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Number of documents: 8

WO9743060	Inert calcia facecoats for investment casting of titanium and titanium-aluminide alloys ALLIED SIGNAL
WO9832557	Method for producing an integrated crucible and mold for low cost gamma-tial castings ALLIED SIGNAL
WO200020652	Creep resistant gamma titanium aluminide alloy ALLIED SIGNAL
US5350466	Creep resistant titanium aluminide alloy ALLIED SIGNAL AVCO HOWMET
US4816347	Hybrid titanium alloy matrix composites ALLIED SIGNAL AVCO LYCOMING SUBSIDIARY OF TEXTRON TEXTRON IPMP
US5906692	Process for producing forged .alpha.-2 based titanium aluminides having fine grained and orthorhombic transformed microstructure and articles made therefrom ALLIED SIGNAL
WO9630551	Castable gamma titanium-aluminide alloy containing niobium, chromium and silicon and turbocharger wheels made thereof ALLIED SIGNAL
WO9630552	Castable gamma titanium-aluminide alloy containing niobium, chromium and silicon ALLIED SIGNAL

Inert calcia facecoats for investment casting of titanium and titanium-aluminide alloys

WO9743060

- Patent Assignee
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- International Patent Classification
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- US Patent Classification
  PCLO=106038900 PCLX=106038220 PCLX=106038270 PCLX=164517000 PCLX=164518000 PCLX=164519000 PCLX=164525000 PCLX=164529000

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- Fampat family

WO9743060	A1	1997-11-20	[WO9743060]
AU3204997	A	1997-12-05	[AU9732049]
US5766329	A	1998-06-16	[US5766329]
EP0910488	A1	1999-04-28	[EP-910488]
CN1225045	A	1999-08-04	[CN1225045]
JP2000510050	A	2000-08-08	[JP2000510050]
EP0910488	B1	2001-07-18	[EP-910488]
AT203192	T	2001-08-15	[ATE203192]
DE69705723	D1	2001-08-23	[DE69705723]
DE69705723	T2	2002-06-13	[DE69705723]
CN1134317	C	2004-01-14	[CN1134317C]

- Abstract:
  (EP-910488)
  A calcia mold facecoat is applied to a mold for casting parts composed of reactive metals such as titanium and titanium aluminide. The facecoat is composed of a calcium carbonate based slurry comprising a dense grain calcium carbonate powder and an aqueous based binder. It is applied to a wax or plastic pattern used in the lost wax process for fabricating a casting shell. The mold is built using multiple dipping of alumina -silicate slurries, and then fired at high temperatures in an oxygen rich environment. The metal part is cast before the fired mold can cool below about 800 DEG C. Organometallic based slurry binders are avoided and significant cost savings are realized owing to the benign nature of the aqueous based suspensions with respect to the environment. (From US5766329 A)

Claims

(EP-910488)

1. A method for casting metal comprising the steps of:
forming a facecoat slurry comprising a calcium carbonate powder and an aqueous binder comprised of a colloidal suspension of inorganics selected from the group of zirconia, titania, hafnia, and silica;

applying the slurry to a casting pattern;

forming a casting shell over the casting pattern to create a mold;

firing the mold;

transferring the mold to a casting chamber;

filling the mold with molten metal, the steps of transferring the mold and filling the mold accomplished while the mold temperature remains greater than about 750 DEG.C from the step of firing;

allowing the metal to cool;
and
removing the mold from the cast metal part.
2. A method as defined in claim 1 wherein the step of firing.the mold is conducted at about 1000 DEG.C for greater than 0.5 hour.
3. A method as defined in claim 1 or 2 wherein the step of firing is further conducted in an oxidizing atmosphere.
4. A method as defined in claim 1,2 or 3 wherein the step of firing the mold is conducted at a temperature sufficient to convert the calcium carbonate facecoat into a calcia facecoat.
5. A method as defined in claim 1,2,3 or 4 wherein the step of forming a casting shell comprises the steps of:
allowing the slurry to partially dry;
and
applying a ceramic stucco laminate to form a desired thickness shell for the mold.
6. A method as defined in claim 5 wherein the step of applying a ceramic stucco laminate comprises applying alternate layers of ceramic stucco and slurry.
7. A method as defined in any one of claims 1 to 6 wherein the molten metal for casting comprises a reactive metal selected from the group of titanium, titanium-aluminide, zirconium, alloys of titanium and alloys of zirconium.

