

(12) STANDARD PATENT
(19) AUSTRALIAN PATENT OFFICE

(11) Application No. **AU 2009321877 B2**

(54) Title
Welding unit for welding rails

(51) International Patent Classification(s)
E01B 29/46 (2006.01)

(21) Application No: **2009321877**

(22) Date of Filing: **2009.11.13**

(87) WIPO No: **WO10/063362**

(30) Priority Data

(31) Number
A 1881/2008

(32) Date
2008.12.03

(33) Country
AT

(43) Publication Date: **2010.06.10**

(44) Accepted Journal Date: **2014.05.29**

(71) Applicant(s)
Franz Plasser Bahnbaumaschinen-Industriegesellschaft mbH

(72) Inventor(s)
Theurer, Josef; Lichtberger, Bernhard; Muhlleitner, Heinz

(74) Agent / Attorney
Phillips Ormonde Fitzpatrick, 367 Collins Street, Melbourne, VIC, 3000

(56) Related Art
US 2003/0141283
EP 0499019
EP 0132227

(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES
PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
Internationales Büro



(43) Internationales Veröffentlichungsdatum
10. Juni 2010 (10.06.2010)

PCT

(10) Internationale Veröffentlichungsnummer
WO 2010/063362 A1

(51) Internationale Patentklassifikation:
E01B 29/46 (2006.01)

(21) Internationales Aktenzeichen: PCT/EP2009/008078

(22) Internationales Anmeldedatum:
13. November 2009 (13.11.2009)

(25) Einreichungssprache: Deutsch

(26) Veröffentlichungssprache: Deutsch

(30) Angaben zur Priorität:
A 1881/2008 3. Dezember 2008 (03.12.2008) AT

(71) Anmelder (für alle Bestimmungsstaaten mit Ausnahme von US): **FRANZ PLASSER BAHNBAUMASCHINEN-INDUSTRIEGESELLSCHAFT MBH** [AT/AT]; Johannesgasse 3, A-1010 Wien (AT).

(72) Erfinder; und

(75) Erfinder/Anmelder (nur für US): **THEURER, Josef** [AT/AT]; Johannesgasse 3, A-1010 Wien (AT). **LICHTBERGER, Bernhard** [AT/AT]; Silberbach 36, A-4230 Pregarten (AT). **MÜHLEITNER, Heinz** [AT/AT]; Flinsbach, Steinbergsiedlung 52, A-3100 St. Pölten (AT).

(81) Bestimmungsstaaten (soweit nicht anders angegeben, für jede verfügbare nationale Schutzrechtsart): AE, AG, AL,

AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

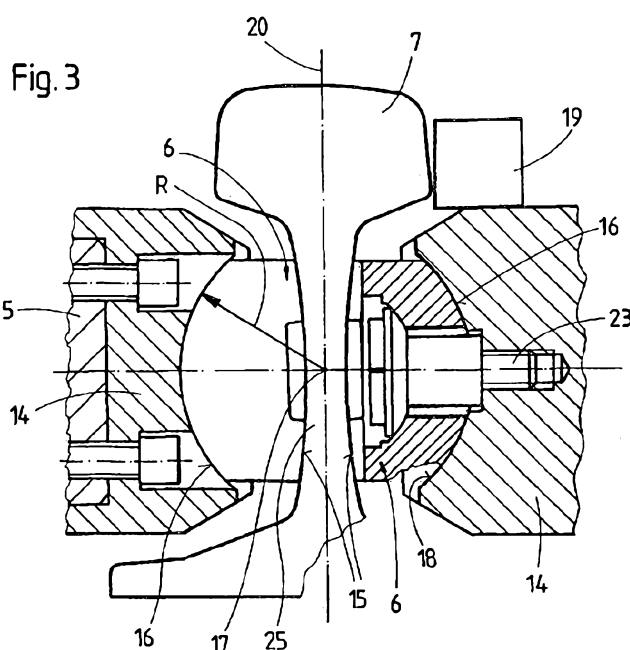
(84) Bestimmungsstaaten (soweit nicht anders angegeben, für jede verfügbare regionale Schutzrechtsart): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), eurasisches (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), europäisches (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Veröffentlicht:

— mit internationalem Recherchenbericht (Artikel 21 Absatz 3)

