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Ingot production method of TiAl basic alloy

JP2009113060

- **Patent Assignee**
  KOBE STEEL
- **Inventor**
  FURUTA SEISHI
  SODO TATSUHIKO
  NOHARA MASAMI
  KANAMARU MORIYOSHI
- **International Patent Classification**
  B22D-011/00 B22D-011/01 B22D-011/041 B22D-021/06 B22D-023/00 C22C-001/02 C22C-014/00

- **Publication Information**
  JP2009113060 A 2009-05-28 [JP2009113060]
- **Priority Details**
  2007JP-0286622 2007-11-02

- **Fampat family**

JP2009113060	A	2009-05-28	[JP2009113060]
JP5064974	B2	2012-10-31	[JP5064974]

- **Abstract:**
  (JP2009113060)
  PROBLEM TO BE SOLVED: To provide a method for producing an ingot of a TiAl-based alloy which can produce a large-sized ingot composed of a lightweight and high strength TiAl-based alloy in which the content of oxygen is low in the whole region, and which has satisfactory room temperature ductility and has no casting defects. SOLUTION: In the method where the bottom plate 3 of a water-cooled crucible 1 made of copper is drawn out in downward direction while feeding a melted base material b formed by melting alloy raw materials (a), so as to produce a long-length ingot d, among the alloy raw materials (a), the content of oxygen in a Ti raw material is controlled to <+800 ppm and the content of oxygen in an Al raw material is controlled to <+100 ppm, and, in the case the other alloy components are Cr, V and Nb, the content of oxygen therein is controlled to <+2,000 ppm, and in the case the other alloy component is Mn, the content of oxygen therein is controlled to <+3,000 ppm. COPYRIGHT: (C)2009,JPO&INPIT

Claims

(JP2009113060)

1. After melting the alloy raw materials, solidifying, in the ingot production method of the TiAl basic alloy which produces the long shaku ingot which becomes the TiAl basic alloy by in advance the component supplying the melting basic material which becomes with the primary ingot which was adjusted, inside the water cooling copper crucible, melting the aforementioned melting basic material with the induction heating by the high frequency coil which surrounds around that water cooling copper crucible it makes the hot water pool, making the sabot which movement unrestrictedly was formed the lower part move in the top and bottom direction which forms the aforementioned water cooling copper crucible, it pulls the aforementioned hot water pool on that sabot to the lower part and pulls out and solidifies,

As inside the aforementioned alloy raw materials, oxygen content of the Ti raw materials below 800ppm, oxygen content of the Al raw materials is designated as below 100ppm, when the other alloy component Cr, V, it is Nb, when those oxygen contents below 2000ppm, the other alloy component is Mn, ingot production method of the TiAl basic alloy which features that oxygen content is designated as below 3000ppm.
2. As inside the aforementioned alloy raw materials, oxygen content of the Ti raw materials below 700ppm, oxygen content of the Al raw materials is designated as below 50ppm, ingot production method of TiAl basic alloying the claim 1 statement which features that oxygen content of the other alloy component is designated as below 1000ppm.
3. As for the aforementioned alloy raw materials, melting beforehand, the claim ingot production method of TiAl basic alloying 1 which features that it is the material which it deoxidized processed or 2 statements.

Ingot production method of TiAl basic alloy

JP2009113062

- **Patent Assignee**
  KOBE STEEL
- **Inventor**
  FURUTA SEISHI
  SODO TATSUHIKO
  SAKAMOTO KOICHI
  KUNII KAZUTAKA
  ISHIDA HITOSHI
- **International Patent Classification**
  B22D-011/00 B22D-011/01 B22D-021/06 B22D-023/00 B22D-027/04

- **Publication Information**
  JP2009113062 A 2009-05-28 [JP2009113062]
- **Priority Details**
  2007JP-0286625 2007-11-02

- **Fampat family**

JP2009113062	A	2009-05-28	[JP2009113062]
JP5022184	B2	2012-09-12	[JP5022184]

