Number of documents: 5

GB9302473	High stress capability, intermetallic phase titanium aluminide coated components DAIMLER
US20070033937	Composite rotor for exhaust-gas turbochargers having titanium aluminide wheels DAIMLER
DE19752776	METHOD FOR PRODUCING A COMPONENT FROM A COMPOSITE Al 2?O 3?/TITANIUM ALUMINIDE MATERIAL DAIMLER
DE19752775	Method for producing a sacrificial body for producing aluminal titanium aluminide composite bodies DAIMLER
DE102005005666	Turbocharger, has turbine wheel as integral part of shaft, and compressor wheel connected with shaft by circular wedge connection, where turbine wheel and shaft are manufactured from high temperature-firm material e.g. titanium aluminide DAIMLER

High stress capability, intermetallic phase titanium aluminide coated components GB9302473

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- **US Patent Classification**
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GB9302473	D0	1993-03-24	[GB9302473]
DE4203869	A1	1993-08-12	[DE4203869]
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GB2264079	B	1995-03-08	[GB2264079]
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- **Abstract:**

(US5281484)
Coated components are produced to withstand high stresses and are composed of the intermetallic phase titanium aluminide material for use, in particular, in piston engines, gas turbines and exhaust gas turbochargers. This material has good technical properties but otherwise only a low resistance to oxidation and wear as a result of friction processes. These disadvantages are overcome in that the components are coated, at least on the parts of their surface which are at risk of hot corrosion and/or wear, with a sheet of a solderable nickel-based alloy soldered on under vacuum. A coating thickness of 0.1 to 0.4 mm is adequate. The nickel-based alloys, of which the soldered-on sheet is composed, preferably have a melting point of below 1180 degrees C.

Claims

(US5281484)

We claim:

1.

High-stress bearing, coated components of an intermetallic phase titanium aluminide material, especially for piston engines, gas turbines, or exhaust turbochargers, wherein the components, at least where their surfaces are exposed to hot corrosional and/or operational wear, are coated with a vacuum-soldered foil of a solderable nickel-based alloy, whereby the nickel-based alloy possesses a melting point below 180 (degree) C. and the nickel-based alloy, upon soldering, forms a refractory alloy or a hard intermetallic phase with the components or with itself.

2. In the components according to claim 1, wherein the nickel-based alloy coating soldered onto the component material has a thickness of 0.1 to 0.4 mm.

3. In the components according to claim 1, wherein the nickel-based alloy soldered on comprises nickel as a main constituent, 6.5% by weight of chromium, 3.0% by weight of boron, 4.5% by weight of silicon and 2.5% by weight of iron.

Composite rotor for exhaust-gas turbochargers having titanium aluminide wheels
US20070033937

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- **Abstract:**
  (US20070033937)
  A rotor for exhaust-gas turbochargers having a turbine wheel (3) made of a metal aluminide, a hollow shaft (2) made of steel or of a nickel-based alloy, and a compressor wheel (1), the compressor wheel (1) having a journal (5), which partially extends into the hollow shaft (2) made of steel or of nickel-based alloy and which forms a positive connection (6) with the same, as well as a method for manufacturing rotors for exhaust-gas turbochargers having a turbine wheel (3), a metal hollow shaft (2), and a compressor wheel (1), including the steps of substance-to-substance bonding of the turbine wheel (3) and of the metal hollow shaft (2), positively connecting the compressor wheel and the metal hollow shaft (2), the positive connection (6) being produced by a journal (5) of the compressor wheel (1) projecting into metal hollow shaft (2), and by the inside of the metal hollow shaft.

Claims

(US20070033937)

What is claimed is:

1.

A rotor for exhaust-gas turbochargers comprising: a turbine wheel made of a metal aluminide, a hollow shaft made of steel or of a nickel-based alloy, and a compressor wheel, the compressor wheel having a journal partially extending into the hollow shaft to form a positive connection with the hollow shaft.

2. The rotor for exhaust-gas turbochargers as recited in claim 1 wherein the positive connection is produced by edge forming or round kneading or by mechanical interlocking.

3. The rotor for exhaust-gas turbochargers as recited in claim 1 wherein, for the positive connection, the journal and the hollow shaft are threadless.

