

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO	
RAD: 14-4276- -4	FECHA: 2016-06-27 10:20:37
DEP: 2020 DIRECCION DE NUEVAS CREACIONES	EVE: 1 REGISTRO/DEPOSITO/CONCESION/DEPOSITO
TRA: 2 PATENTES DE INVENCION	FOLIOS: 6
ACT: 519 TRASLADOINFORME	

DIRECCIÓN DE NUEVAS CREACIONES

2020
Bogotá, D.C.,

Abogado(a)/Señor(a)
CARLOS R. OLARTE GARCIA

Asunto: Radicación: 14-4276- -4
Trámite: 2
Evento: 1
Actuación: 519
Oficio: 8317
Folios: 6

Patente de Invención	X			Patente de Modelo de Utilidad	
Vía Nacional	X				
Vía PCT (Fase Nacional)		Capítulo I		Capítulo II	
No. Solicitud Internacional					
Fecha de Presentación Internacional					

Como resultado del examen de fondo realizado, con fundamento en el Artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se comunica:

1. Documentos estudiados

Descripción:	Rad. N° 14-004276-00000-0000	10/enero/2014
Reivindicaciones:	Rad. N° 14-004276-00000-0000	10/enero/2014
Dibujos:	Rad. N° 14-004276-00000-0000	10/enero/2014
Prioridad:		

2. Objeto de la invención

De acuerdo con lo establecido en el numeral 1.2.2.2 del Capítulo Primero del Título X de la Circular Única para efectos del examen de patentabilidad, se tendrá en cuenta la

tasa pagada por el solicitante al momento de comenzar el examen para las reivindicaciones adicionales; esto es que cuando la solicitud contenga más de diez (10) reivindicaciones y no se haya pagado la tasa complementaria, sólo se estudiarán las cubiertas por la tasa pagada. Por lo tanto sólo se estudiarán las reivindicaciones 1 a 10 del radicado N° 14-004276-00000-0000, página 10.

Título de la solicitud: “Método para la manufactura de materiales compuesto de matriz metálica de estructura globular con partículas cerámicas” (Pág. 1, radicado N° 14-004276-00000-0000).

El problema planteado en esta solicitud consiste en la necesidad desarrollar matrices compuestas de estructura globular con las cuales se mejoren la mojabilidad de los materiales metálicos con los materiales cerámicos y evitar que se generen espacios vacíos en la matriz metálica lo cuales pueden ser generadores de esfuerzos que afectarían las propiedades del material negativamente.

Para resolver este problema técnico, la solicitud en estudio proporciona un método y equipo para elaborar matrices metálicas con partículas cerámicas, el cual comprende las etapas de obtención de colada en estado semisólido del material metálico, cuyas fracciones de sólido están entre 0,3 y 0,6 con respecto al volumen de la colada, con posterior agitación de la colada, adición de partículas cerámicas recubiertas con metal, moldeo de la colada y forjado del material moldeado.

El objeto de la presente solicitud se relaciona con la Clasificación Internacional de Patentes (CIP): B22D 17/10; B22D 23/00; B22D 25/00; B22D 17/00.

3. De la solicitud de patente

Reivindicaciones (Art 30 D 486, Art 22 PCT)

- En las reivindicaciones 1, 5 a 10, los términos y/ frases: “material metálico”, “enfriar”, “agitación”, “partículas cerámicas”, “metal”, “moldear”, “forjar”, “también se aplica agitación”, “agitación de la etapa (b) se mantienen”, “temperatura”, “partículas” “gas inerte”, son escritos de carácter general y sugieren de forma imprecisa que la protección se extiende a otras posibles variaciones o modificaciones, se sugiere realizar las modificaciones respectivas utilizando términos que describan de forma menos general o definir claramente los rangos.
- En la reivindicación 6 se menciona que en la etapa (b) se mantienen “las condiciones de temperatura”, sin embargo, dicha condición no había sido sugerida previamente, por tanto, solicita realizar las aclaraciones del caso.
- La reivindicación 7 menciona términos imprecisos y/o relativos como lo es: “menor o igual”, utilizado para definir rangos la altura de la saliente, sin embargo le restan claridad, por cuanto dichos términos no permiten establecer un intervalo puntual para cada una de las características técnicas, no siendo estas precisas y por lo tanto no claras, ya que no permiten una comparación con el estado de la técnica.

- La reivindicación 1, es clara porque presenta resultados a alcanzar, al mencionar *“hasta lograr una colada en estado semisólido del material metálico con fracciones de sólidos entre 0,3 y 0,6...”*, lo cual no es permitido. Las reivindicaciones deben caracterizar un producto por la forma o constitución del mismo y las partes que lo componen. No se aceptan reivindicaciones que caractericen resultados, usos, ventajas o efectos.
- La reivindicación 1 se refiere a un método, sin embargo, aunque enseña la secuencia de etapas técnicas no presenta las etapas técnicas con sus condiciones técnicas (temperaturas, flujos, presiones, etc.), por todo lo anterior esta reivindicación no es clara, se sugiere realizar las aclaraciones del caso.

4. Determinación del Estado de la Técnica

El estado de la técnica se determinó con base en la fecha de presentación de la solicitud de prioridad: enero 10 de 2014 y se encontraron los siguientes documentos que anticipan el objeto de esta solicitud:

Ítem	Documento	Título	Fecha de Presentación*
D1	US 4,759,995	“Process for production of metal matrix composites by casting and composite therefrom”	26 Julio de 1988
D2	CN 101733368	Method for preparing metal-based composite material	25 de Abril de 2012

El documento D1¹ divulga Esta invención se refiere a materiales compuestos de matriz de metal y, más particularmente, a la preparación de tales materiales por un proceso de fundición. (Col.1, líneas 13 a 15).

El documento D2² divulga un método para preparar un material compuesto a base de metal (resumen).

Examen de Patentabilidad (Art 14 D486)

Es importante mencionar que el estudio de patentabilidad se realizó teniendo en cuenta lo estipulado en el ítem 4.

Nivel Inventivo (Art18 D486)

La reivindicación 1 consiste en *“Un método para la manufactura de un material compuesto de un material metálico...”* (Ver página 29 del radicado N° 14-004276-00000-0000).

1<https://docs.google.com/viewer?url=patentimages.storage.googleapis.com/pdfs/US4759995.pdf>
2<https://www.google.com.co/patents/CN101733368B?cl=en&dq=US4759995&hl=es&sa=X&ved=0ahUKEwjC7JfSjvDKAhUEqR4KHfsSCHoQ6AEIIzAB>

Comparación de las características técnicas **esenciales**, con las del Estado de la Técnica:

Características Esenciales	D1	D2
Un método para la manufactura de un material compuesto (...) que comprende las etapas de:	Método para producir un compuesto de aleación de aluminio reforzado con material cerámico refractario (reivindicación 1).	Método para elaborar una matriz de material compuesto (reivindicación 1).
a) Obtener una colada líquida del material metálico	Fusión de la aleación de aluminio (reivindicación 1).	Derretir la material de metal (reivindicación 1).
Enfriar la misma con aplicación de agitación	Materiales compuestos reforzados con partículas de carburo de silicio con aleación de aluminio se forman usando técnicas que incluye la agitación de una masa fundida de aleación de aluminio (resumen).	La agitación en la preparación de colada es un proceso de bajo costo para la preparación de un material compuesto, que se produce principalmente una fuerte turbulencia en la masa fundida por la rotación de alta velocidad del agitador, para lograr una distribución uniforme de partículas de refuerzo en la masa fundida (Párr.003)
b) Agitar la colada;		
c) Adicionar partículas cerámicas recubiertas con metal;	Reforzar la aleación con partículas de un material cerámico refractario (reivindicación 2). No menciona que las partículas sean recubiertas con metal	Se añaden de forma uniforme dentro de la masa fundida partículas de refuerzo, dichas partículas de refuerzo puede ser SiC, Al ₂ O ₃ ... (Reivindicaciones 1 y 3). No menciona que las partículas sean recubiertas con metal
d) Moldear la colada; y,	El material compuesto es forzado entonces en el molde (Col.6, líneas 52 a 54). No menciona específicamente que el moldeo sea de la colada	Moldear la masa fundida de colada compuesta para obtener un lingote de material compuesto (reivindicación 1)
e) Forjar el material moldeado	Las palanquillas se forjaron en un disco (Col.9, línea 28).	No menciona

Los documentos D1 y D2 se consideran el estado de la técnica cercano a la invención definida en la reivindicación 1 porque divulgan un método para la elaboración de un material compuesto que incluye una matriz de un metal y un material de refuerzo (resumen).

La diferencia entre la invención, definida en la reivindicación 1 y el método de D1 consiste en que este último no divulga que el material de refuerzo este cubierto por un metal y el paso de moldear la colada.

La diferencia entre la invención, definida en la reivindicación 1 y el método de D2 consiste en que este último no divulga que el materia de refuerzo este cubierto por un metal y el paso de forjar el material moldeado.

El efecto técnico que se logra recubriendo el material cerámico con un metal es que facilita la interacción entre la fase liquida que se encuentra en estado semisólido.

Por lo tanto, el problema técnico objetivo que pretende resolver esta invención se puede formular así: “¿Cómo modificar el método divulgado en D1 de tal manera que permita una mejor interacción con la fase liquida del material metálico que se

encuentra en estado semisólido?”.

Sin embargo, es del conocimiento del técnico medianamente versado en la materia la existencia de materiales compuestos cuya función es la de actuar de ligante de la fase de refuerzo, transmitiéndole un esfuerzo aplicado al conjunto, a la vez que la protege del deterioro superficial. También es importante destacar que una función muy común de la matriz es mantener separados los volúmenes de la segunda fase, a fin de evitar la propagación de fisuras entre distintos volúmenes de la misma. Dichos tipos de materiales compuestos se encuentran los compuestos de matriz metálica. (Ítems 6.1 Tipos de materiales compuestos y 6.1.1 Compuestos de matriz metálica, Pág.144)³. En lo que respecta al paso de moldeo, el documento D2 divulga el paso de moldear la masa fundida de colada compuesta para obtener un lingote de material compuesto (reivindicación 1).

En consecuencia, la persona del oficio normalmente versada en la materia, enfrentada al problema objeto de cómo modificar el método divulgado en D1 de tal manera que permita una mejor interacción con la fase líquida del material metálico que se encuentra en estado semisólido, estaría motivado a cubrir el material cerámico conocido en D1 con el fin de tener un material compuesto de matriz metálica con el fin de mejorar la interacción con la fase líquida del material metálico, y moldear la masa fundida de colada, conocido en D2 en el método de D1, por tanto se considera que la solución de la reivindicación 1 carece de nivel inventivo.

Así mismo, el documento D1 divulga las características de las reivindicaciones dependientes así:

Reivindicación 2: Fusión de la aleación de aluminio (reivindicación 1).