(54) Title: WELDING UNIT FOR WELDING RAILS

(54) Bezeichnung : SCHWEISSAGGREGAT ZUM VERSCHWEISSEN VON SCHIENEN



(57) Abstract: A welding unit for welding two rails (7) of a track is equipped with clamping jaws (6) intended for lying against a rail web (25). These clamping jaws each have a sliding surface (16), which is at a distance from a contact surface (15) in the transverse direction of the rail and is arcuately curved with respect to a cross section extending such that it is normal to a neutral axis (17) of the rails (7). The jaw mount (14), intended for fixing the clamping jaw (6), has a sliding surface (18), which is curved in a way corresponding to the sliding surface (16) of the clamping jaw (6), and so the clamping jaw (6) is movable along the sliding surfaces (16, 18) in relation to the jaw mount (14).

(57) Zusammenfassung: Ein Schweißaggregat zum Verschweißen zweier Schienen (7) eines Gleises, ist mit zur Anlage an einen Schienensteg (25) vorgesehenen Klemmbacken (6) ausgestattet. Diese weisen jeweils eine von einer Kontaktfläche (15) in Schienenquerrichtung distanzierte Gleitfläche (16) auf, die bezüglich eines normal zu einer Neutralachse (17) der Schienen (7) verlaufenden Querschnittes kreisbogenförmig gekrümmt ist. Eine zur Fixierung der Klemmbacke (6) vorgesehene Backenhalterung (14) weist eine Gleitfläche (18) auf, die der Gleitfläche (16) der Klemmbacke (6) entsprechend gekrümmt ist, so dass die Klemmbacke

(6) entlang der Gleitflächen (16, 18) relativ zur Backenhalterung (14) bewegbar ist.

A WELDING UNIT FOR WELDING RAILS

- [0001] The invention relates to a welding unit for welding two rails of a track, including two unit parts which are movable towards one another in the longitudinal direction of the rails along guides of the unit by means of displacement cylinders and are each equipped with clamping jaws having contact surfaces intended for application to a rail web.
- [0002] Welding units of this kind are known, for example, from EP 0 132 227 A2 or US 2003/0141283 A1. The clamping jaws have to be pressed onto the rail web with great force in order to be able to move the rails with precision towards one another in their longitudinal direction for the upset stroke finalizing the welding operation.
- [0003] It is the object of the present invention to provide a welding unit of the type mentioned at the beginning which enables an improved transmission of great forces to the rail web.
- [0004] According to the invention, this object is achieved with a welding unit of the specified kind by means of the features cited in the characterising clause of the main claim.
- [0005] With the aid of the cylindrical sliding surface, the clamping jaws acquire a small degree of freedom of movement in order to be able to optimally adjust to the position of the rail web in spite of irregularities which may

exist due to rail head tolerances, for example. This enables a problem-free transmission of also particularly great forces, such as are required especially for closure welding within the range of a temperature which deviates from the neutral temperature.

[0006] Additional advantages of the invention become apparent from the dependent claims and the description of the drawing.

[0007] The invention will be described in more detail below with reference to an embodiment represented in the drawing in which

[0008] Fig. 1 shows a view of the welding unit with two unit parts movable towards one another, Fig. 2 shows a simplified cross-section of a unit part, Fig. 3 shows a cross-section of clamping jaws abutting on a rail web, and Fig. 4 shows a view of a clamping jaw.

[0009] A welding unit 1, represented in Figs. 1 to 3, is composed of two unit parts 4 which are displaceable towards one another along guides 3 of the unit with the aid of displacement cylinders 2. These unit parts 4 are connected in each case to two clamping drives 5 by means of which clamping jaws 6 can be pressed onto rails 7 to be welded to one another.

[0010] Pull rods 8, extending parallel to the guides 3 of the unit, are fastened to the first unit part 4 and pass through the second unit part 4. The two pull rods 8 are connected to a crossbeam 9 to which the two displacement cylinders 2 are articulatedly connected. The

clamping drives 5 – extending perpendicularly to a longitudinal direction 10 of the rails – are each equipped, in the region of piston rods 11, with an opening 12 for passage of the pull rod 8.

