

## Title (en)

Joining device with rotating die and punch and method for joining

## Title (de)

Durchsetzfügevorrichtung mit rotierender Matrice und rotierendem Fügestempel sowie Verfahren zum Durchsetzfügen

## Title (fr)

Dispositif d'assemblage comprenant une matrice et un poinçon rotatifs et procédé d'assemblage

## Publication

**EP 1911534 A1 20080416 (DE)**

## Application

**EP 07016858 A 20070828**

## Priority

DE 102006048645 A 20061013

## Abstract (en)

The clinching device (1) for non-positive and/or positive fit clinching of two sheet layers (12), that partially overlap itself to each other, comprises a joining punch (2), a stencil (4), a transport device for accomplishing the sheet layers by an active area of the clinching device between the joining punch and the stencil, and mold punches arranged on the circumferential surface of a roller (3). The stencil is formed by a circumferential surface (9) of conically formed stencil wheels, which is divided into two stencil wheels, which are mirror-symmetrically arranged to an imaginary plane. The clinching device (1) for non-positive and/or positive fit clinching of two sheet layers (12), that partially overlap itself to each other, comprises a joining punch (2), a stencil (4), a transport device for accomplishing the sheet layers by an active area of the clinching device between the joining punch and the stencil, and mold punches arranged on the circumferential surface of a roller (3). The stencil is formed by a circumferential surface (9) of conically formed stencil wheels, which is divided into two stencil wheels, which are mirror-symmetrically arranged to an imaginary plane. The joining punch is revolvably arranged around a first rotational axis and the stencil is revolvably arranged around a second rotational axis. The first and the second rotational axis are arranged in the active area spaced from each other and diagonal to the transport direction. The imaginary plane lies in transport direction of the sheet layers and vertical to the first rotational axis. The joining punch is formed at the outer circumferential of a joining wheels. Each stencil wheels has a self rotational axis, namely a second and a third rotational axis, and both rotational axis lies in the same plane to each other at an angle of 160[deg] . The stencil comprises revolving shoulders arranged on the circumferential surface of the stencil wheels. The shoulders form flanks of the stencil. The flanks of the stencils form an undercut. The angle of the lateral flanks for the plane of the accomplished sheet layers is 84[deg] . The stencil wheels are embedded in each case by a spherical roller bearing on a common shaft that is aligned parallel to the first rotational axis. The mold punches lie in a rotational plane of the roller, have same distance to each other in circumferential direction, and have a convex upper side at its free end and flanks that converge on the free end of the mold punches. The lateral flanks are arranged diagonal/ parallel to the transport direction at an angle of 45[deg] to the surface of the roller. The roller has lateral defining flanges for lateral guiding of the stencils. Independent claims are included for procedure for non-positive and/or positive fit clinching connection.

## Abstract (de)

Die Erfindung betrifft eine Durchsetzfügevorrichtung (1) und ein Verfahren zum Durchsetzfügen. Dabei werden kraft- und/oder formschlüssige Verbindungen zwischen zwei Blechlagen (12) erzeugt. Die Vorrichtung weist einen Fügestempel (2) und eine zugehörige Matrice (4) auf, die voneinander beabstandet sind. Die Blechlagen (12) überlappen sich teilweise und werden in einem Wirkbereich (14) bearbeitet. Dabei werden die Blechlagen (12) durch einen Bearbeitungsspalt zwischen Fügestempel (2) und zugehöriger Matrice (4) hindurchgeführt. Der Fügestempel (2) ist drehbar um eine erste Rotationsachse (15) und die Matrice (4) ist drehbar um zumindest eine zweite Rotationsachse (16) angeordnet, wobei die erste und zweite Rotationsachse (15,16) im Wirkbereich (14) beabstandet voneinander und quer zur Transportrichtung angeordnet sind. Die Matrice (4) besteht aus einem Matrizenrad (5), das in zwei Matrizenräder (6,7) aufgeteilt ist, die spiegelsymmetrisch zu einer gedachten Ebene angeordnet sind.

## IPC 8 full level

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## CPC (source: EP)

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## Citation (applicant)

- EP 0953386 A2 19991103 - HAHN ORTWIN [DE]
- DE 4431849 A1 19960314 - NAGEL HANS JOACHIM [DE]
- US 2688890 A 19540914 - WILLIAMS IVAN A
- DE 939242 C 19560216 - PAUL CURT JOHANNES GROSSFUSS
- US 3166838 A 19650126 - BRANDT GOLDSWORTHY WILLIAM

## Citation (search report)

- [XDA] DE 4431849 A1 19960314 - NAGEL HANS JOACHIM [DE]
- [XA] DE 4432639 A1 19960328 - MEINIG METU SYSTEM [DE]
- [A] US 5577313 A 19961126 - GUIDO ANTHONY [US], et al
- [A] DE 4400185 A1 19940714 - ARMSTRONG WORLD IND INC [US]

## Cited by

WO2009146676A3

## Designated contracting state (EPC)

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