Reivindicación 5: Materiales compuestos reforzados con partículas de carburo de silicio con aleación de aluminio se forman usando técnicas que incluye la agitación de una masa fundida de aleación de aluminio (resumen).

Así mismo, el documento D2 divulga las características de las reivindicaciones dependientes así:

Reivindicaciones 7 y 8: las partículas de material de refuerzo tienen un tamaño de partícula entre 0,5 a 20 μm en un volumen entre 5 y 30%(reivindicación 1)

Reivindicación 10: El método comprende las siguientes etapas: la adición de partículas reforzantes en un metal fundido, y la transferencia de flujo de gas inerte a alta presión impulsiva al metal fundido por una boquilla (resumen).

De igual manera, las reivindicaciones dependientes 3, 4 y 6 no mencionan características técnicas tangibles adicionales que puedan brindarle novedad al objeto

3Tecnología de proceso y transformación de materiales. Núria Salán Ballesteros. Febrero de 2005.
https://books.google.com.co/books?id=RzDy96-vUckC&pg=PA144&lpg=PA144&dq=cermet+propiedades+matriz+de+SiC&source=bl&ots=M4BySajdlf&sig=YFbSuTuuvDfeW_GObRELMqqiBI&hl=es&sa=X&ved=0ahUKEwiI2qXZs_DKAhXMlR4KHbupCJUO6AEIIDAB#v=onepage&q=cermet%20propiedades%20matriz%20de%20SiC&f=false

de la reivindicación 1, puesto que estas se encuentran redactadas en términos de resultados a alcanzar, efectos o ventajas y usos.

5. Conclusión

Los requisitos de Patentabilidad de la presente Solicitud están afectados así:

Ítem	Documento	Reivindicaciones afectadas	Requisito que afecta
D1	US 4,759,995	1 a 6	Nivel Inventivo
D2	CN 101733368	1 a 8	Nivel Inventivo

En cumplimiento del artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le indica que debe dar respuesta dentro del término de sesenta (60) días contados a partir de la fecha de notificación de la presente comunicación. En caso de no dar respuesta al presente requerimiento, o si a pesar de la respuesta subsistieran los impedimentos para la concesión, se denegará la patente.

Si como respuesta a este requerimiento el solicitante llegara a modificar: i) el capítulo reivindicatorio, ii) la descripción de la invención a proteger, iii) o presente un nuevo capítulo reivindicatorio, y desee que se realice un nuevo examen de patentabilidad a esta modificación, no deberá pagar la tasa de modificación voluntaria pero sí la correspondiente a la tasa de examen de patentabilidad. En todo caso, el número de requerimientos por no patentabilidad estará supeditado a que el término del estudio de patentabilidad no sea superior a 18 meses, contados desde la publicación de la solicitud de patente de invención. Adicionalmente, se le recuerda al solicitante que si como respuesta a este requerimiento llegara a modificar el capítulo reivindicatorio y éste contenga más de diez (10) reivindicaciones deberá pagar la tasa por reivindicación adicional.

Notifíquese el presente oficio conforme a lo dispuesto en el numeral 5.2, literal e), del capítulo quinto del título primero de la Circular Única No. 10 de 2001.



JOSÉ LUIS SALAZAR LÓPEZ
Director de Nuevas Creaciones (c)

El anterior requerimiento fue notificado por fijación en lista, de fecha 2016-06-28

Elaboró: Olga Ximena Benavides Salazar

Revisó: Rosa Patricia Tellez Chavarro

Search history

Search 1: FT=(Method and components and metal and (metal matrix) and composite) (Results 4035)

Search 2: (ceramic metal) (Results 3601)

Search 3: 1 and 2 (Results 89)

Search 4: 3 and semi-solid (Results 0)

Search 5: 3 and (semi-solid) (Results 0)

Search 6: (semi-solid) (Results 10807)

Search 7: 1 and 6 (Results 27)

Search 8: US2004261970 (Results 0)

Search 9: PN=(US2004261970) (Results 1)

Search 10: [SP]: 1. a method of producing semi-finished or finished products from a metal-based material, the method including the steps of: (i) maintaining the material in a mixing furnace in a thixotropic semi-solid state (ii) subjecting the material to a continuous shearing and mixing action and centrifugal force while in the thixotropic semi-solid state within the mixing furnace to form at least in part a fine, globular microstructure and (iii) delivering the material involutely from the mixing furnace while in the thixotropic semi-solid state to a delivery site for solidification.2. a method according to claim 1 including stirring the metal-based material in the thixotropic semi-solid state within the mixing furnace with shearing and mixing means acting about an upright axis to provide the continuous shearing action, the material in the thixotropic semi-solid state being delivered tangentially through discharge means leading from the mixing furnace under forces applied by the shearing and mixing means.3. a method according to claim 1 wherein the metal-based material includes a metal matrix composite material, the method further including the step of introducing a particulate material into the mixing furnace while the metal-based material is subjected to the continuous shearing and mixing action to form the metal matrix composite material therein, the particulate material being mixed substantially evenly through the metal matrix composite material.4. a method according to claim 1 wherein the metal in the metal-based material selected from the group consisting of superplastic alloys, aluminium, magnesium, tin, copper, zinc, alloys of the aforesaid metals, and mixtures thereof.5. a method according to claim 3 wherein the particulate material is selected from the group consisting of ceramic balls, ceramic particles, micro spheres, fly ash, and mixtures thereof.6. a metallic material-making apparatus for producing semi-finished or finished parts from a metal-based material, the apparatus including: i) a mixing furnace to receive a metal-based material ii) temperature control means associated with the mixing furnace to maintain the material in a thixotropic semi-solid state iii) rotatable mixing and shearing and propelling means operable in the mixing furnace to subject the material in the thixotropic semi-solid state to a shearing and mixing action and a centrifugal force iv) supply means to duct the material involutely in the thixotropic semi-solid state from the mixing furnace to a delivery site for solidification into a near-net shape.7. a metallic material-making apparatus according to claim 6 further including delivery means to meter a desired volume of particulate material into the mixing furnace to form the metal-based material therein, the particulate material being substantially evenly distributed through the metal-based material.8. a metallic material-making apparatus according to claim 6 wherein the rotatable mixing and shearing and propelling means includes a plurality of upright blade means spaced radially from an axis of rotation, each the blade member being angled relative to a circumferential direction, with a rear edge zone relative to the direction of rotation of each blade member being a radially outermost dimension of each blade member.9. a metallic material-making apparatus according to claim 8 wherein each blade member forms an angle of about 30 degrees with the circumferential direction.10. a metallic material-making apparatus according to claim 8 wherein the rear edge zone is spaced from an inner wall surface of the mixing furnace by a distance of between 10 and 30 mm.11. a metallic material-making apparatus according to claim 7 wherein the delivery means is positioned to deliver the particulate material to a circumferential zone traversed by the upright blade means.12. a metallic material-making apparatus according to claim 6 wherein the rotatable means includes a central body section adapted to occupy a central zone of the mixing furnace, the central body section having a cylindrical outer surface with a diameter at least 10 percent of an internal diameter of the mixing furnace.13. a metallic material-making apparatus according to claim 12 wherein the diameter of the central body section has a diameter of between 15 percent and 35 percent of the diameter of the mixing furnace.14. a metallic material-making apparatus according to claim 6, further including first pump means to move the metal-based material in the thixotropic state from the mixing furnace to the delivery site.15. a metallic material-making apparatus according to claim 6, wherein the supply means has an exit passage leading from the mixing furnace in a tangential direction whereby flow along the exit passage of the metal-based material is achieved by rotation of the mixing means.16. a metallic material-making apparatus according to claim 6 wherein the supply means includes an exit passage leading from a central zone of the mixing furnace.17. a metallic material-making apparatus according to claim 6 wherein the supply means includes an exit passage leading from a side zone of the mixing region.18. a metallic material-making apparatus according to claim 15, wherein the exit passage is located proximate a mid region of a side zone of the mixing furnace.19. a metallic material-making apparatus according to claim 6, further including: intermediate pump means to move the metal-based material in a thixotropic semi-solid state from the mixing furnace to an intermediate holding furnace, the material being maintained in the intermediate holding furnace in a thixotropic semi-solid state, and casting pump means to move the material from the intermediate holding furnace while in a thixotropic semi-solid state to the delivery site.20. a metallic material-making apparatus according to claim 19 wherein the intermediate and casting pump means include a device selected from the group consisting of a piston, a screw, an electromagnetic pump, and combinations thereof.21. a metallic material-making apparatus according to claim 6, further including a holding furnace to which the metal-based material is delivered and is held in a molten or semi-molten state prior to being delivered therefrom to the mixing furnace.22. a metallic material-making apparatus according to claim 6 wherein return means is provided to duct any metal-based material that is not required for casting from the delivery site to the mixing furnace.23. a metallic material-making apparatus according to claim 6, further including injection means to inject the material from an introduction chamber of a casting machine into the casting machine while in a thixotropic semi-solid state. (Results 36)

Search 11: 10 and forge* or shape* (Results 17)

Title: CONTINUOUS PROCESS FOR FORMING AN ALLOY CONTAINING NON-DENDRITIC PRIMARY SOLIDS

Abstract: Source: US3902544A A process is provided for continuously forming a homogeneous mixture of a liquid-solid metal composition, wherein said solid comprises discrete degenerate dendrites or nodules, from a first metal composition which, when frozen from its liquid state without agitation forms a dendritic structure. The first metal composition is maintained molten in a first zone and then is passed into at least one agitation zone connected to said first zone. The first zone and agitation zone are sealed to prevent entrainment of gas into said agitation zone. In the agitation zone, the metal is vigorously agitated and cooled to solidify a portion thereof and to form primary solids comprising discrete degenerate dendrites or nodules while preventing the formation of interconnected dendritic networks. The primary solids comprise up to about 65 weight percent of the liquid-solid metal composition. The liquid-solid metal composition is removed from the agitation zone at about the same rate that the melted first metal composition is passed into said agitation zone. The metal removed from the agitation zone then can be cast.

