

# UNITED STATES PATENT OFFICE.

JOSEPH SACHS AND ERNEST HUBER, OF NEW YORK, N. Y.

## PROCESS OF MANUFACTURING METALLIC POWDERS.

SPECIFICATION forming part of Letters Patent No. 521,992, dated June 26, 1894.

Application filed February 13, 1894. Serial No. 500,057. (No specimens.)

*To all whom it may concern:*

Be it known that we, JOSEPH SACHS, a subject of the Grand Duke of Baden, and ERNEST HUBER, a citizen of Switzerland, residing in the city and county of New York and State of New York, have invented certain new and useful Improvements in Processes of Manufacturing Metallic Powders; and we 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.

Our invention relates to metallic powders and its novelty consists in the several steps of the process employed to produce the same.

The object of our invention is to cheapen the production of bronze powders by substituting for the inner portion of each particle some other material than that composing the surface of the same. In two other applications for Letters Patent of the United States filed by us, viz: Serial Nos. 468,886 and 499,927 we describe processes based upon electrolysis whereby powders are produced having a core of either a metallic or non-metallic material and a shell of metal. The products which are the result of these processes are satisfactory, but we have discovered a chemical method of producing the product which consists of a core of one metal and a shell of another, which is the subject matter of this application. Our method is based upon the principle that certain metals if immersed in a solution of a metallic salt will receive a coating of that metal which is the base of the salt, provided the metal immersed is less electro negative than the metal which is the base of the dissolved salt. We will describe it in concrete form as applied to materials the properties of which are relatively well known, for instance, the manufacture of a bronze powder each particle of which shall have a shell of brass and a core of zinc. We first prepare an aqueous solution of sulphate of copper and sulphate of zinc adding thereto a sufficient quantity of cyanide of potassium to dissolve the resulting precipitate. We will assume that equal quantities of the metallic salts are employed, though by varying their proportions the final product will have different colors and physical properties as one or the other of the metals predominate. To the solution thus formed we then add from

one-tenth to one-fifth of aqua ammonia and dilute the entire solution to about 8° Baumé with water when it is ready for the next step. We have previously prepared and well cleansed a sufficient quantity of zinc powder. This is then added to the solution above named, the whole being constantly stirred or agitated by any suitable means whereby the particles of the zinc dust are kept in motion. These particles gradually become covered with a deposit of metallic brass and as soon as they are generally covered the agitation is stopped and the coated powder is removed and dried in subsequent operations and for most purposes may be considered as a powder made wholly of brass.

Mechanical apparatus of various kinds may be readily arranged to promote and maintain the necessary agitation of the zinc particles and other solutions, and metallic bases may be substituted by the chemist for those which we have chosen to illustrate our process but the principles underlying our invention remain the same.

We are well aware that it is not broadly new to cause a deposit of one metal upon the plate of another metal by immersing the latter in a suitable solution of the former, but to our knowledge it is quite new to produce a powder composed of composite particles in the manner we have detailed. By the word powder as we have used it we mean to include what is technically known as "flitters" and "metallics."

Having described our invention, what we claim as new is—

The process of manufacturing metallic powders each particle of which consists of a core of one metal and a shell of another which consists in immersing the cores in a finely divided state and under conditions of constant agitation in a suitable solution of a salt of a metal more electro negative than that of which the cores are composed.

In testimony whereof we have signed the specification in the presence of two subscribing witnesses.

JOSEPH SACHS.  
ERNEST HUBER.

Witnesses:

WM. RAIMOND BAIRD,  
MAY G. RIDLEY.