March 17, 1936. V. REUSS 2,034,057

ELECTRODEPOSITED COOKING UTENSIL

Filed May 29, 1933

Fig. 2.

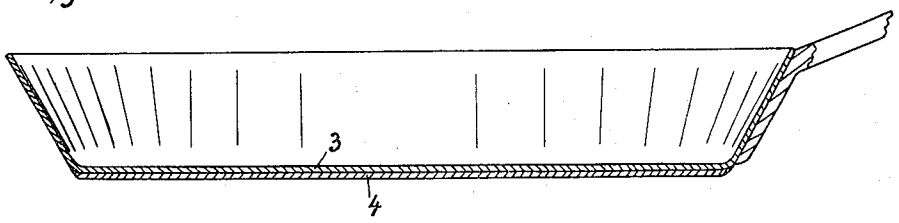


Fig. 1.

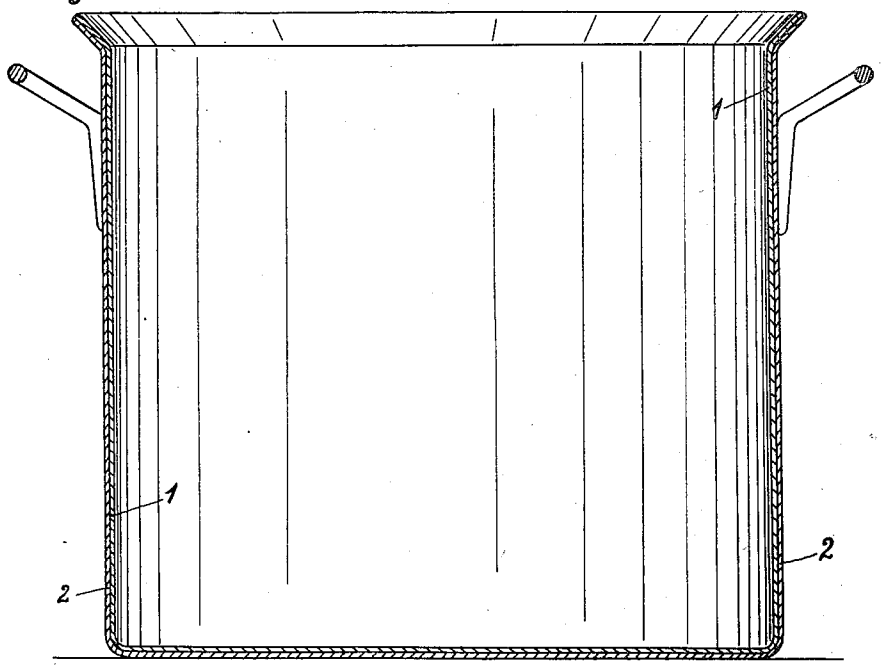
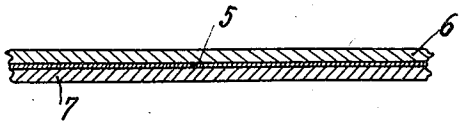


Fig. 3.



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ELECTRODEPOSITED COOKING UTENSIL

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1 Claim. (Cl. 204—1)

My invention relates to a process for the production of metal coatings on chromium or chromium-alloys.

The object of my invention is, to produce in a simple manner firmly adhering metal coatings not only on chromium-containing alloys but also on pure chromium such as chromium deposits, of which the adhesion suffices so as, for example, to be polished directly.

According to the invention the surface of chromium or chromium-containing alloys, to be provided with the coating, is exposed to agents, having a strong acid action, during the application of the coating. This inventive idea is carried out when applying the coating galvanically by using strongly acid baths having a pH-value below 2.5. When using such a strongly acid bath, hereinafter referred to as abnormal acid bath, the galvanic deposits adhere entirely firmly to the surface of chromium or chromium-containing alloy as has been shown clearly by numerous experiments. By the process according to the invention it is possible to produce firmly adhering metal coatings such as nickel, copper, tin, zinc, cadmium and the like coatings. If the coatings were produced with a weaker acid bath the coatings would peel off easily. A further development of the invention resides in the use of the abnormal acid baths with a pH-value below 2.5 for only a short time until a thin deposit has been formed galvanically on the surface of the chromium or chromium-containing alloys and then applying thereon a further deposit thereof or of another metal by a usual weaker acid or alkaline galvanic bath.

The invention is not limited to its use for galvanically produced deposits but it may also be used with good results in the production of coatings by the fusion melting process. In this type of producing coatings the invention is carried out in that at the same time that the coating metal is fused there are used strongly acid fluxes.

The effect obtained according to the invention is apparently due to the fact that chromium, which by reason of its great passivity usually does not allow the applied coatings to adhere firmly, whereas, by reason of the use of the strong acid agents, particularly by the use of abnormal acid baths, the passivity of the chromium is overcome or the chromium is so activated by the high excess of acid that the deposited metal coatings adhere firmly.

Example

For nickeling chromium or chromium-containing alloys, such as rustless steel, there may be used a bath of which one litre contains about

	Grams
Nickel sulphate	200
Sodium sulphate	30
Boric acid	20
Ammonium chloride	10

and which is rendered acid by the addition of sulphuric acid.

In order to apply firmly adhering metal coatings by the fusion melting method to chromium or chromium-containing alloys, such as rustless steel, strong acid fluxes are used according to the invention. Thus, for example, when applying the coating there may be used concentrated hydrochloric acid. There is thus obtained a good adhesion of the coating whereas the use of only weak acid known fluxes such as colophony, does not produce any adhesion of the coating.

Particularly advantageous is the above described process when it is desired to apply to the outside of the bottom or the entire wall of a cooking or frying vessel of rustless steel a layer of another metal which, either by reason of its good heat conductivity serves to distribute the heat from the source of heat over the bottom, so as to prevent burning of the food, or which prevents warping of the bottom by a compensating action (bi-metal principle) based on the difference of the coefficients of expansion of the two layers, or which fulfills both purposes simultaneously. When using the bi-metal principle the ratio of thicknesses of the outer layer and of the inner layer consisting of rustless steel must be adapted to the purpose in view. The production of this coating is preferably effected by the above described galvanic process. The galvanic coating applied according to the invention has the advantage that it adheres uniformly to the rustless steel along the entire contact surface of the two layers. Air spaces therefore cannot be formed between the two layers neither can relative displacements or other movements take place between the two layers.

The outer layer may be formed of any material suitable for the production of a galvanic coating. For example, according to the invention there may be used a galvanic coating consisting of copper. Such a copper coating has a high heat conductivity and a good appearance. The galvanic coating of copper or the like can be deposited by the process according to the invention, either directly on the rustless steel material or solely an intermediate layer may be produced by

means of an abnormal acid bath on which there may be producted the actual galvanic coating by means of a usual weak acid or alkaline bath thereof or of another metal.

Fig. 1 of the drawing illustrates a sectional view of a cooking pot produced according to the invention. In this figure 1 is the wall of the pot. 2 is a galvanic coating.

Fig. 2 is a sectional view of a frying pan, the bottom 3 of which is coated with a galvanic layer 4 produced according to the invention.

Fig. 3 illustrates the galvanic intermediate layer 5 between the ground-metal 6 and the outer layer 7. At least the intermediate layer 5 is produced according to the invention.

I claim:

A cooking utensil having a body of chromium or alloys containing chromium having electrolytically deposited on the bottom thereof through the use of an acid bath with a pH value below 2.5 a thin layer of nickel, an outer layer of copper being electrolytically deposited on the nickel surface.

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