Classifications:

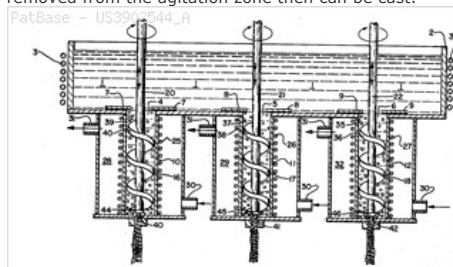
International (IPC 8-9): B22D1/00 B22D11/01 B22D11/10 B22D11/11 B22D11/12 B22D11/16 B22D11/17 B22D27/20 C22C1/00 C22C1/02 D06C21/00 (Advanced/Invention);

B22D1/00 B22D11/01 B22D11/10 B22D11/11 B22D27/00 C22C1/00 C22C1/02 D06C21/00 (Core/Invention)

International (IPC 1-7): B01F7/24 B22D1/00 B22D11/00 B22D11/04 B22D11/10 B22D17/00 B22D25/00 B22D27/00 B22D27/08 B22D27/20 C22B4/06 C22C1/00 C22C1/02 C22C18/00 C22C23/00 C22C33/00 D06C21/00 D06C21/00 D06F21/00 **CPC:** D06C21/00 Y10S164/90 C22C1/005

European: C22C1/00D D06C21/00

US: 148/400 148/420 148/425 148/428 148/433 148/434 148/438 164/122 164/437 164/485 164/71 164/900 26/18.6 26/186 420/590 75/10.65 75/10.67 75/134R 75/135

**Family:**

Publication number	Publication date	Application number	Application date
AR201123 A1	19750214	AR19730251512	19731214
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US3948650 A	19760406	US19730379991	19730717
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US4112559 A	19780912	US19750591293	19750630
ZA7309252 A	19741030	ZA19730009252	19731205
ZM19473 A	19740822	ZM19730000194	19731213

Priority:

US19710153819 19710616	US19720258383 19720531	GB19720028274 19720616
US19730379991 19730717	US19740471324 19740520	US19730354708 19730426
US19740487030 19740710		

Probable Assignee: WEST POINT PEPPERELL INC

Assignee(s): (std): CLUETT PEABODY AND CO INC 433 RIVER STREET TROY ; CLUETT PEABODY AND CO INC ; CLUETT PEPBODY AND CO ; KLYUTT O KO HK ; KLYUTT O KO HK PMA ; ION ; MASSACHUSETTS INST TECHNOLOGY ; MASSACHUSETTS INSTITUTE OF TECHNOLOGY ; MASSACHUSETTS INSTITUTE ; MASSACHUSETTS INSTITUTE TECHNOLO ; MASSACHUSETTS INSTITUTE OF TECHNOLOGY STATE OF INC

Assignee(s): MASSACHUSETTS INST OF TECHNOLOGY ; CLUETT PEABODY AND CO ; KLYUTT UEO O O O KO OHK OPMA ; WEST POINT PEPPERELL INC ; MASSACHUSETTS INSTITUTE OF TECHNOLOGY CAMBRIDGE MASS V ST A ; MASSACHUSETTS INSTITUTE OF TECHNOLOGY CAMBRIDGE MASS US ; MASSACHUSETTS INSTITUTE OF TECHNOLOGY STATE OF INCORPORAT ; TROOPE WALTER S ; LAWRENCE JACKSON ; SPENCER DAVID B ; MEHRABIAN ROBERT ; RIEK RODNEY G ; MASSACHUSETTS INST OF TECHNOLOGY CAMBRIDGE MASS ; MASSACHUSETTS INST TECHNOLO ; MASSACHUSETTS INST OF TECHNOLOGY STATE OF INCORPORAT ; KLYUTT UEO NOT OO O KO OHK ; MASSACHUSETTS INSTITUTE OF TECHNOLOGY CAMBRIDGE MA ; MASSACHUSETTS INST OF TECH ; CLUETT PEABODY ET CO INC US ; CLUETT PEABODY ET CO INC ; CLUETT PEABODY AND CO INC US ; CLUETT PEABODY AND CO INC A CORP OF GEORGIA ; FLEMINGS MERTON C ; CLUETT PEABODY AND CO INC TROY N Y V ST A ; CLUETT PEABODY AND CO INC 433 RIVER STREET TROY NEW YORK E U A ; CLUETT PEABODY AND CO INC A CORP OF DELAWARE ; CLUETT PEABODY AND CO INC TROY N Y ; CLUETT PEABODY CO INC

Inventor(s): (std): DZHEKSI LORENS US ; FLEMINGS M C ; FLEMINGS MERTON C ; J LAWRENCE ; JACKSON LAWRENCE ; LAWRENCE J ; LAWRENCE JACKSON ; LAWRENCE JACKSON US ; LORENS DZHEKSI ; M C FLEMINGS ; MAATON SHII FUREMINGUZU ; MEHRABIAN R ; MEHRABIAN ROBERT ; MEHRABIAN ROBERT ARLINGTON ; R G RIEK ; R MEHRABIAN ; RIEK R G ; RIEK RODNEY G ; ROBAATO MEERABIAN ; RODONII JII RIKU ; SPENCER D B ; SPENCER DAVID B ; TROOPE W ; TROOPE W S ; TROOPE WALTER S ; TROPPE WALTER ; TROPPE WALTER US ; TRUP VOLTER S ; VOLTER STRUP US ; W S TROOPE ; WALTER S TROOPE ; WS TROOPE ; TROOPE WALTER STARK

Inventor(s): TROOPE WALTER STARK LATHAM ; C FLEMINGS MERTON ; VOLTER S TRUP US ; TROOPE WALTER S US ; SPENCER DAVID B BEDFORD ; SPENCER DAVID B BEDFORD MASS US ; RIEK RODNEY G STONEHAM MASS US ; MEHRABIAN ROBERT ARLINGTON MASS ; MEHRABIAN ROBERT ARLINGTON MASS US ; NY ; LAWRENCE JACKSON WEST SAND LAKE ; FLEMINGS MERTON C LEXINGTON ; FLEMINGS MERTON C LEXINGTON MASS US ; G RIEK RODNEY

Agent(s): EITAN PEARL LATZER AND COHEN ZEDEK

Title: APPARATUS FOR MIXING LIQUIDS

Abstract: Source: US4065107A An apparatus for mixing liquids by hand is described comprising a handle having an upper and a lower portion. Extending from the lower portion is slotted mixing blade means and terminating the lower portion there is provided a salient surface for preventing the slotted blade means from rubbing against an underlying surface and for reducing friction between the apparatus and the surface when the apparatus is placed against and rotated about a line perpendicular to the surface.

Classifications:

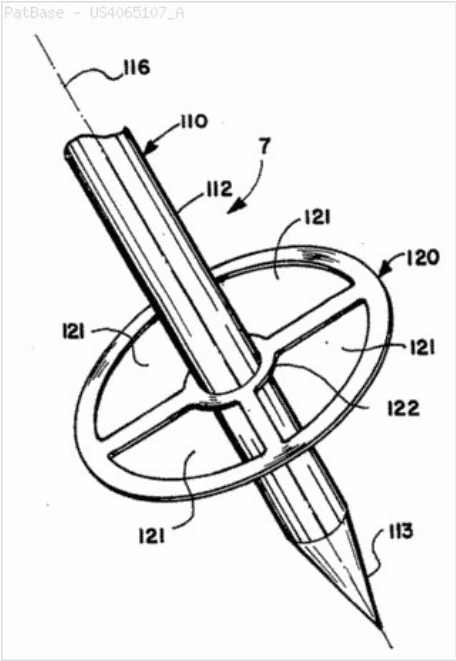
International (IPC 8-9): A47J43/10 B01F15/00 B01F7/00
B44D3/08 (Advanced/Invention);
B01F7/00 (Advanced/Non-invention);
A47J43/00 B01F15/00 B01F7/00 B44D3/06 (Core/Invention);
B01F7/00 (Core/Non-invention)

International (IPC 1-7): B01F7/16 B01F7/32

CPC: A47J43/1068 B01F7/0015 B01F7/00158 B01F7/00175 B01F7/0045 B01F15/00506
B44D3/08 Y10S366/605

European: A47J43/10B8 B01F15/00B15D B01F15/00B15F B01F15/00B16
B01F7/00B12B6 B01F7/00B12B7 B01F7/00B16E B44D3/08 L01F15/00L8C
L01F7/00B12B5 L01F7/00Y8K14

US: 366/129 366/276 366/316 366/317 366/325.4 366/325.5 366/325.8 366/325.93
366/328.3 366/329.1 366/343 366/605 D15/138 D7/300.2



Family:

Publication number	Publication date	Application number	Application date
US4065107 A	19771227	US19760736711	19761029
US4175875 A	19791127	US19770859008	19771209

Priority:

US19760736711 19761029 US19770859008 19771209

Probable Assignee: HORBEK JUDD VAN

Assignee(s): (std): HORBEK JUDD ; HORBEK JUDD VAN

Assignee(s): VAN HORBEK JUDD

Inventor(s): (std): VAN HORBEK JUDD

Title: METHOD FOR MAKING THIXOTROPIC MATERIALS

Abstract: Source: US4694882A A process for producing a liquid-solid composition comprising heating a liquefiable material sufficiently to form a liquid phase with solid dendritic particles therein without completely liquefying the material and subjecting said liquid-solid material to a shearing action sufficient to break at least a portion of the dendritic structures. The process includes injection molding, forging or die casting the material produced by the process.

Classifications:

International (IPC 8-9): B21C23/04 B21C33/02 B22C17/08 B22D17/00 B22D27/11 B22F3/02 B22F3/20 C01D3/22 C22C1/00 C22C1/02 C22F3/00 (Advanced/Invention); B21C23/02 B22D17/00 B22D27/00 C01D3/00 C22C1/02 (Core/Invention); C22F (Subclass/Invention)

International (IPC 1-7): B21C23/04 B21C33/02 B22C17/08 B22D17/00 B22D25/00 B22D27/11 B22F3/02 B22F3/20 C01D3/22 C22C1/00 C22C1/02 C22F1/00 C22F1/06 C22F3/00

CPC: Y10S164/90 C22C1/005 B21J5/004

European: B21J5/00C C22C1/00D

US: 164/113 164/459 164/477 164/71.1 164/900 420/590 72/270

PatBase - CH202788_01

**SUBSTITUTE
REPLACEMENT**

there are **NO DRAWINGS**

il n'y a **PAS DE DESSINS**

Family:

Publication number	Publication date	Application number	Application date
AT27714 E	19870615	AT19820201528T	19821201
AU198310487 A1	19830617	AU19830010487	19821119
AU540021 B2	19841025	AU19830010487	19821119
BR8208006 A	19831018	BR19820008006	19821119
CA1202788 A1	19860408	CA19820416281	19821124
DE3276539 D1	19870716	DE19823276539	19821201
DK158913 B	19900730	DK19830003278	19830715
DK158913 C	19901231	DK19830003278	19830715
DK327883 A	19830715	DK19830003278	19830715
DK327883 A0	19830715	DK19830003278	19830715
EP0080787 A2	19830608	EP19820201528	19821201
EP0080787 A3	19830713	EP19820201528	19821201
EP0080787 B1	19870610	EP19820201528	19821201
ES517802 A1	19831216	ES19820517802	19821130
ES8402025 A1	19840401	ES19820517802	19821130
HK8189 A	19890203	HK19890000081	19890126
JP2015620 B4	19900412	JP19830500278	19821119
JP58502002 T2	19831124	JP19830500278	19830729
JP58502002 T2	19831124	JP19830500278T	19830729
JP58502002 T2	19831124	JP19830500278T	19820729
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KR840002910 A	19840721	KR19820005398	19821201
KR870001321 B1	19870713	KR19820005398	19821201
NO161512 B	19890516	NO19830002743	19830728
NO161512 C	19890823	NO19830002743	19830728
NO832743 A	19830728	NO19830002743	19830728
NZ202615 A	19850320	NZ19820202615	19821125
US4694882 A	19870922	US19810326305	19811201
WO8301961 A1	19830609	WO1982US01629	19821119
ZA8208731 A	19840725	ZA19820008731	19821126

