UNITED STATES PATENT OFFICE.

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PLASTIC METAL.

1,040,972. Specification of Letters Patent. Patented Oct. 8, 1912.

No Drawing. Original application filed April 26, 1910, Serial No. 557,749. Divided and this application filed July 19, 1911. Serial No. 639,461.

To all whom it may concern:

Be it known that I, CHARLES L. ALEXANDER, a citizen of the United States, residing at Charlotte, in the county of Mecklenburg and State of North Carolina, have invented certain new and useful Improvements in Plastic Metal; and I 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.

This invention relates to the production of plastic metal and the process of making the same and is a division of application Serial Number 557,749, filed April 26th, 1910.

In the aforesaid pending application the description refers to the preferred form as consisting of employing finely divided or powdered metal, as gold which is bound together by a binder. Reference is also made to the use of sponge or moss gold and the present application is directed to the latter specific form of the invention.

In carrying out the invention it is found more desirable, under some conditions, to employ what is known in the trade as "sponge gold" or "moss gold" instead of finely divided or powdered gold. When such sponge or moss gold is employed it is of course unnecessary to employ what would be strictly a binder, as the metallic fibers are connected to form an integral metallic mass, but one wherein the fibers are separated by innumerable interstices. In addition to retaining the metallic particles in union it is also necessary to prevent adhesion. In the use of moss or sponge gold, or an equivalent, the substance which in co-pending application 557,749 is termed a binder, is more especially a lubricant to prevent the adhesion of the particles and while as ordinarily employed it serves also as a binder, it will be termed herein a lubricant, it being understood that the same function is performed by such lubricant as is performed by the binder in said co-pending application. The lubricant may be any oleaginous or waxy material but preferably a wax is employed which is soft when warm and which becomes harder when chilled and capable of complete dissipation by heat. As the use of oils would be almost self evident in connection with the sponge or moss gold, the use of the waxy lubricant will be described in detail. The waxy lubricant is applied to the sponge or moss gold in a number of different ways, one of which is dipping the spongy mass into the wax while warm and in a fluid condition so that a thin coating adheres to the surface. Another and perhaps preferable method is to dissolve the wax in a solvent such as benzin, amyl-acetate or the like, and dip the gold into this solution. Upon removing the gold from the solution, the solvent evaporates and leaves the wax coating the gold throughout its entire extent, within the interstices and without. The coating can be made of any desired thickness by employing a solution more or less nearly saturated. This latter method is especially convenient in connection with sponge gold on account of the fact that a very small proportion of wax can be applied to the metal and it is not necessary to compress it or heat it to remove the excess. It is desirable to secure as great a density of the metal as possible in the practical application of this product and therefore it is only advisable to use the smallest possible amount of waxy lubricant as a coating.

Prepared as above described, the plastic metal is employed in a variety of ways but preferably in dentistry, in which art it lends itself admirably to the making of cast inlays, crowns and the like. In the making of inlays the cavity of the tooth having been properly cleaned out and made ready, the plastic metal is forced into place and the cavity filled with it exactly as if it were to be a permanent filling. The plastic metal is then employed in exactly the same manner that the wax is employed in the ordinary casting of a dental inlay although investing, dissipating of the waxy binder and the introduction of molten metal is much less complicated than ordinarily practiced. Heat is applied to dissipate the lubricant from the metallic mass leaving the mold within the investment completely filled with the metallic mass, but such metallic mass filled with interstices. Solder is now melted in the crucible and, by the capillary attraction of the interstices, the metallic mass is immediately drawn into the mold to complete the cast as a solidified entity.

In describing the invention, where the terms "moss gold" and "sponge gold" are employed, it is to be understood that such terms are employed only for the purpose

of clearly indicating the exact nature of the metal. The present invention is not limited to the use of sponge gold or moss gold or gold of any condition, but is applicable to all metals in spongy fibrous mass which may be treated as above described to produce a plastic mass, principally metal but with the particles or fibers treated in such condition that they do not adhere readily.

I claim:—

1. A mass composed of metal in fibrous state presenting interstices filled with a waxy binder capable of plasticity at a temperature which will not cause discomfort when applied to a part of the human anatomy, and of being soldified when cold.

2. A mass composed of metal in the form of fibers presenting interlying interstices filled with a waxy binder capable of being manipulated to move the metal parts one upon the other without separation or adhesion when warmed to a temperature which will not cause discomfort when applied to a part of the human anatomy, and of becoming less plastic as it is cooled.

3. A mass composed of metallic fibers having the interstices filled with a waxy binder capable of plasticity at a temperature which will not cause discomfort when applied to a part of the human anatomy, and of being solidified when cold.

4. A mass composed of metal in the form of connected fibers having the interstices filled with a waxy binder capable of plasticity at a temperature which will not cause discomfort when applied to a part of the human anatomy and of being solidified when cold.

5. A mass composed of metal of spongy formation having the interstices filled with a waxy binder capable of plasticity at a temperature which will not cause discomfort when applied to a part of the human anatomy, and of being solidified when cold.

6. A mass composed of metallic connected fibers having the surfaces of the fibers coated with a lubricant adapted to retain the fibers in a mass and permit the fibers to be manipulated to move one upon the other when the mass is warmed to a temperature which will not cause discomfort when applied to a part of the human anatomy, of being solidified when cold and being completely dissipated by heat.

7. A mass composed of metal in spongy condition having the surfaces of the component fibers covered with a lubricant capable of being completely dissipated by heat.

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

CHARLES LEE ALEXANDER.

Witnesses:

F. H. SIMMONS,

ADSIN ALEXANDER.