

UNITED STATES PATENT OFFICE.

ALEXANDER CARL REINFELD, OF VIENNA, AUSTRIA-HUNGARY.

PROCESS OF ELECTRO-DEPOSITION AND CATHODE THEREFOR.

SPECIFICATION forming part of Letters Patent No. 454,381, dated June 16, 1891.

Application filed March 8, 1889. Serial No. 302,513. (Specimens.) Patented in England February 22, 1889, No. 3,222.

To all whom it may concern:

Be it known that I, ALEXANDER CARL REINFELD, gentleman, a subject of the Emperor of Austria-Hungary, residing at Vienna, in Austria-Hungary, have invented a certain new and useful Improved Process of Treating Plates and the Like for Facilitating the Removal of Galvano-Plastic Deposits Contained Thereon, (for which I have obtained Letters Patent of Great Britain, No. 3,222, dated February 22, 1889,) of which the following is a specification.

Heretofore in galvano-plastic manipulations, and particularly in the formation of thin metal foils, difficulty has always been experienced in lifting off or removing the deposits where no intermediate coating of fat, wax, resin, or the like is used, which substances, it will be remarked, always act in a derogatory manner by destroying the finer details of the design and otherwise. This difficulty, I have discovered, can in a large measure be obviated by the employment of a treated nickel surface, upon which the deposit is made, for while the nickel itself may be readily deposited in a fast-adhering coating on other metals, yet when treated as hereinafter described it possesses in but a very slight degree the property of retaining or adhering to other galvano-plastic deposits. The receiving-surface or cathode may be formed of a body of nickel, nickel alloy, or a deposit of nickel on a base metal. When the receiving-surface has been formed and dressed in the ordinary manner in carrying out my invention, it is then very slightly oxidized, preferably by subjecting it to a very weak oxidizing solution of chromate of manganate (solution of one to two per cent.—that is, a solution of one to two parts of salt to one hundred parts of water) for about one-quarter of an hour. Any description of oxidizing agents may be employed, or even heating; but the oxidation must be very slight, so as not to injure the same, and only sufficient to give a surface to which subsequent deposits will not stick fast, and while surfaces prepared as so far described give better results than it has been possible to secure heretofore, yet more perfect results may be accomplished by a further treatment of the oxidized surface, consisting in rubbing and polishing it with pads or disks of cloth,

leather, or equivalent with a soap-like mixture as a lubricant to prevent the nickel from wearing away too rapidly, and also for effectually filling up or closing the pores of the metal, thereby insuring a perfectly plain surface. Soaps of alkaline earth—such as the ordinary soda-soap or lime-soap obtained from oleic acid and caustic lime—are preferably, although not necessarily, used, because they are insoluble in galvanic baths; and it will be understood that by “soap-like mixtures” are meant all mixtures containing fatty or resinous acids in combination with alkaline substances—for instance, any substance containing oleic acid in combination with a lime or the like. The soap used may be either solid or semi-liquid or in solution in water or alcohol, and is not absolutely necessary, its object being merely to assist the ready removal of the galvanic deposit, though it performs this function very effectively.

As before stated, any description of oxidizing agents will do, provided their action is not too strong, salts of metal acids being especially favorable when used in weak solutions. The nature of the solvent to be chosen depends entirely upon the quantities of the salt. Thus chromate of lead in a solution of potassium hydrate is just as good as a solution of chromate of potassium in water. Experiments show that such oxidizing agents, weak as they are, sufficiently oxidize the nickel surface. Thus if a deposit of silver or copper, &c., be made upon a nickel plate thoroughly freed from fatty matter the deposit can only be removed with difficulty; but if the plate be previously dipped into a solution of chromate of potassium and washed with water no change whatever will be apparent, and yet a metal deposit scarcely one millimeter thick will then be removable with the greatest facility.

The absence of the slightest visible alteration of the surface is the great advantage of the method herein set forth. Yet after being used for one deposit the plate loses its characteristic property, and, although apparently unaltered, it must before it is again employed be oxidized afresh and repolished with soap.

In practicing this invention it is preferable to deposit an exceedingly thin deposit of gold, silver, or other metal and then immerse

the plate in a copper or other metal bath, and so strengthen the first deposit. The thin foils may, if desired, be affixed to paper or other suitable material before their removal from the plate, for which purpose the deposit while still on the plate is coated with glue or equivalent and the paper or other material placed on it and lightly pressed down. When the cement is dry, the paper or other material is lifted off with the attached foil or deposit.

The process can be employed in the production of printing-plates for graphic and plastic purposes, for the production of plastic highly-polished metal foils, and of metal papers for technical and commercial purposes.

Having thus described my invention, what I claim as new is—

1. The herein-described improvement in the art of galvano-plastic deposition, consisting in forming the surface to receive the metal of nickel or nickel alloy, oxidizing the same slightly, depositing the metal thereon by electrolysis, and finally removing such deposit, substantially as described.

2. The herein-described improvement in the art of galvano-plastic deposition, consist-

ing in forming the surface to receive the metal of nickel or nickel alloy, oxidizing and then polishing the same, depositing metal thereon by electrolysis, and finally removing such deposit, substantially as described.

3. The herein-described improvement in the art of galvano-plastic deposition, consisting in forming the surface to receive the metal of nickel or nickel alloy, oxidizing and then polishing the same with a soap-like mixture, depositing metal thereon by electrolysis, and finally removing the deposit, substantially as described.

4. The herein-described cathode or receiving-surface for galvano-plastic deposits, formed of nickel or nickel alloy, having its surface oxidized, polished, and filled with a soap-like mixture, substantially as described.

In witness whereof I have hereto set my hand in the presence of the two subscribing witnesses.

ALEXANDER CARL REINFELD.

Witnesses:

OTTO SCHIFFER,

EDMUND JUSSEN.