- **Abstract:**
  (JP2009113062)
  PROBLEM TO BE SOLVED: To provide a method for producing an ingot of a TiAl-based alloy which can suppress the generation of surface defects, and a sound large-sized ingot can be produced. SOLUTION: In the method where a crucible bottom 1 is drawn out in the downward direction while feeding a melting raw material 3, so as to produce an ingot 6 according to a CCIM (cold crucible induction melting) process, the range of the power P to be applied when the melting raw material 3 is melted, so as to be a molten metal pool 5 is controlled to the range satisfying the inequality of 5600XD(sup 2)COPYRIGHT: (C)2009,JPO&INPIT

Claims

(JP2009113062)

1. Being ingot production method of the TiAl basic alloy which produces the ingot where it pulls the aforementioned hot water pool on that pot bottom outside the induction heating territory by the aforementioned high frequency coil by the fact that the pot bottom dissolving with the induction heating by the high frequency coil which surrounds around that water cooling copper pot designates the dissolved raw materials which are supplied inside the water cooling copper pot which movement unrestrictedly was formed, as the hot water pool in top and bottom direction, makes the aforementioned pot bottom the lower part move, pulls out and solidifies, becomes the TiAl basic alloy,

Dissolving the aforementioned dissolved raw materials, the electric power which it throws to the occasion where it makes the hot water pool (P), ingot production method of the TiAl basic alloy which features that it makes inside the range which satisfies the formula below.

5600xD2<P<8000xD2

With upper formula, as for P the electric power which is thrown to the occasion where the dissolved raw materials are dissolved (the unit: kW)

As for D inside diameter of water cooling copper pot (unit: m)

2. Being ingot production method of the TiAl basic alloy which produces the ingot where it pulls the aforementioned hot water pool on that pot bottom outside the induction heating territory by the aforementioned high frequency coil by the fact that the pot bottom dissolving with the induction heating by the high frequency coil which surrounds around that water cooling copper pot designates the dissolved raw materials which are supplied inside the water cooling copper pot which movement unrestrictedly was formed, as the hot water pool in top and bottom direction, makes the aforementioned pot bottom the lower part move, pulls out and solidifies, becomes the TiAl basic alloy,

Dissolving the aforementioned dissolved raw materials, the electric power which it throws to the occasion where it makes the hot water pool (P), ingot production of the TiAl basic alloy which features that it makes inside the range which satisfies the formula below.

2400xD2<P<4000xD2

With upper formula, as for P the electric power which is thrown to the occasion where the dissolved raw materials are dissolved (the unit: kW)

As for D inside diameter of water cooling copper pot (unit: m)

Ingot production method of TiAl basic alloy
JP2009113061

- **Patent Assignee**
  KOBE STEEL
- **Inventor**
  FURUTA SEISHI
  SODO TATSUHIKO
  KANAMARU MORIYOSHI
- **International Patent Classification**
  B22D-011/00 B22D-011/01 B22D-021/06 B22D-023/00 B22D-027/04 F27B-014/06 F27B-014/14 F27D-011/06

- **Publication Information**
  JP2009113061 A 2009-05-28 [JP2009113061]
- **Priority Details**
  2007JP-0286623 2007-11-02

- **Fampat family**

JP2009113061	A	2009-05-28	[JP2009113061]
JP5006161	B2	2012-08-22	[JP5006161]

- **Abstract:**
  (JP2009113061)
  PROBLEM TO BE SOLVED: To provide a method for producing an ingot of a TiAl-based alloy where the influence of contamination from a bottom board to an ingot can be reduced, there is no need of preparing the bottom board every melting, and further, the drawing-out of the ingot can be smoothly performed. SOLUTION: In the method where a crucible bottom 1 is drawn out to the lower part while feeding a melting raw material 3, so as to produce an ingot 5 composed of a TiAl-based alloy according to a CCIM (cold crucible induction melting) process, the upper face of a bottom board body 6a upon the start of the melting is made to come to <+7 mm in the upper part from the lower edge of a high frequency coil 4, and further, the upper face of the bottom board 6 is made to be a position above the lower edge of the high frequency coil 4. Further, a gap 7 of 1 to 8 mm is formed between the outer circumferential face of the bottom board body 6a and the inner wall face of a water-cooled crucible 2 made of copper. COPYRIGHT: (C)2009,JPO&INPIT

