

UNITED STATES PATENT OFFICE.

JOHN A. DALY, OF WASHINGTON, DISTRICT OF COLUMBIA.

COATING RUBBER WITH METAL.

SPECIFICATION forming part of Letters Patent No. 233,144, dated October 12, 1880.

Application filed June 7, 1880. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. DALY, a citizen of the United States, residing at Washington, in the county of Washington and District of Columbia, have invented certain new and useful Improvements in the Art of Unit-
5 ing a Coating of Metal with Vulcanite Rubber for Dental and other Purposes; and I do hereby declare the following to be a full, clear,
10 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.

The object of my invention is to so unite a coating of gold or other metal with a plate of
15 vulcanized rubber that it will firmly adhere thereto, and the method by which this is accomplished will be fully hereinafter described, and my special improvements pointed out in the claims.

20 Attempts have heretofore been made to cover or line vulcanite dental plates with a coating or foil of gold; but these experiments have failed of practically useful results, for the reason, as I believe, that the foil, having
25 a smooth finished surface, will not adhere to the rubber, even if the rubber be vulcanized on the foil, as has been tried.

My improvement enables me to produce a dental vulcanite plate covered or lined to any
30 desired extent with a gold or other metal plate of any desired thickness, so firmly united that it will be impossible to separate the two by ordinary mechanical means. Usually the part lined will be that which comes in contact with
35 the mouth, so that no poisonous or other ill effect may result from the use of rubber.

I will now proceed to describe one mode of producing a gold-lined dental vulcanite plate.

I take an ordinary plaster model or mold of
40 the mouth, (with or without the teeth attached to said model,) and saturate the plaster with hot wax, by immersion or otherwise, to make the plaster water-repellent. This step does not deform the model in any particular. I
45 then dust or polish this model with graphite, in the ordinary manner of electroplaters, at such parts as I desire to cover with gold. I then hang the model in a gold solution, and by the use of a battery produce an electro-
50 deposit on the coating of the graphite. When the gold film has been deposited to a sufficient

thickness I remove the model from the battery and place it in a flask for vulcanizing, and put in rubber for vulcanization, in the usual manner, and proceed to vulcanize the plate just as
55 if there were no electro-deposit of gold on the model. When the vulcanized plate is taken from the flask the gold film will be found firmly attached to the plate, and cannot be removed therefrom by ordinary mechanical
60 means, but adheres as firmly as if plated on a metal.

The method I have described is one which departs very little from the ordinary processes of dentistry. It will be readily understood,
65 however, that the method may be varied in many particulars without departing from the spirit of my invention. For instance, many substances other than plaster may be used for a model. I have found litharge to answer a
70 good purpose, and when this is used the treatment with wax may be dispensed with. I do not, however, in this application, claim a dental model made of litharge, as I reserve the right to claim that in a separate application.
75

Bronze or substances common in the electroplater's art may be used instead of graphite for coating the model.

Nickel, platinum, and other metals may be used instead of gold to form the coating. Sil-
80 ver does not answer a good purpose, because it is attacked by the sulphur in the vulcanite.

When gold is used it need not be so fine as the pure gold usually employed in dentistry. I have found gold of eighteen carats to do
85 well, and this fineness is generally sufficient to resist acids of food and of the stomach.

My gold solution (cyanide of potassium and gold dissolved in nitro-muriatic acid) can be used cold when a plaster model is employed;
90 but with models which do not require to be saturated with wax it may be used hot, if desired.

Articles of vulcanite jewelry may be coated with metal in the same way as the dental
95 plates hereinbefore described.

There is a radical difference between my method hereinbefore described and the ordinary method of electroplating on a material which is a non-conductor of electricity. Where
100 an electro-deposit is made in the ordinary way the surface of the non-conductor is coated with

graphite or similar substance and the electro-
deposit made thereon, leaving the graphite be-
tween the film and the base. This would be
very objectionable in dental plates; besides,
5 I have found by experiment that gold will not
adhere to dental plates when deposited in this
way sufficiently to secure good results. Again,
the fit of a dental plate made in this way would
not be so good as one made by my process
10 hereinbefore described, as the gold film made
by my process is made on the model, and not
on the completed plate. So in jewelry, fine
lines will be preserved by my method which
would be more or less lost if the metal were
15 deposited on the completed vulcanite base.

I am aware that dental vulcanite plates have
been made, or attempted to be made, with a
metallic lining by placing a piece of gold or
other foil on the model and vulcanizing the
20 rubber upon such foil. This method does not
give good results, for the reason that the foil
will not adhere firmly to the rubber, owing, as
I believe, to the lack of porosity in the foil;
nor can the foil be made to fit the model so
25 nicely as an electro-deposit thereon.

What I claim is—

1. The method herein described of making
articles of vulcanite rubber with metallic sur-

faces, which consists in first coating a mold
with metal by electro-deposition and then vul- 30
canizing the rubber on said metal, substan-
tially as set forth.

2. The method of making dental vulcanite
plates with metallic surfaces, which consists
in first coating the mold with metal by electro- 35
deposition and then vulcanizing the rubber
plate on said metal, substantially as set forth.

3. The method herein described of making
dental vulcanite plates with metallic surfaces,
which consists in first saturating a plaster-of- 40
paris mold with wax, then obtaining an elec-
tro-deposit thereon, and afterward vulcanizing
the rubber plate on said metal, substantially
as set forth.

4. A dental vulcanite plate having its sur- 45
face partly covered with an electro-deposit of
metal without any intervening substance be-
tween the electro-plate and the rubber plate,
substantially such as described.

In testimony whereof I affix my signature 50
in presence of two witnesses.

JOHN A. DALY.

Witnesses:

FREDERICK F. DALY,
M. P. CALLAN.