



New connection on: : 09-06-2018 : 02:33:12 - Last disconnection on: : 09-06-2018 : 02:33:12

V 4.0.0.44358(LP,U,linux) (Rev:43856 2017-04-27 09:03:29 +0200#(D201802)) (RPM D201802)

Welcome to EPOQUE Rebuild under the Production Environment

[EPODOC: SS 17] hot and press+ and form+ and metal and robot

Results in EPODOC 7

[SS 18] ..li



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PN - [CN104690172](#) A 20150610

PNFP - CN104690172B B 20171128

PR - CN2015123101 20150116

AP - CN2015123101 20150116

DT - I

CT - || STSE (A)

[CN102756251](#) A 20121031 [Y] (SHANDONG DAWANG JINTAI GROUP CO LTD)

[Y] 1-10

* 说明书第0015-0036段、附图1-2 *;

[CN202224536U](#) U 20120523 [A] (YULIANG WANG)

[A] 1-10

* 全文 *;

[KR20130137184](#) A 20131216 [A] (SCHWARTZ EVA [DE])

[A] 1-10

* 全文 *;

[CN203804006U](#) U 20140903 [A] (SHENYANG ZHONGTUO ROBOT EQUIPMENT CO LTD)

[A] 1-10

* 全文 *

CTNP - || STSE (A)

[Y] - Harald Lehmann等, "热冲压加热炉", 《第六届中国国际金属成形会议暨2011年中国国际冲压成形会议、2011年中国国际钣金成形会议论文集》, (20110111), page 93

[Y] 1-10

* 第93页 *

[A] - 徐虹等, "热冲压成形中的先进加热技术及设备", 《锻压技术》, (20141231), vol. 39, no. 12, pages 106 - 111

[A] 1-10

* 第106-111页 *

[A] - 刘勇等, "热冲压成形技术在白车身上的应用", 《拖拉机与农用运输车》, (20130630), vol. 40, no. 3, pages 67 - 70

[A] 1-10

* 第67-70页 *

CNOI - (A)

[B21D22/02](#) ; [B21D22/022](#) ; [B21D43/10](#) ; [B21D45/003](#)

PA - (A)
KUNSHAN LONGYUN AUTO PARTS CO LTD

TI - (A)
Hot stamping and **forming** production line

AB - (A)
The invention discloses a **hot** stamping and **forming** production line. The **hot** stamping and **forming** production line comprises a feeding **robot**, a first lifting table, a heating furnace, a second lifting table, a conveying **robot**, a **press** and a discharging **robot** which are arranged sequentially, wherein multiple layers of rolling tables are arranged in a hearth of the heating furnace; each of the first lifting table and the second lifting table comprises a conveying platform and a lifting device for driving the conveying platform to lift, and the lifting device and the conveying platform are matched to feed materials to or discharge materials from the rolling tables layer by layer. Through arrangement of the first lifting table and the second lifting table, the rolling table is not required to perform continuous feeding in a single direction, that is, the length of the hearth of the heating furnace is much shorter than that in the prior art, and the occupation area of the production line is reduced greatly. The manipulators are not required to extend into a furnace cavity to grab blanks, the materials in the furnace cavity cannot be bumped against the manipulator and damaged, so that expensive and vulnerable **metal** materials are not required to be selected, and the production cost is saved; meanwhile, the heat resistance requirement for each manipulator of each **robot** is low, and the production cost is further saved.

