

ALIEN PROPERTY CUSTODIAN

PROCESSES FOR MACHINING LIGHT METALS AND ALLOYS

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The present invention has for object improvements in processes for machining light metals and alloys, in particular in processes in which the members must be distorted by tools against which the surface of said members must slide under pressure, for instance in drawing, extruding crimping, stamping operations, etc.

According to this invention, the surface of the members made of light metal or alloy which are to be machined, is converted into a thin layer of oxides or of stable compound salts, which is firmly anchored to the subjacent metal and which is capable of retaining in a thin and continuous film one of the lubricants generally used in the above-mentioned machining operations.

The members thus treated can be subjected, without intermediate annealing, to distortions at least twice as important as by the usual processes. For instance, a tube blank made of alloy currently called Duralumin or Avial can withstand, after such a treatment, an elongation by cold drawing, without annealing, of more than 100%.

The applicant has already proposed to treat steel members for a similar purpose and in a similar manner, by means of solutions with a basis of metallic phosphates and nitrates; but said solutions are not suitable for the treatment of light metals and alloys.

Here are, on the contrary, a few examples of methods of treatment giving good results with these particular metals and alloys:

1°—Chemical treatment in a bath composed of:

	Grams	
Fluovanadate of potassium-----	10	35
Fluosilicate of sodium-----	2	
Molybdate of sodium-----	2	
Double tartrate of sodium and of potassium (Seignette salt) -----	2	40

for 1.000 cc. of water.

Preferably 15 to 20 minutes at about 60° C. The fluovanadate can be replaced by other halogenated salts of heavy metals.

2°—Chemical treatment in a bath composed of:

Carbonate of sodium-----	grams--	8
Phosphomolybdate -----	do---	2
Chromate of sodium-----	do---	10
Water -----	cubic centimeters--	1.000

Preferably 20 to 30 minutes, at boiling point.

3°—Anodic electrolytic treatment in one of the baths commonly used for that purpose, by regulating the current in such a manner that the film of oxides obtained is sufficiently coherent and has such an opacity that it perfectly retains the film of lubricant used for the operations of mechanical distortions.

It is to be noted that the economy obtained by the present process results, not only from the elimination of one or more annealing operations, which are always costly, but also from the saving in time and labour resulting from the elimination of the heat treatments which were compulsory up to now, in this kind of work.

It is to be understood that the applicant does not intend to claim the treatments indicated above by way of example and all others, more-over known per se, for ensuring the protection against oxidation or the decoration of the machined members, the essential feature of the invention consisting, on the contrary, in treating the members before they are machined, that is to say not for their protection or their decoration but in order to facilitate, as above indicated, these various machining operations; the latter being terminated, it will moreover be advisable to again subject the members to the usual protecting or decorating treatments.

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