[0011] As visible particularly in Figs. 2 and 3, each of the clamping jaws 6 – lying opposite one another in a transverse direction 13 of the rails – is supported in a jaw mount 14. One of these is fixedly connected in each case to the unit part 4, and the opposite jaw mount 14 is connected to the piston rod 11.

[0012] As shown in Fig. 3, each clamping jaw 6 has a sliding surface 16, spaced from a contact surface 15, which is curved – with respect to a cross-section extending perpendicularly to a neutral axis 17 of the rail 7 – in the shape of a circular arc having a radius R . The jaw mounts 14 provided for fixation of the clamping jaw 6 also have a sliding surface 18 which is curved with the radius R in accordance with the sliding surface 16 of the clamping jaw 6. Thus, the two sliding surfaces 16, 18 form part of a cylindrical surface so that the clamping jaw 6 is movable in each case relative to the jaw mount 14 about the neutral axis 17.

[0013] The connection of each clamping jaw 6 to the associated jaw mount 14 is accomplished by means of a screw 23 which, having a correspondingly shaped head, enables the said rotatability of the clamping jaw 6 over a range of approximately 1 to 2 degrees.

[0014] As can be seen in Figs. 2 and 3, the jaw mount 14 lying opposite the clamping drive 5 is connected to a stop bar 19 extending parallel to the longitudinal direction 10 of the rails. With this, the rails 7 to be welded can be lined up in a joint alignment. Of the two clamping jaws 6 lying opposite one another in pairs, only one is movable relative to the unit part 4 by the clamping drive 5 in a direction extending perpendicularly to a plane of symmetry 20 of the rail.

[0015] As visible particularly in Fig. 4, the clamping jaw 6 has two contact bars 21, extending parallel to one another and in the longitudinal direction of the rail and forming the contact surface 15, which are separated from one another by a recess 22. Bores 24 are provided in each case for receiving the afore-mentioned head of the screws 23. The contact surface 15 on each clamping jaw 6 or contact bar 21 is tempered by plasma transfer arc welding for improving the force-locked connection to a rail web 25.

[0016] To initiate the welding procedure, the rails 7 are lifted by means of a lifting device (not shown) from the sleepers of the track and pressed against the stop bars 19. Subsequently, the clamping drives 5 are actuated in order to press the clamping jaws 6, connected thereto, against the rail web 25 of the rail 7 as well as to the oppositely positioned clamping jaws 6 with a clamping force of approximately 350 tons.

[0017] Now, if the two rails 7 abutting the stop bars 19 do not lie precisely in a common plane of symmetry 20 of the rail – for example, due to cross-sectional deviations within the tolerance range – there is a corresponding automatic rotation and adjustment of the clamping jaws 6. In further sequence, this enables a problem-free transmission of the great clamping forces to the rail web 25 in order to finally press the rails 7 to one another by means of the displacement cylinders 2 for the welding of said rails.

Claims

1. A welding unit (1) for welding two rails (7) of a track, including two unit parts (4) which are movable towards one another in the longitudinal direction (10) of the rails along guides (3) of the unit by means of displacement cylinders (2) and are each equipped with clamping jaws (6) having contact surfaces (15) intended for application to a rail web (25), characterized by the following features:

- a) each clamping jaw (6) has a sliding surface (16), spaced from the contact surface (15) in the transverse direction (13) of the rails, which is curved – with respect to a cross-section extending perpendicularly to a neutral axis (17) of the rails (7) – in the shape of a circular arc,
- b) a jaw mount (14) provided for fixation of the clamping jaw (6) has a sliding surface (18) which is curved in accordance with the sliding surface (16) of the clamping jaw (6), so that the clamping jaw (6) is movable along the sliding surfaces (16, 18) relative to the jaw mount (14).

2. A welding unit according to claim 1, characterized in that a circular arc centre point of the two sliding surfaces (16, 18) is positioned in the neutral axis (17) of the rails (7).

3. A welding unit according to claim 1, characterized in that one of the two jaw mounts (14) is connected to a stop bar (19) intended for application to a rail head of the rail (7).

4. A welding unit according to one of claims 1, 2 or 3, characterized in that only one of the two clamping jaws (6) is movable relative to the unit part (4) by means of the clamping drive (5) in a direction extending perpendicularly to a plane of symmetry (20) of the rail.

