

ALIEN PROPERTY CUSTODIAN

PROCESS FOR THE PRODUCTION OF OXIDIC PROTECTIVE LAYERS ON MAGNESIUM OR ITS ALLOYS

Gerhard Elssner and Ernst Schröder, Leipzig, Germany; vested in the Alien Property Custodian

No Drawing. Application filed April 10, 1939

It is known to protect objects of magnesium and its alloys against corrosion by providing the surfaces of the objects with oxidic protective layers by anodic treatment in electrolytes, and subsequently, these impregnating layers, e. g. with lacquers, oils, fats and the like. Also dyeing of these oxidic protective layers has already been carried out. Further it is known to submit the objects to be anodically oxidised to a pretreatment which comprises the generally usual degreasing of the surface and also the removal of oxides and other impurities by etching in acids, usually nitric acid. The surface of the magnesium becomes hereby or remains shining white. In an attempt to increase the absorptive power, and the adhesiveness of the oxidic protective layers for impregnating substances such as lacquers, oils, fats or dyestuffs without thereby affecting the hardness of the oxide layers series of experiments have been carried out which have led to the recognition that the relatively small absorptive power of oxide layers of magnesium which are strong in themselves is caused by a characteristically dense nature of the first formed and thus outermost oxide layer. For this reason it has been attempted to form more favourably the surface of the part to be oxidised, by other than the hitherto usual pretreatment processes. Surprisingly it has been found that a treatment with nearly neutral salt solutions, preferably with ammonium salts, e. g. ammonium chloride, gives a completely different result from the hitherto usual etching with nitric acid of different concentrations. The surface does not remain polished but becomes

slightly matt and bright grey without however a loose etching residue occurring on the surface.

The pure salt solutions can also contain small amounts of free alkalies, or acids, however the solutions must be approximately neutral. A solution which may be used for almost all purposes can be composed of 200 g. of ammonium chloride per litre of water. It is used if necessary at slightly raised temperatures for example 30 to 40° C.

For brightening the protective layers according to the invention, a treatment in strong alkali solution is intercalated between the pretreatment with salt solutions and the oxidation.

Preferably the layers are boiled for a rather long time in pure water following upon the anodic oxidation in order to still further improve the brightening.

It appears to be a question of selective solution of single alloy components in the pretreatment with salt solutions according to the invention.

Practically the action in each case is very strong and striking. If for example magnesium parts are etched in nitric acid solution and then anodically oxidised, they assume only a weak colour in the solution of an organic dyestuff.

If however, similar parts are treated in the above named ammonium chloride solution, these parts show saturated, deep and uniform colorations. The coloration gives a measurement of the absorptive power. Other impregnating substances also are correspondingly taken up in a strong degree.

GERHARD ELSSNER.
ERNST SCHRÖDER.