Method for producing an integrated crucible and mold for low cost gamma-tial castings

WO9832557

- Patent Assignee
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- International Patent Classification
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- CPC Code
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- Publication Information
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  1997US-60036041 1997-01-27
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- Fampat family

WO9832557	A1	1998-07-30	[WO9832557]
AU6533698	A	1998-08-18	[AU9865336]
EP0963262	A1	1999-12-15	[EP-963262]
CN1244147	A	2000-02-09	[CN1244147]
BR9807084	A	2000-04-18	[BR9807084]
JP2001509083	A	2001-07-10	[JP2001509083]
EP0963262	B1	2002-05-02	[EP-963262]
AT216929	T	2002-05-15	[ATE216929]
DE69805164	D1	2002-06-06	[DE69805164]
PT963262	E	2002-09-30	[PT-963262]
DE69805164	T2	2002-10-31	[DE69805164]
ES2176986	T3	2002-12-01	[ES2176986]
CN1101284	C	2003-02-12	[CN1101284C]

- Abstract:
  (EP-963262)
  An integral crucible for casting of reactive metals incorporates a graphite sleeve (10) adapted for attachment of an investment pattern (14) over which a laminate of alternating layers of facecoat slurry (20) and ceramic stucco (22) are applied to form an investment shell. The layers of the laminate extend over a mating portion of the sleeve and firing of the shell vaporizes the investment pattern leaving the sleeve and shell an integral crucible (From WO9832557 A1)

Claims

(EP-963262)

1. A method for producing an integral crucible and mold for casting of reactive metals comprising the steps of:
attaching an investment pattern to a cylindrical graphite crucible sleeve;

forming an investment shell around the pattern and a mating portion of the crucible sleeve;

firing the shell and attached crucible sleeve for complete cure of the shell and volatilization of the pattern.
2. A method as defined in claim 1 wherein the step of attaching the investment pattern to the crucible sleeve comprises:
dipping a mating portion of the pattern in hot wax;
and
inserting the mating portion of the pattern into a recess in the graphite crucible sleeve.
3. A method as defined in claim 1 wherein the step of forming comprises:
dipping the in pattern in a facecoat slurry;

allowing the dipcoat layer to partially dry or cure;

applying alternating layers of ceramic stucco and dipcoat on both the pattern and the mating portion of the crucible sleeve until a shell of desired thickness is formed.
4. A method as defined in claim 3 wherein the step of applying alternating layers is followed by a step of allowing the shell to dry thoroughly.
5. A method as defined in claim 1 wherein the pattern is polystyrene plastic.
6. A method as defined in claim 1 wherein the firing is accomplished at temperatures near 100 DEG.C for a period of no less than 0.5 hour in an oxidizing atmosphere such as air.
7. A method as defined in claim 3 wherein the step of applying alternating layers is followed by the step of applying at least one laminating layer of flint grains and alumina silicate powders.
8. A method as defined in claim 3 wherein the facecoat slurry forming an inert ceramic.
9. A method as defined in claim 8 wherein the inert ceramic comprises yttria.
10. A method as defined in claim 8 wherein the inert ceramic comprises calcia.

Creep resistant gamma titanium aluminide alloy
WO200020652

- **Patent Assignee**
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- **International Patent Classification**
  C22C-014/00
- **US Patent Classification**
  PCLO=148421000 PCLX=420418000
- **CPC Code**
  C22C-014/00; C22F-001/18/3
- **Publication Information**
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  1998US-09153430 1998-09-14

- **Fampat family**

WO200020652	A1	2000-04-13	[WO200020652]
US6174387	B1	2001-01-16	[US6174387]

- **Abstract:**
  (US6174387)
  A creep resistant titianium aluminide alloy composition consisting essentially of, in atomic percent, about 44 to about 49 Al, about 0.5 to about 4.0 Nb, about 0.0 to about 3.0 Mn, about 1.0 to about 1.5 W, about 0.1 to about 1.0 Mo, about 0.4 to about 0.75 Si, and the balance Ti.