Claims

(JP2009113061)

1. The crucible bottom in top and bottom direction the melting raw materials which are supplied inside the water cooling copper crucible which movement unrestrictedly was formed, melting with the induction heating by the high frequency coil which surrounds around that water cooling copper crucible, above diameter 200mm, being ingot production method of the TiAl basic alloy which produces the ingot where the height size for diameter becomes, the TiAl basic alloy above the 1.5 times by making the aforementioned crucible bottom the lower part move,

The batholith which becomes the melting start material when starting the melting in the surface of the aforementioned crucible bottom is provided, that batholith, the batholith itself and is designated as the aforementioned melting raw materials which are deposited in that surface where becomes more structure or the pure titanium material or the titanium alloy material only of the batholith itself which becomes the pure titanium material or the titanium alloy material and two layer system which is formed with the batholith upper material of the abbreviation same material,

As surface position of the aforementioned batholith itself when starting the melting, in order to become position below upper part 7mm, arranges from bottom position of the aforementioned high frequency coil,

Surface position of the aforementioned batholith when starting the melting, in order to become position above bottom position of the aforementioned high frequency coil, ingot production method of the TiAl basic alloy which features that it arranges.
2. When starting the melting, with the peripheral aspect of the aforementioned batholith itself which becomes the pure titanium material or the titanium alloy material and the inner wall aspect of the aforementioned water cooling copper crucible, ingot production method of TiAl basic alloying the claim 1 statement which features that the opening of 1-8mm is formed.
3. In the aforementioned opening, ingot production method of TiAl basic alloying the claim 2 statement which features that it fills up stuffing ones of the heatproof ceramics make.
4. As for height size of the aforementioned batholith itself which becomes the pure titanium material or the titanium alloy material, the claim in either 1 which features that it is 0.15-0.5 two times the inside diameter of the aforementioned water cooling copper crucible or 3 ingot production method of TiAl basic alloying the statement.

Production of alloy based on tial as intermetallc compound
JP05345936

- **Patent Assignee**
  KOBE STEEL
- **Inventor**
  FUJITSUNA NORIYUKI
  MIYAMOTO ATSUYUKI
- **International Patent Classification**
  C22C-001/00 C22C-001/02 C22C-014/00 C22F-001/00 C22F-001/18 F01D-005/28

- **Publication Information**
  JPH05345936 A 1993-12-27 [JP05345936]
- **Priority Details**
  1992JP-0153510 1992-06-12

- **Fampat family**

JPH05345936	A	1993-12-27	[JP05345936]

- **Abstract:**
  (JP05345936)
  PURPOSE: To reduce the temp. and time required to heat-treat an ingot and to enhance hot workability and productivity. CONSTITUTION: An alloy whose principal constituent phase is TiAl as an intermetallic compd. contg. >47-<55 atomic % Al is cast at >=1 deg.C/sec cooling rate at the time of solidification and the cast alloy is heat-treated at 1,100-1,350 deg.C for >=30min. The alloy may further contain <+5 atomic % one or more among Mn, Cr and V as additive elements. COPYRIGHT: (C)1993,JPO&Japio

Claims

(JP05345936)

1. 47 atmoic % to exceed Al, 55 atmoic % under content
The alloy which designates the intermetallic TiAl which it does as principal constitution phase,
Cooling rate when solidifying above 1.deg.C/second, to cast, after that 1100
.deg.C At temperature above and below the 1350.deg.C of 30 minutes or more heat-treating
Production method of the intermetallic TiAl basic alloy which is made feature.
2. Furthermore, as a additional element Mn and Cr, V
Above the 1 or 2 kinds which are chosen from inside 5 atmoic % or less content
Intermetallic Ti of the claim 1 statement which features that it does
Production method of Al basic alloy.