2/7 © EPODOC / EPO

PN - [DE102012001335](#) A1 20130725

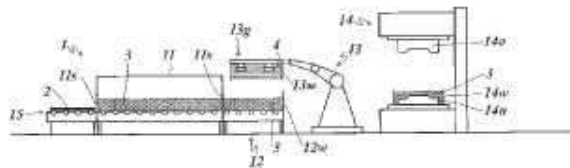
PNFP - DE102012001335 B4 20170727

PR - DE20121001335 20120125

AP - DE20121001335 20120125

DT - *; Rep

CT - || STSE (B4)
[DE102006027625](#) B3 20070809 [] (BENTELER AUTOMOBILTECHNIK GMBH [DE]);
[EP1847342](#) A1 20071024 [] (LINDE AG [DE])



CCI - [C21D1/74](#) ; [C21D9/46](#) ; [C21D1/673](#)

PA - (A1)
BRAUNELISABETH [DE]
- (B4)
BRAUN [DE]

TI - (A1)
Device, used for **hot forming** of metallic workpieces e.g. **metal** sheet circuit boards, includes a heating device, a transportation device, and a **hot-forming press**, where the heating device and the **hot-forming press** comprise a receiving space

AB - (A1)
The device comprises a heating

device (11), a transportation device (15), and a **hot-forming press** (14), where the heating device and the **hot-forming press** comprise a receiving space (11w, 14w), and the receiving space comprises a protective gas connection device for filling the receiving space with a protective gas (3) and a protective gas retainer wall at its bottom-side and cover-side. The receiving space of the **hot-forming press** is upwardly open. A conveying device is arranged downstream to the heating device. The transportation device comprises a transfer device. The device comprises a heating device (11), a transportation device (15), and a **hot-forming press** (14), where the heating device and the **hot-forming press** comprise a receiving space (11w, 14w), and the receiving space comprises a protective gas connection device for filling the receiving space with a protective gas (3) and a protective gas retainer wall at its bottom-side and cover-side. The receiving space of the **hot-forming press** is upwardly open. A conveying device is arranged downstream to the heating device. The transportation device comprises a transfer device, which is engaged into the receiving space of the: heating device; **hot-forming press**; and conveying device and/or passes through the heating device, the **hot-forming press** and the conveying device. The transfer device is designed as a gripper device and/or as a roller conveyer. The transportation device further comprises an industrial **robot** with a gripper device. The receiving space of the heating device, the conveying device and the **hot-forming press**: is filled with the protective gas having a relative density of greater than 1 at a current protective gas temperature and a current air temperature; and encloses a workpiece to be processed so that it is covered by the protective gas. The receiving space of the gripper device of the

industrial **robot**: is filled with the protective gas having a relative density of smaller than 1 at a current protective gas temperature and a current air temperature; and encloses the workpiece to be transported in such a way that it is covered by the protective gas. The protective gas is a heated combustion exhaust gas having a relative density of smaller than 1 at the current protective gas temperature and at the current air temperature. An outer contour of an upper edge section of the receiving space of the conveying device and the receiving space of the **hot-forming press** is congruently **formed** to an inner contour of a lower edge section of the receiving space of the gripper device of the industrial **robot**, or the inner contour of an upper edge section of the receiving space of the conveying device and the receiving space of the **hot-forming press** is congruently **formed** to the outer contour of the lower edge section of the receiving space of the gripper device of the industrial **robot**. A clearance space and a circumferential sealing element are **formed** between the outer contour of the upper edge section of the receiving space of the conveying device and the **hot-forming press** and the inner contour of the lower edge section of the receiving space of the gripper device of the industrial **robot**, or a clearance space and a circumferential sealing element are **formed** between the inner contour of the upper edge section of the receiving space of the conveying device and the **hot-forming press** and the outer contour of the lower edge section of the receiving space of the gripper device of the industrial **robot**. A lower tool of the **hot-forming press** is arranged in the receiving space of the **hot-forming press** so that it is covered by the protective gas. The heating device is a continuous furnace, and a tub-

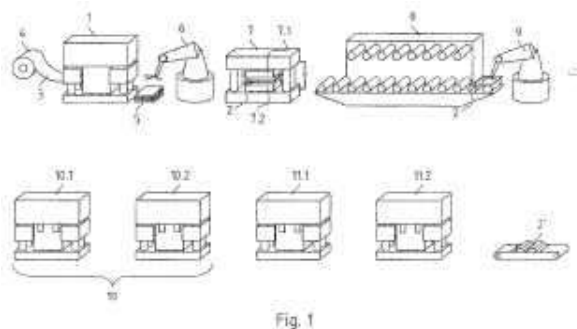
shaped furnace with inductive or conductive heating or with contact heating. A lock device is arranged between the successive receiving spaces. The heating device, the conveying device, the industrial **robot** and the **hot-forming press** are connected one behind the other in the course of the procedure.