4. The rotor for exhaust-gas turbochargers as recited in claim 1 wherein the hollow shaft on a side of the compressor wheel has at least one slot for corresponding driving elements on the journal.

5. The rotor for exhaust-gas turbochargers as recited in claim 1 wherein the compressor wheel lacks any recesses or material accumulations for balancing the rotor.

6. The rotor for exhaust-gas turbochargers as recited in claim 1 wherein the positive connection is designed to be releasable between the compressor wheel and the shaft.

7. The rotor for exhaust-gas turbochargers as recited in claim 6 wherein the connection is releasable by heating the hollow shaft and by cooling the compressor wheel made of aluminum alloy to a temperature difference of at least 300 deg. C.

8. The rotor for exhaust-gas turbochargers as recited in claim 1 wherein the connection between the hollow shaft and the turbine wheel is a substance-to-substance bond.

9. The rotor for exhaust-gas turbochargers as recited in claim 1 wherein the turbine wheel is made of a titanium aluminide.

10. The rotor for exhaust-gas turbochargers as recited in claim 1 wherein the connection between the hollow shaft and the turbine wheel is a welded connection.

11. The rotor for exhaust-gas turbochargers as recited in claim 1 wherein the compressor wheel is made of an aluminum alloy or of titanium aluminide.

12. A method for operating a rotor as recited in claim 1 comprising: operating the rotor in in an exhaust gas system of a motor vehicle internal combustion engine at rotational speeds above 80,000 rpm.

13. A method for manufacturing rotors for exhaust-gas turbochargers having a turbine wheel, a metal hollow shaft, and a compressor wheel, the method comprising the steps of substance-to-substance bonding of the turbine wheel and of the metal hollow shaft, positively connecting the compressor wheel and the metal hollow shaft via a connection produced by a journal of compressor wheel projecting into the metal hollow shaft and contacting an inside of the hollow metal shaft.

14. The method as recited in claim 13 wherein the positive connection is produced by a mechanical action on an outside of the hollow shaft in the region of the journal.

15. The method as recited in claim 13 wherein the positive connection is produced by edge forming or round kneading of the metal hollow shaft.

16. The method as recited in claim 13 wherein the positive connection is produced by shrinking of the hollow shaft onto the journal.

17. The method as recited in claim 16 wherein, at a coldest operating point, the positive connection exhibits an overlap of the hollow shaft and the journal of 0.01 to 0.1 mm.

18. The method as recited in claim 13 wherein, during the process of forming the positive connection, a centering or a balancing of the rotor is carried out with respect to its longitudinal axis.

19. The method as recited in claim 13 wherein the turbine wheel and the metal hollow shaft are joined to one another in a friction-welding installation, and, subsequently thereto, the positive connection is produced between the metal hollow shaft and the compressor wheel in a same clamping installation or a same system.

METHOD FOR PRODUCING A COMPONENT FROM A COMPOSITE AI 2?O 3?/TITANIUM ALUMINIDE MATERIAL

DE19752776

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- **International Patent Classification**
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DE19752776	C1	1998-11-05	[DE19752776]
WO9928274	A1	1999-06-10	[WO9928274]
EP1034151	A1	2000-09-13	[EP1034151]
BR9815057	A	2000-10-03	[BR9815057]
CN1276774	A	2000-12-13	[CN1276774]
KR20010024193	A	2001-03-26	[KR20010024193]
US6322608	B1	2001-11-27	[US6322608]
CZ20001960	A3	2001-12-12	[CZ200001960]
JP2002536538	A	2002-10-29	[JP2002536538]

- **Abstract:**
(US6322608)
The invention relates to a process for producing a component from an Al2O3/titanium aluminide composite material. To produce the component, a shaped body is pressed from a starting mix of titanium, in particular as an oxide, carbon and/or its precursors, fillers and binders. At a conversion temperature, the shaped body is subjected to a heat treatment in order to form a pressure-stable sacrificial body. In the process, the filler and, if appropriate, the binder is/are also removed by thermal means. The sacrificial body is filled with aluminum and/or an aluminum alloy under pressure. The filling takes place at a filling temperature which is above the conversion temperature. Then, the temperature is reduced to a transformation temperature, the materials of the filled sacrificial body and the aluminum reacting through a solid-state reaction, below the filling temperature, to form an Al2O3/titanium aluminide composite body. (From US6322608 B1)

Claims

(US6322608)

What is claimed is:

1.

