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COATED METAL BODY

No Drawing. Original application filed September 13, 1926, Serial No. 135,278. Divided and this application filed April 4, 1928. Serial No. 267,484.

Our invention relates to iron and steel bodies more particularly those having plane surfaces such as sheets, plates and strips, formed or unformed into completed articles, which articles have a surface coating of a metallic alloy; and this application is a division of application Serial No. 135,278 filed Sept. 13, 1926.

It is the object of our invention to provide a metal body of ferrous material which is coated with a zinc alloy, said alloy being treated in such a way as to produce a coating that while it has excellent bending qualities, and very tight and permanent adherence to the base metal, presents a uniform, fine grained, rough outer surface which has particular value for the reception of paint coatings.

In preparing our material we prefer to follow a machine process throughout for purposes of economy. To this end pieces of metal, say ferrous sheets or plates are passed down through a body of flux supported on a molten bath of a metal such as lead, and thence out from the lead bath through a body of the coating material which is supported in an exit compartment on the surface of the lead bath.

The coating material will preferably be a commercially pure zinc to which has been added sufficient aluminum to produce an alloy having around three percent and upwardly of aluminum. The upper limit of aluminum from the point of view of the quality of the coating has not been determined by us, but from point of view of process we doubt the feasibility of using more than twenty percent aluminum by weight to eighty percent commercially pure zinc by weight.

Thus we have produced a highly satisfactory product using a floating alloy on the lead bath which imparts to the ferrous body a coating containing commercially pure zinc with eight percent aluminum.

When the product is completed, and either at once or at any time later, the metal body coated with the zinc aluminum alloy is subjected to heat under conditions which approach closely or surpass the melting point of the zinc aluminum alloy coating.

The period of exposure to this temperature is not important, it being sufficient to know that when the exposure takes place under conditions when the base metal can enter into solution with the coating, there will be a crystalline rearrangement thereof.

The product prior to heating possesses a very smooth, almost veinless finish, which is bright and glassy to the touch. After the crystalline rearrangement, the coating shows a dull finish, not dark or drab, with some of the base metal in solution with the coating.

The important factor, however, is the development of a rough texture to the surface of the coating. The appearance is one of a dull spangle, of very fine division, and the "tooth" of the coating, without any buffing or polishing by rolls, will be excellent for the reception of a coat of paint, or other brushed or sprayed, cold-hardening finish.

The changed coating still possesses excellent bending qualities and its tight adherence to the ferrous base is apparently not affected destructively in any way.

We do not wish to be limited to the use of commercially pure zinc alone, as some of the zinc spelters, at present used commercially, will when combined with aluminum in sufficient quantities preferably above two percent, by weight, exhibit in a partial way the qualities hitherto pointed out for commercially pure zinc, aluminum alloys. Neither do we wish to exclude the use of other alloying elements with the aluminum to impart particular qualities.

We are aware that sheets have been coated with tin or zinc, and thereafter the zinc or tin has been replaced with a coating of aluminum, which coating has been heat treated. But in such products there is little or no zinc present, its purity is of no apparent importance, and the development of the rough texture to the smooth coated surface does not occur.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:

1. A process for preparing ferrous metal bodies so that they will have a permanent rough textured surface, which consists in

applying thereto an alloy of zinc and aluminum in a molten condition, and thereafter heating the body and coating to a temperature approximately the melting point of the coating or above, so as to bring about a crystalline rearrangement.

2. A process for preparing ferrous metal bodies so that they will have a permanent rough textured surface, which consists in applying thereto an alloy of commercially pure zinc and aluminum in a molten condition, and thereafter heating the body and coating to a temperature approximately the melting point of the coating or above, so as to bring about a crystalline rearrangement.

3. A process for preparing ferrous metal bodies so that they will have a permanent rough textured surface, which consists in applying thereto an alloy of commercially pure zinc and aluminum in a molten condition, and thereafter heating the body and coating to a temperature approximately the melting point of the coating or above, so as to bring about a crystalline rearrangement, said body while the coating is hot from said heating treatment being exposed to oxidizing conditions.

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