Title (en)

Method and device for thermal recasting of pressure-hardened casting components made of sheet metal

Title (de)

Verfahren und Warmumformanlage zur Herstellung von pressgehärteten Formbauteilen aus Stahlblech

Title (fr)

Procédé et station de déformage à chaud pour la fabrication de composants de formage en tôle d'acier durcis par presse

Publication

EP 2233593 B1 20130220 (DE)

Application

EP 10157673 A 20100325

Priority

DE 102009014670 A 20090327

Abstract (en)

[origin: EP2233593A2] The hot working plant comprises a furnace (8) by which steel sheet (2) to be hot-worked is partially heated at austenitisation temperature and a pressing device (10) for hot-working and press-hardening the steel sheet heating in the furnace. The furnace is associated to a heating device (7) by which steel sheet is partially heated at 500-700[deg] C and the pressing device is formed in multi-stage manner. A first part of the pressing device comprises a first tool for hot-working and cooling the steel sheet heated in the furnace, and a subsequent part of the pressing plant comprises a second tool. The hot working plant comprises a furnace (8) by which steel sheet (2) to be hot-worked is partially heated at austenitisation temperature and a pressing device (10) for hot-working and press-hardening the steel sheet heating in the furnace. The furnace is associated to a heating device (7) by which steel sheet is partially heated at 500-700[deg] C and the pressing device is formed in multi-stage manner. A first part of the pressing device comprises a first tool for hot-working and cooling the steel sheet heated in the furnace, and a subsequent part of the pressing plant comprises a second tool for further cooling the hot-worked steel sheet. The heating device comprises heating plates that are movable relative to each other and are arranged or pressed to the steel sheets to be heated. The heating device comprises a press by which the heating plates are hydraulically or mechanically arranged to the steel sheet to be heated. The heating device is implemented so that the steel sheets to be hot-worked are partially heatable or strongly heatable in part areas. The pressing device is arranged in transport direction of the steel sheet to a mechanically or hydraulically driven clipping device for clipping and/or punching the hot-worked, press-hardened steel sheets. The clipping device is formed from a toggle press that is equipped with a clipping- and/or punching tool. Between the pressing device and the clipping device, a cooling device is arranged by which the steel sheet to be hot-worked and cooled is cooled with water, oil or emulsion. The cooling device comprises an immersion bath container. The furnace consists of roller hearth furnace and is equipped with an inductive heating device and/or an infrared radiator. The heating device is arranged to a punch press for cutting steel sheets from steel sheet band (3). A robot is equipped for the delivery of the respective steel sheet from the heating device to the furnace and/or from the furnace to the pressing device and/or from the pressing device to the clipping device. The robot is equipped for heating the steel sheets to be delivered. The pressing device is equipped with hydraulic or mechanical positioning element that allows a variation of locking distance between the relative mold halves movable to each other. The positioning elements are controlled in dependence of the shrinkage of the sheet and/or the thickness of the sheet and sensors are provided for the detection of the shrinkage and thickness of the sheet. An independent claim is included for a method for the production of press-hardened mold parts from steel sheets.

IPC 8 full level

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CPC (source: EP)

B21D 22/022 (2013.01); **B21D 37/16** (2013.01); **C21D 1/673** (2013.01); C21D 2221/00 (2013.01)

Cited by

DE102018200843A1; CN104275412A; CN105682818A; CN112553442A; CN110036121A; DE102016120605A1; CN110394388A; CN111515287A; CN111565862A; CN103464557A; CN107614137A; CN111774465A; CN111872220A; CN108772712A; US11511330B2; CN114029411A; CN108026603A; EP2324938A1; DE102013105488A1; CN105363864A; DE102014111501B4; DE102021110702A1; US11740023B2; US11785678B2; CN103732334A; AU2012292518B2; RU2597488C2; US2018085810A1; CN109792805A; JP2020504278A; RU2715560C1; WO2019120857A1; WO2017113411A1; DE102014111501A1; US10472691B2; TWI494178B; WO2013020757A3; WO2018064138A1; WO2014091014A1; WO2019137910A1; WO2018115298A1; WO2019243147A1; WO2013020757A2; US9925626B2; US10370749B2; US10508328B2; US10837090B2; US10844467B2; US11072843B2; US11242586B2; US11377721B2; US11479837B2; US11499213B2; US11821066B2; EP2441850B1

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