A process for producing a component from an Al2 O3 /titanium aluminide composite material comprising pressing a shaped body from a starting mix containing an oxide of titanium, a source of carbon, at least one filler, and at least one binder;

subjecting the shaped body to a heat treatment at a conversion temperature to produce a sacrificial body;

filling the sacrificial body with softened or liquid aluminum under pressure at a filling temperature;

and reacting the sacrificial body with the filled aluminum to form an Al2 O3 /titanium aluminide composite material,

wherein the conversion temperature is selected to be less than or equal to the filling temperature,

wherein the filler has a decomposition temperature which is less than or equal to the filling temperature,

wherein the filler is removed before or during the filling with aluminum;

and

wherein the filling temperature is above the melting temperature of the aluminum but below a reaction temperature at which an exchange reaction takes place between the aluminum and the oxide of titanium.

2. A process according to claim 1, wherein, for filling, the aluminum and the mould are heated to the filling temperature.

3. A process according to claim 2, wherein, for filling, the sacrificial body is heated to the filling temperature.

4. A process according to claim 1, wherein the sacrificial body is filled with the aluminum in the unsintered state.

5. A process according to claim 1, wherein the sacrificial body is produced close to its final shape.

6. A process according to claim 1, wherein the sacrificial body is machined to close to its final shape.

7. A process according to claim 1, wherein said oxide of titanium is a member selected from the group consisting of TiO, Ti2 O3, Ti3 O5, and TiO2.

8. A process according to claim 7, wherein said oxide of titanium is TiO2.

9. A process according to claim 8, wherein the TiO2 is reduced by the carbon, the filler is removed thermally, and during the thermal removal of the filler, the carbon is formed as an end product and remains in the sacrificial body.

10. A process according to claim 1, wherein the filler is vaporized below the filling temperature or is converted into carbon.

11. A process according to claim 1, wherein the binder is vaporized below the filling temperature or is converted into carbon.

12. A process according to claim 1, wherein the filler is an organic filler.

13. A process according to claim 12, wherein the filler is a thermoplastic or thermosetting material.

14. A process according to claim 13, wherein the filler is selected from the group consisting of starch, flour, and cellulose derivatives.

15. A process according to claim 14, wherein the filler is cellulose acetate.

16. A process according to claim 1, wherein the ingredients of the starting mix are homogeneously dispersed.

17. A process according to claim 1, wherein 1-3% by weight of binder is added to the starting mix.

18. A process according to claim 1, wherein the filler is a powder with a grain size of between 10 MU m and 100 MU m.

19. A process according to claim 18, wherein the filler has a grain size of about 20 MU m.

20. A process according to claim 1, wherein the binder is polyvinyl alcohol or polyethylene glycol.

21. A process according to claim 20, wherein the binder is in an aqueous solution.

22. A process according to claim 1, wherein a nonvolatile additive is added to the starting mix at the filling temperature.

23. A process according to claim 22, wherein the nonvolatile additive is selected from the group consisting of TiC, SiC, BaC, TiB2, and mixtures thereof.

24. A process according to claim 1, wherein the Al2 O3 of the Al2 O3 /titanium aluminide composite material is bonded together in all three spatial directions.

25. A process according to claim 1, wherein mineral or ceramic fibers are added to the starting mix.

26. A process according to claim 1, wherein the aluminum is introduced with only a slight excess pressure.

27. A process according to claim 1, wherein after the sacrificial body has been filled with the aluminum, the filled sacrificial body is cooled to a transformation temperature which is below the melting temperature of the aluminum, and wherein at the transformation temperature starting materials of the sacrificial body and the aluminum are reacted with one another in a solid-state reaction to form the Al2 O3 /titanium aluminide composite material.

28. A process according to claim 1, wherein the binder has a decomposition temperature which is less than or equal to the filling temperature.

