

1

3,107,175

METHOD OF APPLYING METALLIC COATINGS
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1 Claim. (Cl. 117—130)

This invention relates generally to methods of applying
metallic coatings, but has reference more particularly to
the production of metallic coatings on articles by chemical
methods.

In accordance with the invention, a mixture of alumi-
num powder and nickel fluoride, in the proportions of 40
to 60 parts by weight of aluminum to 60 to 40 parts by
weight of the fluoride, is placed, in a thin layer, on a part,
as for example, a part made of stainless steel, super alloys,
etc., and the article is heated to a temperature within the
range of from about 1950° F. to about 2050° F., for
about one hour.

This produces a reaction, as a result of which a layer
or coating is formed on the article, consisting of an alloy
of nickel and aluminum, having a thickness of from about
0.0007 inch up to about 0.0035 inch, which coating is
highly resistant to oxidation.

The time or period of heating has some influence on the
nature and thickness of the coating formed, and this may
be varied from about ½ hour to about 1½ hours.

To facilitate application of the aforesaid mixture to
the article, the mixture may be formed into a paste, using
a binder of an acrylic resin or other suitable binder, which
disappears during the reaction, and does not therefore
enter into the reaction.

If it is desired that the coating contain some chro-
mium, the mixture can contain, in a desired amount,
chromium fluoride, chromium difluoride or chromium tri-

2

fluoride, in addition to, or in substitution for, the nickel
fluoride.

If it is desired that the coating contain some cobalt,
the mixture can contain, in a desired amount, a cobalt
fluoride, in addition to, or in substitution for, the nickel
fluoride.

In most cases, the adherence of the alloy coating to the
article is greatly aided by applying to the article, before
the mixture is applied, a plating or thin layer of gold or
platinum.

The reactions, in all cases, tend to be exothermic.

It is to be understood that various changes can be
made in the method, as described, without departing from
the scope of the appended claim.

Having thus described my invention, I claim:

The method of forming an alloy coating on a metallic
article, which consists in applying to the article a mix-
ture containing from about 40 to 60 parts by weight of
aluminum powder, and from 60 to 40 parts by weight of
one or more fluorides, selected from the group consisting
of nickel fluoride, chromium fluoride, chromium difluo-
ride, chromium trifluoride, and cobalt fluoride, and heat-
ing the article to a temperature within the range of from
about 1950° F. to about 2050° F., for a period of from
about ½ hour to about 1½ hours to produce a reaction
in which a layer of an alloy is formed on the article, said
alloy consisting of aluminum and at least one element
selected from the group consisting of nickel, chromium
and cobalt.

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