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[Continued on next page]

(54) Title: METHOD AND SYSTEM FOR FORMING A HIGHER PURITY SEMICONDUCTOR INGOT USING LOW PURITY SEMICONDUCTOR FEEDSTOCK

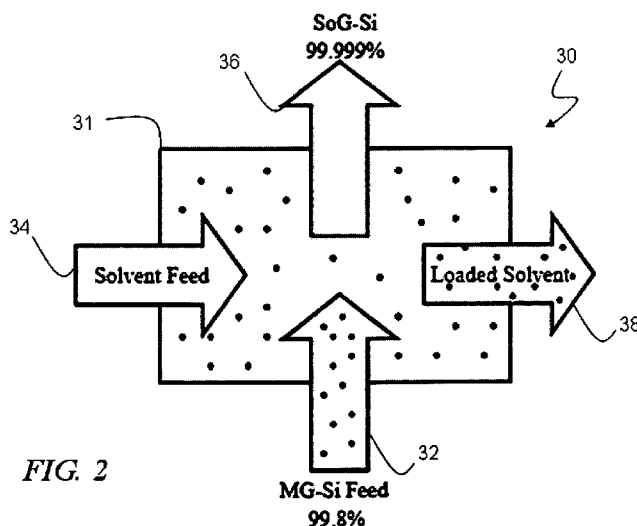


FIG. 2

(57) Abstract: Techniques for the formation of a higher purity semiconductor ingot using a low purity semiconductor feedstock include associating within a crucible a low-grade silicon feedstock, which crucible forms a process environment of said molten silicon. The process associates with the low-grade silicon feedstock, a quantity of the at least one metal and includes forming within the crucible a molten solution (e.g., a binary or ternary solution) of molten silicon and the metal at a temperature below the melting temperature of said low-grade silicon feedstock. A silicon seed crystal associates with the molten solution within the crucible for inducing directional silicon crystallization. The process further forms a silicon ingot from a portion of the molten solution in association with the silicon seed. The silicon ingot includes at least one silicon crystalline formation grown in the induced directional silicon crystallization process. The resulting silicon ingot has a silicon purity substantially exceeding the silicon purity of said low grade silicon feedstock.



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Declarations under Rule 4.17:

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<p>A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - C30B 27/02, C30B 30/00 (2008.04) USPC - 117/18; 117/208, 117/214 According to International Patent Classification (IPC) or to both national classification and IPC</p>														
<p>B. FIELDS SEARCHED</p> <p>Minimum documentation searched (classification system followed by classification symbols) IPC (8) - C30B 27/02, C30B 30/00 (2008.04) USPC - 117/18; 117/208, 117/214</p> <p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched IPC (8) - C30B 27/02, C30B 30/00 (2008.04) USPC - 117/18; 117/208, 117/214</p> <p>Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) PUBWEST (PGPB,USPT,USOC,EPAB,JPAB) Terms - silicon aluminum zinc copper tin silver nickel melt crystal getter metallurgical grade calisolar seed crystal aluminum crucible puller Google - high purity silicon ingot zinc; high purity silicon ingot calisolar; silicon seed crystal aluminum crucible</p>														
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:10%;">Category*</th> <th style="width:70%;">Citation of document, with indication, where appropriate, of the relevant passages</th> <th style="width:20%;">Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X --- Y</td> <td>US 2006/0194417 A1 (ISHIHARA et al.) 31 August 2006 (31.08.2006), para [0011], [0023], [0027]-[0031], [0040], [0047]</td> <td>1-16, 18, 20-36, 38, 40-41 ----- 17, 19, 37, 39</td> </tr> <tr> <td>Y</td> <td>US 2006/0048698 A1 (HALL et al.) 09 March 2006 (09.03.2006), para [0036]</td> <td>17, 37</td> </tr> <tr> <td>Y</td> <td>US 5,779,792 A (ATAMI et al.) 14 July 1998 (14.07.1998), col 2, ln 13-25</td> <td>19, 39</td> </tr> </tbody> </table>			Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X --- Y	US 2006/0194417 A1 (ISHIHARA et al.) 31 August 2006 (31.08.2006), para [0011], [0023], [0027]-[0031], [0040], [0047]	1-16, 18, 20-36, 38, 40-41 ----- 17, 19, 37, 39	Y	US 2006/0048698 A1 (HALL et al.) 09 March 2006 (09.03.2006), para [0036]	17, 37	Y	US 5,779,792 A (ATAMI et al.) 14 July 1998 (14.07.1998), col 2, ln 13-25	19, 39
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<p>Date of the actual completion of the international search</p> <p>31 July 2008 (31.07.2008)</p>		<p>Date of mailing of the international search report</p> <p align="center">07 AUG 2008</p>												
<p>Name and mailing address of the ISA/US</p> <p>Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201</p>		<p>Authorized officer:</p> <p align="center">Lee W. Young</p> <p>PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774</p>												