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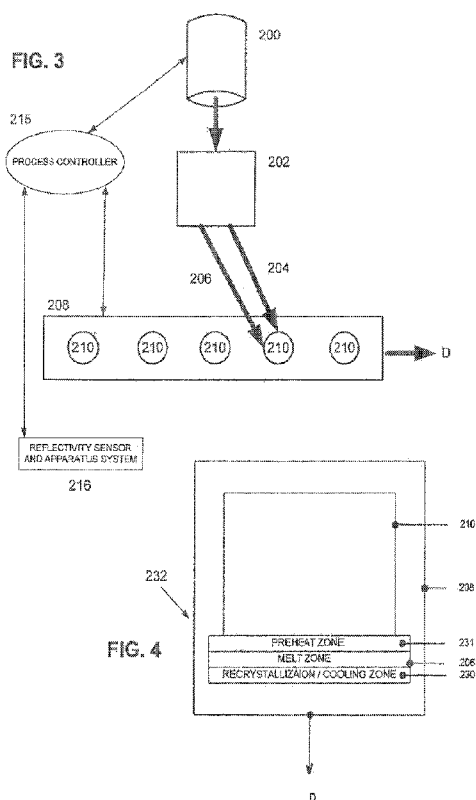
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[Continued on next page]

(54) Title: METHOD AND SYSTEM FOR PRE-HEATING OF SEMICONDUCTOR MATERIAL FOR LASER ANNEALING AND GAS IMMERSION LASER DOPING



(57) Abstract: A fiber laser system enables a method for treating a semiconductor material by preheating a wafer for laser annealing and gas immersion laser doping by a laser source. A long wave length fiber laser having a Gaussian or similar profile is applied in a full-width ribbon beam across an incident wafer. Preferably the wavelength is greater than 1 μm (micron) and preferably a Yb doped fiber laser is used. The process is performed in a suitable environment which may include doping species. The process ensures the temperature gradient arising during processing does not exceed a value that results in fracture of the wafer while also reducing the amount of laser radiation, required to achieve controlled surface melting, recrystallization and cooling.

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- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/043786**A. CLASSIFICATION OF SUBJECT MATTER*****H01L 21/324(2006.01)i, H01L 21/26(2006.01)i***

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)

H01L 21/324; E05B 67/38; B23K 26/36; H01L 21/31; E05B 67/06; H01L 21/461; H01L 21/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: GILD, laser doping, preheat, Gaussian profile, ribbon beam

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2011-066548 A1 (UVT TECH SYSTEMS, INC.) 03 June 2011 See claims 1,5,6; and figure 9.	1-11
A	US 05885904A A (MEHTA; SUNIL et al.) 23 March 1999 See column 7 line 21-column 9 line 10.	1-11
A	US 2006-0252282 A1 (TALWAR; SOMIT et al.) 09 November 2006 See paragraphs [0058]-[0072]; and figure 1C.	1-11
A	US 2008-0264910 A1 (KASHYAP; RAMAN et al.) 30 October 2008 See paragraphs [0045], [0046], [0067], [0069]; and figures 1,16.	1-11

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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"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

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"&" document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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