Tial-based intermetallic compound alloy excellent in workability, toughness and high temperature strength

JP07173557

- **Patent Assignee**
  KOBE STEEL
- **Inventor**
  FUJITSUNA NORIYUKI
  MIYAMOTO ATSUYUKI
- **International Patent Classification**
  C22C-014/00

- **Publication Information**
  JPH07173557 A 1995-07-11 [JP07173557]
- **Priority Details**
  1993JP-0317850 1993-12-17

- **Fampat family**

JPH07173557	A	1995-07-11	[JP07173557]

- **Abstract:**
  (JP07173557)
  PURPOSE: To obtain a TiAl-based intermetallic compd. alloy excellent in various characteristics in a well-balanced state by imparting a mixed structure to the matrix of an alloy and allowing fine deposits to exist. CONSTITUTION: A mixed structure consisting of an isometric particle structure 1 and a lamellar structure 2 is imparted to the matrix of a TiAl-based intermetallic compd. alloy and fine deposits 3 of TiC, etc., are allowed to exist in the particles and at the particle boundaries. The deposits 3 are of a 3rd phase other than .gamma.-phase (TiAl) and .alpha.2-phase (Ti(sub 3)Al) and of a compd. of one or more kinds of elements selected from among C, Si and B and an element forming the inter-metallic compd. The objective alloy excellent in workability, toughness and high temp. strength is obtd. COPYRIGHT: (C)1995,JPO

Claims

(JP07173557)

Claims machine translated from Japanese
1. Matrix, and so on axial grain organization and lamella
To consist of the mixture organization of organization, at the same time inside the grain and in the grain boundary minuteness
It features that it is something where the deposit exists, processing
The TiAl fund intergeneric chemical combination which is superior in characteristic, tenacity and strength at elevated temperature
Thing alloy.
2. Deposit, I phase (TiAl) and I [2]
Phase (Ti [3] Al) in the claim 1 which is 3rd phase other than statement
TiAl fund intergeneric chemical compound alloy.
3. The deposit, C, the group which consists of Si and B
From the element and the intermetallic of 1 kinds or more which are chosen are formed
In the claim 1 which is the chemical compound of the [ru] element or 2 Ti of statement
Al fund intergeneric chemical compound alloy.

Surface-modified tial intermetallc compound-based alloy member for heat resistant material excellent in high temperature oxidation resistance

JP06299350

- **Patent Assignee**
  KOBE STEEL
- **Inventor**
  SATO HIROSHI
  SUGIZAKI YASUAKI
  SATO TOSHIKI
  YASUNAGA TATSUYA
  KAWADA KAZUHISA
  YASHIKI TAKASHI
- **International Patent Classification**
  C22C-014/00 C23C-014/16 C23C-014/48

- **Publication Information**
  JPH06299350 **A 1994-10-25 [JP06299350]**
- **Priority Details**
  1993JP-0026988 1993-02-16
  1993JP-0098161 1993-04-23

- **Fampat family**

JPH06299350	A	1994-10-25	[JP06299350]

- **Abstract:**
  (JP06299350)
  PURPOSE:To impart excellent high temp. oxidation resistance to a TiAl intermetallic compd.-based alloy member by a simple process by implanting ions of Ni, Ta or a Pt group element into the surface of the member. CONSTITUTION:Ions of one or more kinds of elements selected among Ni, Ta and a Pt group element are implanted into the surface of a TiAl intermetallic compd.-based alloy member to form a layer enriched with the ion implanted elements in the surface of the member. The elements do not form a compd. and produce an effect of inhibiting the diffusion of oxygen and the oxidation of Al only by existence as the elements. The Pt group element is Ru, Rh, Pd, Os, Ir or Pt. The pref. amt. of ions implanted is >=1X10<15> ions/cN<2>).

Claims

(JP06299350)

1. Surface of intermetallic TiAl basic alloy component
From the group which consists of Ni, Ta and the elements of the platinum group choosing
The ion to fill the element above [ru] 1 kind, the aforementioned intermetallic T
In the surface section of the iAl basic alloy component, the aforementioned ion implantation element it is dense
The resistance high temperature which features that it is something which formed degree enriched horizon
The surface improvement intermetallic TiA for the heat resistant material which is superior in oxidation characteristic
l basic alloy component.