29. A process according to claim 1, wherein the binder is removed before or during the filling with aluminum.

30. A process according to claim 1, wherein the component is a tribological system having a frictional surface.

31. A process according to claim 1, wherein the component is an engine component having a frictional surface.

32. A process according to claim 1, wherein the component is a vehicle component having a frictional surface.

33. A process according to claim 1, wherein the component is a brake disc having a frictional surface.

34. A product made by the process of claim 1.

35. A tribological system having a frictional surface made by the process of claim 1.

36. An engine component having a frictional surface made by the process of claim 1.

37. A vehicle component having a frictional surface made by the process of claim 1.

38. A brake disc having a frictional surface made by the process of claim 1.

Method for producing a sacrificial body for producing aluminal titanium aluminide composite bodies

DE19752775

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DE19752775	C1	1999-04-29	[DE19752775]
WO9928276	A1	1999-06-10	[WO9928276]
EP1036050	A1	2000-09-20	[EP1036050]
BR9815038	A	2000-10-03	[BR9815038]
CN1279659	A	2001-01-10	[CN1279659]
KR20010031873	A	2001-04-16	[KR20010031873]
JP2001524607	A	2001-12-04	[JP2001524607]
CZ20001961	A3	2001-12-12	[CZ200001961]

- **Abstract:**
  (WO9928276)
  The invention relates to a method for producing a sacrificial body from an initial mixture which is then used to produce a component consisting of an Al2O3/titanium aluminide composite substance. The invention also relates to an initial mixture and to a sacrificial body. In addition to titanium, preferably in oxide form, carbon and/or its intermediate products, fillers and binders are added to the initial mixture. A shaped body is then pressed from the initial mixture and subjected to heat treatment at a transition temperature in order to obtain a pressure-resistant sacrificial body. The filler and optionally, the binder are thermally removed during this process. The sacrificial body is provided under pressure for subsequent filling with aluminium and/or an aluminium alloy. The filling process takes place at a filling temperature which is higher than the transition temperature. The materials in the filled sacrificial body and the aluminium are reacted in a solids reaction below the filling temperature to form an Al2O3/titanium aluminide composite body. (From WO9928276 A1)

Claims

(WO9928276)