Claims

(US6174387)

What is claimed is:

1.

Titanium aluminide alloy composition consisting essentially of, in atomic %, about 44 to about 49 Al, about 0.5 to about 4.0 Nb, about 0.0 to about 3.0 Mn, about 1.0 to about 1.5 W, about 0.1 to about 1.0 Mo, about 0.4 to about 0.75 Si, and the balance Ti.

2. An investment casting having the composition of claim 1.

3. Titanium aluminide alloy composition consisting essentially of, in atomic %, about 47 Al, 2.0 Nb, 0.0 Mn, 1.0 W, 0.5 Mo, 0.5 Si, and the balance Ti.

4. An investment casting having the composition of claim 2.

5. A creep resistant titanium aluminide alloy article consisting essentially of, in atomic %, about 44 to about 49 Al, about 0.5 to about 4.0 Nb, about 0.0 to about 3.0 Mn, about 1.0 to about 1.5 W, about 0.1 to about 1.0 Mo, about 0.4 to about 0.75 Si, and the balance Ti, said article having a microstructure including gamma phase and at least one additional phase bearing at least one of W, Mo, and Si dispersed as distinct regions in the microstructure.

6. The article of claim 5 wherein the microstructure comprises a majority of gamma phase with a minority of alpha-two phase present.

7. The article of claim 5 wherein the additional phase is present as distinct regions located intergranularly of the gamma and alpha -two phases.

8. A creep resistant gas turbine engine component consisting essentially of, in atomic %, about 44 to about 49 Al, about 0.5 to about 4.0 Nb, about 0.0 to about 3.0 Mn, about 1.0 to about 1.5 W, about 0.1 to about 1.0 Mo, about 0.4 to about 0.75 Si, and the balance Ti, said article having a microstructure including gamma phase an at least one additional phase including W, Mo, or Si, or combinations thereof, dispersed as distinct regions in the microstructure.

Creep resistant titanium aluminide alloy
US5350466

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- **International Patent Classification**
  C22C-014/00
- **US Patent Classification**
  PCLO=148421000 PCLX=148669000 PCLX=148670000 PCLX=420418000 PCLX=420421000
- **CPC Code**
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- **Publication Information**
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- **Priority Details**
  1993US-08094297 1993-07-19

- **Fampat family**

US5350466	A	1994-09-27	[US5350466]
CA2116987	A1	1995-01-20	[CA2116987]
EP0636701	A2	1995-02-01	[EP-636701]
JPH0754085	A	1995-02-28	[JP07054085]
EP0636701	A3	1995-03-29	[EP-636701]
EP0636701	B1	1996-11-06	[EP-636701]
DE69400848	D1	1996-12-12	[DE69400848]
DE69400848	T2	1997-04-03	[DE69400848]
CA2116987	C	1998-04-21	[CA2116987]

- **Abstract:**
  (EP-636701)
  Creep-resistant titanium aluminide alloy for use in gas turbine engines A Ti aluminide alloy comprises (at.%): 44-49 Al, 0.5-4 Nb, 0.25-3 Mn, 0.1 to less than 1 Mo, 0.1 to less than 1 W, 0.1-0.6 Si and the balance Ti. The alloy pref. comprises (at.%): 45-48 Al, 1-3 Nb, 0.5-1.5 Mn, 0.25-0.75 Mo, 0.25-0.75 W, 0.15-0.3 Si and the balance Ti. The most pref. compsn. is (at.%): 47 Al, 2 Nb, 1 Mn, 0.5 W, 0.5 Mo, 0.2 Si and the balance Ti. A creep-resistant alloy article, e.g. a gas turbine engine component (of the pref. compsn.), has a microstructure including a gamma phase and at least one additional phase bearing at least one of W, Mo and Si dispersed as distinct regions in the microstructure. The max. individual amts. of Mo and W are 0.90 at.%. The alloy is formed into an investment casting. The microstructure is predominantly gamma phase with a minority of alpha-two phase present. The additional phase is present as distinct regions located intergranularly of the gamma and alpha-two phases.

