

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
22 January 2004 (22.01.2004)

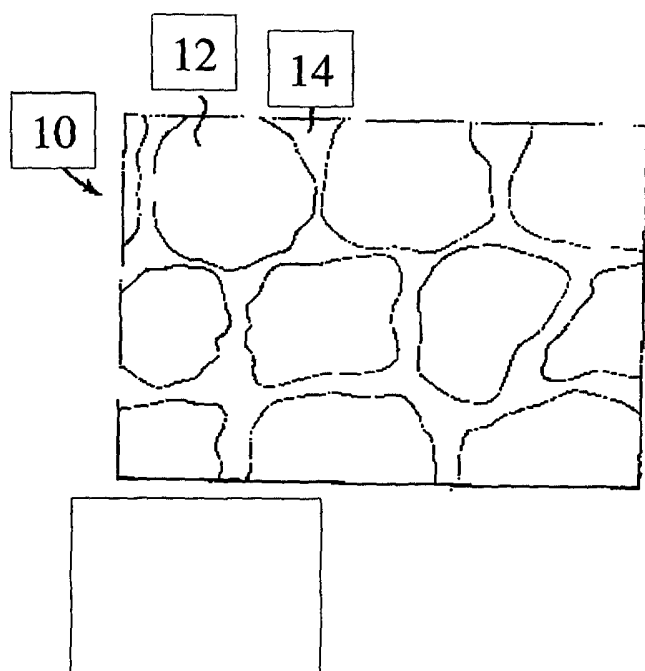
PCT

(10) International Publication Number
WO 2004/007786 A3

- (51) International Patent Classification⁷: **C22C 45/02**, 45/10
- (21) International Application Number: PCT/US2003/022522
- (22) International Filing Date: 17 July 2003 (17.07.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 60/397,981 17 July 2002 (17.07.2002) US
- (71) Applicant (for all designated States except US): **LIQUID-METAL TECHNOLOGIES** [US/US]; 100 North Tampa Street, Suite 3150, Tampa, FL 33602 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **PEKER, Atakan** [TR/US]; 17 Coffeeberry, Aliso Viejo, CA 92656 (US).
- (74) Agent: **PECK, John, W.**; Christie, Parker & Hale, LLP, Post Office Box 7068, Pasadena, CA 91109-7068 (US).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published: — with international search report
- (88) Date of publication of the international search report: 18 March 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD OF MAKING DENSE COMPOSITES OF BULK-SOLIDIFYING AMORPHOUS ALLOYS AND ARTICLES THEREOF



(57) Abstract: A method of making composites (10) of bulk-solidifying amorphous alloys (14) containing at least one type or reinforcement material (12), wherein the composite material (10) preferably comprises a high volume fraction of reinforcement material (12) and is fully-dense with minimum porosity, is provided. Articles made by the method are also provided.

WO 2004/007786 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/22522

A. CLASSIFICATION OF SUBJECT MATTER				
IPC(7) : C22C 45/02, 45/10				
US CL : 148/403, 421, 538, 561				
According to International Patent Classification (IPC) or to both national classification and IPC				
B. FIELDS SEARCHED				
Minimum documentation searched (classification system followed by classification symbols) U.S. : 148/403, 421, 538, 561				
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched				
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) WEST, search terms=amorphous and (matrix or reinforcement)				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	US 5,567,251 A (PEKER et al.) 22 October 1996, see entire document.	21-28		
X	US 5,567,532 A (PEKER et al.) 22 October 1996, see entire document.	21, 23-28		
X	US 6,010,580 A (DANDLIKER et al.) 04 January 2000, see entire document.	21-28		
A	US 4,612,059 A (MORI et al.) 16 September 1986, see entire document.	1-28		
A	US 5,288,344 A (PEKER et al.) 22 February 1994, see entire document.	6,7		
A	US 5,735,975 A (LIN et al.) 07 April 1998, see entire document.	1-28		
A	WO 00/68469 A (CALIFORNIA INSTITUTE OF TECHNOLOGY) 16 November 2000, see entire document.	1-28		
A,P	WO 03/040422 A1 (JOHNS HOPKINS UNIVERSITY) 15 May 2003, see entire document.	1-28		
X,P	DE 10237992 A1 (LEIBNIZ INSTITUT) 27 March 2003, see entire document.	21-28		
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.				
* Special categories of cited documents: <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed </td> <td style="width: 50%; border: none;"> "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family </td> </tr> </table>			"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family
"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family			
Date of the actual completion of the international search 03 November 2003 (03.11.2003)		Date of mailing of the international search report 11 DEC 2003		
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703)305-3230		Authorized officer Roy V King Telephone No. 703-308-0661 		