

Title (en)
COOLING DEVICE FOR A PLATE

Title (de)
KÜHLVORRICHTUNG FÜR EINE PLATINE

Title (fr)
DISPOSITIF DE REFROIDISSEMENT POUR UNE TÔLE

Publication
EP 2117743 B1 20150805 (DE)

Application
EP 08716041 A 20080226

Priority
• EP 2008001501 W 20080226
• DE 102007009937 A 20070301

Abstract (en)
[origin: DE102007009937A1] To shape a metal plate (P), it is heated to a given temperature of 800-1000[deg] C. Before being passed into the press, for shaping, it is transferred to a cooling unit (10) where both plate surfaces are in direct contact with at least one cooling element (16,19) to reduce the plate temperature to 400-500[deg] C. The cooling elements are pressed together by a hydraulic system (11), to clamp the plate between them.

IPC 8 full level
B21D 22/02 (2006.01); **B21D 35/00** (2006.01); **B21D 37/16** (2006.01); **B21J 1/06** (2006.01); **B30B 15/34** (2006.01); **C21D 1/673** (2006.01); **C21D 9/46** (2006.01)

CPC (source: EP KR US)
B21D 22/02 (2013.01 - KR US); **B21D 22/022** (2013.01 - EP); **B21D 35/00** (2013.01 - EP KR US); **B21D 37/16** (2013.01 - EP KR US); **B21J 1/06** (2013.01 - EP KR US); **B30B 15/34** (2013.01 - EP KR US); **C21D 1/673** (2013.01 - EP KR US); **C21D 9/46** (2013.01 - EP KR US); **B21D 45/02** (2013.01 - EP)

Citation (opposition)
Opponent : Autotech Engineering A.I.E.
• US 2002069506 A1 20020613 - BRODT MARTIN [DE], et al
• DE 102005032113 B3 20070208 - SCHWARTZ EVA [DE]
• DE 10341867 A1 20050331 - VOLKSWAGEN AG [DE]
• JP 2004025247 A 20040129 - JFE STEEL KK
• WO 2008025387 A1 20080306 - MAGNA AUTOMOTIVE SERVICES GMBH [DE], et al
• US 2002113041 A1 20020822 - OZAWA MASASHI [JP]
• US 3845651 A 19741105 - VAU J
• EP 0059432 A2 19820908 - HITACHI LTD [JP]
• US 2006283530 A1 20061221 - KNAUP HANS-JURGEN [DE], et al
• US 2005257862 A1 20051124 - ASAI TATSUYA [JP], et al
• TRANSLATION OF D4
• SCHULER, METAL FORMING HANDBOOK, 1998, Berlin Heidelberg, XP055289415

Cited by
EP2014777B1

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

DOCDB simple family (publication)
DE 102007009937 A1 20080904; BR PI0808539 A2 20140826; CA 2679432 A1 20080904; CA 2679432 C 20150721; CN 101674901 A 20100317; CN 101674901 B 20150429; EA 015975 B1 20120130; EA 200970815 A1 20100226; EP 2117743 A1 20091118; EP 2117743 B1 20150805; JP 2010520058 A 20100610; JP 5329438 B2 20131030; KR 101495139 B1 20150224; KR 20090115957 A 20091110; MX 2009009115 A 20100129; US 2010095733 A1 20100422; US 8272245 B2 20120925; WO 2008104360 A1 20080904

DOCDB simple family (application)
DE 102007009937 A 20070301; BR PI0808539 A 20080226; CA 2679432 A 20080226; CN 200880014448 A 20080226; EA 200970815 A 20080226; EP 08716041 A 20080226; EP 2008001501 W 20080226; JP 2009551125 A 20080226; KR 20097018984 A 20080226; MX 2009009115 A 20080226; US 44974708 A 20080226