Claims

(EP-636701)

1. Titanium aluminide alloy composition consisting essentially of, in atomic %, about 44 to about 49 Al, about 0.5 to about 4.0 Nb, about 0.25 to about 3.0 Mn, about 0.1 to less than about 1.0 Mo, about 0.1 to less than about 1.0 W, about 0.1 to about 0.6 Si and the balance titanium.
2. The alloy composition of Claim 1 wherein Mo and W each do not exceed about 0.90 atomic %.
3. Titanium aluminide alloy composition consisting essentially of, in atomic %, about 45 to about 48 Al, about 1.0 to about 3.0 Nb, about 0.5 to about 1.5 Mn, about 0.25 to about 0.75 Mo, about 0.25 to about 0.75 W, about 0.15 to about 0.3 Si and the balance titanium.
4. Titanium aluminide alloy composition consisting essentially of, in atomic %, about 47 Al, 2 Nb, 1 Mn, 0.5 W, 0.5 Mo, 0.2 Si and the balance Ti.
5. A creep resistant titanium aluminide alloy article consisting essentially of, in atomic %, about 45 to about 48 Al, about 1.0 to about 3.0 Nb, about 0.5 to about 1.5 Mn, about 0.25 to about 0.75 Mo, about 0.25 to about 0.75 W, about 0.15 to about 0.3 si and the balance titanium, said article having a microstructure including gamma phase and at least one additional phase bearing at least one of W, Mo, and Si dispersed as distinct regions in the microstructure.
6. The article of Claim 5 wherein the microstructure comprises a majority of gamma phase with a minority of alpha-two phase present.
7. The article of Claim 5 wherein the additional phase is present as distinct regions located intergranularly of the gamma and alpha -two phases.
8. A creep resistant gas turbine engine component consisting essentially of, in atomic %, about 45 to about 48 Al, about 1.0 to about 3.0 Nb, about 0.5 to about 1.5 Mn, about 0.25 to about 0.75 Mo, about 0.25 to about 0.75 W, about 0.15 to about 0.3 Si and the balance titanium, said article having a microstructure including gamma phase and at least one additional phase including W, Mo, or Si, or combinations thereof, dispersed as distinct regions in the microstructure.
9. An investment casting having the composition of Claim 1.
10. An investment casting having the composition of Claim 3.

Hybrid titanium alloy matrix composites
US4816347

- **Patent Assignee**
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- **International Patent Classification**
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- **US Patent Classification**
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- **CPC Code**
  B22F-2998/10; B32B-015/01; C22C-047/06/8; C22C-047/20; C22C-049/11; C22C-049/12; C22C-2204/00 C22C-2204/00; Y10T-428/12438; Y10T-428/12444; Y10T-428/12486; Y10T-428/12493
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  1987US-07055415 1987-05-29
  1988US-07228257 1988-08-04
- **Fampat family**

US4816347	A	1989-03-28	[US4816347]
US4896815	A	1990-01-30	[US4896815]

- **Abstract:**
  (US4816347)
  A combination of unique properties of (i) high strength and stiffness at temperatures up to about of 1500 (degree) F., (ii) good room temperature mechanical properties including good ductility and (iii) improved resistance to matrix cracking is achieved in a titanium structure by forming a hybrid titanium alloy matrix composite in which the matrix consists of layers of at least two alloys, i.e. a high temperature-resistant titanium aluminide alloy and a ductile, lower modulus titanium alloy, that are bonded metallurgically to each other in various embodiments. A reinforcing material in the form of filaments, fibers or wiskers, e.g. silicon carbide, can be embedded within either or both types of the titanium layers.

Claims

(US4816347)

What is claimed is:

1.