Priority:

US19810326305 19811201 WO1982US01629 19821119 EP19820201528 19821201
CA19820416281 19821124

Probable Assignee: THIXOMAT INC

Assignee(s): (std): DOW CHEMICAL CO

Assignee(s): DOW CHEMICAL CO THE ; DOW CHEMICAL COMPANY THE ; THIXOMAT INC ; THE DOW CHEMICAL COMPANY ; THE DOW CHEMICAL CO ; BUSK ROBERT S

Inventor(s): (std): SCHOLLEY BUSK ROBERT ; ROBERT SCHOLLEY BUSK ; BUSK ROBERT SCHOLLEY ; BUSK R S ; BUSK ROBERT S

Inventor(s): BUSK ROBERT SHOLLEY ; BUSK RS

Agent(s): PHILLIPS ORMONDE FITZPATRICK; SMART AND BIGGAR

Designated states: AT AU BE BR CH DE DK FR GB IT JP LI LU NL NO SE SU

Title: PROCESS FOR PRODUCTION OF METAL MATRIX COMPOSITES BY CASTING AND COMPOSITE THEREFROM

Abstract: Source: US4759995A Silicon carbide particulate reinforced aluminum alloy matrix composites are formed using techniques which include agitation of a melt of aluminum alloy, containing magnesium, and silicon carbide particulates in a manner whereby the silicon carbide particles are maintained, during agitation, within the body of the melt; the agitation, which involves shearing or wiping of the particles in the liquid, is carried out under vacuum; and may involve incorporation into the melt of an additional amount of magnesium such that that amount compensates for the amount of magnesium which segregates to the carbide surfaces, and is sufficient to effect strengthening of the resulting composite. Aluminum alloy matrix composites, containing copper, are produced using similar agitation and mixing procedures, with the copper being incorporated in such a way as to discourage reaction between the copper and SiC particles.

Classifications:

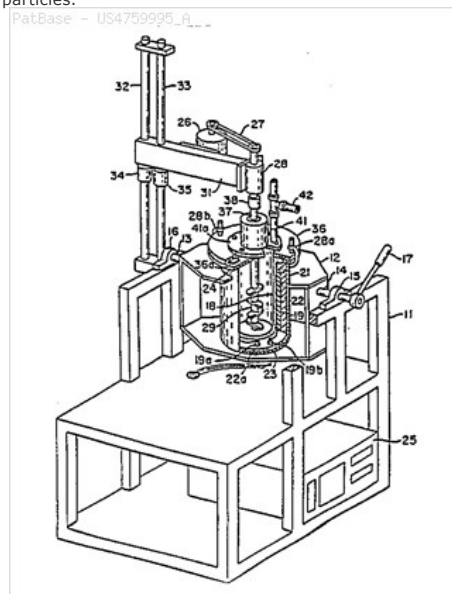
International (IPC 8-9): B01F15/00 B01F7/00 B01F7/16 B22D1/00 B22D11/11 B22D19/00 B22D19/14 B22D27/20 B22D41/005 C22C1/00 C22C1/02 C22C1/10 C22C21/00 C22C32/00 F27D23/04 F27D27/00 F27D3/00 (Advanced/Invention); B22D19/14 F27D23/04 F27D3/00 (Advanced/Non-invention); B22D1/00 B22D11/11 B22D19/14 B22D27/00 C22C1/10 C22C21/00 C22C32/00 (Core/Invention); B01F B01J B22D C22C G01J (Subclass/Invention)

International (IPC 1-7): B01F B01J B22D B22D1/00 B22D11/00 B22D11/10 B22D19/00 B22D19/14 B22D27/20 B22D41/005 C22C C22C1/02 C22C1/09 C22C1/10 C22C21/00 C22C21/02 C22C32/00 C22L21/02 G01J

CPC: B22D1/00 B22D11/11 B01F7/00641 B01F7/16 Y10T428/12486 F27D27/00 B01F7/166 C22C1/005 C22C1/1005 C22C1/1036 C22C32/0036 C22C32/0063 C22C2001/1047 F27D3/0026

European: B01F15/00B25 B01F7/00B16N2 B01F7/16 B01F7/16K B22D1/00 B22D11/11 B22C1/00D C22C1/10A C22C1/10D C22C32/00C8 C22C32/00D2C F27D27/00 L01F7/00B16N2 L01F7/00Y8M4 M22C1/10D4 R27D3/00H2

US: 148/439 164/270.1 164/417 164/97 266/208 266/216 266/235 420/129 420/526 420/528 420/532 420/534 420/548 420/590 428/614



Family:

Publication number	Publication date	Application number	Application date
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AT99000 E	19940115	AT19870903165T	19870429
AU198773939 A1	19871124	AU19870073939	19870429
AU198820822 A1	19890213	AU19880020822	19880708
AU199213335 A1	19921006	AU19920013335	19920304
AU606598 B2	19910214	AU19870073939	19870429
AU609171 B2	19910426	AU19880020822	19880708
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CA1293104 A1	19911217	CA19870535791	19870428
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DE69223950 D1	19980212	DE19926023950	19920304
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EP0265498 A4	19890530	EP19870903165	19870429
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EP0324832 A1	19890726	EP19880906507	19880708
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EP0575397 A1	19931229	EP19920906047	19920304
EP0575397 B1	19980107	EP19920906047	19920304
ES2006139 AF	19890416	ES19870001300	19870430
ES2012588 AF	19900401	ES19890000150	19890116
JP1501489 T2	19890525	JP19870502847T	19870429
JP1972382 C3	19950927	JP19870502847	19870429
JP2500201 T2	19900125	JP19880506133T	19880708
JP3096064 B2	20001010	JP19920505906	19920304
JP6505198 T2	19940616	JP19920505906T	19920304
JP7000819 B4	19950111	JP19870502847	19870429
JP7000819 B4	19950111	JP19870502847T	19870429
KR950003052 B1	19950330	KR19870071253	19871230
MX169340 B	19930630	MX19870006303	19870430
NO303722 B1	19980824	NO19930003243	19930910
NO891001 A	19890509	NO19890001001	19890308
NO891001 A0	19890308	NO19890001001	19890308
NO933243 A	19931111	NO19930003243	19930910
NO933243 A0	19930910	NO19930003243	19930910
US4759995 A	19880726	US19860856336	19860501
US4786467 A	19881122	US19860856338	19860501
US4865806 A	19890912	US19870072122	19870709
US5167920 A	19921201	US19880259581	19881018
US5531425 A	19960702	US19940192950	19940207
WO8706624 A1	19871105	WO1987US00940	19870429
WO8900614 A1	19890126	WO1988US02254	19880708
WO9215412 A1	19920917	WO1992CA00095	19920304
ZA8703111 A	19890125	ZA19870003111	19870430
ZA8707100 A	19890125	ZA19870007100	19870430

Priority:

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WO1987US00940	19870429	US19860856338	19860501	CA19870535791	19870428
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US19910667558	19910311				

Probable Assignee: ALCAN ALUMINUM CORP

Assignee(s): (std): ALCAN ALUMINUM CORP ; ALCAN INT LTD ; DURAL ALUMINUM COMPOSITES CORP ; SKIBO MICHAEL D ; SCHUSTER DAVID M

Assignee(s): ALCAN INT LTD MONTREAL QUEBEC CA ; DURAL ALUMINIUM COMPOSITES CORP ; DURAL ALUMINUM COMPOSITES 10326 ROSELLE STREET SAN

Inventor(s): (std): DAVID M SCHUSTER ; MICHAEL D SKIBO ; RICHARD S BRUSKI ; SCHUSTER DAVID ; SCHUSTER DAVID M ; BRUSKI RICHARD ; BRUSKI RICHARD S ; SKIBO MICHAEL ; SKIBO MICHAEL D ; SKIBO MICHAEL DAVID

Inventor(s): BRUSKI RICHARD S ENCINITAS CA 92009 US ; SCHUSTER DAVID M LA JOLLA CA 92037 US ; SCHUSTER M ; SCHUSTER M DAVID LAJOLLA CA 92037 US ; SKIBO D ; SKIBO D MICHAEL LEUCADIA CA 92024 US

Agent(s): WATERMARK PATENT AND TRADE MARKS ATTORNEYS; KIRBY EADES GALE BAKER

Designated states: AT AU BE BR CA CH DE DK ES FR GB GR IT JP KR LI LU MC NL NO SE

Title: Apparatus for milling metal powder to produce high bulk density fine metal powders

Abstract: Source: US4844355A Apparatus for milling metal powder in a mill is disclosed which comprises a central shaft, the top of which is rotatably mounted to rotating apparatus, bottom stirrer(s), attached to the bottom edge of central shaft, upper stirrer(s), attached above the point of attachment of the bottom stirrer(s), and two or more primary stirrers, upper ends of which are attached to outer edge(s) of the upper stirrer(s) and the bottom ends attached to bottom edge(s) of the bottom stirrer(s). The bottom stirrer has a downward sloping leading edge with a first angle formed by a first plane extending along this edge to a second plane extending along the bottom of the mill, this angle being 10 DEG to 90 DEG, the first angle being that between those faces of the first and second planes within which the bottom stirrer sits. The distance between the bottom of the mill and the lowest point of the downward sloping leading edge is equal to or less than the distance between the bottom of the mill and the other points on the bottom edge of the bottom stirrer. The upper stirrer has an upward sloping leading edge, with a second angle formed by a third plane extending along this edge to a fourth plane parallel to the top of the mill and above the upper stirrer(s), this angle being 10 DEG to 90 DEG, the second angle being that between those faces of the third and fourth planes within which the upper stirrer sits. The distance between the fourth plane and the uppermost point of the upward sloping leading edge is equal to or less than the distance between the fourth plane and the other point(s) on the top edge of the upper stirrer(s).

