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**Horia Hulubei National Institute for
R&D in Physics and Nuclear
Engineering**

**LUBRICATING AND WEARPROOF
COMPOUND BASED ON WOLFRAM
BISULPHIDE, CARBON AND METAL**

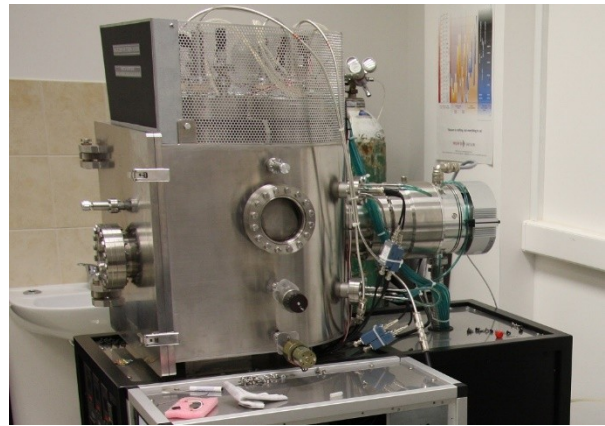
Patent Number: RO 127963/30.06.2011

Abstract

The invention relates to a method for vacuum coating metal parts with lubricating and wear proof dry thin layers from a WS₂ + Metal + C compound, using sputtering methods of the magnetron or ionized magnetron type or cathode arc evaporation, with a view to reducing the static and dynamic friction coefficients of the working surfaces thereof. According to the invention, the method consists in coating the surfaces of metal parts by using the simultaneous sputtering of WS₂, of a metal which can be Ti, Mo, Cr, Al or the like and of carbon/graphite, from three independent sputtering targets placed on three magnetron-type sputtering devices, where the total thickness of the coating layers is higher than 0.5 μm . The coating layer claimed by the invention consists of WS₂, a metal and carbon/graphite, having a single layer-type structure with a constant or gradual composition from 100% to 0% C, or a multilayer-type structure with various compositions and thicknesses of the intermediate layers, the multiple thin layers with super-lattice structures having thicknesses in the range of 2...10 nm..

Technology stage

The product was tested and the technology is proved on a small scale. The patent is ready for licensing.



Applications

Industrial applications

Advantages

The patent uses the advantages of tungsten disulphide multilayers super lattice by comparison to the molybdenum disulphide widely used now.

- Better adherence to the substrate
- Stronger hardness and therefore higher allowed weights
- High temperature resistance
- Lower friction coefficient at higher humidity
- Longer lifetime

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