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The invention relates to an alloy which is particularly used for manufacturing jewellery, spectacle frames, for metal parts which are to be worn on the body or are attached to articles of clothing and for toothbrushes etc.. Furthermore, the invention relates to pieces of jewellery and spectacle frames manufactured using the alloy, as well as to intermediate products and starting materials, for example spectacle wire, for manufacturing the jewellery and spectacle frames or parts thereof.

When manufacturing jewellery, spectacle frames, metal parts to be worn on the body or the like, varying criteria have to be fulfilled so as to be able to use the product in practice. On the one hand, the manufactured products must have sufficient strength, on the other hand the visual requirements have to be satisfied. The strength problems particularly arise with spectacle frames, for example with the rims for the lenses or with the sidebows. With other accessories too, for example brooches, rings, ear-rings, chains, bracelets or the like, the alloy unavoidably has specified strength values so as to avoid mechanical damage. Furthermore, additional physical properties have to be fulfilled for certain applications, for example regarding heat conductivity, linear extension coefficients, electrical resistance and electrical conductivity. Another criterion for the selection of an alloy of this type is its producibility. The alloy should be both easy to cast — so as to manufacture the required blanks by means of for example continuous casting or casting in moulds — and easy to shape — so as to be able to produce for example bars, wires, strips or the like from the alloy. Alloys which partially or totally fulfil the above-mentioned requirements are for example described in the utility model 90 17 408.9 or DE-OS 38 34 186. DE-PS 26 26 251 also describes an alloy of this type.

The above-mentioned alloys are all characterised in that they contain a relatively high proportion of nickel. This nickel proportion is increasingly undesirable in the case of pieces of jewellery, spectacle frames and similar articles which are worn against bare skin, since a great number of people have an allergy to nickel. As a result of the increasing environmental damage among other reasons, the percentage of the population affected by allergies of this type is increasingly rising, so that nickel-containing alloys are increasingly meeting with rejection by the customer. In a few cases, this can be remedied by coatings or coverings, but with most applications this is not possible.

The object of the invention is to develop an alloy of the type mentioned in the introduction which contains no nickel and can be produced at low cost, can be processed in a simple manner and has a high level of mechanical strength.

The object is accomplished in accordance with the invention by an alloy which has the following composition in percentages by weight: 86.0 - 90.0 percent copper, 2.8 - 4.5 percent aluminium, 0.4 - 1.3 percent manganese, 1.0 - 2.5 percent iron, 0 - 0.5 percent silicon, remainder zinc.

The alloy in accordance with the invention is characterised by a series of considerable advantages. In accordance with the invention, for the first time there has been developed an alloy which has very good mechanical strength and good resistance to corrosion, can be processed in a conventional manner and does not contain any nickel. The alloy in accordance with the invention can consequently particularly be used for pieces of jewellery, spectacle frames or the like, without the wearers or users possibly developing nickel allergies. In accordance with the invention, all additional preventive measures known from the prior art, such as for example coatings, coats of varnish or the like, by means of which direct skin contact by the nickel-containing alloys known prior to this application is to be avoided, are consequently unnecessary with the finished products. The alloy in accordance with the invention consequently enables simple, low cost manufacture of the appropriate products. On the other hand, this alloy is also suitable for coatings not containing nickel, e.g. for decorative purposes.

The alloy in accordance with the invention is particularly characterised by good ability to be cold worked and very good elastic qualities. It can also be processed well, for example by brazing or welding. Very good tensile strength values (in the spring-hard state 970 - 1030 N/mm²) and good hardness numbers of up to 280 DPH are also recorded.

In a particularly preferred embodiment of the invention it is provided that the alloy has the following composition in percentages by weight: 86.0 - 88.0 percent copper, 3.8 - 4.2 percent aluminium, 0.7 - 1.0 percent manganese, 1.0 - 1.3 percent iron, 0 percent silicon, remainder zinc. The following composition can also be preferred: 87.0 - 89.0 percent copper, 3.6 - 4.0 percent aluminium, 0.7 - 1.0 percent manganese, 1.7 - 2.0 percent iron, 0.3 - 0.5 percent silicon, remainder zinc (all data in percentage by weight). In another advantageous development of the invention, the alloy has the following composition (in percentages by weight): 86.0 - 88.0 percent copper, 4.0 - 4.4 percent aluminium, 0.8 - 1.1 percent manganese, 1.8 - 2.1 percent iron, 0 percent silicon, remainder zinc.

In addition to the above-mentioned advantages, very good elastic properties are noted with the alloys in accordance with the invention as well as good values for resistance to corrosion. Consequently the alloys are in particular especially suited to the manufacture of spectacle frames.

The invention is not restricted to the described alloy compositions, rather there are manifold possible variations and modifications available to the expert within the framework of the invention.



Claims

1. An alloy, particularly to be used for manufacturing jewellery, spectacle frames, for metal parts which are to be worn on the body or are attached to articles of clothing and for toothbrushes etc., characterised by the following composition in percentages by weight:

Cu 86.0 - 90.0 %
Al 2.8 - 4.5 %
Mn 0.4 - 1.3 %
Fe 1.0 - 2.5 %
Si 0 - 0.5 %
Zn Remainder.

2. An alloy, particularly to be used for manufacturing jewellery and spectacle frames, characterised by the following composition in percentages by weight:

Cu 86.0 - 88.0 %
Al 3.8 - 4.2 %
Mn 0.7 - 1.0 %
Fe 1.0 - 1.3 %
Si 0 %
Zn Remainder.

3. An alloy, particularly to be used for manufacturing jewellery and spectacle frames, characterised by the following composition in percentages by weight:

Cu 87.0 - 89.0 %
Al 3.6 - 4.0 %
Mn 0.7 - 1.0 %
Fe 1.7 - 2.0 %
Si 0.3 - 0.5 %
Zn Remainder.

4. An alloy, particularly to be used for manufacturing jewellery and spectacle frames, characterised by the following composition in percentages by weight:

Cu 86.0 - 88.0 %
Al 4.0 - 4.4 %



Mn 0.8 - 1.1 %
Fe 1.8 - 2.1 %
Si 0 %
Zn Remainder.

5. Jewellery manufactured using an alloy in accordance with any one of Claims 1 - 4.
6. A spectacle frame or parts thereof, manufactured using an alloy in accordance with any one of Claims 1 - 4.
7. Metal parts for articles of clothing, manufactured using an alloy in accordance with any one of Claims 1 - 4.
8. An intermediate product or starting material, in particular wires, strips or bars, manufactured using an alloy in accordance with any one of Claims 1 - 4.