Tial based alloy excellent in ductility at ordinary temperature
JP05271829

- **Patent Assignee**
  KOBE STEEL
- **Inventor**
  HENMI YOSHIO
  ABE MUTSUMI
- **International Patent Classification**
  C22C-014/00

- **Publication Information**
  JPH05271829 A 1993-10-19 [JP05271829]
- **Priority Details**
  1992JP-0100431 1992-03-25

- **Fampat family**

JPH05271829	A	1993-10-19	[JP05271829]

- **Abstract:**

(JP05271829)
PURPOSE: To provide a TiAl based alloy having high heat resistance, ensuring enhanced ductility at ordinary temp. while attaining reduced weight and capable of increasing the range of its use. CONSTITUTION: This TiAl based alloy excellent in ductility at ordinary temp. consists of 21.0-41.0wt.% Al, 0.05-6.0wt.% Sc and the balance essentially Ti. In this case, 0.2-10.0wt.% Cr, V or Mn may be added in combination with the substitution with Y for part or all of the Sc. COPYRIGHT: (C)1993,JPO&Japio

Claims

(JP05271829)

1. Weight % With, Al: 21.0-41.0% and Sc:
The 0.05- 6.0% is included, the remainder substantially consists of Ti
The TiAl basic alloy which is superior in the normal temperature ductility which is featured.
2. Weight % With, Al: 21.0-41.0% and Sc:
To include the 0.05- 6.0%, at the same time Cr, V, one kind of Mn or one
To designate the addition quantity above kind as 0.2 -10.0%, the remainder substantial T
TiAl which is superior in the normal temperature ductility which features that it consists of i
Basic alloy.
3. Claim in 1 or 2, the portion of Sc and
Being superior to the normal temperature ductility which features that all is substituted with Y
It is the TiAl basic alloy.

Insert material for joining ti-al series intermetallic compound and ti base alloy and joining method therefor and joined body

JP11077365

- **Patent Assignee**
  KOBE STEEL
- **Inventor**
  TAKEDA HIROYUKI
- **International Patent Classification**
  B23K-001/19 B23K-031/02 B23K-035/14 B23K-035/22 B23K-035/28 B23K-035/30 B23K-103/14 C22C-005/08 C22C-009/00 C22C-021/00 C23C-014/34

- **Publication Information**
  JPH1177365 A 1999-03-23 [JP11077365]
- **Priority Details**
  1997JP-0194435 1997-07-18
  1998JP-0163903 1998-06-11

- **Fampat family**

JPH1177365	A	1999-03-23	[JP11077365]

- **Abstract:**
  (JP11077365)
  PROBLEM TO BE SOLVED: To provide a new insert material capable of obtaining sound joined boundaries at the time of joining a Ti-Al series intermetallic compd. and a Ti base alloy and free from the generation of cracking in the Ti-Al series intermetallic compd. SOLUTION: This joined body is the one in which both side faces are provided with brazing filler metal layers 12 and 14 via a stress relaxing layer 13, and three forms are shown. Concretely, as a primary insert material, the brazing filler metal layers 12 and 14 are formed by Al alloy solder, and the stress relaxing layer 13 is formed by Ag or an Ag alloy. As a secondary insert material, the brazing filler metal layers 12 and 14 are formed by Ag-Cu series solder contg. In, and the stress relaxing layer 13 is formed by Cu or a Cu alloy. Then, as a third insert material, the bazing fillet metal materials 12 and 14 are formed by Ag-Cu series solder contg. In, and the stress relaxing layer 13 is formed by Ag or an Ag alloy. COPYRIGHT: (C)1999,JPO

Claims

(JP11077365)

Claims machine translated from Japanese
1. Through stress relief layer, on the both sides the brazing filler metal
The TiAl system which features that it is something where it can provide layer
The intermetallic and insertion in order to connect the Ti basic alloy
Material.
2. The aforementioned brazing filler metal layer with the Al alloy wax shape
The forming and the aforementioned stress relief layer with the Ag or Ag alloy
In the claim 1 which is something which was formed the insertion material of statement.
3. The description above thickness of Ag or Ag alloy 0.1
In the claim 2 which is -3mm the insertion material of statement.
4. Ag-C where the aforementioned brazing filler metal layer contains In
By, the u wax to be formed, the aforementioned stress relief layer Cu and
In the claim 1 which is something which was formed by the Cu alloy description
Insertion material of *** .
5. The description above thickness of Cu or Cu alloy 0.1
In the claim 4 which is -3mm the insertion material of statement.
6. The description above thickness and TiA of Cu or Cu alloy
Al content in l based intermetallic, the below-mentioned relational expression (1)
Or in the claim 5 which is something which it is satisfied (2) [i] of statement
[nsato] material.

