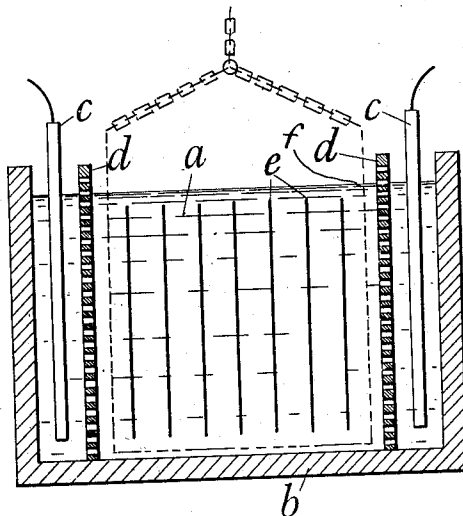


C. H. THOMPSON.
CLEANING METAL SURFACES.
APPLICATION FILED MAY 20, 1913.

1,098,338.

Patented May 26, 1914.



WITNESSES

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CHARLES HERBERT THOMPSON, OF STOURBRIDGE, ENGLAND.

CLEANING METAL SURFACES.

1,098,338.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES HERBERT THOMPSON, subject of the King of Great Britain, residing at Harrington House, Amblecote, Stourbridge, England, Fellow of the Chemical Society, analytical and consulting chemist, have invented certain new and useful Improvements Relating to the Cleaning of Metal Surfaces, of which the following is a specification.

During the manufacture of many forms of metal articles it is necessary to subject the surfaces to a cleaning operation. Some articles, such as baths and other hollowware, sheets and tubes of iron, steel and copper, require to be cleaned before they can be properly enameled, galvanized or plated. And other articles require to be cleaned after heating or annealing before a shaping or like operation can be performed thereon.

This invention relates to the cleaning of such metal surfaces in an electrolyte.

Various processes have been proposed for cleaning metal surfaces by electrolysis under the action of direct currents, periodically-reversed direct currents and alternating currents, but none have been hitherto entirely successful owing either to the cost of maintaining the bath or of handling the articles placed therein.

According to this invention the objections to the known methods of procedure are avoided, and cleaning operations on the surfaces of metal articles can be performed both effectively and economically.

The invention comprises the employment of a bath of any suitable chlorid, sulfate or nitrate solution, passing an alternating current through such bath, separating the electrodes from the articles to be treated by perforated or porous partitions, and placing the articles in the bath without any metallic connection with the electrodes.

The accompanying sectional drawing illustrates diagrammatically one convenient means for carrying this invention into effect.

For the electrolyte I prefer a saturated solution of any suitable chlorid, sulfate or nitrate in water. Solutions of sodium chlorid or magnesium sulfate are found to be among the most convenient, although solutions of other chlorid, sulfate or nitrate salts may be employed. Also, solutions of suitable complex sulfates and chlorids containing ammonia will give satisfactory results. For example, a solution of an alum

containing aluminium and ammonium sulfate is satisfactory.

As regards the alternating current, any of the usual periodicities adopted in electrical power and lighting systems may advantageously be employed, but I prefer a periodicity of 50 cycles per second. The density of the current required may vary considerably according to the class of work to be treated, and is best determined by actual trial on sample articles. The electrodes may consist of iron, carbon or other bars or plates connected to the current supply. These electrodes are contained in perforated earthenware or other tubes or receptacles placed in the bath so that they are kept entirely apart from that portion of the bath which receives the articles to be treated. Or, the electrodes may be separated from the main portion of the bath by perforated division plates placed across the bath. The object of the partitions is to prevent possibility of contact of the articles with the electrodes. The perforations in the partitions enable free circulation of the electrolyte therethrough to be obtained. In all cases the partitions employed for separating the electrodes from the main portion of the bath are of non-conductive material.

The articles to be treated are simply placed in the bath in such a manner that they are not connected metallically with the electrodes. In the case of sheets or tubes these may conveniently be mounted on a wooden cradle which can be lowered into the bath. In fact, it is a convenience to mount all other articles in this way for the reason that not only is the moving of the articles into and out of the bath facilitated but it is also rendered possible to keep the articles in a state of motion within the bath, for example, by swinging the cradle or imparting to it a regular up and down movement.

In the diagram *a* indicates the bath of salt solution contained in a tank *b*, *c* are the electrodes, and *d* the perforated partitions which separate the electrodes from the main portion of the bath into which the articles as *e* are placed. The cradle is indicated by dotted lines *f*.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

An electrolytic process for cleaning the surfaces of metal articles consisting in plac-

ing the articles without metallic connection with the electrodes in a bath of any suitable chlorid, sulfate or nitrate solution, preventing the articles from contacting with the
5 electrodes, arranging said articles in series with each other and the electrodes, and passing an alternating current through such bath, the current by the said arrangement of articles and electrodes passing through the

articles in succession, substantially as described. 10

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES HERBERT THOMPSON.

Witnesses:

JOHN MORGAN,
FRANCIS MALPAS.