A hybrid titanium metal matrix composite article having good strength at temperatures up to about 1500 (degree) F. and good ductility comprising at least one layer of a titanium aluminide alloy having a minimum thickness of at least about 0.001 inch metallurgically bonded to at least one layer of a ductile titanium alloy, said composite article having substantially higher yield strength, ultimate tensile strength and % elongation ductility than said layer of titanium aluminide alloy at both room temperature and at 1200 (degree) F., and having substantially higher yield strength and ultimate tensile strength at 1200 (degree) F. than said layer of ductile titanium alloy has at 1000 (degree) F.

2. A composite article according to claim 1 wherein a plurality of filaments are embedded in said matrix.

3. A composite article according to claim 1 wherein said titanium aluminide comprises Ti3 Al and/or TiAl.

4. A hybrid titanium metal matrix composite article according to claim 1 comprising a plurality of layers of a said ductile titanium alloy and layers of a said titanium aluminide alloy, each of the layers of titanium aluminide alloy being separated from each other by at least one layer of titanium alloy.

5. A hybrid titanium metal matrix composite article according to claim 1 comprising a plurality of layers of a said ductile titanium alloy and layers of a said titanium aluminide alloy, the layers of titanium aluminide alloy being separated from each other by one or more layers of the titanium alloy, at least some of the layers having a plurality of filaments embedded therein.

6. A hybrid titanium metal matrix composite article according to claim 1 comprising at least one said layer of a titanium aluminide alloy, at least one said layer of a ductile titanium alloy having a plurality of filaments embedded therein, and at least one layer of a different ductile titanium alloy having a composition and properties different from said other ductile titanium alloy layer.

7. A hybrid titanium metal matrix composite article according to claim 1 comprising at least one layer of a Ti3 Al and/or TiAl titanium aluminide alloy, and at least one layer of a ductile titanium alloy selected from the group consisting of Ti-64, Ti-5621S, Ti-15-3 and Ti-6246.

8. A composite article according to claim 2 wherein said filaments are embedded in at least some of said layers of titanium aluminide alloy.

9. A composite article according to claim 2 wherein said filaments are embedded in at least some of said layers of titanium alloy.

10. A composite article according to claim 2 wherein said filaments, comprise at least one material selected from the group consisting of boron, B4 C, TiB2, Al2 O3, silicon nitride, silicon carbide, tungsten and molybdenum.

11. A composite article according to claim 2 wherein said filaments comprise silicon carbide filaments.

12. A composite article according to claim 3 wherein a plurality of filaments are embedded in said matrix.

13. A composite article according to claim 4 in which said ductile titanium alloy layers comprise layers of different titanium alloys having different compositions and properties.

14. A composite article according to claim 4 wherein said titanium aluminide comprises Ti3 Al and/or TiAl.

15. A composite article according to claim 4 wherein said ductile titanium alloy contains about 6% by weight aluminum, about 4% by weight vanadium and the balance titanium.

16. A composite article according to claim 5 wherein at least some of said layers of titanium alloy have a plurality of filaments embedded therein.

17. A composite article according to Claim 5 wherein said filaments comprise materials selected from the group consisting of boron, B4 C, TiB2, Al2 O3, silicon nitride, silicon carbide, tungsten and molybdenum.

18. A composite article according to claim 5 wherein said filaments comprise silicon carbide.

19. A composite article according to claim 5 wherein said titanium aluminide alloy is a Ti3 Al alloy selected from the group consisting of titanium alloys containing about 14% by weight aluminum, about 25% by weight niobium, the balance titanium, and titanium alloys containing about 14% by weight aluminum, about 20% by weight niobium, about 3% by weight vanadium, about 2% by weight molybdenum and the balance titanium.

20. A composite article according to claim 5 wherein said titanium aluminide comprises Ti3 Al and/or TiAl.

21. A composite article according to claim 5 wherein the thickness of each of the titanium ally layers measures between about 0.001 and about 0.010 inches.

22. A composite article according to claim 5 wherein the thickness of each of the titanium aluminide layers measures about 0.001 and about 0.010 inches.

23. A composite article according to claim 5 wherein said filaments are unidirectionally oriented.

24. A composite article according to claim 5 wherein said layers of titanium alloy and titanium aluminide are diffusion bonded to each other.