Classifications:

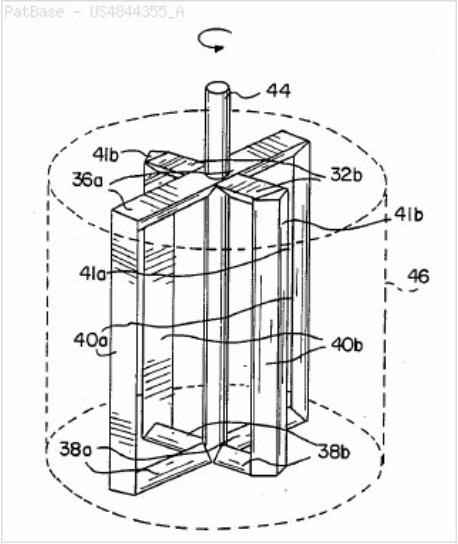
International (IPC 8-9): B01F15/00 B01F7/00 B02C17/16 (Advanced/Invention); B01F15/00 B01F7/00 B02C17/16 (Core/Invention)

International (IPC 1-7): B02C17/16

CPC: B01F7/00175 B02C17/163

European: B01F15/00B15F B01F7/00B12B7 B02C17/16C

US: 241/172 366/279 366/343



Family:

Publication number	Publication date	Application number	Application date
US4844355 A	19890704	US19870117702	19871105

Priority:

US19870117702 19871105

Probable Assignee: GTE PROD CORP

Assignee(s): (std): GTE PROD CORP

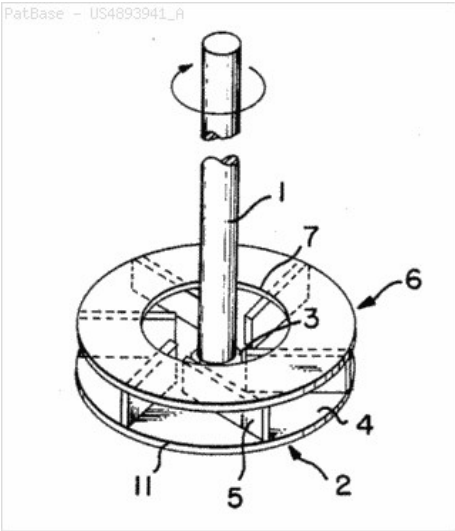
Assignee(s): GTE PRODUCTS CORP

Inventor(s): (std): HOLLAND SR ROBERT J ; KEMP JR PRESTON B

Title: Apparatus for mixing viscous liquid in a container

Abstract: Source: US4893941A A rotary device for mixing viscous liquids within a container. A vertical rotary driven shaft is connected to a circular disc at its terminal end. Radial or tangential mixing vanes are connected to the top surface of the disc and a baffle plate or cover disc is located over the vanes to prevent vertical flow in the area of the vanes. A central flow passage is provided about the shaft. Fluid is driven laterally outwardly by the vanes and replacement fluid is pulled downwardly by a pumping action along the shaft and likewise driven laterally outwardly for mixing. A removable washer **shaped** flow restrictor is placed in the central flow passage, vertically supported by the inner ends of the vanes and held in place by the downward flow during rotation of the mixing device.

Classifications:
International (IPC 8-9): B01F15/00 B01F7/00 (Advanced/Invention); B01F13/00 B01F5/00 B01F7/00 (Advanced/Non-invention); B01F7/00 (Core/Non-invention)
International (IPC 1-7): B01F5/12
CPC: B01F7/0015 B01F7/00241 B01F7/00583 B01F7/00633 B01F13/002 B01F15/00538 B01F2005/0011 B01F2215/005
European: B01F15/00B14 B01F15/00L8G B01F7/00B16A L01F13/00K2B L01F215/00A60 L01F5/00A4B L01F7/00B12B5 L01F7/00B16K L01F7/00B16N1 L01F7/00Y6K L01F7/00Y8K14 L01F7/00Y8M2
US: 366/265 366/317 366/343



Family:

Publication number	Publication date	Application number	Application date
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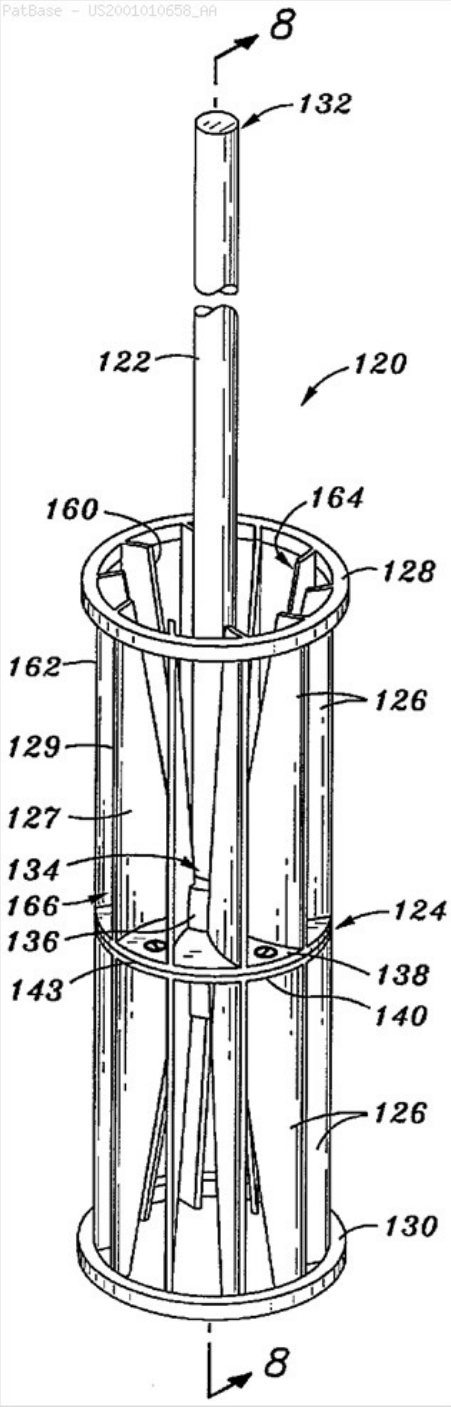
Priority:
US19870069813 19870706 US19880213078 19880629
Probable Assignee: WAYTE JOSEPH M
Assignee(s): (std): WAYTE JOSEPH M
Inventor(s): (std): WAYTE JOSEPH M

Title: METHOD AND APPARATUS FOR MIXING VISCOUS FLUIDS

Abstract: Source: US2001010658A The present invention is a method and apparatus for mixing viscous fluids. The mixing apparatus comprises a cage located at the end of a shaft. The cage comprises a central circular disc with an outer edge and top and bottom sides. A number of vanes extend from one or both sides of the disc, the vanes spacedly located near the outer edge of the plate. The method comprises rotating the mixing apparatus in a container of fluid.

Classifications:

International (IPC 8-9): B01F13/00 B01F15/00 B01F3/08 B01F3/10 B01F3/12 B01F3/18 B01F5/00 B01F5/12 B01F7/00 B01F7/16 B01F7/26 B01F7/32 C23C14/00 C23C14/34 C23C14/40 C23C14/54 C23C14/58 (Advanced/Invention); B01F13/00 B01F15/00 B01F3/10 B01F5/00 B01F7/00 (Advanced/Non-invention); B01F7/16 C23C14/00 C23C14/34 C23C14/36 C23C14/54 C23C14/58 (Core/Invention); B01F13/00 B01F3/08 B01F7/00 (Core/Non-invention); B01F (Subclass/Invention)
International (IPC 1-7): B01F13/00 B01F15/00 B01F3/12 B01F5/12 B01F5/12 B01F7/16 B01F7/26 B01F7/26 B01F7/32 B01F7/32 C23C14/00 C23C14/34 C23C14/40 C23C14/54 C23C14/56 C23C14/58 H01J37/34
CPC: C23C14/0078 C23C14/54 C23C14/5826 Y10S366/605 B01F15/00487 B01F3/10 B01F3/1221 B01F7/00175 B01F7/00241 B01F7/00 B01F7/0015 B01F7/00583 B01F7/1625 B01F7/32 B01F13/002 B01F15/00538 B01F2005/0011 B01F2215/005
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Family:

Publication number	Publication date	Application number	Application date
AT254498 E	20031215	AT19960943592T	19961205
AT359861 E	20070515	AT20010910874T	20010215
AT487536 E	20101115	AT20010007518T	20010215
AU199712794 A1	19970627	AU19970012794	19961205
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Priority:

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Probable Assignee: HOMAX PRODUCTS INC

Assignee(s): (std): BALZERS HOCHVAKUUM ; BERGMANN ERICH ; DAVID MASHALL KING ; DUPONT FRANCOIS ; KING DAVID MARSHALL ; SITE B CO ; KING RONNALD B ; KING RONNALD BRIAN ; MARTIN THOMAS ARNOLD ; SITE B COMPANY ; RONALD BRIAN KING ; THOMAS ARNOLD MARTIN ; UNAXIS BALZERS AG ; UNAXIS BALZERS AG BALZERS

Assignee(s): BALZERS AG ; BALZERS AG BALZERS LI ; BALZERS AKTIENGESSELLSCHAFT ; ROYAL BANK OF SCOTLAND PLC SECOND LIEN COLLATERAL AGENT AS ; UNAXIS BALZERS BALZERS AG ; MAGIC AMERICAN PRODUCTS INC ; OSMEGEN INC ; OERLIKON TRADING AG ; MARTIN THOMAS AMOLD ; MARTIN THOMAS A ; ROYAL BANK OF SCOTLAND PLC SECOND LIEN COLLATERAL ; OERLIKON TRADING TRUBBACH AG ; ROYAL BANK OF SCOTLAND PLC FIRST AND SECOND AS ; SIBE B CO ; ROYAL BANK OF SCOTLAND PLC AS FIRST AND SECOND ; ROYAL BANK OF SCOTLAND PLC ; ROYAL BANK OF SCOTLAND PLC AS SECOND LIEN COLLATER ; GENERAL ELECTRIC CAPITAL CORP ; FREEPORT FINANCIAL LLC AS SECOND LIEN AGENT ; HOMAX PRODUCTS INC ; KING DAVID M ; FREEPORT FINANCIAL LLC SECOND LIEN AGENT AS ; GENERAL ELECTRIC CAPITAL AGENT AS CORP ; KING RONALD BRIAN ; KING DAVID MASHALL ; GONZO COPORATION

Inventor(s): (std): KING RONNALD ; MARTIN THOMAS AMOLD ; MARTIN THOMAS A ; KING RONNALD B ; KING DAVID MARSHALL ; KING DAVID M ; DUPONT FRANCOIS DR ING ; DUPONT FRANCOIS ; BERGMANN ERICH DR ; BERGMANN ERICH ; MARTIN THOMAS ARNOLD ; KING RONNALD BRIAN

Inventor(s): DAVID MARSHALL KING ; BERGMANN ERICH DR MELS CH ; DUPONT FRANCOIS DR ING TH WANGS CH ; THOMAS ARNOLD MARTIN ; RONNALD BRIAN KING ; RONNALD B KING

Agent(s): GRIFFITH HACK; OYEN WIGGS GREEN AND MUTALA LLP; FIENER JOSEF; WEIDE AND MILLER LTD

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EE ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LI LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NE NL NO NZ PL PT RO RU SD SE SG SI SK SL SN SZ TD TG TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW

Title: METHOD AND APPARATUS FOR INJECTION MOLDING OF SEMI-SOLID METALS

Abstract: Source: US5501266A A new method and apparatus for the injection molding of semi-solid materials (SSM). In this process (called Rheomolding), a superheated liquid metal is cooled into the semi-solid state in the barrel of a special vertical injection-molding machine, with the growing dendrites of the solid phase being broken into small and nearly spherical particles by the shearing force generated by the screw and barrel. Compared with the superheated liquid metal, SSM has lower temperature, lower shrinkage and a more stable flow pattern. Therefore, the rheomolding process can produce net-**shape** metal or metal-matrix-composite parts continuously at lower cost.

