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METHOD FOR TREATING ELECTROPLATING BATHS

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This invention refers to a method of treating electroplating baths and more particularly to the treating of used electroplating baths in order to avoid pittings and porous coatings.

Very often when using electroplating baths for a longer period of time, the quality of the metal deposits becomes worse and worse. In the case of nickel plating baths used for a long time, for instance, this is caused by small hydrogen bubbles adhering to the nickel coating, said bubbles preventing further deposition of nickel at those places where they adhere to the coating, and yielding nickel coatings that appear to be overstrewn with dot-like indentations, so-called pittings.

One object of this invention is to restore completely the efficiency of such used electroplating baths that cause pittings. This is achieved by treating the baths with materials having a high surface activity, that is, inert solid adsorption materials of large specific surface such as fuller's earth, silicagel, activated charcoal, frankonite and the like. The effectiveness of these materials may be enhanced, if required, by the addition of suitable other soluble compounds, such as metal hydroxides, carbonates, silicates and the like, and/or oxydation agents, such as persulfates, perborates and the like.

The known treatment of electroplating baths, especially of nickel baths, that consists, for instance, in heating to boiling point in the presence of nickel carbonate, sodium carbonate and the like, in general does not suffice to restore completely the usefulness of such baths. But when adding according to the process claimed, materials of high surface activity to the bath, small amounts of said materials, such as 1 to 3 grams for the liter, are sufficient to yield electroplating baths working again in an unobjectionable manner. Furthermore it is not necessary to heat the baths to boiling, a feature that means a substantial advantage in electroplating works.

According to the invention, the treatment of the baths may be carried out, for instance, in such a manner that the materials of high surface activity are added either alone or in mixture with the above mentioned compounds in powdery condition directly to the used bath. But the powder may also be made into a paste with a suitable solvent or other liquid. Said paste or suspension is then admixed to the bath. It may previously be freed from the gases adsorbed by the materials of high surface activity by an appropriate treatment, such as heating, evacuating and the like. The materials of high surface activity may either remain in the bath together with the other additions, whereby the bath, after settling, is again ready to use, or the baths are filtered after the treatment described. The former procedure has the advantage that the baths require only stirring up for a further treatment.

The treatment of electroplating baths according to this invention may also be carried out in such a manner, that the materials used for said treatment are employed as a filtering layer through which the bath is forced to run. In this case the filtering layer preferably consists of a suitable granular material.

The following examples serve to illustrate the invention without, however, limiting the same to them:

Example 1

To 100 liters of a used nickel plating bath there are added 1.5 kgs. of frankonite while stirring thoroughly. After allowing the adsorption agent to settle, the clear bath is decanted and the remainder filtered.

Example 2

A mixture of 2.5 kgs. of fuller's earth, 0.3 kg. of nickel carbonate and 0.2 kg. of pulverized water glass is added to 100 liters of a used nickel plating bath. The treatment is carried out as described in Example 1.

Example 3

Instead of 2.5 kgs. of fuller's earth of the mixture according to Example 2, there may be used with the same result 0.2 kg. of an activated charcoal "carboraffin."

Example 4

To 100 liters of a used acid, rapidly working copper bath there are added either 1.0 kg. of pulverized silicagel or 2.5 kgs. of granular silicagel. After thoroughly stirring the mixture, the adsorption agent is removed by filtration or decantation. The treatment may be carried out at the ordinary temperature of operation.

In general, such materials of high surface activity are used with advantage that do not migrate to one of the electrodes under the influence of the electric current. Hence, it is not necessary to remove them from the bath during electroplating. This, of course, must be done when using materials that do migrate, since otherwise the quality of the metal coating would be impaired.

Of course, many changes and variations may be made in these examples by those skilled in the

art in accordance with the principles set forth herein and in the claims annexed hereto.

What I claim is:

1. A method for regenerating used electroplating baths, comprising bringing said baths into contact with inert solid adsorption materials of large specific surface capable of adsorbing gases subsequent to electrolysis, removing said material from said bath, and thereafter electrolyzing said bath.

2. A method according to claim 1, wherein the inert solid adsorption material of large specific surface is selected from the group consisting of activated charcoal, fuller's earth silicagel.

3. A method according to claim 1, wherein 1 to 3 grams of an inert solid adsorption material of large specific surface are added to each liter of used electroplating bath.

4. A method according to claim 1, wherein the regeneration is carried out at the temperature of operation of the bath to be regenerated.

5. A method according to claim 1 wherein soluble alkali metal compounds of alkaline reaction are added to the used acid electroplating bath together with said inert solid adsorption material of large specific surface.

6. A method according to claim 1, wherein soluble compounds of the metals to be deposited, together with said inert solid adsorption material of large specific surface are added to the used electroplating bath to be regenerated.

7. A method according to claim 1, wherein oxidation agents together with said inert solid adsorption material of large specific surface are added to the used electroplating bath to be regenerated.

8. A method for regenerating used electroplating baths, comprising bringing said bath into contact with suspensions of inert solid adsorption materials of large specific surface capable of adsorbing gases and thereafter electrolyzing said bath.

9. A method according to claim 8, wherein said suspensions are freed from adsorbed gases before addition to the used baths.

10. A method for regenerating used electroplating baths, comprising bringing said bath into contact with inert solid adsorption materials of large specific surface capable of adsorbing gases and thereafter electrolyzing said bath.

11. A method for regenerating used electroplating baths, comprising filtering the baths through layers of inert solid adsorption materials of large specific surface capable of adsorbing gases and thereafter electrolyzing said bath.

12. A method for regenerating used electroplating baths, comprising filtering the baths through layers of inert granular adsorption materials of large specific surface capable of adsorbing gases and thereafter electrolyzing said bath.

13. A method according to claim 1, wherein water glass together with said inert solid adsorption material is added to the used acid nickel plating bath.

14. A method according to claim 1, wherein nickel carbonate, together with said inert solid adsorption material is added to the used acid nickel plating bath.

15. A method according to claim 1, wherein nickel carbonate and water glass, together with said inert solid adsorption material are added to the used acid nickel plating bath.

16. A new mixture for regenerating used acid electroplating baths, consisting essentially of inert solid adsorption materials of large specific surface capable of adsorbing gases and soluble alkali metal compounds of alkaline reaction.

17. A new mixture for regenerating used acid nickel plating baths, consisting essentially of inert solid adsorption materials of large specific surface and water glass.

18. A new mixture for regenerating used acid nickel plating baths, consisting essentially of inert solid adsorption materials of large specific surface and nickel carbonate.

19. A new mixture for regenerating used acid nickel plating baths, consisting essentially of inert solid adsorption materials of large specific surface, nickel carbonate and water glass.

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