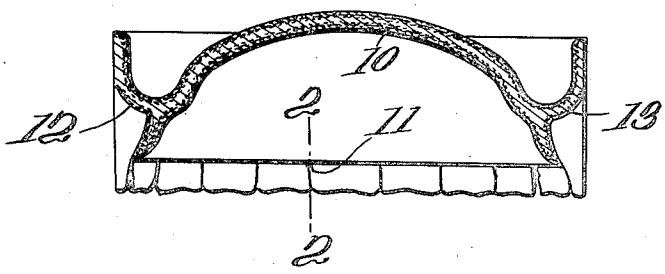
Oct. 30, 1923. 1,472,245

J. A. DALY

ARTIFICIAL DENTURE AND PROCESS OF PRODUCING THE SAME

Filed Sept. 16, 1922

Fig. 1.



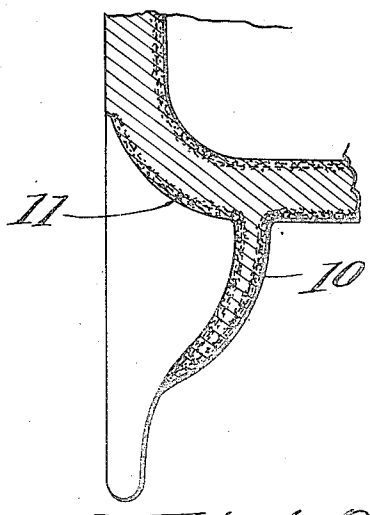


Fig. 2.

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UNITED STATES PATENT OFFICE.

JOHN A. DALY, OF NEW ROCHELLE, NEW YORK, ASSIGNOR TO GOLD SEALED DENTURE PROCESS CO., INC., A CORPORATION OF NEW YORK.

ARTIFICIAL DENTURE AND PROCESS OF PRODUCING THE SAME.

Application filed September 16, 1922. Serial No. 588,720.

To all whom it may concern:

Be it known that I, JOHN A. DALY, a citizen of the United States, residing at Rochelle Park, New Rochelle, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Artificial Dentures and Processes of Producing the Same, of which the following is a specification.

My invention relates to an improvement in that class of artificial dentures in which a body or plate of vulcanite, such as vulcanized rubber, or similar materials is employed with artificial teeth embedded therein. Plates of this character are absorbent to a greater or less degree of the liquids of the mouth and the foods or other ingested material deposited thereon, thus rendering the same unsanitary and deleterious. It has been found that the absorbent quality of such plates renders the cleansing of the same difficult and inefficient by the ordinary methods employed, the absorbent quality being such that the deleterious matter extends below the surface of the plate and is not removed therefrom by brushing, the usual method employed in cleansing them.

It has been found in the use of such dentures that particles of food are deposited in the interstices between the teeth and pores of the plate where they decay, thus setting up a microbic condition exceedingly harmful to the person using such plates.

The object of my invention is the provision of means whereby an artificial denture, such as before described, will be completely covered throughout its entire area, including the interstices between the teeth mounted therein, with an impervious coating of metal which is precipitated upon the surface of such denture and which extends to a slight depth below such surface, whereby such coating will not only cover the surface of the plate but will extend to a slight extent within the body thereof.

A form of denture embodying the invention is shown in the accompanying drawing in which

Fig. 1 is a vertical transverse section through a plate for the roof of the mouth with teeth set therein, and

Fig. 2 is a detail vertical section on line 2—2 of Fig. 1, on an enlarged scale.

The foundation plate or body of the denture can be made thinner than is usually employed, the coating of metal adding strength and thus the completed plate is stronger and lighter than those of ordinary manufacture.

A further advantage of dental plates constructed according to my process is that they are less liable to accidental breakage, the metal shielding them therefrom.

To prepare the plate for the treatment it is first thoroughly cleansed from any foreign matter, especially such as is of a greasy nature, and to this end may be immersed in or scrubbed with soda or lye. The plate is then immersed in some substance which has the power of dissolving the vulcanite, as for instance chloroform, alcohol, acetic acid, or a mixture thereof, and is allowed to remain therein a sufficient length of time for the material of the plate upon its surface and for a slight depth therebelow to become softened by the action of the solvent. This will usually take place in about twenty minutes.

The third step in the practice of the invention is the cleansing of the plate from the solvent, for which purpose it may be merely washed with water.

Fourth, the plate immediately after washing is placed in an aqueous solution of gold chloride, silver nitrate, or a dissolved salt of the metal which is to be precipitated thereon. In the case of silver or gold about a 20% solution is found to give good results. In the solution of the metallic salt about 10% of potassium sulphide (K_2S) is dissolved and a reducing agent, such as oxalic acid or formaldehyde is added thereto.

The metallic salt in the presence of potassium sulphide and the reducing agent will cause a precipitation of the metal upon and within the plate under treatment in an exceedingly fine state of subdivision. The metal seems to have an affinity for the substances supplied to the rubber for its vulcanization in such a manner as to make a close union therewith of some character, and the result as shown by the practice of the invention is a coating of metal 10 which can only be separated therefrom by mechanical means with great difficulty.

Should the first immersion in the solution of the metallic salt with the accompanying sulphide and reducing agent give an insufficient coating the plate can be a second or a third time immersed in a like solution

with a resulting precipitation of fresh metal thereon at each treatment, without an additional bath in the vulcanite solvent. After sufficient metal has been precipitated on the plate to make the surface thereof an electric conductor, which result may be found after the first immersion, additional metal may be deposited on the plate by electroplating instead of by successive immersions in the solution of metallic salt.

The chemical reactions which take place in the carrying out of the invention are very complex and difficult of explanation. Apparently in the presence of potassium sulphide a double sulphide of gold and potassium is formed, which sulphide is reduced by the reducing agent with the consequent precipitation of the metal upon and within the body of the plate.

It will be obvious that bridges, partials, and other forms of dental plates, as now constructed and in actual use, can be processed according to the invention herein described so as to render them sanitary and free from their present absorbent condition. Since the process is chemical in its nature and will take effect upon the plate wherever the liquids used can penetrate, it follows that the surface of the plate in the smallest interstices between the teeth, as at 11, 12, 13, will be provided with a coating of the protective metal.

The above process is found to be suitable for all kinds of vulcanized plates with which it has been tried. It is found, however, that with some plates, more especially the lighter colored ones, that the process may be successfully carried out without the step of softening the plate by a solvent.

Minor changes may be made without departing from the spirit of the invention.

I claim:

1. In artificial dentures, in combination, a body of vulcanite, artificial teeth embedded therein and having interstices between them, and a coating of metal covering the surface of the vulcanite and extending into the smallest of said interstices.

2. In artificial dentures, in combination, a body of vulcanite, artificial teeth embedded therein and having interstices between them, and a coating of metal upon and extending slightly below the surface of the vulcanite, said coating extending into the smallest of the interstices between the teeth.

3. The process of producing an artificial denture comprising a body of vulcanite having teeth embedded therein with interstices between them, which comprises softening the surface of the vulcanite by chemical means, applying a coating of metal upon and slightly below the softened surface of the vulcanite, said coating extending into the smallest of said interstices.

4. The process of producing an artificial denture comprising a body of vulcanite having artificial teeth embedded therein with interstices between them, which comprises softening the surface of said body including that in the smallest of said interstices, by chemical means, depositing a coating of metal upon the thus softened surface including that in said smallest interstices.

JOHN A. DALY.