Patented May 17, 1932

1,858,631

# UNITED STATES PATENT OFFICE

HEINRICH LEISER, OF BERLIN-FRIEDENAU, GERMANY

## PROCESS FOR PRODUCING A COATING OF CHROMIUM ON OBJECTS OF IRON AND STEEL OR ALUMINUM AND PARTICULARLY ON KNIVES, FORKS, AND SPOONS

No Drawing. Application filed July 16, 1928, Serial No. 293,314, and in Germany July 21, 1927.

A process for producing a coating of chromium on objects of iron and steel or aluminum and particularly on knives, forks and spoons.

For obtaining a shiny coating of chromium it was necessary until now to subject the objects in question to be coated electrically namely galvanically with chromium to an expensive mechanical pretreatment by grinding and polishing.

Such a pretreatment is commercially possible for high grade metals, which are free of pores and are smooth like brass, German silver and the like. However in the case of iron this pretreatment is so difficult and expensive that the costs are prohibitive, so that it is preferable to use instead of iron more expensive metals like brass, German silver and the like.

Further it must be considered that the iron during the mechanical treatment is subject to fine pores or surface cracks which must be removed with a corresponding considerable waste of material, grinding means and work.

For instance in manufacturing spoons even if a ground and polished sheet metal has been used the spoons after the rolling and pressing, etc., show pores and cracks or fissures so that it is necessary to again grind and polish which operation is very expensive.

However just from such pores, cracks and fissures corrosion starts.

It is the purpose of the present invention to propose a method for obtaining shiny chromium coatings of a highly polished appearance on iron and steel in a cheap and reliable manner.

Corresponding to this method the objects after the operations of forming or before one of the last operations of forming in a manner known per se are coated with one or more intermediate layers of other metals before depositing the coating of chromium.

The invention in first line is distinguished by the feature that the inner coating layer for the objects, which need not be polished before, is applied in molten state, whereupon after applying the further intermediate metal layer the objects if desired without any further polishing step are provided with the chromium deposit galvanically, which deposit shows at once a shiny surface.

The coating applied by melting in distinction from a galvanic coating fills out all pores and fissures, has a quite better adhesion or adherence and is thicker.

With particular advantage tin is used for the innermost coating layer upon the iron.

By a last pressing or other smoothing operation before or after applying the second intermediate layer consisting of brass the surface is improved and if necessary or desirable a further improvement can be obtained by treating the objects in a rotating drum by the sheradizing process. The relatively thick and tenacious coating of tin applied by melting is particularly well adapted for being smoothed by pressing.

The coating of brass can be applied galvanically. Preferably however also this second intermediate layer is heated at or after applying it. This second layer may be applied for example by spraying with the spraying "gun" or by melting or by applying fine amorphous metal powders, which if necessary or desired can be alloyed by heating in a reducing atmosphere and are protected against oxidation in accordance with the nature of the metal.

After such treatment the chromium coating is deposited galvanically and has immediately a shiny surface.

Claims:

1. A method for covering with chromium objects formed from coarse-grained metals, comprising the steps of covering the objects with a coating of melted tin, arranging a second coating of an electro-positive metal thereon, and thereafter applying a coating of chromium thereon.

2. A method for covering with chromium forks and spoons or the like formed from iron, comprising the steps of melting on the objects a coating of tin, arranging a coating of brass thereon, and chromium-plating the articles so formed.

3. A method for chromium-plating objects made from coarse-grain metals, with the use of a plurality of intermediate metal layers between the chromium and the base, comprising the steps of covering the objects with a coating of melted tin, arranging a second coating of an electro-positive metal thereon, and thereafter applying a coating of chromium thereon.

In testimony whereof I affix my signature.

DR. HEINRICH LEISER.