25. A composite article according to claim 5 wherein each layer of titanium alloy comprises a layer of titanium alloy with said filaments embedded therein and each layer of titanium aluminide alloy is free of said filaments.

26. A composite article according to claim 7 in which said titanium alloy layer includes a plurality of filaments.

27. A composite article according to claim 12 wherein said filaments are present within at least some of said layers of titanium aluminide alloy.

28. A composite article according to claim 12 wherein said filaments are embedded within at least some of said layers of titanium alloy.

29. A composite article according to claim 25 wherein each of said layers is metallurgically bonded to adjoining layers.

30. A composite article according to claim 26 wherein said filaments comprise silicon carbide.

31. A composite article according to claim 28 in which said filaments are embedded between and within adjacent layers of titanium alloy.

32. A composite article according to claim 28 in which two layers of said filaments are embedded within at least some of said layers of titanium alloy to provide a high density filament content.

Process for producing forged .alpha.-2 based titanium aluminides having fine grained and orthorhombic transformed microstructure and articles made therefrom

US5906692

- **Patent Assignee**
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- **International Patent Classification**
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- **CPC Code**
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  1993US-08174394 1993-12-28
  1994US-08362132 1994-12-22
  1996US-08705081 1996-08-29

- **Fampat family**

US5906692	A	1999-05-25	[US5906692]

- **Abstract:**

(US5906692)
Process for improving the mechanical properties and ultrasonic inspection efficiency of alpha-2 titanium aluminide forged products, parts or components and for preserving or retaining these improved properties at use temperatures up to about 1200 DEG F. The process involves heating a billet of the alloy below its beta transus temperature, forging the heated billet within a true strain range of about 1.2 and 1.4 and within a strain rate of about 0.1 and 0.15 per second to produce >90% refinement of prior beta grains to a typical size less than about 0.2 mm, preferably about 0.02 mm, and cooling the forged billet to room temperature. A heat-treatment may be applied by rapidly cooling to room temperature to form the transformed beta phase with no precipitation of alpha platelets, and then heating to a transformation temperature (T) for a period of time (t) to form a beneficial orthorhombic crystalline phase microstructure including very fine alpha-2 particles, and not heating the alloy again above the use temperature of 1200 DEG F., whereby the beneficial microstructure is retained and remains stable for extended periods of exposure at or below 1200 DEG F.

Claims

(US5906692)

We claim:

1.

A forging process for refining the BETA grain size to improve the mechanical properties and ultrasonic inspection properties of a forging of an alpha-2 titanium aluminide to produce a typical maximum prior BETA grain size less than about 0.2 mm, comprising the steps of:

(a) heating an alpha-2 titanium alloy billet to a temperature which is 75 to 135 (degree) F. below the BETA transus temperature of said alloy;

(b) forging the heated billet within a true strain range of about 1.2 to 1.4 and within a strain rate of about 0.1 to 0.15 per second, to effect dynamic recrystallization and >90% refinement of prior BETA grains to a typical size less than about 0.2 mm, and

(c) cooling the forged billet to room temperature to produce a forged alpha-2 titanium aluminide alloy having fine grained microstructure, improved mechanical properties and ultrasonic inspection properties and comprising

- the additional steps of rapidly cooling the forged alloy in step (c) to produce a transformed BETA phase microstructure with substantially no precipitation of alpha-2 platelets;

reheating the cooled alloy to a transition temperature (T) between about 1300 (degree) and 1700 (degree) F. for a period of time (t) between about 1.0 and 1.5 hours to form orthorhombic phase and fine ALPHA 2 particles as important microstructural constituents of the forging, and cooling to room temperature to produce an alpha-2 titanium aluminide forging having stable fine grained microstructure, improved mechanical properties and ultrasonic inspection properties.

2. A forging process according to claim 1 in which the transition temperature (T) is between about 1550 (degree) and 1600 (degree) F.

