Title (en)

Densification tool, press comprising such tool and process for the densification of a sintered part or powder

Title (de)

Verdichtungswerkzeug, sowie eine Pressvorrichtung dieses Werkzeug enthaltend und Verfahren zum Verdichten eines Sinterbauteils oder eines Pulvers

Title (fr)

Outil d'étanchéité, dispositif de compactage comprenant cet outil et procédé pour la compactage d'une pièce frittée ou de poudres

Publication

EP 2060346 A3 20170517 (DE)

Application

EP 08005614 A 20080326

Priority

AT 18402007 A 20071114

Abstract (en)

[origin: EP2060346A2] The tool (3) for the production of a sintered component such as toothed wheels with an external toothing and an internal toothing by solidifying the sintered component or the powder for the sintered component, comprises a clamping element (10) and a compression element (11), which is changeable radially related to its dimensions, with a contact surface for the sintered component and/or the powder, a guiding element arranged at and/or in the clamping element and having an external thread, which intervenes in an internal thread of the clamping element, and a spring element. The tool (3) for the production of a sintered component such as toothed wheels with an external toothing and an internal toothing by solidifying the sintered component or the powder for the sintered component, comprises a clamping element (10) and a compression element (11), which is changeable radially related to its dimensions, with a contact surface for the sintered component and/or the powder, a guiding element arranged at and/or in the clamping element and having an external thread, which intervenes in an internal thread of the clamping element, a spring element arranged between the clamping element parts and formed as a spring bellow made of elastomer, and a wedge groove is arranged in the compression element. The contact surface is formed with a surface complementary to the surface of the sintered component to be produced. The clamping element has a first oblique surface (12) and the compression element has a second oblique element complementary to the first oblique element. The oblique surfaces cooperate for widening and/or expanding or reducing the compression element. The clamping element and/or the compression element are relocatable in the axial direction, if necessary with a supporting element. The clamping element has a first clamping element part (19) and a second clamping element part (20), which are arranged one above the other in axial direction. The second clamping element part has a further oblique surface opposite to the first oblique surface. The compression element has the second oblique surface and an additional oblique surface opposite to the second oblique surface. The first oblique surface of the clamping element cooperates with the second oblique surface of the compression element and the further oblique surface of the clamping element cooperates with the additional oblique surface of the compression element. The compression element is formed as a double cone element. The first clamping element part is formed by a cone element with an outer cone and the second clamping element part is formed by a wedge plate with an inner cone. The compression element has an internal cone for intervening with the outer cone of the cone element and an external cone for intervening with the wedge plate. Slit-shaped releases are arranged in the compression element extending in the radial direction if necessary the releases have a drill and/or a recess at one of its ends in axial direction with a larger diameter than a width of the releases. The compression element has teeth with tooth tips at its contact surface for the sintered component and tooth bases arranged between the teeth. The tooth base is complementary to the teeth of the sintered component. The releases are extendingly arranged themselves from a limiting surface oppositely-lying to the teeth of the compression element in radial direction up to in an area of tooth tip circles and/or root circles of the teeth of the compression element. The releases in the area of the tooth tip circles starting from the limiting surface of the compression element extend themselves maximally only up to in the area of the root circles. The drill and/or the recess are formed at the ends of the releases in axial direction, where the releases lie close to the root circles. The releases end in the area of the root circles above the limiting surface. A depth of the releases, which extend themselves up to in the area of the tooth tip circles, is selected from an area up to an upper limit of 10% of an overall height of the compression element in axial direction. The releases are provided at its surface with an anti-adherent coating in an area-wise manner. The anti-adherent coating is formed as rubber coating, or by a lubricant e.g. polytetrafluoroethylene. An insert element e.g. a sleeve is arranged over the contact surface of the compression element for the sintered component and/or powder. A recess for the arrangement of a tool insert is arranged in the insert element and/or the compression element for the production of undercuts at the sintered component. The tooth tips are provided with a recess. The compression element is formed from lamella and/or segments that are individually arranged next to each other. Groove-shaped recesses are arranged at the lamella and/or segments in the form of a dovetails, and projections are complementarily arranged to the recesses. Recesses, in which the guiding element is insertable, have the lamella and/or segments. The clamping element is arranged between the supporting element and the compression element or the compression element is arranged between the supporting element and the clamping element in radial direction. The oblique surfaces have an inclination against a normal in axial direction, whose absolute value is selected from a region with a lower limit of 2[deg] and an upper limit of 30[deg] . The compression element has a height in the axial direction, where the height enables simultaneous insertion of the sintered components. Independent claims are included for: (1) a pressing device; and (2) a method for solidifying a powder to a sintered component in a tool.

IPC 8 full level

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CPC (source: AT EP US)

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Citation (search report)

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