Classifications:

International (IPC 8-9): B22D17/00 B22D17/20 B22D17/30 B29C45/18 B29C45/23 (Advanced/Invention);

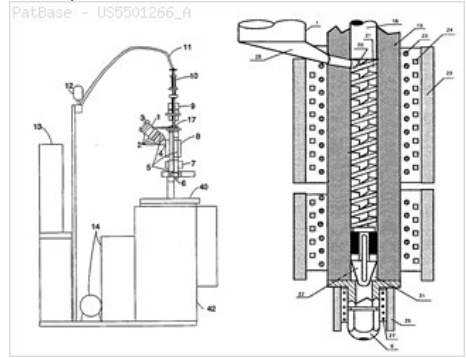
B22D17/00 B22D17/20 B22D17/30 B29C45/18 B29C45/23 (Core/Invention)

International (IPC 1-7): B22D17/00 B22D17/20 B22D17/30 B22D23/00 B22D27/08 B29C45/18 B29C45/23

CPC: B22D17/007 Y10S164/90

European: B22D17/00S

US: 164/113 164/312 164/71.1 164/711 164/900



Family:

Publication number	Publication date	Application number	Application date
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WO9534393 A1	19951221	WO1995US07494	19950613

Priority:

US19940259625 19940614 WO1995US07494 19950613

Probable Assignee: CORNELL RESEARCH FOUNDATION INC

Assignee(s): (std): CORNELL RES FOUNDATION INC

Assignee(s): CORNELL RESEARCH FOUNDATION INC ; CORNELL RESEARCH FOUNDATION INC 20 THORNWOOD DRIVE SUITE 105 ; CORNELL RESEARCH FOUNDATION INC ITHACA N Y US ; NATIONAL SCIENCE FOU ; NATIONAL SCIENCE FOUNDATION ; KOONERU RISAACHI FUAUNDEESHON INC

Inventor(s): (std): PENG HSUAN ; WANG KUO K ; WANG NAN ; WANG SHAU POH ; WANG KUO

Inventor(s): WAN SHAUHO ; WAN NAN ; WAN KUO KEI ; PEN SUAN ; WANG SHAU POH ITHACA NY 14850 US ; WANG NAN ITHACA NY 14850 US ; WANG KUO K ITHACA NY 14850 US ; PENG HSUAN ITHACE NY 14850 US

Designated states: AT BE CH DE DK ES FR GB GR IE IT JP LI LU MC NL PT SE

Abstract: Source: US2002069997A An apparatus and process is provided for producing semi-solid material and directly casting the semi-solid material into a component wherein the semi-solid material is formed from a molten material and the molten material is introduced into a container. Semi-solid is produced therefrom by agitating, shearing, and thermally controlling the molten material. The semi-solid material is maintained in a substantially isothermal state within the container by appropriate thermal control and thorough three-dimensional mixing. Extending from the container is a means for removing the semi-solid material from the container, including a temperature control mechanism to control the temperature of the semi-solid material within the removing means.

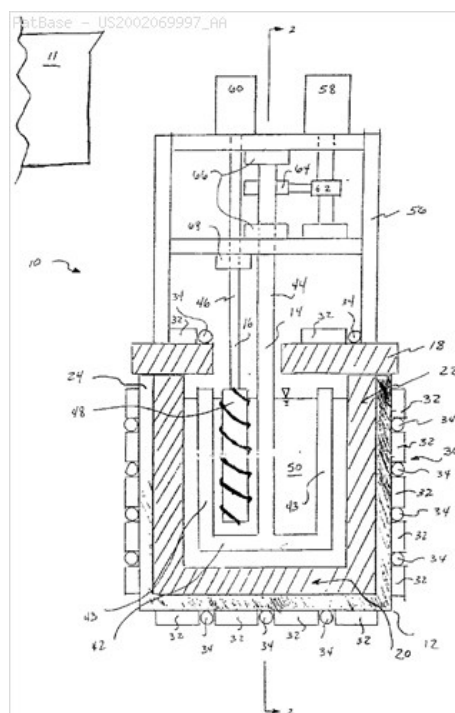
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International (IPC 1-7): B22D1/00 B22D11/00 B22D11/10 B22D11/11 B22D17/08
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CPC: Y10S164/90 B22D17/007 B22D1/00

European: B22D1/00 B22D17/00S

US: 164/113 164/133 164/71.1 164/900



Publication number	Publication date	Application number	Application date
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Assignee(s): (std): SEMI SOLID TECHNOLOGIES INC

Assignee(s): VERYST ENGINEERING LLC ; BROWN STUART B ; MENDEZ PATRICIO F ; MYOJIN SHINYA ; RICE CHRISTOPHER S

Inventor(s): (std): BROWN STUART B ; MENDEZ PATRICIO F ; MYOJIN SHINYA ; RICE CHRISTOPHER S ; RICE CHRISTPHER S

Inventor(s): SHINYA MYOJIN ; STUART B BROWN ; PATRICIO F MENDEZ ; CHRISTOPHER S RICE

Agent(s): SMART AND BIGGAR

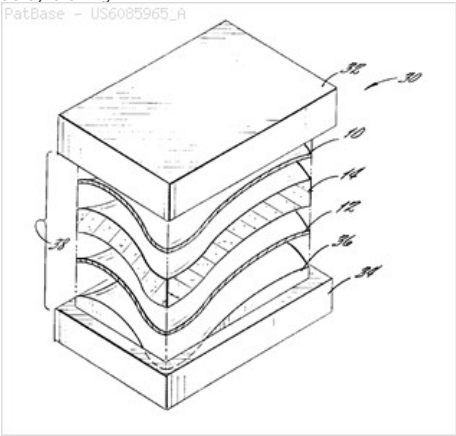
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Title: Pressure bonding and densification process for manufacturing low density core metal parts

Abstract: Source: US6085965A A novel method of forming low density core metal parts by pressure bonding face sheets to a porous foam metal core and simultaneously densifying the core is disclosed. In particular, low density core aluminum and aluminum alloy parts can be formed according to the method of the invention. The method of forming low density core metal parts generally comprises the steps of providing a porous, foam metal core and simultaneously pressure bonding first and second solid metal face sheets directly to opposite sides of the core and densifying the core by applying heat and uniaxial **forge** pressure to the first and second face sheets and to the core for a predetermined period of time. The method of the invention can therefore produce LDC parts having a predetermined **shape** and density. Furthermore, the LDC parts are less subject to interfacial oxidation and delamination than conventional LDC parts made by brazing.

Classifications:

International (IPC 8-9): B22F7/00 B23K20/02 B23K20/233 B32B15/01 (Advanced/Invention)
International (IPC 1-7): B23K20/02 B23K20/233 B32B15/01
CPC: B22F7/006 B22F2998/10 B23K20/02 B23K20/2336 B32B15/016
European: B22F7/00B2F B23K20/02 B23K20/233B B32B15/01E L22F998/10
US: 228/190 228/205 228/221 228/235.1



Family:

Publication number	Publication date	Application number	Application date
AU199861408 A1	19980825	AU19980061408	19980203
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Priority:

US19970794835 19970204 WO1998US01952 19980203

Probable Assignee: MCDONNELL DOUGLAS CORP

Assignee(s): (std): DEUSER DONALD A ; MARTIN RICK L ; MC DONNELL DOUGLAS CORP ; MCDONNELL AND DOUGLAS CORP ; SCHWARTZ DANIEL S

Assignee(s): MCDONNELL DOUGLAS CORP

Inventor(s): (std): DEUSER DONALD A ; MARTIN RICK L ; SCHWARTZ DANIEL S

Inventor(s): DANIEL S SCHWARTZ ; RICK L MARTIN ; DONALD A DEUSER

Designated states: AL AM AT AU AZ BA BB BE BF BG BJ BR BY CA CF CG CH CI CM CN CU CZ DE DK EE ES FI FR GA GB GE GH GM GN GR GW HU ID IE IL IS IT JP KE KG KP KR KZ LC LK LR LS LT LU LV MC MD MG MK ML MN MR MW MX NE NL NO NZ PL PT RO RU SD SE SG SI SK SL SN SZ TD TJ TM TR TT UA UG US UZ VN YU ZW

Title: PROCESS FOR PRODUCING A LIGHTWEIGHT MOLDED PART AND MOLDED PART MADE OF METAL FOAM

Abstract: Source: US2003005793A A process for producing a lightweight molded part, comprising introducing a gas into a particle-containing, molten metal to produce a metal foam having voids with a monomodal distribution of their dimensions, introducing the metal foam into a casting die and compressing it therein essentially under all-round pressure; and the molded part made by this process.

Classifications:

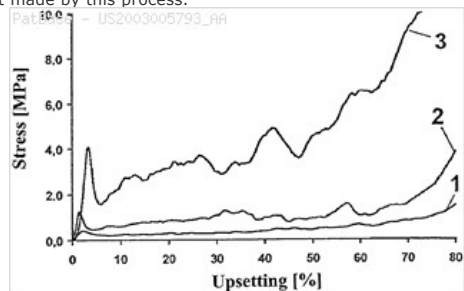
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International (IPC 1-7): B22D1/00 B22D11/06 B22D19/14 B22D25/00 B22D25/02 B22D27/00 B22D27/09 B22D27/20 B22D45/00 B22F3/11 C21C7/00 C22B5/20 C22B9/05 C22C1/08 C22C1/10 C22C21/00 C22C32/00

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European: B22D25/00F B22F3/11B C22C1/08 L22F3/11B1 L22F998/00 M22C1/08F M22C1/08F4

US: 148/437 148/437S 164/55.1 164/79 266/217 266/217S 266/220 75/415 75/415P



Family:

Publication number	Publication date	Application number	Application date
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Priority:

AT20010000936 20010615	AT20010000935 20010615	AT20020000621 20020422
US20060607914 20061204	US20020170684 20020614	CA20022390766 20020614
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Probable Assignee: HUTTE KLEIN REICHENBACH GES MBH

Assignee(s): (std): HATTE KLEIN REICHENBACH GES M B H ; HUETTE KLEIN REICHENBACH GES M ; HUETTE KLEIN REICHENBACH GMBH ; HATTE KLEIN REICHENBACH GMBH ; HUTTE KLEIN REICHENBACH GES M ; HUTTE KLEIN REICHENBACH GMBH ; HUTTE KLEIN REICHENBACH GES M B H

