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DENTAL ALLOY FOR CAST DENTURES

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This invention relates in general to alloys, and more particularly to an alloy especially suitable for use in making cast metal dentures.

Metal bases for dentures, such as plates, bridge work saddles and backings, are frequently made by casting, but many metals and alloys which have been used heretofore for that purpose are objectionable for various reasons. Some metals and alloys are too expensive, many do not melt into completely liquid state, but rather tend to "puddle" so that perfect castings cannot be made, while some are too soft or lack adequate strength to withstand use in dentures; many cannot be satisfactorily polished, many quickly tarnish or oxidize especially under influence of the oral fluids, and some deleteriously affect the tissues of the oral cavity. Many known alloys which would otherwise be satisfactory, have such high melting points beyond the usual range of temperatures available in dental laboratory practice, that such alloys are impracticable for use. Some known alloys also are heavy, which is objectionable in a dental casting where a minimum of weight consistent with the necessary strength, is greatly to be desired, if not a prime requirement.

It is also highly desirable that a metal base for a denture be as inconspicuous as possible, and accordingly an allow that is light or substantially white in color and which will take and retain a high mirror-like polish to reflect the color of the oral tissues is especially advantageous; many known alloys do not possess these qualities.

Therefore, one object of my invention is to provide a novel and improved alloy and especially such an alloy for making dental castings, which shall be relatively inexpensive and from which a casting substantially perfect as to form and as to strength, appearance and hygienic properties required in a dental casting, can be made with the knowledge, facilities and equipment usually available in the average dental laboratory.

Other objects of my invention are to provide an alloy and especially an alloy for making dental castings, which shall be inexpensive, which shall have a relatively low melting point well within the usual range of temperatures available in dental laboratory practice, which shall melt cleanly into complete liquidity and shall not "puddle", which shall be sufficiently hard and strong to withstand all strains incident to normal use in dentures, which shall be capable of taking and retaining a high, mirror-like polish, which shall be substantially white in color, which shall have high resistance to oxidation, especially to prevent material tarnishing under influence of oral fluids, which shall not deleteriously affect or injure the tissues of the oral cavity, which shall have a low specific gravity and be light in weight as compared to alloys used today for dentures, and which shall be capable of being practically perfectly cast into any desired shape; and to obtain other advantages and results as will be brought out by the following description.

I have discovered that an alloy of gold, palladium, silver, copper and zinc is admirably adapted for metal bases for dentures and to accomplish all of the foregoing objects and attain the above-mentioned advantages and results. Satisfactory alloys can be produced from these metals, gold, palladium, silver, copper and zinc, combined in various proportions, but I have found that the most desirable alloys may contain from ten (10) percent to twenty (20) percent of gold, twenty (20) percent to thirty (30) percent of palladium, forty (40) to fifty (50) percent of silver, eleven (11) to eighteen (18) percent of copper and one (1) to four (4) percent of zinc, the proportions within said ranges being variable to produce many different combinations. An especially satisfactory alloy is composed of fifteen parts of gold, twenty-four parts of palladium, forty-five parts of silver, fifteen parts of copper and one and one-quarter parts of zinc.

Alloys composed of gold, palladium, silver, copper and zinc, in the proportions above stated, are relatively inexpensive, for example, the cost of such alloys is from one-half to one-third the cost of known alloys containing a major portion of gold, and at the same time alloys made according to my invention have high chemical resistivity and do not materially oxidize or tarnish, especially under influence of oral fluids. Moreover, my alloy has a melting point considerably below that of pure gold, well within the range of temperatures available in the average dental laboratory, and the alloy freely melts into a completely liquid state, so that castings substantially perfect in form can be produced with ease by the average dentist or dental technicians.

Furthermore, my alloy has adequate strength to retain any shape into which it is formed and to resist the strains incident to use in dentures, and it is sufficiently hard to take and retain a mirror-like polish. The alloy also is substantial-

ly white or platinum-like in color and when highly polished is capable of reflecting the color of the oral tissues so that the alloy will be inconspicuous in the mouth. Also, while the alloy contains precious metal, it has a comparatively low specific gravity, i. e., less than 12, so as to ensure a minimum of weight of metal in a precious metal base for dentures; and the alloy is hygienic and sanitary and does not deleteriously affect the oral tissues.

The gold and palladium apparently bring resistivity to chemical action, oxidation and tarnishing, while the silver seems to facilitate the melting of the alloy into a completely fluid state, and possibly increases the hardness of the alloy, the copper adds hardness and appears to lower the melting point of the combined gold, silver and palladium, and the zinc probably provides further resistance to tarnishing and lowers the melting point of the alloy.

While I have described specific proportions of the metals constituting my alloy, I do not wish to be understood as limiting myself to specific proportions of the metals except as required by the following claims when construed in the light of the prior art. Furthermore, other metals having properties similar to those of the metals described may be utilized without departing from the spirit or scope of the invention.

Having thus described my invention, what I claim is:

1. An alloy composed of from ten (10) percent to twenty (20) percent of gold, from twenty (20) percent to thirty (30) percent of palladium, from forty (40) percent to fifty (50) percent of silver, from eleven (11) percent to eighteen (18) percent of copper, and from one (1) percent to four (4) percent of zinc.

2. An alloy for dentures composed of fifteen parts of gold, twenty-four parts of palladium, forty-five parts of silver, fifteen parts of copper and one and one-quarter parts of zinc.

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