3/7 © EPODOC / EPO

- PN - [CN202491050U](#) U 20121017
- PR - CN20122132546U 20120331
- AP - CN20122132546U 20120331
- DT - I
- PA - SHANDONG ELEC POWER RES INST
- TI - Special voice-operated screw cap breaking tool for high-voltage **hot-line work robot**
- AB - The utility model relates to a special voice-operated screw cap breaking tool for a high-voltage **hot-line work robot**. The special voice-operated screw cap breaking tool is composed of a screw cap breaking tool main body, a voice-operated emitting and starting remote controller and a voice-operated assembly, wherein the screw cap breaking tool main body comprises a motor, an oil tank, an oil pump, an oil cylinder, a manipulator gripper mechanism, a working head, a main shell, a **pressure** relief device and a power supply; the voice-operated emitting and starting remote controller comprises a DSP (Digital Signal Processor) which is connected with a man-machine interface unit, the DSP is also connected with a coding chip, and the coding chip is connected with a wireless driving unit; the voice-operated assembly comprises a wireless receiver, the wireless receiver is connected with a microcontroller, the microcontroller is connected with a motor drive circuit through an optical isolation circuit, and the motor drive circuit is connected with the motor; simultaneously the voice-operated emitting and starting remote controller and the motor drive circuit are respectively connected with the power supply; and the motor drive circuit and the microcontroller **form** a closed-loop connection through a current feedback circuit. The motor drive circuit can control the speed and the cutting moment of the special voice-operated screw cap breaking tool for the high-voltage **hot-line work robot**, the remote operation is realized by utilizing the voice-operated emitting and starting remote controller, which is safe, reliable and convenient by comparing with manual screw cap breaking tool, and the requirements for special working tools of the high-voltage **hot-line work robot** on breaking screw caps and **metal** foreign bodies can be satisfied.

4/7 © EPODOC / EPO

- PN - [EP2233593](#) A2 20100929
- PNFP - EP2233593 A3 20110406
- EP2233593 B1 20130220
- PR - DE20091014670 20090327
- AP - EP20100157673 20100325
- DT - *; Rep
- CT - || STSE (A3)
- [EP2143808](#) A1 20100113
- [XPAYI] (BENTELER
- AUTOMOBILTECHNIK GMBH [DE])

