

UNITED STATES PATENT OFFICE.

SAMUEL PEACOCK, OF WHEELING, WEST VIRGINIA.

PROCESS FOR ELECTROLYTICALLY DEPOSITING ELEMENTAL CHROMIUM UPON METALS.

No Drawing.

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To all whom it may concern:

Be it known that I, SAMUEL PEACOCK, a citizen of the United States, residing at Wheeling, in the county of Ohio and State of West Virginia, have invented certain new and useful Improvements in Processes for Electrolytically Depositing Elemental Chromium Upon Metals; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a process for electrolytically depositing elemental chromium upon metals, and has for its object to improve the procedures heretofore proposed.

With these and other objects in view, the invention consists in the novel steps and combinations of steps constituting the process, all as will be more fully hereinafter disclosed and particularly pointed out in the claims.

In carrying out this invention, I provide a suitable bath from a fused salt of chromium such for example as a bath of an alkali metal chromium fluoride containing a small proportion of basic sodium silicate. By this term, I mean a compound such as Na_2SiO_3 or any sodium silicate containing sodium oxide exceeding 70 per cent. The concentration of the chromium in the bath is maintained in any suitable manner, as by the addition of finely divided chromic oxide, and any suitable mechanical means for thoroughly stirring the mixture or incorporating the chromic oxide with the fused bath may also be provided.

The electrodes may be of any suitable material, the anode being either a soluble chromium compound or alloy or it may be of carbon.

The purpose in hand involves the deposition of the elemental chromium from the above-mentioned fused salt either for the purpose of making a rust-resisting coating upon metals that are prone to corrosion under various conditions of contact with corrosive solutions, or for the purpose of melting the cathodes upon which the chromium has been deposited, and thereby producing an alloy of chromium and the melted cathode which will be substantially free of metalloids. To illustrate, I deposit chromium upon very pure iron sheets for example, and the coating process is followed by the fusion through any suitable means, of said sheets,

whereupon a ferro-chromium alloy is made which is substantially free of metalloid impurities. Or, to illustrate the use of this process in the making of a chromium surfaced object, with very high corrosion resisting properties, I employ a mild steel wire or mild steel sheets, for example, and deposit chromium thereon in the manner above stated. Upon withdrawing the wire or sheets from the plating bath they are passed between suitable wiping and burnishing devices, to the end that the finished article is not only cleaned of any adhering fused bath materials or salt but it is found to be smooth and polished, and burnished as well, to the extent desired.

Either a potassium chromium fluoride or a sodium chromium fluoride may be employed for the bath.

What I claim is:—

1. The process of coating a metal with chromium which consists in preparing a fused bath of an alkali metal chromium fluoride; adding to said bath a basic sodium silicate; employing the metal to be coated as the cathode in said bath, and plating out the chromium present by passing a current from said bath to said cathode.

2. The process of coating a metal with chromium which consists in preparing a fused bath of an alkali metal chromium fluoride; adding to said bath a basic sodium silicate; adding to said bath sufficient chromic oxide to maintain the concentration of said bath substantially constant; employing the metal to be coated as the cathode in said bath; and plating out the chromium present by passing a current from said bath to said cathode.

3. The process of coating a metal with chromium which consists in preparing a fused bath of an alkali metal chromium fluoride; adding to said bath a basic sodium silicate; employing the metal to be coated as the cathode in said bath; plating out the chromium present by passing a current from said bath to said cathode; and subjecting said coated cathode to a wiping and burnishing action.

4. The process of coating a metal with chromium which consists in preparing a fused bath of an alkali metal chromium fluoride; adding to said bath a basic sodium silicate; employing the metal to be coated as the cathode in said bath; plating out the chromium present by passing a current from

said bath to said cathode; and melting said coated cathode to provide an alloy of the latter and chromium.

5 5. The process of making an alloy of iron and chromium free from metalloids which consists in preparing a fused bath of an alkali metal chromium fluoride; employing

iron free from metalloids as the cathode in said bath; plating out the chromium to be alloyed on to said iron; and melting the chromium coated iron to form the desired alloy. 10

In testimony whereof I affix my signature.
SAMUEL PEACOCK.