

Title (en)  
METHOD OF PREDICTING QUENCH CRACKING IN COMPONENTS FORMED BY HIGH DEFORMATION PROCESSES

Title (de)  
VERFAHREN ZUR VORHERSAGE VON RISSBILDUNG BEI MITTELS HOCHVERFORMUNGSVERFAHREN HERGESTELLTEN KOMPONENTEN

Title (fr)  
PROCÉDÉ DE PRÉDICTION DE FISSURATION DUE À LA TREMPÉ DANS DES COMPOSANTS FORMÉS PAR DES PROCÉDÉS À HAUTE DÉFORMATION

Publication  
**EP 2798093 A1 20141105 (EN)**

Application  
**EP 12818739 A 20121221**

Priority

- US 201161581354 P 20111229
- US 201213721984 A 20121220
- US 2012071122 W 20121221

Abstract (en)  
[origin: US2013167979A1] A process for heat treating a component formed of an alloy. The process includes manipulating uniaxial strain test data of the alloy using a triaxiality factor to determine an equivalent multiaxial stress state. Conditions are then applied to the multiaxial stress state to identify a cooling path for the component. The cooling path includes boundaries for heat treatment temperatures and cooling rates that do not exceed predetermined stresses or strains and/or avoid predetermined residual stress patterns in the alloy. The component is then heated to a heat treatment temperature and quenched according to the cooling path identified in the applying step.

IPC 8 full level  
**C21D 6/00** (2006.01); **C21D 1/00** (2006.01); **C21D 6/02** (2006.01); **C22C 19/03** (2006.01); **C22F 1/10** (2006.01); **F01D 5/02** (2006.01)

CPC (source: EP US)  
**C21D 1/00** (2013.01 - EP US); **C21D 9/0068** (2013.01 - EP US); **C22C 19/03** (2013.01 - EP US); **C22F 1/002** (2013.01 - EP US); **C22F 1/10** (2013.01 - EP US); **F01D 5/02** (2013.01 - EP US); **F01D 5/3007** (2013.01 - EP US); **F01D 5/34** (2013.01 - EP US); **F05D 2230/25** (2013.01 - EP US); **F05D 2230/40** (2013.01 - EP US)

Citation (search report)  
See references of WO 2013101692A1

Citation (examination)  
U. CIHAK ET AL: "Characterization of Residual Stresses in Compressor Discs for Aeroengines: Neutron Diffraction and Finite Element Simulations", SUPERALLOYS 718, 625, 706 AND DERIVATIVES, PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON SUPERALLOYS 718, 625, 706 AND DERIVATIVES, 3RD, 1 January 2005 (2005-01-01), pages 517 - 526, XP055404458, ISBN: 978-0-87339-602-8, DOI: 10.7449/2005/Superalloys\_2005\_517\_526

Designated contracting state (EPC)  
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DOCDB simple family (publication)  
**US 2013167979 A1 20130704**; BR 112014016065 A2 20170808; CA 2860214 A1 20130704; CN 104136635 A 20141105; CN 104136635 B 20160622; EP 2798093 A1 20141105; JP 2015507701 A 20150312; JP 6105626 B2 20170329; WO 2013101692 A1 20130704

DOCDB simple family (application)  
**US 201213721984 A 20121220**; BR 112014016065 A 20121221; CA 2860214 A 20121221; CN 201280065599 A 20121221; EP 12818739 A 20121221; JP 2014550389 A 20121221; US 2012071122 W 20121221