Assignee(s): HUTTE KLEIN REICHENBACH GES MBH ; LEITLMEIER DIETMAR ; SCHULZ PETER ; HUTTE KLEIN REICHENBACH GESELLSCHAFT MBH ; HUTTE KLEIN REICHENBACH GESELLSCHAFT M B H ; BIRGMANN ALOIS ; DOBESBERGER FRANZ ; FLANKL HERBERT ; HUETTE KLEIN REICHENBACH GES MBH ; HUETTE KLEIN REICHENBACH GESELLSCHAFT MBH ; HUTTE KLEIN REICHENBACH GES ; HUETTE KLEIN REICHENBACH GES M B H ; HATTE KLEIN REICHENBACH GESELLSCHAFT M B H ; HUETTE KLEIN REICHENBACH GESELLSCHAFT M B H ; HUETTE KLEIN REICHENBACH GES M B H SCHWARZENAU

Inventor(s): (std): ALOIS BIRGMANN ; BIRGMANN ALOIS ; DIETMAR LEITLMEIER ; DOBESBERGER FRANZ ; FLANKL HERBERT ; FRANKL HERBERT ; FRANZ DOBESBERGER ; HERBERT FLANKL ; LEITLMEIER DIETMAR ; SCHULZ PETER

Inventor(s): PETER SCHULZ

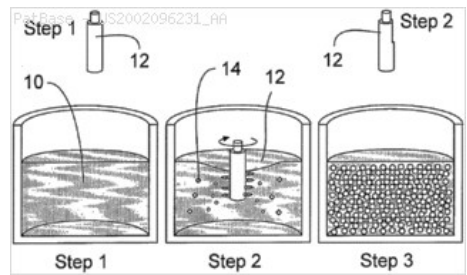
Agent(s): MARKS AND CLERK; PATENTANWAELTE PINTER AND WEISS OG; CARVAJAL Y ISABEL; GREENBLUM AND BERNSTEIN PLC

Designated states: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT RO SE SI TR

Title: METAL ALLOY COMPOSITIONS AND PROCESS

Abstract: Source: US2002096231A A skinless metal alloy composition free of entrapped gas and comprising primary solid discrete degenerate dendrites homogeneously dispersed within a secondary phase is formed by a process wherein the metal alloy is heated in a vessel to render it a liquid. The liquid is then rapidly cooled while vigorously agitating it under conditions to avoid entrapment of gas while forming solid nuclei homogeneously distributed in the liquid. Agitation then is ceased when the liquid contains a small fraction solid or the liquid-solid alloy is removed from the source of agitation while cooling is continued to form the primary solid discrete degenerate dendrites in liquid secondary phase. The solid-liquid mixture then can be formed such as by casting.

Classifications:
International (IPC 8-9): C22B21/06 C22B9/00 C22C1/00 C22C21/02 (Advanced/Invention); C22B21/00 C22B9/00 C22C1/00 C22C21/02 (Core/Invention)
International (IPC 1-7): B22D27/08 C21D1/00 C22F1/00
CPC: Y02P10/253 C22C21/02 C22B9/003 C22B21/06 C22C1/005
European: C22B21/06 C22B9/00I C22C1/00D C22C21/02
US: 148/538 148/549 164/122



Family:

Publication number	Publication date	Application number	Application date
US2002096231 AA	20020725	US20020104536	20020325
US6645323 BB	20031111	US20020104536	20020325

Priority:
US20000666760 20000921 US20020104536 20020325

Probable Assignee: MASSACHUSETTS INST OF TECHNOLOGY

Assignee(s): (std): DE FIGUEREDO ANACLETO M ; FLEMINGS MERTON C ; MARTINEZ AYERS RAUL A ; MASSACHUSETTS INST TECHNOLOGY ; YURKO JAMES A

Assignee(s): MASSACHUSETTS INSTITUTE OF TECHNOLOGY ; MASSACHUSETTS INST OF TECHNOLOGY ; ENERGY UNITED STATES DEPARTMENT OF

Inventor(s): (std): YURKO JAMES A ; MARTINEZ AYERS RAUL A ; FLEMINGS MERTON C ; DE FIGUEREDO ANACLETO M

Title: Shot blocks for use in die casting

Abstract: Source: US2003051854A A shot block for use in a die casting machine for die casting molten and semi-molten metal parts is formed from a metal or metal alloy having a thermal conductivity of at least about 25 Btu/ft.hr. Degrees Fahrenheit, a Rockwell C hardness of at least about 25 and a 0.2 percent Yield Strength of at least about 90 ksi.

Classifications:
International (IPC 8-9): B22D17/00 B22D17/20 (Advanced/Invention); B22D17/00 B22D17/20 (Core/Invention)
International (IPC 1-7): B22D17/00 B22D17/08
CPC: B22D17/007 B22D17/2023
European: B22D17/00S B22D17/20D1
US: 164/113 164/312

Family:

Publication number	Publication date	Application number	Application date
US2003051854 AA	20030320	US20010882904	20010615
US6591894 BB	20030715	US20010882904	20010615

Priority:
US20010882904 20010615

Probable Assignee: BRUSH WELLMAN INC

Assignee(s): (std): BRUSH WELLMAN ; GUHA AMITAVA ; NIELSEN WILLIAM D

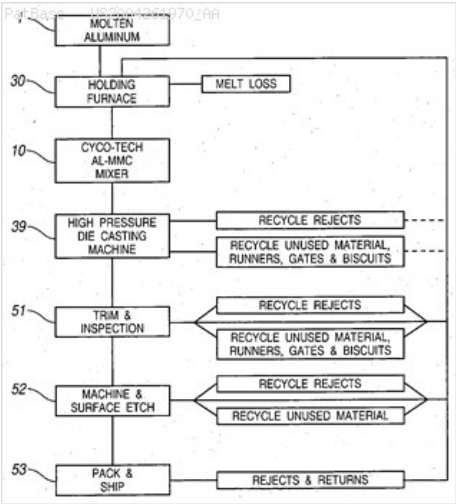
Assignee(s): JPMORGAN CHASE BANK NATIONAL ASSOCIATION AS ADMINI ; NATIONAL CITY BANK ; BRUSH WELLMAN INC

Inventor(s): (std): GUHA AMITAVA ; NIELSEN JR WILLIAM D ; NIELSEN WILLIAM D

Title: METHOD AND APPARATUS FOR PRODUCING COMPONENTS FROM METAL AND/OR METAL MATRIX COMPOSITE MATERIALS

Abstract: Source: US2004261970A Method and apparatus for producing semi-finished or finished products from metal-based material. The apparatus includes a mixing furnace to receive a metal-based material to be formed; temperature control means to maintain the metal-based material in a thixotropic semi-solid state in the mixing furnace; rotatable mixing means operable in the mixing furnace to subject the metal-based material to a mixing and shearing action while imparting a centrifugal force; and supply means to move the material to a delivery site. Optionally, injection means are provided to inject the material from an introduction chamber of a casting machine into a mold or die cavity while the material is in a thixotropic semi-solid state.

Classifications:
International (IPC 8-9): B22D17/00 (Advanced/Invention);
B22D17/00 (Core/Invention)
International (IPC 1-7): B22D17/00 B22D17/10 B22D23/00 B22D25/00
CPC: B22D17/007
European: B22D17/00S
US: 164/113 164/900 164/97



Family:

Publication number	Publication date	Application number	Application date
AU2003903273 A0	20030710	AU20030903273	20030627
US2004261970 AA	20041230	US20040753651	20040108
WO05002759 A2	20050113	WO2004US20782	20040628
WO05002759 A3	20050331	WO2004US20782	20040628

Priority:
AU20030903273 20030627 AU20030905040 20030916 US20040753651 20040108

Probable Assignee: CYCO SYSTEMS PTY LTD CORP
Assignee(s): (std): CYCO SYSTEMS CORP PTY LTD ; WITHERS GRAHAM REX
Assignee(s): CYCO SYSTEMS PTY LTD CORP
Inventor(s): (std): WITHERS GRAHAM REX
Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NA NE NI NL NO NZ OM PG PH PL PT RO RU SC SD SE SG SI SK SL SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

Title: NEAR LIQUIDUS INJECTION MOLDING PROCESS

Abstract: Source: US2006096733A An injection-molding process for molding a metal alloy into a near net **shape** article that is characterized in that the processing temperature of the alloy at injection is approaching the liquidus, preferably having a maximum solids content of 5 percent, whereby a net-**shape** molded article can be produced that has a homogeneous, fine equi-axed structure without directional dendrites, and a minimum of entrapped porosity. Advantageously, the resulting solid article has optimal mechanical properties without the expected porosity and solidification shrinkage attributed to castings made from super-heated melts.

Classifications:

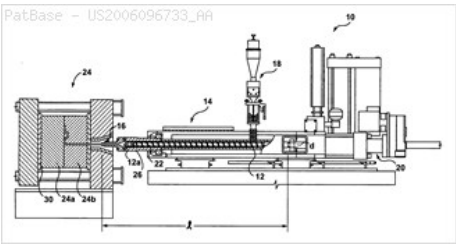
International (IPC 8-9): B22D17/00 B22D17/02 B22D17/04 B22D17/10 B22D17/32 B22D21/04 B22D23/00 B22D25/00 C22C1/00 C22C18/00 C22C21/00 C22C23/00 C22C23/02 (Advanced/Invention); B22D17/00 B22D25/00 (Advanced/Non-invention); B22D17/00 B22D17/02 B22D17/08 B22D17/32 B22D21/00 B22D23/00 B22D25/00 C22C18/00 C22C21/00 C22C23/00 (Core/Invention); C22C1/00 C22C23/02 (Core/Non-invention); B22D (Subclass/Invention)

International (IPC 1-7): B22D17/00 C22C1/00 C22C23/02

CPC: Y10S164/90 B22D17/007 B22D27/003

European: B22D17/00S B22D27/00A

US: 148/420 148/437 148/441 148/538 164/113 164/900



Family:

Publication number	Publication date	Application number	Application date
AU2005304221 AA	20060518	AU20050304221	20051109
AU2005304221 BB	20080605	AU20050304221	20051109
BRPI0517746 A	20081021	BR2005PI17746	20051109
CA2582687 AA	20070330	CA20052582687	20051109
CA2582687 C	20100504	CA20052582687	20051109
CN101056728 A	20071017	CN200580038315	20051109
EP1819464 A1	20070822	EP20050803459	20051109
EP1819464 A4	20081112	EP20050803459	20051109
HK1106176 A3	20080307	HK20080100217	20080109
IL182379 A0	20070724	IL20070182379	20070401
IN02838DN2007 A	20070803	IN2007DN02838	20070417
JP2008519690 T2	20080612	JP20070540465T	20051109
KR20070085906 A	20070827	KR20077012920	20070608
MX2007005401 A1	20070704	MX20070005401	20070504
MX2007005401 A1	20070704	MX20070005401	20051109
RU2007121668 A	20081220	RU20070121668	20051109
RU2352435 C1	20090420	RU20070121668	20051109
TW200636081 A	20061016	TW20050139499	20051110
TWI307368 B	20090311	TW20050139499	20051110
US2006096733 AA	20060511	US20040985879	20041110
US2006096734 AA	20060511	US20050273650	20051114
US7237594 BB	20070703	US20050273650	20051114
US7255151 BB	20070814	US20040985879	20041110
WO06050597 A1	20060518	WO2005CA01545	20051011
WO06050599 A1	20060518	WO2005CA01707	20051109