(1) thickness of Cu or Cu alloy below 0.7mm place
Combination
(62.22-494.02x [tCu] +1650.5x [tCu] (2)-2709.3 A [tCu]
(3)+2330.2 A [tCu] (4)-1038.7x [tCu] (5)+222.62 A [tCu] (6)-1
7.777 A [tCu] (7))/{1+5x ([XAl] /100-0.3) (2)} (2) <=12.15
(2) thickness of the Cu or Cu alloy exceeds 0.7mm
When
(7.1946x [tCu] +1.1681x [tCu] (2)-0.23621x [tCu] (3)-0.0
3275)/{1+5 A ([XAl] /100-0.3) (2)} (2)<=12.15
In formula, [tCu]: Thickness of Cu or Cu alloy (mm)
[XAl]: Al content in TiAl based intermetallic (atom
%) Is.
7. Ag-C where the aforementioned brazing filler metal layer contains In
By, the u wax to be formed, the aforementioned stress relief layer Ag and
In the claim 1 which is something which was formed by the Ag alloy description
Insertion material of *** .
8. The description above thickness of Ag or Ag alloy 0.1
In the claim 7 which is -3mm the insertion material of statement.
9. In claim 2 or 3 insertion material of statement
The TiAl based intermetallic and the Ti basic alloy are connected of making use
Being [ru] method, the TiAl based intermetallic and the Ti basic alloy
After inserting the said insertion material between, the vacuum or inertness
Between the TiAl metal which feature that it heats under atmosphere
Connecting method of chemical compound and Ti basic alloy.
10. In either of claim 4-8 in of statement
Making use of the [sato] material the TiAl based intermetallic and the Ti basic alloy
Being the method of connecting, TiAl based intermetallic and T
After inserting the said insertion material during i basic alloy, the [ma] under the vacuum
It is under inactive atmosphere it heats to the temperature which does not exceed the 783.deg.C
The TiAl based intermetallic and the Ti basis which feature that it does
Connecting method of alloy.
11. In claim 9 or 10 TiAl of statement
Being connecting method of the type intermetallic and the Ti basic alloy, in
On the surface of the TiAl based intermetallic which is connected with the [sato] material
TiA which is something which beforehand administers metal coating processing
Connecting method of l based intermetallic and Ti basic alloy.
12. With the aforementioned metal coating processing formation
Is done the metal coating layer which Ag or Cu, or
In the claim 11 which is the Ag-Cu based alloy connecting method of statement.
13. TiAl based intermetallic and Ti basic alloy
In either of claim 1-8 insertion material of statement mediating/helping
Doing, the wax TiA which features that it is something which is attached

Connection union of l based intermetallic and Ti basic alloy.

14. TiAl which is connected with the aforementioned insertion material

Metal coating layer exists on the surface of the type intermetallic

In the claim 13 which it does connection union of statement.

15. The aforementioned metal coating layer does Ag young, the [ku]

In the claim 14 which is Cu or the Ag-Cu based alloy description

Connection union of *** .

16. The aforementioned brazing filler metal layer, crystal in stress relief layer

Paralleling to the grain boundary, either of the claim 13-15 which has permeated?

Connection union of statement.

17. As a target material for sputtering

In either of the claim 13-16 which is something which is used description

Connection union of *** .

