

Title (en)
Method of press hardening and cutting of a sheet material

Title (de)
Verfahren zum Presshärten und Schneiden eines Blechmaterials

Title (fr)
Procédé pour le durcissement et découpe d'une tôle

Publication
EP 2583768 A1 20130424 (DE)

Application
EP 12006819 A 20121001

Priority
DE 102011116714 A 20111022

Abstract (en)
The tool comprises: two tool parts (200, 300) that are moved, relative to each other, in a working direction and between which a heated sheet metal material is formed by applying a compressive force acting in the working direction; and a separation device, with which a separation operation is executed at the metal material present between the tool parts. The separation device comprises a separation vane that is movable transverse to the working direction, with which the separation operation is executable after forming the metal material in a steep section extending to the working direction. The tool comprises: two tool parts (200, 300) that are moved, relative to each other, in a working direction and between which a heated sheet metal material is formed by applying a compressive force acting in the working direction; and a separation device, with which a separation operation is executed at the sheet metal material present between the tool parts. The separation device comprises a separation vane that is movable transverse to the working direction, with which the separation operation is executable after forming the sheet metal material in a steep section extending to the working direction. One of the tool parts is formed with a tool segment (220) that is supported resiliently on a base plate of the tool part and with a cooling device (230, 330) for the active cooling of a tool effective area. The movable separation vane: is passively actuated; is shifted in a direction transverse to the working direction; is formed for cutting or punching the sheet metal material; and comprises a given direction of movement that vertically extends to the steep section. The tool further comprises: a driver for the passive operation of the separation vane; a spring device (240) for resilient support of the tool segment at the base plate, where the spring device acts as a gas pressure spring and a nitrogen spring; and a drive element for the active operation of the separation vane. A cross-section line for the separation operation executed by the movable separation vane partially passes in a non-active cooled steep section. An independent claim is included for a method for press hardening a sheet metal material.

Abstract (de)
Die Erfindung betrifft ein Werkzeug (100) zum Warmformen und insbesondere zum Presshärten eines Blechmaterials (400), mit wenigstens zwei Werkzeugteilen, die in einer Arbeitsrichtung (A) relativ zueinander verfahrbar sind und zwischen denen unter Aufbringung einer in Arbeitsrichtung (A) wirkenden Presskraft (F) ein erwärmtes Blechmaterial (400) geformt werden kann, und mit wenigstens einer Trennvorrichtung, mit welcher an dem zwischen den Werkzeugteilen befindlichen Blechmaterial (400) eine Trennoperation ausführbar ist. Es ist vorgesehen, dass die Trennvorrichtung wenigstens einen quer zur Arbeitsrichtung (A) bewegbaren Trennschieber (260) aufweist, mit dem nach dem Formen des Blechmaterials (400) in einem sich steil zur Arbeitsrichtung (A) erstreckenden Abschnitt eine Trennoperation (C, D) ausführbar ist. Die Erfindung betrifft ferner ein auf diesem Werkzeug (100) ausführbares Verfahren zum Warmformen und insbesondere zum Presshärten eines Blechmaterials.

IPC 8 full level
B21D 24/16 (2006.01); **B21D 22/02** (2006.01); **B21D 28/32** (2006.01); **B21D 37/16** (2006.01)

CPC (source: EP)
B21D 22/022 (2013.01); **B21D 24/16** (2013.01); **B21D 28/325** (2013.01); **B21D 37/16** (2013.01)

Citation (applicant)
DE 102006040224 A1 20080320 - MAGNA AUTOMOTIVE SERVICES GMBH [DE]

Citation (search report)
• [YD] DE 102006040224 A1 20080320 - MAGNA AUTOMOTIVE SERVICES GMBH [DE]
• [Y] DE 102009043926 A1 20110310 - THYSSENKRUPP STEEL EUROPE AG [DE]
• [Y] US 2002113041 A1 20020822 - OZAWA MASASHI [JP]
• [Y] JP 2005248253 A 20050915 - UNIPRES CORP
• [Y] EP 1362651 A1 20031119 - UMIK CO LTD [JP]
• [Y] US 2006101894 A1 20060518 - CHUN VICTOR L [US], et al
• [Y] JP 2009039722 A 20090226 - KANTO JIDOSHA KOGYO KK

Cited by
DE102020202998B3; FR3017810A1; EP2902130A1; FR3046733A1; DE102018215545A1; DE102018215545B4; WO2017121786A1; DE102020201407A1; DE102020201407B4; EP3060687B1; EP3868900B1

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 2583768 A1 20130424; **EP 2583768 B1 20161214**; CN 103056212 A 20130424; CN 103056212 B 20161221;
DE 102011116714 A1 20130425; DE 102011116714 B4 20221222

DOCDB simple family (application)
EP 12006819 A 20121001; CN 201210398641 A 20121019; DE 102011116714 A 20111022