

Title (en)

RAPID COOLING METHOD FOR PARTS BY CONVECTIVE AND RADIATIVE TRANSFER

Title (de)

VERFAHREN ZUM SCHNELLEN ABKÜHLEN VON WERKSTÜCKEN DURCH KONVEKTIVER UND STRAHLUNGS-ÜBERTRAGUNG

Title (fr)

PROCEDE DE REFROIDISSEMENT RAPIDE DE PIECES PAR TRANSFERT CONVECTIF ET RADIATIF

Publication

EP 1543170 B1 20071205 (FR)

Application

EP 03712227 A 20030109

Priority

- FR 0300053 W 20030109
- FR 0211680 A 20020920

Abstract (en)

[origin: FR2844809A1] Rapid cooling of metal components is carried with a cooling gas under pressure. The cooling gas includes one or more gases that absorb infrared radiation, to improve the heat transfer of the component in conjunction with the phenomena of radiation and convection transfer, and to improve the coefficient of convection transfer. A Independent claim is given for utilization of the method in an installation for the rapid cooling of metal components with the aid of a gas under pressure, optimized to operate with nitrogen, using a cooling gas including 20-80% of a gas absorbing infrared radiation and 80-20% of hydrogen and/or helium. The composition of the gas is adjusted so that it is not necessary to provide any significant modifications to the installation.

IPC 8 full level

C21D 1/00 (2006.01); **C21D 1/613** (2006.01); **C21D 1/76** (2006.01); **C21D 1/767** (2006.01)

CPC (source: EP KR US)

C21D 1/613 (2013.01 - EP KR US); **C21D 1/767** (2013.01 - EP US); **C21D 2241/01** (2013.01 - EP US)

Designated contracting state (EPC)

AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT SE SI SK TR

DOCDB simple family (publication)

WO 2004027098 A1 20040401; **WO 2004027098 A8 20050929**; AT E380256 T1 20071215; AU 2003216799 A1 20040408; AU 2003216799 A8 20040408; BR 0314597 A 20050809; BR PI0314597 B1 20150609; CA 2498929 A1 20040401; CA 2498929 C 20110419; CN 100567516 C 20091209; CN 1681947 A 20051012; DE 60317912 D1 20080117; DE 60317912 T2 20080612; EP 1543170 A1 20050622; EP 1543170 B1 20071205; EP 1543170 B8 20080423; ES 2297138 T3 20080501; FR 2844809 A1 20040326; FR 2844809 B1 20070629; JP 2005539142 A 20051222; JP 4490270 B2 20100623; KR 100953818 B1 20100421; KR 20050084565 A 20050826; MX PA05002716 A 20051117; US 2006048868 A1 20060309

DOCDB simple family (application)

FR 0300053 W 20030109; AT 03712227 T 20030109; AU 2003216799 A 20030109; BR 0314597 A 20030109; CA 2498929 A 20030109; CN 03822222 A 20030109; DE 60317912 T 20030109; EP 03712227 A 20030109; ES 03712227 T 20030109; FR 0211680 A 20020920; JP 2004537189 A 20030109; KR 20057004677 A 20030109; MX PA05002716 A 20030109; US 51178505 A 20050725