

Title (en)  
DIE CUSHION DEVICE

Title (de)  
STEMPELKISSENVORRICHTUNG

Title (fr)  
COUSSIN

Publication  
**EP 3845324 A4 20211020 (EN)**

Application  
**EP 19854535 A 20190823**

Priority  
• JP 2018162953 A 20180831  
• JP 2019077026 A 20190415  
• JP 2019033114 W 20190823

Abstract (en)  
[origin: EP3845324A1] A die cushion device includes: a hydraulic cylinder (10) that vertically moves a cushion pad (14); a hydraulic pump (P) that supplies hydraulic oil from an oil tank (T) to the hydraulic cylinder (10); a relief valve (20) that returns hydraulic oil discharged from the hydraulic cylinder (10), to the oil tank (T); a pressure sensor (PS) that detects a hydraulic oil pressure, which is a die cushion pressure of the hydraulic cylinder (10); and a control device (40) that controls a flow rate and a pressure of hydraulic oil supplied from the hydraulic pump (P) to the hydraulic cylinder (10). The control device controls the number of rotations of the hydraulic pump (P) such that the hydraulic oil pressure detected by the pressure sensor (PS) reaches a die cushion pressure command value, and when a hydraulic oil pressure detected by the pressure sensor is equal to or higher than a set pressure of the relief valve (20), the control device (40) reversely rotates the hydraulic pump (P).

IPC 8 full level  
**B21D 24/02** (2006.01); **B21D 24/14** (2006.01); **B30B 15/02** (2006.01); **F15B 11/16** (2006.01)

CPC (source: EP)  
**B21D 24/14** (2013.01); **B30B 15/16** (2013.01); **B30B 15/26** (2013.01)

Citation (search report)  
• [XAI] EP 2777840 A1 20140917 - AIDA ENG LTD [JP]  
• [XPA] WO 2019087565 A1 20190509 - DAIKIN IND LTD [JP]  
• [XAI] US 2011226141 A1 20110922 - KOHNO YASUYUKI [JP]  
• [XAI] DE 102016120068 A1 20180426 - VOITH PATENT GMBH [DE]  
• [XAI] US 2016074920 A1 20160317 - KOHNO YASUYUKI [JP]  
• [XAI] DE 102011053615 A1 20130314 - RING MASCHB GMBH & CO KG [DE]  
• [XAI] US 2009090161 A1 20090409 - AMINO HIROYUKI [JP]  
• See references of WO 2020045300A1

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)  
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DOCDB simple family (publication)  
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DOCDB simple family (application)  
**EP 19854535 A 20190823**; JP 2019033114 W 20190823; JP 2019151783 A 20190822