

Title (en)
METHOD AND APPARATUS FOR THE THERMOMECHANICAL TREATMENT OF SEAMLESS RINGS PRODUCED ON RADIAL-AXIAL RING ROLLING MACHINES

Title (de)
VERFAHREN UND VORRICHTUNG ZUR THERMOMECHANISCHEN BEHANDLUNG VON NAHTLOS AUF RADIAL-AXIAL-RINGWALZMASCHINEN HERGESTELLTEN RINGEN

Title (fr)
PROCÉDÉ ET APPAREIL DE TRAITEMENT THERMOMÉCANIQUE D'ANNEAUX SANS CORDON FABRIQUÉS SUR DES MACHINES DE LAMINAGE D'ANNEAUX DE TYPE RADIAL-AXIAL

Publication
EP 2078099 A1 20090715 (DE)

Application
EP 07801829 A 20070823

Priority
• EP 2007007400 W 20070823
• DE 102006045871 A 20060928

Abstract (en)
[origin: WO2008037327A1] The invention relates to a method and a device for the thermomechanical treatment of seamless steel rings produced on radial-axial ring rolling machines, particularly rings of fine grain steel, heat-treatable steel, case hardened steel, or austenitic steel, preferably of steel tower flanges for wind turbine generators, wherein the ring blank is inserted into the ring rolling machine at a temperature in the range of 900°C to 1150°C and is rolled to an outer diameter preferably in the range of 0.2 m to 10m by a hot forming process. According to the invention, the hot ring (1) is quickly cooled down by a controlled process directly following the rolling, without secondary heating, from a temperature over the conversion temperature in the austenite range to a temperature below 400°C. The device, according to the invention, comprises a dipping basin filled with cooling liquid (8) or an unfilled cooling container, and a carrier (5) that can be lowered with a hoisting device (4), the rolled ring (1) lying on said carrier. Pressure nozzles (13) are arranged in the dipping basin or the cooling container (2) on one or several ring lines (11), in an equal distribution, for the targeted application of the cooling liquid (8) onto at least one of the ring-shaped surfaces of the ring (1). Measurement of the ring temperature before and/or after the cooldown is carried out, preferably, with a radiation pyrometer.

IPC 8 full level
C21D 1/02 (2006.01); **B21H 1/06** (2006.01); **C21D 8/00** (2006.01); **C21D 9/40** (2006.01)

CPC (source: EP KR US)
B21H 1/06 (2013.01 - EP KR US); **C21D 1/02** (2013.01 - EP KR US); **C21D 8/00** (2013.01 - EP US); **C21D 9/40** (2013.01 - EP KR US)

Citation (search report)
See references of WO 2008037327A1

Citation (examination)
DE 2609014 A1 19770908 - CESKOSLOVENSKA AKADEMIE VED

Designated contracting state (EPC)
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR

DOCDB simple family (publication)
DE 102006045871 A1 20080403; **DE 102006045871 B4 20100128**; CN 101506391 A 20090812; CN 101506391 B 20110914; EP 2078099 A1 20090715; JP 2010505038 A 20100218; JP 5394926 B2 20140122; KR 20090073090 A 20090702; MX 2009002391 A 20090316; RU 2009115859 A 20101110; RU 2441076 C2 20120127; US 2010024929 A1 20100204; US 8377238 B2 20130219; WO 2008037327 A1 20080403

DOCDB simple family (application)
DE 102006045871 A 20060928; CN 200780031708 A 20070823; EP 07801829 A 20070823; EP 2007007400 W 20070823; JP 2009529551 A 20070823; KR 20097003781 A 20070823; MX 2009002391 A 20070823; RU 2009115859 A 20070823; US 44277207 A 20070823