3. A process for improving the microstructure and mechanical properties of an alpha-2 titanium aluminide forging by formation of an orthorhombic phase and fine ALPHA 2 particles in the microstructure, comprising the steps of in the following sequence:

(a) heating a forged alpha-2 titanium aluminide to a solutioning temperature which is 75 to 135 (degree) F. below the BETA transus temperature of said alloy;

(b) rapidly cooling the forged alloy to room temperature to produce a transformed BETA phase microstructure with substantially no precipitation of ALPHA 2 platelets,

(c) reheating the solutioned and cooled forging to a transition temperature (T) between about 1300 and 1700 (degree) F. for a period of time (t) between about 1.0 and 1.5 hours to form orthorhombic phase and fine ALPHA 2 particles as important microstructural constituents, and

(d) cooling to room temperature to produce an alpha-2 titanium aluminide forging having stabilized microstructure and improved mechanical properties.

4. A process according to claim 3 in which said alpha-2 titanium aluminide comprises Ti-25Al-10Nb-3V-1Mo.

5. A process according to claim 3 in which the solutioning temperature in step (a) is between about 1875 (degree) F. and 1935 (degree) F.

6. A process according to claim 3 in which the transition temperature (T) in step (c) is between about 1550 (degree) F. and 1600 (degree) F.

Castable gamma titanium-aluminide alloy containing niobium, chromium and silicon and turbocharger wheels made thereof

WO9630551

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- **International Patent Classification**
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- **Priority Details**
  1995US-08412475 1995-03-28

- **Fampat family**

WO9630551	A1	1996-10-03	[WO9630551]

- **Abstract:**
  (WO9630551)
  A gamma titanium aluminide rotor is produced from an alloy consisting essentially of the formula Ti-AlaCrbNbcSid, where "a", "b", "c" and "d" are in atomic percent, "a" ranges from about 44 to about 48, "b" ranges from about 2 to about 6, "c" ranges from about 2 to about 6 and "d" ranges from about 0.5 to about 1.0. The alloy is castable into a mold to thereby form the rotor. Advantageously, the mold can contain fine detail and sharp angle. Molded rotors composed of the alloy exhibit excellent strength and toughness.

Claims

(WO9630551)

What is claimed is:

1.

A y-TiAI turbocharger rotor cast from a composition consisting essentially of the formula Ti-AlaCrbNbcSid, where "a" , "b", "c" and "d" are in atomic percent, "a" ranges from about 44 to about 48, "b" ranges from about 2 to about 6;
"c" ranges from about 2 to about 6 and "d" ranges from about 0.5 to about 1.0.

2. A cast y-TiAl turbocharger rotor having the composition as recited by claim 1, wherein "a" is 46.

3. A cast γ-TiAl turbocharger rotor having the composition U recited by claim 1, wherein "a" is 48, "b" is 2 and "c" is 2.

4. A cast y-TiAl turbocharger rotor having the composition, as recited by claim 1, wherein "a" is 48, "b" is 2 and "c" is 4.

Castable gamma titanium-aluminide alloy containing niobium, chromium and silicon

WO9630552

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- **Abstract:**
  (WO9630552)
  A gamma titanium aluminide alloy has a composition consisting essentially of the formula Ti-AlaCrbNbcSid, where "a", "b", "c" and "d" are in atomic percent, "a" ranges from about 44 to about 48, "b" ranges from about 2 to about 6; "c" ranges from about 2 to about 6 and "d" ranges from about 0.5 to about 1.0. The alloy is castable into molds containing fine detail and sharp angle. Molded parts composed of the alloy exhibit excellent strength and toughness.

Claims

(WO9630552)

What is claimed is:

1. A composition consisting essentially of the formula Ti-Al,CrbNbid, where "a", a "b", "c" and "d" are in atomic percent, "a" ranges from about 44 to about 48, "b" ranges from about 2 to about 6;
"c" ranges from about 2 to about 6 and "d" ranges from about 0.5 to about 1.0.

2. A composition as recited by claim 1, wherein "a" is 46.

3. A composition as recited by claim 1, wherein "a" is 48, "b" is 2 and "c" is 2.

4. A composition, as recited by claim 1, wherein "a" is 48, "b" is 2 and "c" is 4