Claims machine translated from German
Pa entannpr nehe
1. procedures for the production of a Opferkorpers from an output mixture for the later production of a Al2.theta. [3] /Titanaluminid Verbundkorpers, with which procedure titanium is added to the output mixture, in particular as oxide and a molded article from the output mixture is pressed, which is submitted molded articles at a transfer temperature of a temperature treatment for the formation of the victim body, whereby the victim body is intended for filling with aluminum and/or an aluminum alloy - in the following simplifying aluminum mentioned - under pressure, and whereby the materials of the Opferkorpers and aluminum to a Al2.theta. [3] is reacted to /Titanaluminid Verbundkorper, D A D u r C h g e k e n n z e i C h n e t that the output mixture Carbon and/or its pre-products, fillers and bonding agents to be added that from this output mixture of the molded articles it is pressed that with the bonding agent the individual components of the output mixture are interconnected at least bereichsweise printingstabilizing that the decomposition temperature of the filler and preferably also the binder is selected directly or smaller than the filling temperature, so that the filler and/or the bonding agent is removed with and/or before the later Befullen from the raw materials form-pressed Opferkorpers with aluminum, and that the transfer temperature is arranged below the filling temperature, so that the molded article during warming up to filling temperature to the later printing filling into the victim body is converted.
2. Procedure according to claim 1, D A D u r C h g e k e n n z e i C h n e t that to the Befullen with aluminum the form-pressed and ungesinterte victim body is intended.
3. Procedure according to claim 1, D A D u r C h g e k e n n z e i C h n e t that the victim body is end form near manufactured.
4. Procedure according to claim 1, D A D u r C h g e k e n n z e i C h n e t that the victim body is pressed and worked on afterwards machine cutting end form near.
5. Procedure according to claim 1, D A D u r C h g e k e n n z e i C h n e t that preferably as oxide of the titanium TiO and/or Ti [2] are used .theta.3 and/or Ti [3] 0 [5] and/or Ti.theta.2.
6. Procedure according to claim 1, D A D u r C h g e k e n n z e i C h n e t that as oxide of the titanium TiU [2] is used that TiU2 is reduced by carbon and that with the preferably thermal distance of the fillers and/or the bonding agent that is formed reducing effective carbon as final product and in the victim body remains.
7. Procedure according to claim 1, D A D u r C h g e k e n n z e i C h n e t that the fillers are evaporated below the filling temperature and/or converted into carbon.
8. Procedure according to claim 1, D A D u r C h g e k e n n z e i C h n e t that the bonding agent below the filling temperature are evaporated and/or converted into carbon.
9. Procedure according to claim 1, D A D u r C h g e k e n n z e i C h n e t that as filler organic material prefers thermoplastic or duroplastisches material, and particularly prefers strength and/or flour and/or a cellulose derivative, in particular Celluloseacetat and/or is selected.
10. Procedure according to claim 1, D A D u r C h g e k e n n z e i C h n e t that the raw materials of the output mixture are distributed homogeneous.
11. Procedure according to claim 1, D A D u r C h g e k e n n z e i C h n e t that the output mixture 1 - 3 weight percentage (Gew. - %) Bonding agent to be added.
12. Procedure according to claim 1, D A D u r C h g e k e n n z e i C h n e t that as bonding agent Polyvenylalkohol (PVA) is selected and/or Polyethy lenglykol (PEG) preferentially in aqueous solution.
13. Procedure according to claim 1, D A D u r C h g e k e n n z e i C h n e t that as filler a powder with a preferential grain size between 10 is selected .micro.m and 100 .micro.m, particularly preferentially about 20 .micro.m.
14. Procedure according to claim 1, D A D u r C h g e k e n n z e i C h n e t that at filling temperature non volatile additives in particular TIC and/or SiC and/or BaC and/or TiB [2] are added to the output mixture.
15. Procedure according to claim 1, D A D u r C h g e k e n n z e i C h n e t that fibers are added to the output mixture, in particular from mineral and/or ceramic materials.
16. Output mixture to manufacturing a victim body, whereby the victim body is made of a molded article by a temperature treatment at a transfer temperature, which molded article is form-pressed preferably from the titanium as oxide exhibiting output mixture, whereby the victim body is intended at a filling temperature to the Befullen with aluminum and/or an aluminum alloy - in the following simplifying aluminum mentioned - and to a reaction with the materials of the victim body with aluminum, and whereby with the reaction a construction unit from a Al2.theta.3/Titanaluminid-Verbundwerkstoff is formed, D A D u r C h g e k e n n z e i C h n e t that the output mixture carbon exhibits and/or its pre-products, fillers and bonding agents that with the bonding agent the individual components of the output mixture at least bereichsweise printingstabilizing are with one another connected that the decomposition temperature of the filler is and preferably also those of the binder same or smaller than the filling temperature, so that they are removable with and/or before the Befullen of the victim body with aluminum, ungesinterten form-pressed, from the raw materials and, and that the transfer temperature is below or equal to the filling temperature, so that the transformation of the molded article takes place into the victim body during warming up to filling temperature.
17. Output mixture according to claim 16, D A D u r C h g e k e n n z e i C h n e t that the oxide of the titanium TiO and/or Ti [2] is reducing 0 [3] and/or Ti [3] 0 [5] and/or Ti.theta.2 with effective carbon.
18. Output mixture according to claim 16, D A D u r C h g e k e n n z e i C h n e t that the oxide of the titanium i.theta. [2] is that carbon is reducing effective regarding the i.theta.2 and that carbon is a final product developing with the distance of the bonding agent and/or the fillers.
19. Output mixture according to claim 16, D A D u r C h g e k e n n z e i C h n e t that the fillers and if necessary the bonding agent at or below the filling temperature evaporation and/or in carbon is convertible.
20. Output mixture according to claim 16, D A D u r C h g e k e n n z e i C h n e t that the filler particularly prefers organically preferentially thermoplastic or duroplastisch, and strength and/or flour and/or a cellulose derivative, in particular a Celluloseacetat

is.

