

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
18 May 2007 (18.05.2007)

PCT

(10) International Publication Number  
**WO 2007/055964 A3**

- (51) International Patent Classification:  
C03C 3/087 (2006.01) C03C 13/00 (2006.01)  
C03C 3/04 (2006.01)
- (21) International Application Number:  
PCT/US2006/042406
- (22) International Filing Date: 31 October 2006 (31.10.2006)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
11/267,702 4 November 2005 (04.11.2005) US
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AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

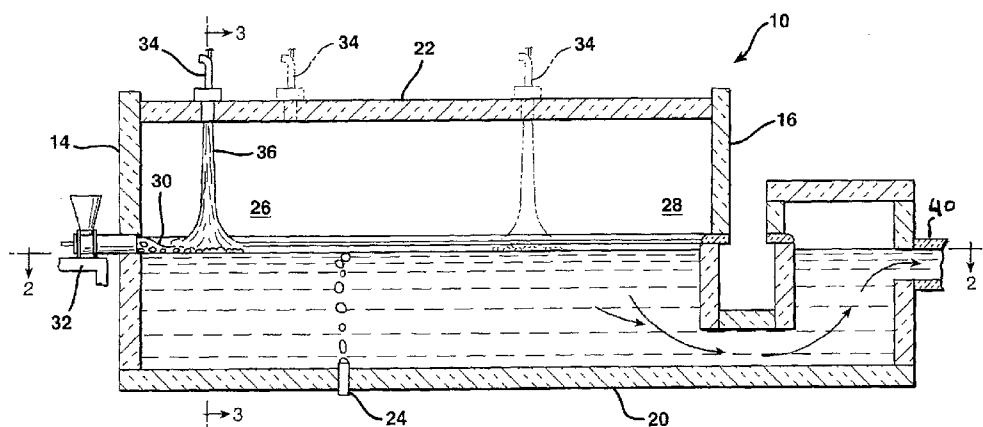
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**  
— with international search report  
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:  
5 July 2007

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 MANUFACTURING HIGH PERFORMANCE GLASS FIBERS IN A REFRACTORY LINED MELTER AND FIBER FORMED THEREBY



(57) Abstract: A method of forming high strength glass fibers in a refractory lined glass melter is disclosed. The refractory lined melter is suited to the batch compositions disclosed for the formation high modulus, and high-strength glass fibers. The glass composition for use in the method of the present invention is up to about 70.5 Weight % SiO<sub>2</sub>, 24.5 weight % Al<sub>2</sub>O<sub>3</sub>, 22 weight % alkaline earth oxides and may include small amounts of alkali metal oxides and ZrO<sub>2</sub>. Oxide based refractories included alumina, chromic oxide, silica, alumina-silica, zircon, zirconia-alumina-silica and combinations thereof. By using oxide based refractory lined furnaces the cost of production of glass fibers is substantially reduced in comparison with the cost of fibers using a platinum lined melting furnace. Fibers formed by the present invention are also disclosed.

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**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US 06/42406

**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC(8): C03C 3/087, 3/04, 13/00 (2007.01)  
 USPC : 501/70, 53, 35  
 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)  
 USPC : 501/70, 501/53, 501/35

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
 USPC: 65/66,385; 501/11,35,53-55,59,68-70,72 (text search - see terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
 WEST (PGPB,USPT,USOC,EPAB,JPAB); DialogPro (General Research); Google Scholar  
 Search terms: glass, fiber, silica, alumina, oxide, fiberize, softening, liner or lining, strength, modulus, resin or polymer, matrix, cte

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4,857,485 A (BRENNAN et al.) 15 August 1989 (15.08.1989), col 1, ln 10-48; col 2, ln 40-65; col 3, ln 4-6; and Table 1.	1-20
Y	US 3,904,423 A (GUTHRIE) 09 September 1975 (09.09.1975), abstract, col 2, ln 54-65; Table 1; col 3, ln 28-31; col 4, ln 40-55; and claim 1.	1-20
Y	US 2002/0000101 A1 (CHENOWETH et al.) 03 January 2002 (03.01.2002), abstract; para [0003], [0004], [0036] and [0038].	1-20
Y	US 2005/0084440 A1 (CHACON et al.) 21 April 2005 (21.04.2005), abstract, para [0008] and Table 1.	11
Y	US 5,851,932 A (DICKSON et al.) 22 December 1998 (22.12.1998), col 1, ln 30-58; col 3, ln 20-35.	12-17
A	US 6,579,599 B1 (BLUM et al.) 17 June 2003 (17.06.2003); abstract; col 4, ln 57 - col 5, ln 47; col 7, ln 28-31; col 13, ln 45-50.	12-17
A	US 3,861,926 A (IRLAM et al.) 21 January 1975 (21.01.1975), entire document.	1-20
A	US 2005/0031703 A1 (BEIER et al.) 10 February 2005 (10.02.2005), entire document.	1-20
A, P	US 6,998,361 B2 (LEWIS) 14 February 2006 (14.02.2006), entire document.	1-20

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Date of the actual completion of the international search 04 March 2007 (04.03.2007)	Date of mailing of the international search report <b>08 MAY 2007</b>
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