(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
19 June 2003 (19.06.2003)

PCT

(10) International Publication Number
WO 03/050330 A1

(51) International Patent Classification[7]: C30B 25/02, 25/14, 25/16, 29/10

(21) International Application Number: PCT/US02/39615

(22) International Filing Date:
11 December 2002 (11.12.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/014,466 11 December 2001 (11.12.2001) US

(71) Applicant: **APPLIED MATERIALS, INC.** [US/US]; P.O. Box 450A, Santa Clara, CA 95052 (US).

(72) Inventors: **SAMOILOV, Arkadii, V.**; 1136 S. Mary Avenue, Sunnyvale, CA 94089 (US). **BERLIN, Dean, E.**; 3793 Kersten Drive, San Jose, CA 95124 (US).

(74) Agents: **MORRIS, Frank, E.** et al.; Pennie & Edmonds LLP, 1155 Avenue of the Americas, New York, NY 10036 (US).

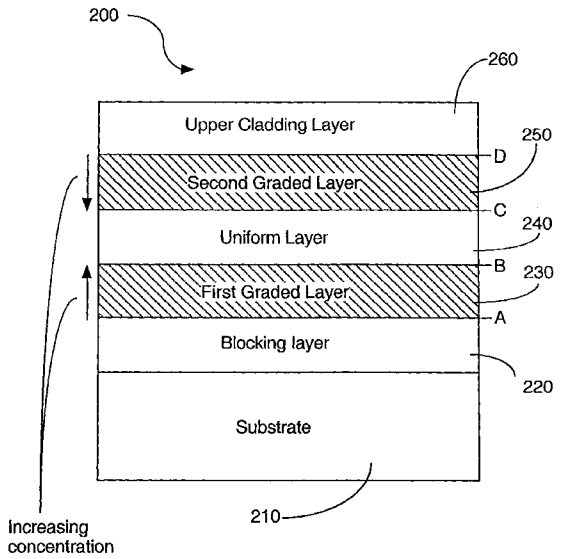
(81) Designated States *(national)*: CN, JP, KR, SG.

(84) Designated States *(regional)*: European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR).

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*

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: WAVEGUIDES SUCH SiGeC WAVEGUIDES AND METHOD OF FABRICATING THE SAME



(57) Abstract: A waveguide structure (200) and method of fabricating the same, the method comprising forming a first graded layer (230) on a substrate (210), wherein the first graded layer comprises a first and a second optical material, and a lattice constant adjusting material, wherein the concentration of the second optical material increases with the height of the first graded layer and the concentration of the lattice constant adjusting material varies in proportion to the second optical material; and forming a second graded layer, the second graded layer (250) comprising the first and second optical materials, and a lattice constant adjusting material, wherein the concentration of the second optical material decreases with the height of the second graded layer and the concentration of the lattice constant adjusting material varies in proportion to the second optical material.

WO 03/050330 A1