

Title (en)

Thermoforming tool

Title (de)

Warmumformungswerkzeug

Title (fr)

Outil de déformation à chaud

Publication

EP 3017888 A1 20160511 (DE)

Application

EP 14197507 A 20141211

Priority

DE 102014016502 A 20141107

Abstract (en)

[origin: WO2016071423A1] Disclosed is a hot forming tool (1) which consists of a main tool member (2) having an at least partial surface coating (4) and which can be obtained by providing the main tool member with a raised metal relief that is then entirely or partly oxidized and converted into a protective layer.

Abstract (de)

Vorgeschlagen wird ein Warmumformwerkzeug 1 bestehend aus einem Werkzeuggrundkörper 2 mit wenigstens anteiliger Oberflächenbeschichtung 4, welches dadurch erhältlich ist, dass man den Grundkörper mit einem erhabenen metallischen Relief versieht, welches anschließend ganz oder teilweise oxidiert und in eine Schutzschicht umgewandelt wird.

IPC 8 full level

B21B 25/00 (2006.01)

CPC (source: CN EP KR RU US)

B21B 19/04 (2013.01 - CN EP KR US); **B21B 25/00** (2013.01 - CN EP KR RU US)

Citation (applicant)

- DE 102008056988 A1 20090610 - SMS MEER GMBH [DE]
- WO 2011107214 A1 20110909 - SMS MEER GMBH [DE], et al
- EP 0385439 A1 19900905 - NIPPON KOKAN KK [JP]

Citation (search report)

- [XDA] DE 102011010646 A1 20110908 - SMS MEER GMBH [DE]
- [XAI] EP 2404680 A1 20120111 - SUMITOMO METAL IND [JP]
- [A] JP 2002224713 A 20020813 - KAWASAKI STEEL CO

Cited by

EP3590622A1; DE102018116238A1

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

Designated extension state (EPC)

BA ME

DOCDB simple family (publication)

EP 3017888 A1 20160511; **EP 3017888 B1 20190424**; BR 112017007858 A2 20180116; CN 107206442 A 20170926; CN 107206442 B 20200407; DE 102014016502 A1 20160512; JP 2017536237 A 20171207; KR 20170086519 A 20170726; RU 2017118964 A 20181207; RU 2017118964 A3 20181207; RU 2687321 C2 20190513; US 2017333964 A1 20171123; WO 2016071423 A1 20160512

DOCDB simple family (application)

EP 14197507 A 20141211; BR 112017007858 A 20151104; CN 201580060124 A 20151104; DE 102014016502 A 20141107; EP 2015075758 W 20151104; JP 2017522549 A 20151104; KR 20177013758 A 20151104; RU 2017118964 A 20151104; US 201515519988 A 20151104