21. Output mixture according to claim 16, D A D u r C h g e k e n n z e i C h n e t that the raw materials of the output mixture before pressing are homogeneous distributed to the victim body.

22. Output mixture according to claim 16, D A D u r C h g e k e n n z e i C h n e t that the output mixture 1 - 3 weight percentage (Gew. - %) Bonding agent exhibits.

23. Output mixture according to claim 16, D A D u r C h g e k e n n z e i C h n e t that the bonding agent Polyvenylalkohol (PVA) and/or Polyethy is preferential lenglykol (PEG) in aqueous solution.

24. Output mixture according to claim 16, D A D u r C h g e k e n n z e i C h n e t that the filler a powder with a preferential grain size between 10 is particularly preferential .micro.m and 100 .micro.m, about 20 .micro.m.

25. Output mixture according to claim 16, D A D u r C h g e k e n n z e i C h n e t that the output mixture exhibits non volatile additives, in particular TIC and/or SiC and/or BaC and/or TiB [2] at filling temperature of the Opferkorpers.

26. Output mixture according to claim 16, D A D u r C h g e k e n n z e i C h n e t that the output mixture exhibits fibers, in particular from mineral and/or ceramic materials.

27. Victim body to making a construction unit of a Al2.theta. [3] /Titanaluminid composite material, which victim body exhibits titanium in particular as oxide and which victim body is intended to the Befullen with aluminum and/or an aluminum alloy - in the following simplifying aluminum mentioned - and for the reaction of the materials of the victim body with aluminum, whereby with the reaction the construction unit from the Al2.theta. [3] the /Titanaluminid composite material is formed, whereby the victim body is made of a molded article by a temperature treatment at a transfer temperature, which is pressed from an output mixture, D A D u r C h g e k e n n z e i C h n e t that the ungesinterte victim body is printingstable in relation to positive pressure that the victim body carbon and/or its pre-products, fillers and bonding agents exhibits that the bonding agent interconnects the individual components of the victim body at least bereichsweise printingstabilizing that the decomposition temperature of the filler and preferably also the binder is same or smaller than the filling temperature, so that they are removable with and/or before the Befullen of the form-pressed and ungesinterten victim body with aluminum and that the transfer temperature is smaller or equal to the filling temperature.

28. Victim body according to claim 27, D A D u r C h g e k e n n z e i C h n e t that the oxide of the titanium TiO and/or Ti [2] is .theta.3 and/or Ti [3] 0 [5] and/or Ti.theta.2.

29. Victim body according to claim 27, D A D u r C h g e k e n n z e i C h n e t that the oxide of the titanium is Ti0 [2] that carbon is regarding the Ti.theta.2 reducing effectively carbon and that carbon is a final product developing with the distance of the bonding agent and/or the fillers.

30. Victim body according to claim 27, D A D u r C h g e k e n n z e i C h n e t that the filler and if necessary the bonding agent are convertible at or below the filling temperature evaporation and/or in carbon.

31. Victim body according to claim 27, D A D u r C h g e k e n n z e i C h n e t that the filler particularly prefers organically preferentially thermoplastic or duroplastisch, and strength and/or flour and/or a cellulose derivative, in particular a Celluloseacetat is.

32. Victim body according to claim 27, D A D u r C h g e k e n n z e i C h n e t that the raw materials are homogeneous distributed in the victim body.

33. Victim body according to claim 27, D A D u r C h g e k e n n z e i C h n e t that the victim body 1 - 3% weight percentage (Gew. - %) Bonding agent exhibits.

34. Victim body according to claim 27, D A D u r C h g e k e n n z e i C h n e t that the bonding agent Polyvenylalkohol (PVA) and/or Polyethy is preferential lenglykol (PEG) in aqueous solution.

35. Victim body according to claim 27, D A D u r C h g e k e n n z e i C h n e t that the filler a powder with a preferential grain size between 10 is particularly preferential .micro.m and 100 .micro.m, about 20 .micro.m.

36. Victim body according to claim 27, D A D u r C h g e k e n n z e i C h n e t that the victim body exhibits non volatile additives, in particular TIC and/or SiC and/or BaC and/or TiB [2] at filling temperature.

