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PROCESS FOR THE PRODUCTION OF COLOURED PROTECTIVE LAYERS ON CASTINGS, ESPECIALLY DIE-CASTINGS, OF MAGNESIUM BASE ALLOYS

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This invention relates to a process for the production of coloured protective layers on castings, especially die-castings, of magnesium base alloys.

For the production of objects, such as casings, fittings and the like, for example mounts for field-glasses, cast magnesium base alloys are being used to an increasing extent especially in the form of pressure die-castings. For such pressure die-castings, magnesium base alloys are generally used which contain, in addition to other alloying constituents, at least 4% of aluminium.

In order to impart to the surface of the metal a uniform appearance and at the same time adequate resistance to corrosion, it is customary to subject the surface of the cast objects to dipping or pickling treatment with known agents, such as dichromate solutions. It has however hitherto been impossible, with the known dips to obtain a layer of uniform, flawless appearance on the surface of the casting; moreover it was not possible to obtain uniform surface layers of dark to black coloration on pressure die-cast objects consisting of magnesium base alloys having an aluminium content of over 4%. Since in many cases a uniformly coloured protective layer is of importance, the practice has been to apply suitable colour lacquers on to the layers by brushing or spraying. It has been found, however, that such lacquer films frequently possess insufficient powers of adhesion to the previously treated metal surface and readily crack and peel off during subsequent machining of the objects.

The present invention aims at obviating the foregoing drawbacks and at providing a simple process of producing homogeneously coloured protective layers on castings of magnesium base alloys.

To this end, according to the invention, water-soluble organic colouring materials which are not decomposed by chromate salts are added to the per se known dips or pickling baths, preferably consisting of solutions containing dichromate and sulphate ions.

It has been found convenient to carry out the process in two stages, by first treating the objects in one of the per se known dips and thereupon allowing a dilute dichromate solution containing the organic colouring matter in solution, for example a sulphurised nigrosin or indulin base, to act on the thus previously pickled metal surface, without previous rinsing.

The dipping and/or colouring treatment is or are preferably, but not necessarily, carried out at

temperatures which lie a little beneath the boiling point of the solutions employed. By the single or two-stage processes carried out in accordance with the present invention, homogeneous coloured protective layers, which adhere firmly to the metal and at the same time afford to the metal a high degree of protection from corrosion, are obtained.

The adhesion of the protective layer to the surface of the metal is not impaired in any way by the embedded colouring matter.

Example 1.—A field-glass mount, consisting of a pressure die-casting (magnesium base alloy containing 8% of aluminium) is treated, after being pickled bright for a few seconds in nitric acid of about 8% strength and then rinsed with water, with an aqueous solution containing 100 grams of a mixture of 70 grams of magnesium sulphate and 30 grams of dichromate per litre at a temperature of 90° C. After 30 minutes the object is removed from the solution and, without previous rinsing, is dipped in a colouring bath heated to a temperature of 90° C. and containing 50 grams of sodium dichromate and 20 grams of water-soluble nigrosin (see "Farbstofftabellen" Gustav Schultz, 6th edition, 1931, No. 986) per litre of aqueous solution, and is left therein for 15 minutes. After removal from the bath, the casting is washed for a short time in hot water and air-dried. The deep black, tightly adhering protective layer deposited on the metal has a matt appearance and protects the surface of the casting in a high degree against corrosion.

Example 2.—A casing of a wireless apparatus, consisting of a pressure die-casting (magnesium base alloy containing 9% of aluminium and 1% of zinc), after being pickled for a few seconds in nitric acid of about 8% strength and subsequently rinsed with water, is dipped into an aqueous solution heated to a temperature of 95° C. and containing 120 grams of a mixture of 50 grams of sodium dichromate, 50 grams of sodium sulphate and 20 grams of water-soluble indulin (see "Farbstofftabellen" Gustav Schultz, 6th edition, 1931, No. 984) per litre, and left therein for 45 minutes. After removal from the bath the casting is briefly washed in hot water and air-dried. A firmly adhering pickling layer of uniform dark-blue coloration is obtained on the surface of the casting.

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