unnecessary the use of a protecting coating to cover the parts which are to be left blank.

Another object is to prevent side etching which is very liable to occur and which has very harmful effect in methods heretofore employed.

According to the invention, aluminum or a substance containing aluminum as an essential component thereof is etched by oxidation by means of an organic oxidizing agent or agents, with the aid of catalytic action of mercury. Or more precisely, a figure, design or character or a combination thereof is depicted on the metal surface as amalgamated parts, and an organic oxidizing agent is allowed to cover the whole surface. As oxidizing organic agents may be mentioned, for example, acetyl-, benzoyl-, or benzoyl-hydro-peroxide, ethyl- or amyl-nitrite, nitrates, such as benzoyl-nitrate, amines, such as hydroxylamine, quinone or isatin and nitro-compounds, such as nitrobenzol, as well as mixtures of the above substances. Also in certain cases the oxidizing agents may advantageously be used associated with alcohol or other solvents to make the starting easy or more rapid. Again sometimes alcohol, acetone or the like may be used for diluting the reagents to slow down the action.

The amalgam acts to catalyze the oxidation of the aluminum by the organic reagent, which being weak can not otherwise act on the metal.

This invention is applicable for such articles as various tools, metal ceiling, wall board and plates for printing purposes.

A few examples are given to illustrate the invention:

Example 1

Any suitable design is depicted on aluminum plate by means of a suitable water color pigment, the plate is covered with an asphalt film, then the whole is dipped in water and the surface is rubbed gently with the fingers to rub off the film adhering to the design. The plate is then immersed in mercuric chloride solution for a few minutes and then washed with water. The plate is again dipped in nitrobenzene to which has been added a small quantity of alcohol and left over night. After such treatment, the plate may be dipped in carbonsulfide sulphur solution for a few hours.

Example 2

An aluminum plate is painted with asphalt varnish or like material and then dipped in mercuric chloride solution. After amalgamation it is dipped in an alcoholic solution of nitrobenzene. The remaining treatment is performed as above.

Example 3

A design is impressed on an aluminum plate by usual photographic printing on a chrome gelatin film coating over the surface, and is washed in water after exposure to light. The plate is heated so as to make the film completely adhere to the surface. The design on the plate after amalgamation is etched in alcoholic solution of nitrobenzene.

Example 4

The whole surface of metal is amalgamated. The plate is then dipped in nitrobenzene diluted with alcohol. Variable dilutions produce different types of etching on the surface. A solution of 100 c. c. nitrobenzene with 10–15 c. c. alcohol produces an etched surface which looks as if it were scratched, and a solution of 100 c. c. nitrobenzene with about 10 c. c. alcohol produces an etched surface which looks like pebbles distributed over the surface. In this manner various types of etching can be produced.

What I claim is:

1. A method of etching designs on a surface containing a major portion of aluminum that comprises amalgamating the portion of the surface to be etched and applying nitrobenzene diluted with alcohol to the surface.

2. A method of etching designs on a surface containing a substantial portion of aluminum that comprises amalgamating the portion of the surface to be etched and thereafter applying nitrobenzene to the surface.

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