37. Victim body according to claim 27, D A D u r C h g e k e n n z e i C h n e t that the victim body exhibits fibers, in particular from mineral and/or ceramic materials.

38. Use of a procedure according to claim 1 for the production of Reibflachen of tribologischen systems or of engine components and/or of vehicle components and/or of brake disks and/or of Reibflachen for brake disks.

39. Use of an output mixture 16 for the production of Reibflachen of tribologischen systems or of engine components and/or of vehicle components and/or of brake disks and/or of Reibflachen for brake disks.

40. Use of a Opferkorpers 27 for the production of Reibflachen of tribologischen systems or of engine components and/or of vehicle components and/or of brake disks and/or of Reibflachen for brake disks.

Turbocharger, has turbine wheel as integral part of shaft, and compressor wheel connected with shaft by circular wedge connection, where turbine wheel and shaft are manufactured from high temperature-firm material e.g. titanium aluminide

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- **Abstract:**
  (DE102005005666)
  The turbocharger has a turbine wheel (13) as an integral part of a shaft. A compressor wheel (12) is connected with the shaft by a circular wedge connection, where the wheels (13, 12) are arranged in turbine and compressor casings. A bearing housing is arranged between the housings, where the wheel (13) and the shaft are designed as a single piece and manufactured from a high temperature-firm material e.g. titanium aluminide material. (From DE102005005666 A1)

Claims

(DE102005005666)

Claims machine translated from German

1. Fluid-flow machine, in particular supercharger, marked by a compressor wheel (12), a turbine (13) and a wave (11), by it that the turbine (13) is integral part of the wave (11), and that the compressor wheel (12) by a circle wedge connection with the wave (11) is connected.

Claims machine translated from German

1. Fluid-flow machine, in particular supercharger, marked by a compressor wheel (12), a turbine (13) and a wave (11), by it that the turbine (13) is integral part of the wave (11), and that the compressor wheel (12) by a circle wedge connection with the wave (11) is connected.

2. Fluid-flow machine according to claim 1, by the fact characterized that the turbine (13) and the wave (11) are one-piece and/or one-piece trained.

3. Fluid-flow machine according to claim 1 or 2, by the fact characterized that the turbine (13) and the wave (11) are made of a high temperature-firm material.

4. Fluid-flow machine according to claim 3, by the fact characterized that the turbine (13) and the wave (11) are made of a TiAl material.

5. After fluid-flow machine or several of the claim 1 to 4, by the fact characterized that the circle wedge connection to the attachment of the Verdichterrads (12) at the wave (11) is through assigned wedge-shaped collections (19) and a second surface (21) assigned wedge-shaped recesses (20) formed for a first surface (18), whereby an upward gradient of the wedge surfaces essentially follows the process of a logarithmic spiral.

6. After fluid-flow machine or several of the claim 1 to 5, by the fact characterized that the circle wedge connection is directly between the compressor wheel (12) and the wave (11) trained.

7. Fluid-flow machine according to claim 6, by the fact characterized that at an outside extent range (18) of the wave (11) the wedge-shaped collections (19) are arranged and at an inner surface (21) of a drilling of the Verdichterrads (12) the appropriate wedge-shaped recesses (20).

8. After fluid-flow machine or several of the claim 1 to 5, by the fact characterized that the circle wedge connection between a mother and the wave is trained.

9. Fluid-flow machine according to claim 8, by the fact characterized that the compressor wheel is positively fixed on the wave pushed and onto the wave against rotating, whereby at an outside extent range of the wave the wedge-shaped collections are arranged and at an inner surface of a drilling of the mother the appropriate wedge-shaped recesses.

10. After fluid-flow machine or several of the claim 1 to 5, by the fact characterized that the circle wedge connection between a mother and the compressor wheel is trained.

11. Fluid-flow machine according to claim 10, by the fact characterized that the compressor wheel is pushed onto the wave, whereby at a section of the Verdichterrads the wedge-shaped collections are arranged and at an inner surface of a drilling of the mother the appropriate wedge-shaped recesses, and whereby the compressor wheel is fixable against rotating by the mother radially compressably and like that on the wave.