

Title (en)

A microporous layer for lowering friction in metal forming processes

Title (de)

Mikroporöse Schicht zur Minderung der Reibung bei Metallverformungsprozessen

Title (fr)

Couche microporeuse pour diminuer la friction dans un procédé de formage de métaux

Publication

**EP 2006420 A1 20081224 (EN)**

Application

**EP 07388045 A 20070622**

Priority

EP 07388045 A 20070622

Abstract (en)

The invention is a microporous layer to be used in metal forming processes providing lower friction and improved resistance against galling. The layer is a thin, porous metallic film, which is electrochemically deposited on a metallic substrate, whereafter one of the metals of the deposited film is selectively removed by chemical etching, thereby leaving a micro- or even nanoporous layer on the surface of the substrate, which enhances lubricant entrapment leading to improved lubrication during metal forming processes.

IPC 8 full level

**C25D 3/60** (2006.01); **C21D 7/04** (2006.01); **C22F 1/00** (2006.01); **C22F 1/08** (2006.01); **C23F 1/28** (2006.01); **C25D 5/48** (2006.01); **C25D 7/10** (2006.01)

CPC (source: EP US)

**C23F 1/30** (2013.01 - EP US); **C23F 1/44** (2013.01 - EP US); **C25D 5/48** (2013.01 - EP US); **C25D 7/10** (2013.01 - EP US); **C25D 3/60** (2013.01 - EP US)

Citation (search report)

- [XA] WO 2004111312 A2 20041223 - BOSCH GMBH ROBERT [DE], et al
- [XA] EP 0042715 A1 19811230 - FUJIKURA LTD [JP]
- [XA] GB 1558683 A 19800109 - TOOLS FOR BENDING INC
- [X] US 3438789 A 19690415 - WEISS FRANZ, et al
- [X] US 4065365 A 19771227 - IBARGUENGOITIA JUAN RETOLAZA
- [X] US 2450339 A 19480928 - HENSEL FRANZ R

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

Designated extension state (EPC)

AL BA HR MK RS

DOCDB simple family (publication)

**EP 2006420 A1 20081224**; DK 2176447 T3 20140324; EP 2176447 A1 20100421; EP 2176447 B1 20131225; JP 2010530475 A 20100909; JP 5602013 B2 20141008; US 2010137171 A1 20100603; WO 2008154925 A1 20081224

DOCDB simple family (application)

**EP 07388045 A 20070622**; DK 08758242 T 20080620; DK 2008000233 W 20080620; EP 08758242 A 20080620; JP 2010512520 A 20080620; US 45211808 A 20080620