5. A welding unit according to one of claims 1 to 4, characterized in that each clamping jaw (6) has two contact bars (21), extending parallel to one another and in the longitudinal direction (10) of the rail and forming the contact surface (15), which are separated from one another by a recess (22).

6. A welding unit according to claim 5, characterized in that the contact surface (15) on each contact bar (21) is formed by plasma transfer arc welding.

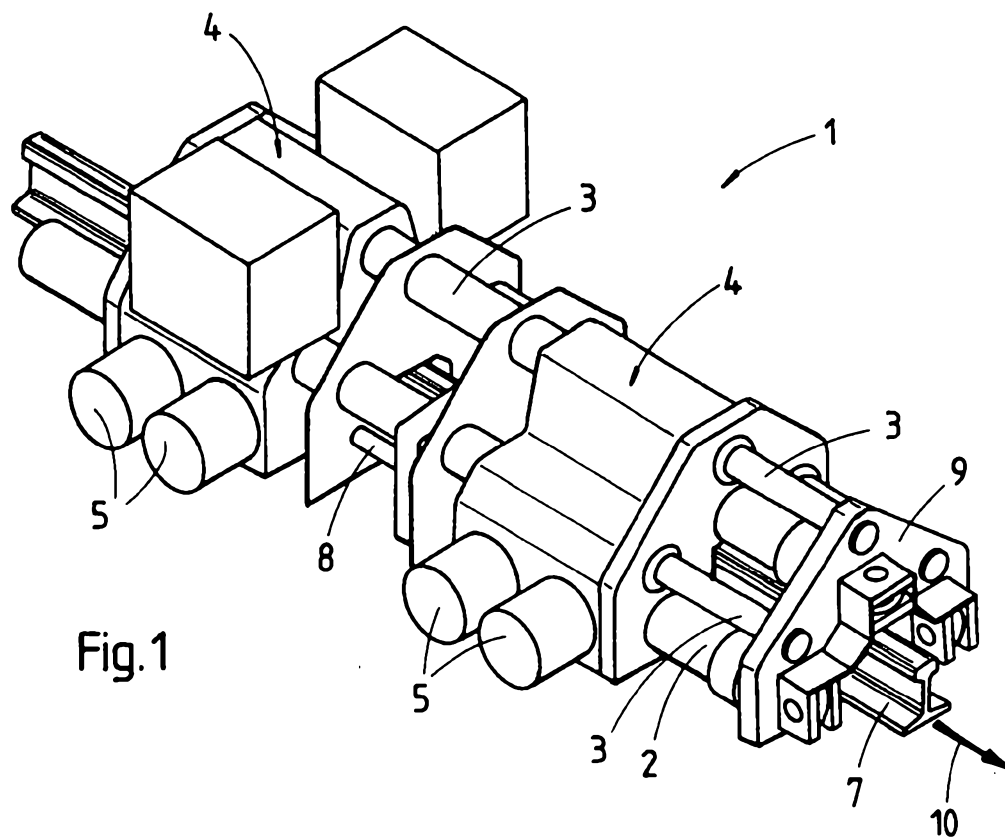


Fig. 1

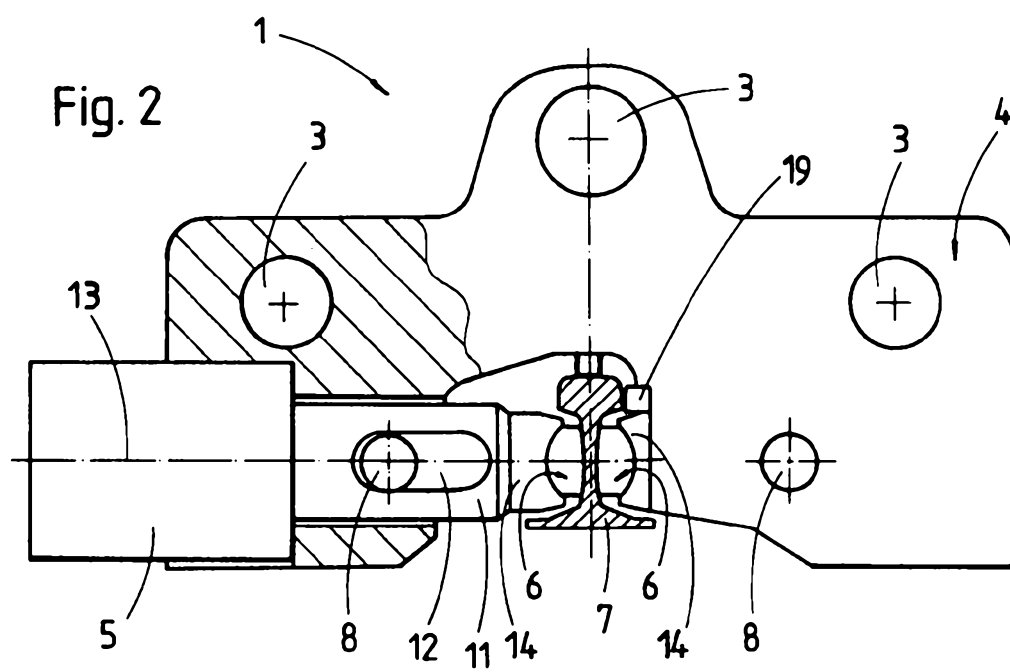


Fig. 2

Fig. 3

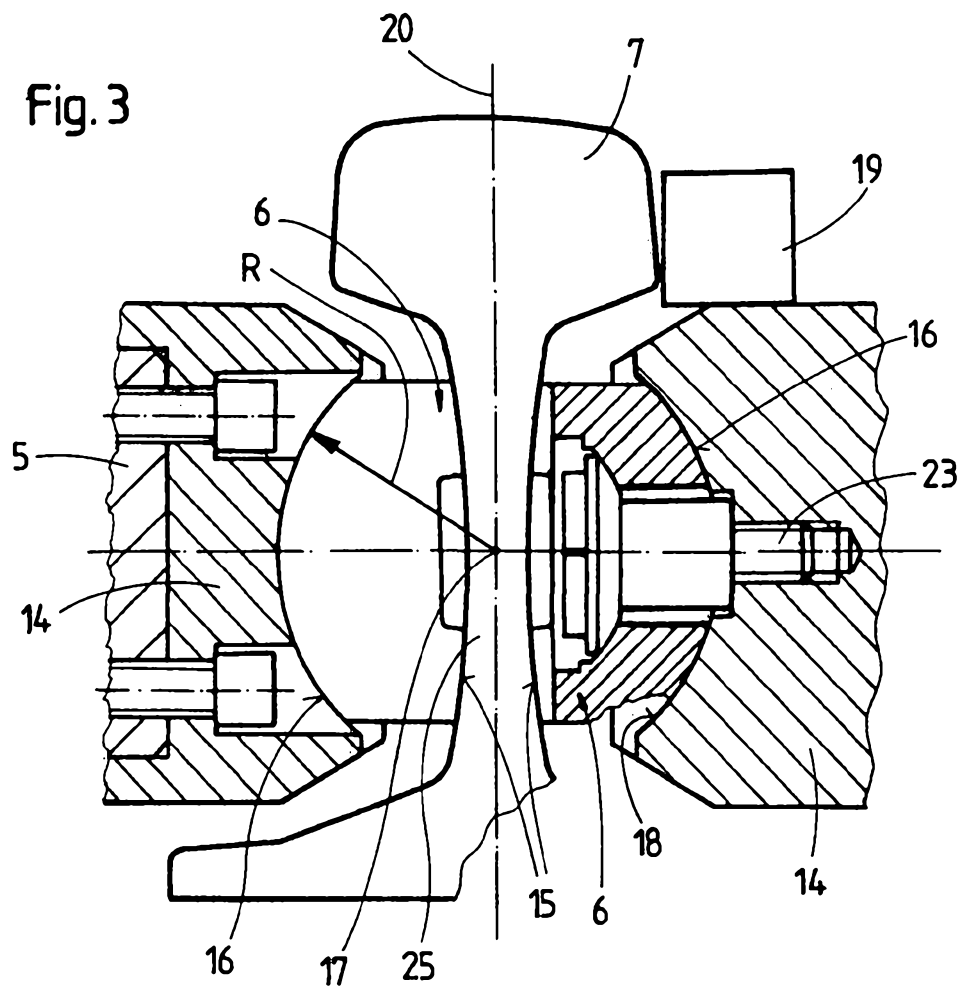


Fig. 4

