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COMPOSITION OF MATTER

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3 Claims. (Cl. 75—1)

This invention relates to a composition of matter, especially to a composition of matter known as an alloy, more particularly to an alloy substantially free from iron, so that it may be properly designated a non-ferrous alloy.

Heretofore, dentures and dental bridges and like structures have often been constructed by employing the so-called noble metals, such as, for instance, gold and platinum These metals are quite expensive and, consequently, considerable advantage would be gained if some of the relatively inexpensive metals could be used as a substitute for the noble metals.

A substitute for the noble metals in the construction of the devices mentioned must necessarily possess some of the outstanding characteristics of the noble metals, that is, such substitute must be susceptible of a high polish, be untarnishable and non-corrodible when in contact with the complex media in a human mouth, as saliva, food, or drink, and be of a nature such that additions and changes may be made to a substantially finished device by soldering portions of the same metal thereto or joining by other means, such as welding.

A principal object of this invention is to provide a substitute for the noble metals, in those devices which must be made of a substance which is susceptible to taking a high polish, is untarnishable and non-corrodible, and which is rapidly unitable with another portion of the same metal by the common solders usually employed by dental workers such, for instance, as the so-called silver solders and gold solders, or by welding.

Non-ferrous alloys containing cobalt, chromium and tungsten possess the advantage of a relatively low cost as compared with the cost of noble metals, and in addition, are susceptable of a high polish comparable to that of the noble metals, and are also untarnishable and non-corrodible by contact with ordinary atmospheric conditions and by the moisture conditions to which a denture is subjected. Such an alloy, however, is not susceptible of treatment and manipulation in the same way as the noble metals because two portions of such an alloy may not be soldered together by the common soldering metals ordinarily used by dental workers, such as silver and gold solder.

Applicant has discovered that he can make an alloy which possesses desirable characteristics of the noble metals and the characteristics of a cobalt, chromium, tungsten alloy, and in addition is of such a nature that two portions thereof may be soldered together by the use of the ordinary silver and gold solders commonly used by dental workers by the addition of titanium to the cobalt chromium tungsten alloy.

Applicant has further found that although the alloy so produced is one of extremely high melting point, its fluidity when melted is greatly improved by the addition thereto of silicon, and the mechanical properties of the solid alloy are materially enhanced.

Applicant has found that the best proportions for an alloy suitable for the purpose indicated is about as follows: chromium 32 parts; cobalt 58 parts; tungsten 2 parts; silicon 1 part; titanium 2 to 6 parts. An actual alloy was composed of the following:

	Parts
Chromium	32.6
Cobalt	58.0
Tungsten	2.1
Silicon	1.04
Titanium	6.12

The main base of the alloy is chromium and cobalt. As in the alloys of the prior art, tungsten is added but in a less quantity than is usually placed in those alloys. The amount of titanium present in the alloy is such that it gives the desired soldering properties. The silicon is in an amount sufficient to sufficiently aid the fluidity of the mixture when subjected to the proper melting temperature.

Applicant's alloy as made generally contains a small amount of iron. This iron, however, does not affect the characteristics of the alloy and only happens to be present because applicant prefers to introduce the titanium in the alloy by making use of the well known ferro-titanium of commerce containing about 90% of titanium and 10% of iron.

Applicant's alloy has a melting point of about 3200° C. When cast it is of a hardness such that it is what is known commonly as "file hard", but is, however, sufficiently flexible and when polished has a bright surface characteristic of noble metals and a color somewhat akin to but not as white at platinum.

When melting the alloy of applicant's invention, one should avoid the use of any apparatus for holding the alloy which is capable of giving up carbon to the alloy because the addition of carbon to applicant's alloy is undesired because it gives it an entirely unwanted hardness and brittleness.

Applicant's alloy is not only useful for making articles as dentures and analagous structures but is also of use in the manufacture of jewelry and

such devices as extrusion dies which have to remain non-corrodible and untarnishable even when heated by the extrusion of hot metal therethrough.

Although applicant has described one particular physical embodiment of his invention, and described the proportions of the best form of his alloy, nevertheless, it is to be understood that the proportions set forth are merely illustrative but do not exhaust other possible proportions of ingredients by which an alloy of the character described is obtained.

What is claimed as new and desired to secure by Letters Patent of the United States, is:

1. An alloy consisting of about 32 parts of chromium, 58 parts of cobalt, 2 parts of tungsten, 1 part of silicon, and 6 parts of titanium.

2. A carbon free alloy consisting of about 32 parts of chromium, 58 parts of cobalt, 2 parts of tungsten 1 part of silicon, and 2 to 6 parts of titanium.

3. A denture formed of an alloy consisting of about 32 parts of chromium, 58 parts of cobalt, 2 parts of tungsten, 1 part of silicon, and 6 parts of titanium.

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