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- (81) **Designated States** (*unless otherwise indicated, for every
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HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KN, KP, KR,
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MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
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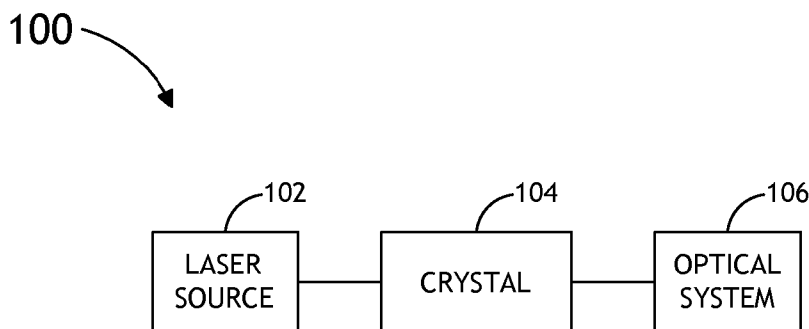
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TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
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6 March 2014

(54) **Title:** LASER CRYSTAL DEGRADATION COMPENSATION



(57) **Abstract:** Method and system for laser crystal degradation compensation are disclosed. The method includes: defining a plurality of sites on a frequency converting crystal; determining a degradation rate associated with each of the plurality of sites; determining an amount of time T wherein a site is continuously operable within a tolerated variation of at least one beam parameter, the amount of time T being determined based on the tolerated variation of the at least one beam parameter and the degradation rate; determining an amount of time t wherein t is a fraction of T; and iteratively shifting among the plurality of sites, wherein each of the plurality of sites is utilized continuously for a duration of time t for each iteration.



A. CLASSIFICATION OF SUBJECT MATTER**H01L 21/66(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 21/66; H01S 3/10; H01S 5/06; H03B 5/18; H01S 5/14; H03B 5/32; G02F 1/01; H01S 3/13; H01S 3/108; G02F 1/35

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: frequency, convert, crystal, short, interval, laser and degradation

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2008-0144678 A1 (HAIPING LU et al.) 19 June 2008 See paragraphs [0042]-[0059], claims 1-12 and figures 1-7.	1-20
A	US 2011-0222565 A1 (DAVID HORAIN et al.) 15 September 2011 See abstract, paragraphs [0041]-[0066] and figures 1-5.	1-20
A	US 2010-0111119 A1 (KENJI SATO et al.) 06 May 2010 See abstract, paragraphs [0052]-[0083] and figures 4, 7-9.	1-20
A	US 6388534 B1 (ALFIERO BALZANO et al.) 14 May 2002 See abstract, column 3, line 30 - column 5, line 57 and figures 1-2, 5-6.	1-20
A	US 2006-0072635 A1 (CHARLES XIAOYI WANG) 06 April 2006 See abstract, paragraphs [0056]-[0060] and figures 10-12.	1-20



Further documents are listed in the continuation of Box C.



See patent family annex.

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"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

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2008-0144678 A1	19/06/2008	CN 101222105 A CN 101222105 C0 EP 1933197 A1 US 7826502 B2	16/07/2008 16/07/2008 18/06/2008 02/11/2010
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US 2006-0072635 A1	06/04/2006	US 7242700 B2 WO 2006-041620 A1	10/07/2007 20/04/2006