

Title (en)  
LOWER TOOL WITH FRICTION REDUCTION DEVICE

Title (de)  
UNTERWERKZEUG MIT REIBREDUKTIONSVORRICHTUNG

Title (fr)  
OUTIL INFÉRIEUR À DISPOSITIF DE RÉDUCTION DE FROTTEMENT

Publication  
**EP 3790680 B1 20220629 (DE)**

Application  
**EP 19730250 A 20190506**

Priority  
• AT 503792018 A 20180507  
• AT 2019060152 W 20190506

Abstract (en)  
[origin: WO2019213681A1] The invention relates to a lower tool (3) for a bending machine (1), in particular a die bending machine, comprising a longitudinally extending main body (5) which, on its underside (6), has a tool shaft (8) for receiving in a guide groove (9) of a tool holder (10) and optionally in the transverse direction (13), tool shoulders (7), and at least one friction reduction device (11) is arranged on the underside (6) of the main body (5) in order to reduce a friction force (15) between the underside (6) and the tool holder (10) during a displacement of the lower tool (3) in the longitudinal direction (12), characterized in that the at least one friction reduction device (11) is designed in such a way that a weight force (17) of the lower tool (3) on the tool holder (10), under the application of a pretensioning force (16) in the direction of the weight force (17), causes a resultant normal force (18) of the lower tool (3) on the tool receptacle (10) which is lower relative to the weight force (17).

IPC 8 full level  
**B21D 5/02** (2006.01); **B21D 5/04** (2006.01); **B21D 37/14** (2006.01)

CPC (source: AT EP US)  
**B21D 5/0209** (2013.01 - AT); **B21D 5/0227** (2013.01 - EP); **B21D 5/0236** (2013.01 - AT EP US); **B21D 5/0254** (2013.01 - AT EP); **B21D 37/14** (2013.01 - AT EP US); **B21D 5/0254** (2013.01 - US); **B21D 5/04** (2013.01 - EP US)

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

DOCDB simple family (publication)  
**WO 2019213681 A1 20191114**; AT 520541 A4 20190515; AT 520541 B1 20190515; CN 112074355 A 20201211; CN 112074355 B 20220819; EP 3790680 A1 20210317; EP 3790680 B1 20220629; JP 2021523834 A 20210909; US 11565296 B2 20230131; US 2021107049 A1 20210415

DOCDB simple family (application)  
**AT 2019060152 W 20190506**; AT 503792018 A 20180507; CN 201980030427 A 20190506; EP 19730250 A 20190506; JP 2020561922 A 20190506; US 201917046508 A 20190506