

Title (en)
METHOD FOR TREATING A WORKPIECE MADE OF TANTALUM OR A TANTALUM ALLOY

Title (de)
BEHANDLUNGSVERFAHREN EINES WERKSTÜCKS AUS TANTAL ODER EINER TANTALLEGIERUNG

Title (fr)
PROCEDE DE TRAITEMENT D'UNE PIÈCE EN TANTALE OU EN UN ALLIAGE DE TANTALE

Publication
EP 3109339 B1 20170621 (FR)

Application
EP 16175631 A 20160622

Priority
FR 1555872 A 20150625

Abstract (en)
[origin: US2016376692A1] A process for treating a piece of tantalum or of a tantalum alloy, which consists in: placing the piece in a furnace and heating the furnace under vacuum at least at 1 400° C.; forming a carbon multilayer in the peripheral part of the piece, by injecting, in the heated furnace, a gas carbon source at a pressure #10 mbar, the multilayer comprising at least one layer C1 of tantalum carbide, which is located at the surface of the piece, and two layers C2 and C3 comprising a carbon content lower than the carbon content of the layer C1; stopping the formation of the multilayer by cooling the piece; placing around the piece a device capable of trapping carbon, oxygen and nitrogen to protect the piece from carbon and oxygen and nitrogen traces present in the furnace; causing the diffusion of carbon present in the layer C1 towards the layers C2 and C3, by heating the furnace under vacuum, the piece being held in the protecting device; and stopping the diffusion of carbon in the piece by cooling the piece under vacuum before the carbon present in the multilayer reaches the centre part of the piece. Thus, a piece the surface of which is free from TaC, the centre part of which is free from carbon and the part of which located between the surface and the centre part comprises tantalum and carbon is obtained.

IPC 8 full level
C23C 8/20 (2006.01); **C22C 27/02** (2006.01)

CPC (source: EP KR US)
C22C 27/02 (2013.01 - EP US); **C22C 29/06** (2013.01 - KR); **C22F 1/02** (2013.01 - EP US); **C22F 1/18** (2013.01 - EP US);
C23C 8/02 (2013.01 - KR); **C23C 8/20** (2013.01 - EP KR US); **C23C 8/80** (2013.01 - KR); **F27D 19/00** (2013.01 - KR);
F27D 2007/066 (2013.01 - KR); **F27D 2009/0081** (2013.01 - KR); **F27D 2019/0031** (2013.01 - KR); **F27D 2019/0056** (2013.01 - KR);
F27D 2019/0075 (2013.01 - KR)

Designated contracting state (EPC)
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)
EP 3109339 A1 20161228; EP 3109339 B1 20170621; FR 3037971 A1 20161230; FR 3037971 B1 20170721; JP 2017088998 A 20170525;
JP 6803156 B2 20201223; KR 102501313 B1 20230217; KR 20170001636 A 20170104; US 10287667 B2 20190514;
US 2016376692 A1 20161229

DOCDB simple family (application)
EP 16175631 A 20160622; FR 1555872 A 20150625; JP 2016125538 A 20160624; KR 20160079146 A 20160624;
US 201615189778 A 20160622