Production of titanium aluminum base alloy

JP08225907

- **Patent Assignee**
  KOBE STEEL
- **Inventor**
  FUJITSUNA NORIYUKI
  MIYAMOTO ATSUYUKI
- **International Patent Classification**
  C22C-014/00 C22C-021/00 C22F-001/00 C22F-001/18

- **Publication Information**
  JPH08225907 A 1996-09-03 [JP08225907]
- **Priority Details**
  1995JP-0033589 1995-02-22

- **Fampat family**

JPH08225907	A	1996-09-03	[JP08225907]

- **Abstract:**

(JP08225907)
PURPOSE: To obtain a TiAl base alloy having uniform and fine grain structure and excellent workability by executing the specific times of works having a specific working strain speed to the TiAl base alloy at a specific temp. to make the total working ratio the specific value and successively, applying the work having a specific working strain speed and a specific working ratio. CONSTITUTION: The TiAl base alloy is heated at 900-1200 deg.C. The multi-step work having <1X10(sup -2)/sec working strain speed under the above heating temp. is repeated >=4 times and the total working ratio is made to be >=30%. Successively, the work having >=1X10(sup -2)/sec working strain speed and >=20% working ratio is applied. In the initial stage of the repeating works, the work is executed under the condition of being difficult to develop the crack and equi-axed grains are promoted to develop in the structure and the workability is made high. When the total working ratio becomes >=30%, the deforming resistance becomes <+1/2 of that at the initial stage of the work. In the following work, the working strain speed is made quicker and thereby, the coarsening of recrystallized grain is restrained and motive recrystallizing grain diameter is made small. COPYRIGHT: (C)1996,JPO

Claims

(JP08225907)

Claims machine translated from Japanese
1. Ti which designates intermetallic TiAl as principal constitution phase
Al basic alloy, temperature: To heat to 900 -1200.deg.C, the heating warm
In under degree, process rate of strain: 1x10 (- 2)/adding under second
Manufacture multi-stage processing which 4 times or more is repeated entire process ratio: 30% or more
Doing, to administer, continuation and process rate of strain: The 1x10 (- 2)/second from here
On, process ratio: Ti which features that processing 20% or more is administered
Production method of Al basic alloy.
2. Processing which continues to the aforementioned multi-stage processing, the processed [hi]
Completed speed: The 1x10 (- 2)/to repeat processing above second, entire processing
The claim 1 description which is done with repetition processing which designates ratio as 20% or more
Production method of TiAl basic alloying the *** .

Titanium aluminum alloy thin plate and its production
JP08225906

- **Patent Assignee**
  KOBE STEEL
- **Inventor**
  FUJITSUNA NORIYUKI
  SAKAMOTO KOICHI
  SODO TATSUHIKO
  MIYAMOTO ATSUYUKI
- **International Patent Classification**
  C22C-001/00 C22C-014/00 C22F-001/00 C22F-001/18

- **Publication Information**
  JPH08225906 A 1996-09-03 [JP08225906]
- **Priority Details**
  1995JP-0033588 1995-02-22

- **Fampat family**

JPH08225906	A	1996-09-03	[JP08225906]

- **Abstract:**
  (JP08225906)
  PURPOSE: To provide the method for easily producing a TiAl alloy thin plate excellent in secondary forming property and capable of being subjected to secondary forming without any trouble in execution. CONSTITUTION: A molten metal of a TiAl alloy having the primary constitutional phase of an intermetallic compound TiAl is poured into a cast having a one side heat insulating and one side cooling structure in a plate thickness direction and solidified directionally, then cast in thin film shape. The obtained thin film like ingot is subjected to a hot rolling of >=20% draft. In this production method, the TiAl alloy thin plate having fine particular structure is obtained. COPYRIGHT: (C)1996,JPO

Claims

(JP08225906)