Priority:
US20040985879 20041110 WO2005CA01707 20051109 US20050273650 20051114

Probable Assignee: HUSKY INJECTION MOLDING SYSTEMS LTD

Assignee(s): (std): HUSKY INJECTION MOLDING ; KHASKI INDZHEKSHN MOULDING SIS

Assignee(s): ROYAL BANK OF CANADA ; HUSKY INJECTION MOLDING SYSTEMS SA ; CZERWINSKI FRANK ; HUSKY INJECTION MOLDING SYSTEMS LIMITED ; HUSKY INJECTION MOLDING SYSTEMS LTD ; HUSKY INJECTION MOLDING SYSTEMS LTD CA ; HUSKY INJECTION MOLDING SYSTEMS S A ; KHASKI INDZHEKSHN MOULDING SISTEMZ LTD

Inventor(s): (std): CZERWINSKI FRANK ; FRANK CZERWINSKI ; SHERVINSKI FRANK

Agent(s): SPRUSON AND FERGUSON; HUSKY INTELLECTUAL PROPERTY SERVICES; HUSKY INJECTION MOLDING SYSTEMS LTD, CO/AMC INTELLECTUAL PROPERTY GRP; HUSKY INJECTION MOLDING SYSTEMS LTD CO AMC INTELLECTUAL PROPERTY GRP

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LC LI LK LR LS LT LU LV LY MA MC MD MG MK ML MN MR MW MX MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RU SC SD SE SG SI SK SL SM SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

Title: METHOD FOR MANUFACTURING COMPRESSOR SLIDER, AND COMPRESSOR

Abstract: Source: US2010284844A A method for manufacturing a compressor slider includes a slider preform manufacturing step, a resin coating step, and a machining step. In the slider preform manufacturing step, an iron slider preform in which at least one property selected from the tensile strength and the tensile modulus of elasticity is greater than that of flake graphite cast iron is manufactured using a prescribed mold. In the resin coating step, the slider preform is not machined, but the resin coating layer is formed on all or a part of the slider preform. In the machining step, only the resin coating layer is machined, and a completed slider is obtained.

Classifications:

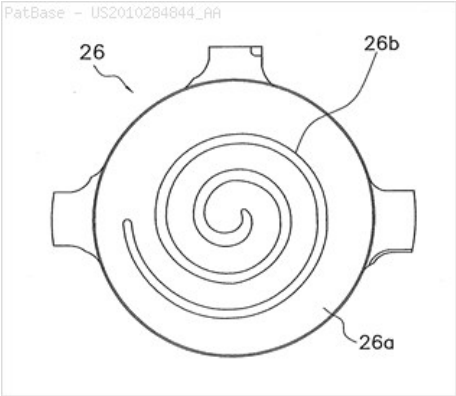
International (IPC 8-9): B05D3/12 B22C9/04 B22D17/00 B22D27/08 B22D27/09 C22C37/00 C22C37/04 F04B39/00 F04C18/02 F04C29/00 (Advanced/Invention); B22C9/04 B22D17/00 C22C37/00 F04B39/00 F04C18/02 F04C29/00 (Core/Invention)

International (IPC 1-7): F04B39/00

CPC: F04C2230/91 F04B39/0005 F04C18/0246 F05C2201/0442 F05C2253/20

European: F04B39/00B F04C18/02B6 R05C201/04S2C2 R05C253/20

US: 164/120 164/120S 164/71.1 164/71.100S 164/76.1 164/76.100S 418/55.1 418/55.100P 427/355 427/355S



Family:

Publication number	Publication date	Application number	Application date
AU2007208667 AA	20070802	AU20070208667	20070125
AU2007208667 BB	20100701	AU20070208667	20070125
AU2007208667 BH	20100722	AU20070208667	20070125
BRPI0707288 A2	20110426	BR2007PI07288	20070125
CN101375055 A	20090225	CN200780003587	20070125
EP1983192 A1	20081022	EP20070707432	20070125
IN03445KN2008 A	20090213	IN2008KN03445	20080822
JP2007245234 A2	20070927	JP20060244649	20060908
KR100984498 B1	20101001	KR20087019609	20070125
KR20080085214 A	20080923	KR20087019609	20070125
RU2008134719 A	20100310	RU20080134719	20070125
RU2399794 C2	20100920	RU20080134719	20070125
RU2439371 C1	20120110	RU20100120812	20100524
US2010284844 AA	20101111	US20070160844	20070125
WO07086479 A1	20070802	WO2007JP51200	20070125

Priority:

JP20060017626 20060126 JP20060041216 20060217 WO2007JP51200 20070125
JP20060244649 20060908

Probable Assignee: DAIKIN IND LTD

Assignee(s): (std): ARAI MIE ; DAIKIN IND LTD ; KISHIKAWA MITSUHIKO ; HIROUCHI TAKASHI ; YAMAJI HIROYUKI ; KAJIWARA MIKIO

Assignee(s): DAIKIN INDASTRIZ LTD ; DAIKIN INDUSTRIES LTD

Inventor(s): (std): ARAI MIE ; HIROUCHI TAKASHI ; HIROYUKI YAMAJI ; KAJIWARA MIKIO ; KISHIKAWA MITSUHIKO ; MIE ARAI ; MIKIO KAJIWARA ; MITSUHIKO KISHIKAWA ; TAKASHI HIROUCHI ; YAMAJI HIROYUKI ; KISIKAVA MITSUKHIKO ; KHIROUTI TAKASI ; KADZIVARA MIKIO ; JAMADZI KHIROJUKI

Agent(s): SPRUSON AND FERGUSON; GODDARD HEINZ J; GLOBAL IP COUNSELORS LLP

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD MG MK ML MN MR MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: COMPRESSION MECHANISM AND SCROLL COMPRESSOR INCLUDING THE SAME

Abstract: Source: US2010202910A A compression mechanism is configured to be used in a scroll compressor. The compression mechanism includes a fixed scroll and a movable scroll. One of the fixed scroll and the movable scroll is a cast iron molding fabricated through semi-molten die casting, and the other of the fixed scroll and the movable scroll is a grey iron casting.

Classifications:

International (IPC 8-9): B22D17/00 C22C37/00 F04C18/02 F04C23/00

F04C29/00 (Advanced/Invention);

F04C18/02 F04C29/00 (Advanced/Non-invention);

F04C18/02 F04C29/00 (Core/Invention)

International (IPC 1-7): F04C18/02

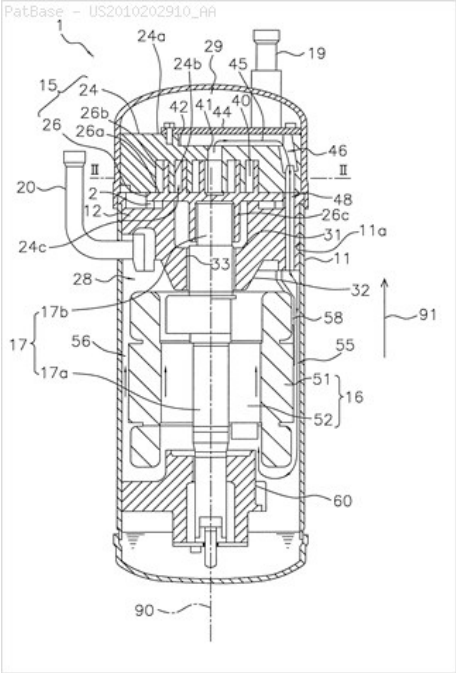
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F04C2210/1072 F04C2230/21 F05C2201/0439 C22C1/02

European: F04C18/02B6 F04C18/02B6D F04C23/00D R04C210/10E R04C210/10R

R04C230/21 R05C201/04S2C

US: 418/55.1 418/55.2 418/55.200P 418/55.3



Family:

Publication number	Publication date	Application number	Application date
AU2008284809 AA	20090212	AU20080284809	20080805
AU2008284809 BB	20110217	AU20080284809	20080805
CN101772647 A	20100707	CN200880102154	20080805
CN101772647 B	20120613	CN200880102154	20080805
EP2192302 A1	20100602	EP20080792185	20080805
EP2192302 A4	20150408	EP20080792185	20080805
IN00788KN2010 A	20100806	IN2010KN00788	20100302
JP2009041378 A2	20090226	JP20070204780	20070806
JP4241862 B2	20090318	JP20070204780	20070806
KR101155511 B1	20120618	KR20107004645	20080805
KR20100049097 A	20100511	KR20107004645	20080805
RU2010108271 A	20110920	RU20100108271	20080805
RU2434161 C1	20111120	RU20100108271	20080805
US2010202910 AA	20100812	US20080671282	20080805
US8512017 BB	20130820	US20080671282	20080805
WO09020106 A1	20090212	WO2008JP63988	20080805

Priority:

JP20070204780 20070806 WO2008JP63988 20080805

Probable Assignee: DAIKIN IND LTD

Assignee(s): (std): ARAI MIE ; DAIKEN CORP ; DAIKIN IND LTD ; KAJIWARA MIKIO ; MURAKAMI YASUHIRO ; YAMAMOTO SATOSHI ; YAMAJI HIROYUKI ; KISHIKAWA MITSUHIKO

Assignee(s): DAIKIN INDASTRIZ LTD

Inventor(s): (std): ARAI MIE ; KAJIWARA MIKIO ; KISHIKAWA MITSUHIKO ; MURAKAMI YASUHIRO ; YAMAJI HIROYUKI ; YAMAMOTO SATORU ; YAMAMOTO SATOSHI ; YASUHIRO MURAKAMI ; SATOSHI YAMAMOTO ; MURAKAMI JASUKHIRO ; MITSUHIKO KISHIKAWA ; MIKIO KAJIWARA ; MIE ARAI ; KISHIKAWA MITSUHIKO ; KADZIVARA MIKIO ; JAMAMOTO SATOSI ; JAMADZI KHIROJUKI ; HIROYUKI YAMAJI ; KISHIKAWA MITSUHIKO

Agent(s): SPRUSON AND FERGUSON; GODDARD HEINZ J; GLOBAL IP COUNSELORS LLP; GLOBAL IP COUNSELORS; SHINJYU GLOBAL IP

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW