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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/473,362	05/16/2012	Christopher D. Prest	069648-0396610	8861
98648	7590	12/07/2012	EXAMINER	
Pillsbury Winthrop Shaw Pitman LLP (Crucible)			YOON, KEVIN E	
P.O. Box 10500			ART UNIT	PAPER NUMBER
McLean, VA 22102			1735	
			NOTIFICATION DATE	DELIVERY MODE
			12/07/2012	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

Docket_IP@pillsburylaw.com

Office Action Summary	Application No. 13/473,362	Applicant(s) PREST ET AL.	
	Examiner KEVIN E. YOON	Art Unit 1735	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 31 October 2012.
- 2a) This action is **FINAL**.
- 2b) This action is non-final.
- 3) An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
- 4) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) Claim(s) 1-20 is/are pending in the application.
- 5a) Of the above claim(s) 11-20 is/are withdrawn from consideration.
- 6) Claim(s) _____ is/are allowed.
- 7) Claim(s) 1-10 is/are rejected.
- 8) Claim(s) _____ is/are objected to.
- 9) Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

- 10) The specification is objected to by the Examiner.
- 11) The drawing(s) filed on 16 May 2012 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
 - 1. Certified copies of the priority documents have been received.
 - 2. Certified copies of the priority documents have been received in Application No. _____.
 - 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 3) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 4) Other: _____.

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DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, claims 1-10 in the reply filed on 10/31/12 is acknowledged.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "the float chamber comprises an integrated cooling channel within the float chamber (claim 6)" and "melting a solid feedstock of the first molten metal using in-flight heating of the solid feedstock (claim 10)" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will

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be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of 35 U.S.C. 112(a):

(a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), first paragraph:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-10 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

5. Claim 1 recites “at a cooling rate of 1000 degree C or less.” However, the cooling rate should be given with a unit of “temperature/time”, for example, 1000 degree C/sec. The specification does not provide what the unit of time should be. Therefore, one skill in the art would not use the invention without undue experiment to find out the correct cooling rate.

6. The following is a quotation of 35 U.S.C. 112(b):

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(B) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-10 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

8. Claim 1 recites “at a cooling rate of 1000 degree C or less.” However, the cooling rate should be given with a unit of “temperature/time”, for example, 1000 degree C/sec. The specification does not provide what the unit of time should be. For the purpose of prosecution, the examiner will interpret the limitation as “**at a cooling rate of 1000 degree C/sec or less.**”

Please note, however, that if applicant amends the claim to include the unit of time, it will raise a new matter issue, since the specification does not have a support for it.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**** The following rejections are provided with interpreting the limitation as “at a cooling rate of 1000 degree C/sec or less.” ****

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10. Claims 1-3 and 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by McRae (US 2003/0183310).

Re Claim 1. McRae teaches a method comprising:

pouring a first molten metal (Fig. 1, item M, para. 10) comprising a metal alloy at a temperature near or above a melting temperature (T_m) of the first molten metal so as to form a sheet of the first molten metal (Fig. 1), wherein the first molten metal has a composition that forms a bulk solidifying amorphous alloy (para. 9) at a cooling rate of 1000 degree C/sec or less (para. 9, 1000 degree F/sec=537.78 degree C/sec),

floating the sheet of the first molten metal (Fig. 1, item S, para. 16) on a second molten metal (Fig. 1, item 20, para. 16) in a float chamber (Fig. 1, item 31, para. 12);

and cooling the first molten metal to form a bulk solidifying amorphous alloy sheet (para. 14), wherein the cooling is at a cooling rate such that a time-temperature profile during the cooling does not traverse through a region bounding a crystalline region of the metal alloy in a time-temperature-transformation (TTT) diagram.

McRae does not expressly disclose that the cooling is at a cooling rate such that a time-temperature profile during the cooling does not traverse through a region bounding a crystalline region of the metal alloy in a time-temperature-transformation (TTT) diagram.

However, it is inherent to the invention of McRae to use a fast cooling rate, because if a time-temperature profile during the cooling traverses through a region bounding a crystalline

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region of the metal alloy in a time-temperature-transformation (TTT) diagram, the sheet of the first molten metal would transform into a crystalline sheet, not the amorphous sheet.

Re Claim 2. McRae teaches wherein the first molten metal comprises a zirconium or iron based alloy (para. 9).

Re Claim 3. McRae teaches wherein the second molten metal comprises tin (para. 15).

Re Claim 7. McRae teaches maintaining the first molten metal in a melter/reservoir (Fig. 1, item 10, para. 10) at the temperature near or above the melting temperature (T_m) of the first molten metal (para. 10).

Re Claim 8. McRae teaches wherein the maintaining the first molten metal in the melter/reservoir at the temperature near or above T_m of the first molten metal comprises induction heating (Fig. 1, item 12, para. 14) the first molten metal.

Re Claim 9. McRae does not expressly disclose the melter/reservoir is substantially electromagnetically transparent.

However, it is inherent to the invention of McRae for the melter/reservoir to be substantially electromagnetically transparent. If not, the induction coil would not be able to melt the metal and maintain it as molten metal.

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Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over McRae as applied to claim 1 above, and further in view of Leghorn (US 3,430,680).

The teachings of McRae have been discussed above.

McRae fails to specifically teach that: **(re Claim 4)** the second molten metal comprises bismuth; and **(re Claim 5)** the second molten metal comprises a fusible alloy having a melting point below the melting point of zinc or tin.

The invention of Leghorn encompasses a method of casting by floating a first molten metal on a second molten metal.

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Leghorn teaches that bismuth (C4/L25-44, C14/L57-75, and C32/L28-39) or a fusible alloy having a melting point below the melting point of zinc or tin (C4/L25-44, C14/L57-75, C32/L28-39, and Table) as a second molten metal in place of tin, as they have a high density and low melting point.

In view of Leghorn, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the invention of McRae to use bismuth or a fusible alloy having a melting point below the melting point of zinc or tin as a second molten metal; since Leghorn teaches the advantage of using them, which is having a high density and low melting point (C32/L28-39).

In addition, the substitution of one known element (bismuth or a fusible alloy) for another (tin) would have yielded predictable results to one of ordinary skill in the art. See MPEP 2143. *KSR International Co. v. Teleflex Inc. (KSR)*, 550 U.S. ___, 82 USPQ2d 1385 (2007).

14. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over McRae as applied to claim 1 above, and further in view of Martin (US 3,841,387).

McRae fails to specifically teach that the float chamber comprises an integrated cooling channel within the float chamber, wherein the cooling channel is configured to allow a coolant to flow through the cooling channel.

The invention of Martin encompasses a method of casting by floating a first molten metal on a second molten material.

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Martin teaches that the float chamber (item 30, C2/L52-64) comprises an integrated cooling channel (item 45, C2/L52-64) within the float chamber, to set the second molten material at desired temperature (C2/L52-64).

In view of Martin, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the invention of McRae to use the float chamber having an integrated cooling channel; since Martin teaches the advantage of using it, which is to set the second molten material at desired temperature (C2/L52-64).

15. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over McRae as applied to claim 7 above, and further in view of Watanabe et al. (Innovative in-flight glass-melting technology using thermal plasmas, Pure and Applied Chemistry, Vo. 82, No. 6, pp. 1337-1351, 4/20/10, hereinafter Watanabe).

McRae fails to specifically teach melting a solid feedstock of the first molten metal using in-flight heating of the solid feedstock to form the first molten metal in-flight prior to the melter/reservoir.

The research of Watanabe encompasses a method of making glass using in-flight melting. Watanabe teaches to melt a solid feedstock of the first molten material using in-flight heating of the solid feedstock to form the first molten material in-flight prior to the melter/reservoir (Fig. 2) to expedite the melting process (p. 1338).

In view of Watanabe, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the invention of McRae to melt a solid feedstock of the first molten

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metal using in-flight heating of the solid feedstock to form the first molten metal in-flight prior to the melter/reservoir; since Watanabe teaches the advantage of doing it, which is to expedite the melting process (p. 1338).

Conclusion

The rejections above rely on the references for all the teachings expressed in the text of the references and/or one of ordinary skill in the art would have reasonably understood from the texts. Only specific portions of the texts have been pointed out to emphasize certain aspects of the prior art, however, each reference as a whole should be reviewed in responding to the rejection, since other sections of the same reference and/or various combinations of the cited references may be relied on in future rejections in view of amendments.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEVIN E. YOON whose telephone number is (571)270-5932. The examiner can normally be reached on Monday-Friday, 9:00 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Keith Walker can be reached on 571-272-3458. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KEVIN E. YOON/
Examiner, Art Unit 1735

11/19/12

/Kevin P. Kerns/
Primary Examiner, Art Unit 1735

Notice of References Cited	Application/Control No. 13/473,362	Applicant(s)/Patent Under Reexamination PREST ET AL.	
	Examiner KEVIN E. YOON	Art Unit 1735	Page 1 of 1

U.S. PATENT DOCUMENTS

*	Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A US-2003/0183310	10-2003	McRae, Michael M.	148/561
*	B US-3,430,680	03-1969	LEGHORN GEORGE R	164/81
*	C US-3,841,387	10-1974	Martin, Hubert	164/81
	D US-			
	E US-			
	F US-			
	G US-			
	H US-			
	I US-			
	J US-			
	K US-			
	L US-			
	M US-			

FOREIGN PATENT DOCUMENTS

*	Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N				
	O				
	P				
	Q				
	R				
	S				
	T				

NON-PATENT DOCUMENTS

*	Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)				
	U	Watanabe et al., Innovative in-flight glass-melting technology using thermal plasmas, Pure and Applied Chemistry, Vol. 82, No. 6, pp. 1337-1351, 4/20/10			
	V				
	W				
	X				

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.