Claims machine translated from Japanese
1. Ti which designates intermetallic TiAl as principal constitution phase
The *** hot water of the Al basic alloy, vis-a-vis board thickness direction one side heat insulation and one side cold
The note hot water doing in the mold of *** structure, depending on the thing which can point to directivity solidification
Vis-a-vis the sheet condition slab which it casts in sheet condition, is obtained, ratio under pressure
The TiAl basis which features that hot rolling of 20% or more is done go
Production method of gold sheet.
2. The case of the aforementioned directivity solidification cooling rate 5.deg.C/
The TiAl basic alloy sheet of the claim 1 statement which is made above second production
Law.
3. Tsune who rolls the hot rolling of the aforementioned slab at constant temperature
The TiAl basic alloy of statement it is thin in the claim 1 which is done with hot press extending or 2
Production method of board.
4. Hot rolling of the aforementioned slab happening of dynamic recrystallization it is dense
[ru] temperature and in the claim 1 which is done at rate of strain, 2 or 3 statement
Production method of TiAl basic alloy sheet.
5. The case of the aforementioned hot rolling rolling temperature 900 .deg.C from here
The claim which is on, rate of strain the 10(0) -10 (- 4)/is second
In 1, 2, 3 or 4 production method of TiAl basic alloy sheet of statement.
6. Hot rolling of the aforementioned slab, slab in sheath
Enclosing, the claim 1 which it does with pack rolling which it rolls,
In either 2 or 4 production method of TiAl basic alloy sheet of statement.
7. *** Make, the aforementioned casting and hot rolling of the aforementioned *** hot water
The case the vacuum or inactive atmosphere is applied as an atmosphere
Claim in either 1 or 6 TiAl basic alloy sheet of statement
Production method.
8. In claim 1, 2, 3, 4, 5, 6 or 7
To be produced by the sheet production method of TiAl basic alloying the statement, the metal
The TiAl basic alloy sheet which becomes between chemical compound TiAl as a principal constitution phase.
9. The claim to which mean diameter of crystal is 15 .micro.m or less
In section 8 TiAl basic alloy sheet of statement.
10. Mean diameter of crystal 5 .micro.m or less, super plasticity
In the claim 8 where the extension is 200% or more or 9 the TiAl basis of statement
Alloy sheet.
11. The claim 8 which is for fabrication, 9 or 10
TiAl basic alloy sheet of statement.

Blank for rolling titanium-aluminum alloy and its production
JP07316683

- **Patent Assignee**
  KOBE STEEL
- **Inventor**
  SAKAMOTO KOICHI
  SODO TATSUHIKO
- **International Patent Classification**
  C22C-001/00 C22C-001/02 C22C-014/00

- **Publication Information**
  JPH07316683 A 1995-12-05 [JP07316683]
- **Priority Details**
  1994JP-0111182 1994-05-25

- **Fampat family**

JPH07316683	A	1995-12-05	[JP07316683]

- **Abstract:**
  (JP07316683)
  PURPOSE: To make it possible to obtain a blank for rolling a TiAl alloy which has decreased casting defects, has excellent workability and is obtd. by easy hot rolling and eventually to obtain a defectless and good TiAl alloy plate by easy rolling CONSTITUTION: This blank for rolling the TiAl alloy is obtd. by pouring the melt of the Till alloy contg. Ti and Al as essential components into casting molds which have planar cavities and have a one-side heat insulating and one side cooling structure in the thickness direction of the plate and casting the melt to a planar shape by allowing the melt to solidify directionally. The blank consists of the planar Till alloy solidified directionally in the thickness direction and the angle formed by the longitudinal direction of the laminar structure of the alloy and the thickness direction is preferably 30 to 60 deg.. COPYRIGHT: (C)1995,JPO

Claims

(JP07316683)

1. TiAl which contains Ti and Al as a major component
The type alloy hot water, to possess the plate shaped cavity, confronting board thickness direction
The note hot water doing in the mold of [te] one side heat insulation and one side cooling structure, directivity solidification
Ti which features that it casts in plate shape by being able to point
Production method of material for Al based alloy rolling.
2. Al quantity in the aforementioned TiAl based alloy hot water 30-50at
% The material for TiAl based alloy rolling of claim 1 statement which is production
Law.
3. The case of the aforementioned casting as an atmosphere the vacuum or non-
The claim TiAl combination of 1 where active atmosphere is applied or 2 statements
Production method of material for gold rolling.
4. In board thickness direction directivity plate shaped TiAl which solidifies
To consist of the type alloy, longitudinal direction and board thickness one of stratified organization of the said alloy
TiAl which features that the angle which direction forms is the 30-60.deg.
Material for type alloy rolling.