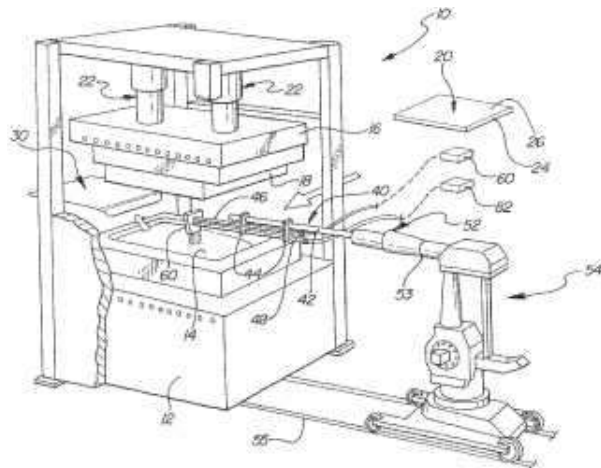


[XP] 1,7,8,11,16
 * abstract *
 * paragraph [0015] -
 paragraph [0016] *
 [A] 18
 [Y] 4,5
 [I] 2,3,6,9,10,12-15,17,19;
[WO2011009769](#) A1 20110127
 [E] (THYSSENKRUPP STEEL EUROPE AG
 [DE], et al)
 [E] 1,3,6,7,11,13
 * abstract *;
[DE102006027625](#) B3 20070809
 [IA] (BENTELER AUTOMOBILTECHNIK
 GMBH [DE])
 [I] 1,4,6-11,15-17,19
 * abstract *
 [A] 2,3,5,12-14,18;
[JP2007136533](#) A 20070607
 [IAY] (NIPPON STEEL CORP)
 [I] 1,6-11,15-17,19
 * abstract *
 * paragraph [0024] *
 * paragraph [0050] *
 [A] 2,3,12-14,18
 [Y] 4,5;
[EP1462192](#) A1 20040929 [IA] (AUDI
 AG [DE])
 [I] 1,4,6-11,15-19
 * abstract *
 * paragraph [0022] *
 [A] 2,3,5,12-14;
[EP1195208](#) A2 20020410
 [IA] (DAIMLER CHRYSLER AG [DE])
 [I] 1,4,6-11,15-17,19
 * paragraph [0025]; figures 1b,4 *
 * abstract *
 [A] 2,3,5,12-14,18;
[WO2005078144](#) A1 20050825
 [A] (AUDI AG [DE], et al)
 [A] 1-19
 * the whole document *
 CCI - [B21D22/022](#) ; [B21D37/16](#) ;
[C21D1/673](#)
 CCA - [C21D2221/00](#)
 PA - (A2)
 THYSSENKRUPP UMFORMTECHNIK
 GMB [DE]; THYSSENKRUPP SOFEDIT S
 A S [FR]
 - (A3)
 THYSSENKRUPP UMFORMTECHNIK
 GMBH [DE]; THYSSENKRUPP SOFEDIT S
 A S [FR]

- (B1)
GMF UMFORMTECHNIK GMBH [DE];
THYSSENKRUPP SOFEDIT S A S [FR]
- TI - (A2 A3 B1)
Method and device for thermal recasting of **pressure**-hardened casting components made of sheet **metal**
- AB - (A2)
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.

PN - [US2002078727](#) A1 20020627
 PNFP - US6516645 B2 20030211
 PR - US20000748096 20001227
 AP - US20000748096 20001227
 DT - *, Rep
 CT - || STSE (B2)
 [US3485073](#) A 19691223 [
] (METAL IMPROVEMENT CO);
 [US4581913](#) A 19860415 [
] (LUSTER FINISH INC [US]);
 [US5373047](#) A 19941213 [
] (INVENTA AG [CH]);
 [US5409415](#) A 19950425 [
] (NIKKATO CORP [JP], et al);
 [US5671628](#) A 19970930 [
] (GEN ELECTRIC [US]);
 [US6416389](#) B1 20020709 [
] (XEROX CORP [US])
 CCI - [B21D26/055](#) ; [B08B7/0092](#) ;
 [B08B9/00](#) ; [B24C1/003](#)
 CCA - [Y10T29/479](#)
 PA - (B2)
 GEN MOTORS CORP [US]
 TI - (A1 B2)
 Hot die cleaning for
 superplastic and quick
 plastic **forming**
 AB - (A1 B2)
 Equipment and methods for the
 rapid and easy cleaning
 of **metal forming** dies while in
 a **press** and operating at
 elevated temperatures. The
 invention features the physical
 removal of excess lubricant
 collecting on the **hot** surface of
 the **forming** dies under
 operating conditions so that no
 lubricant-induced flaws occur
 on the show surface of
 the **formed** part for optimized
 production of high quality
 parts. Special and effector
 tooling is supplied with high
 velocity air which draws in
 solid CO2 which sublimates
 into **pressurize** streams of
 gaseous CO2 that is discharged
 through nozzles onto
 the **forming** surfaces of **hot**
 forming dies after a number of
 lubricated parts have



been **formed** therewith to physically sweep foreign matter including lubricants from the die surfaces. A **robot** is employed to move the activated end effector in predetermined paths across the dies for fully sweeping and cleaning the **forming** surfaces. The gas then dissipates.

6/7 © EPODOC / EPO

- PN - [JP2006130513](#) A 20060525
- PR - JP20040319359 20041102
- AP - JP20040319359 20041102
- DT - I
- FI - B21D22/20&H; B21D22/20&Z; B21D24/00&M; B21D43/00&J
- PA - NISSAN MOTOR
- TI - **HOT PRESS** WORKING METHOD AND **HOT PRESS** WORKING APPARATUS
- AB - PROBLEM TO BE SOLVED: To prevent the deformation of a hole at **press forming**, the hole being located in a part affected by **metal** inflow at the **press forming**, even when the hole is worked prior to **hot press forming**.
- SOLUTION: After a holed workpiece W is heated in a heating furnace 5, the workpiece is conveyed to a **hot press forming** machine 9 by clamping it with the workpiece clamping arm 11 of a workpiece conveying **robot** 7. By making use of this conveyance time, partial quenching is performed by holding and locally cooling the peripheral part of the worked hole by a holding/cooling part 29 which is provided on the workpiece clamping arm 11.
- COPYRIGHT: (C)2006,JPO&NCIPI

7/7 © EPODOC / EPO

- PN - [JPH02236266](#) A 19900919
- PR - JP19890054883 19890309
- AP - JP19890054883 19890309
- DT - I
- CT - || STSE (A)
- [JPS5855019](#) A 19830401 [] (KURITA WATER IND LTD)
- [JPS5469529](#) A 19790604 [] (NIPPON STEEL CORP)
- [JPS52146729](#) A 19771206 [] (NIPPON STEEL CORP, et al)
- [JPS58171549](#) A 19831008 [] (NIPPON STEEL CORP)
- [JPS57126961](#) A 19820806 [] (HITACHI LTD)
- FI - C23C4/06; C23C4/12; C23C4/123; C23C4/134; C23C4/18
- FT - 4K031/AA08; 4K031/AB08; 4K031/AB09; 4K031/BA04; 4K031/BA07; 4K031/CB14; 4K031/CB39; 4K031/CB44; 4K031/CB45; 4K031/DA04; 4K031/EA03; 4K031/EA10; 4K031/FA02; 4K031/FA04
- PA - TOCALO CO LTD
- TI - MEMBER FOR MOLTEN **METAL** AND ITS PRODUCTION
- AB - PURPOSE: To **form** a sprayed deposit excellent in corrosion resistance to molten nonferrous **metal** by thermally spraying a cermet consisting of **metal** boride or **metal** carbide and Ta or Nb onto the surface of a steel member to be in contact with

nonferrous **metal** in a molten state. CONSTITUTION: A thermal spraying **robot** 11 having a thermal spray gun 15 and a steel stock 13 to be treated, such as conductor roll for use in a **hot** dip **metal** coating tank, are disposed in a chamber 1. After the inside of the chamber 1 is evacuated, low-**pressure** Ar gas is introduced through a supply pipe 7 and a plasma arc is produced by using the thermal spray gun 15 as a cathode and the steel stock 13 to be treated as an anode, by which the surface of the steel stock 13 is cleaned and heated. Subsequently, the polarities of the thermal spray gun 15 and the steel stock 13 are reversed, and, while rotating the steel stock 13, a cermet material prepared by mixing 5-40wt.% of Ta or Nb with ZrB₂ or TiB₂ is thermally sprayed from the thermal spray gun 15, by which a sprayed deposit in which surface roughness Ra and porosity are regulated to 0.01-5μm and <1.8%, respectively, is **formed**. By this method, the cermet film excellent in corrosion resistance to molten nonferrous **metal**, such as Zn, Al, and Sn, and molten alloy can be **formed**. Further, a cermet in which various **metal** carbides are used can be used instead of borides, such as ZrB₂.