

ABSTRACT

A new family of titanium carbide/tungsten boride coatings having excellent wear and corrosion resistance is disclosed. The coatings comprise hard, ultrafine, titanium carbide particles and tungsten boride precipitates dispersed in a metal matrix, the two phases constituting from about 30 to about 80 volume percent of the coating, the balance being metal matrix. The metal matrix contains at least one metal selected from a group consisting of nickel, cobalt and iron. The coatings may be prepared by a process which comprises depositing a mechanically blended powder mixture composed of separate components including a first component containing tungsten carbide and a second component containing boron and at least one metal selected from the group consisting of nickel, cobalt and iron, the powder mixture including titanium in the first or second component or in a separate third component, at least one of the first, second or third components having a melting point below about 1200°C, and then heat treating the as-deposited coating. The heating treatment effects a diffusion reaction between the deposited elements resulting in the formation of ultrafine titanium carbide particles and tungsten boride precipitates dispersed in a metal matrix. The coating can be deposited onto the substrate using any of the known deposition techniques.

This Sheet Has Been Replaced

