

(19) World Intellectual Property Organization
International Bureau



(10) International Publication Number
WO 2009/105281 A3

(43) International Publication Date
27 August 2009 (27.08.2009)

(51) International Patent Classification:
H04B 10/13 (2006.01) *H04B 10/02* (2006.01)
H04B 10/12 (2006.01)

(21) International Application Number:
PCT/US2009/001 159

(22) International Filing Date:
23 February 2009 (23.02.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/030,936 22 February 2008 (22.02.2008) US
61/096,730 12 September 2008 (12.09.2008) US

(71) Applicant (for all designated States except US):
OPVISTA INCORPORATED [US/US]; 870 McCarthy Blvd., Milpitas, CA 95035 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **WAY, Winston, I.** [US/US]; 5096 Harcum Lane, Irvine, CA 92612 (US).

(74) Agent: **AI, Bing**; Fish & Richardson P.C., P.O. Box 1022, Minneapolis, MN 55440-1022 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, 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, LY, MA, MD, ME, 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, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(H))

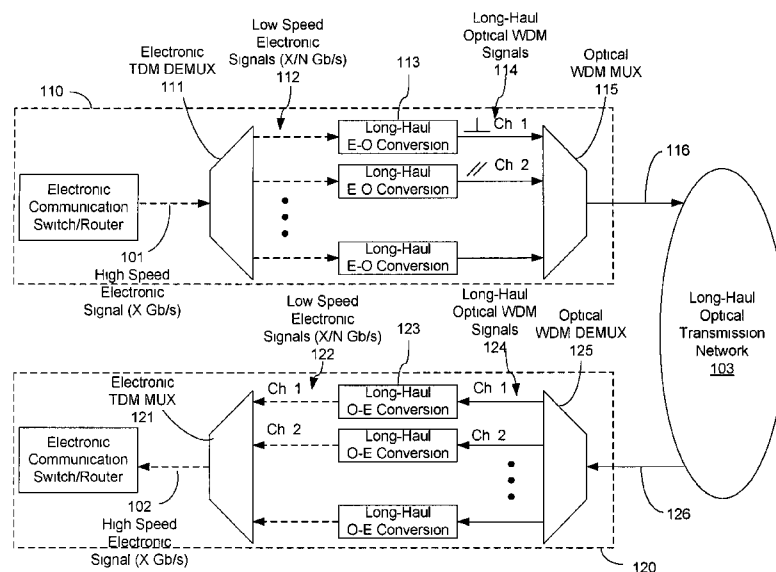
Published:

— 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(i))

(88) Date of publication of the international search report:
3 December 2009

(54) Title: SPECTRALLY EFFICIENT PARALLEL OPTICAL WDM CHANNELS FOR LONG-HAUL MAN AND WAN OPTICAL NETWORKS

FIG. 1A



(57) Abstract: Techniques, apparatus and systems for optical WDM communications that use spectrally efficient parallel optical WDM channels for WAN and MAN networks.

WO 2009/105281 A3

A. CLASSIFICATION OF SUBJECT MATTER**H04B 10/13(2006.01)1, H04B 10/12(2006.01)1, H04B 10/02(2006.01)1**

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)

IPC H04B

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 since 1975

Japanese Utility models and applications for Utility models since 1975

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

eKOMPASS(KIPO internal) "WDM, transceiver, modulation, mux, demux"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category's* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No |
|-------------|--|---------------------------------|
| X | WO 2007-014055 A1 (NOVERA OPTICS, INC) 01 Feb 2007 Abstract, Figs 3-7 | 54, 147,154 |
| A | | 1-53,55-146,148-153, 155-157 |
| A | US 6141 126 A (LAHAT et al) 31 Oct 2000 Abstract, Fig 1 | 1-157 |
| A | US 2007-0258716 A1 (BARBIERI) 08 Nov 2007 Abstract, Fig 1 | 1-157 |
| A | US 7209660 B1 (YEE et al) 24 Apr 2007 Abstract, Figs 11-12 | 1-157 |

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

* Special categories of cited documents

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"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

Date of the actual completion of the international search

09 OCTOBER 2009 (09 10 2009)

Date of mailing of the international search report

09 OCTOBER 2009 (09.10.2009)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, 139 Seonsa-ro, Seo-
gu, Daejeon 302-701, Republic of Korea

Facsimile No 82-42-472-7140

Authorized officer

LEE, Jin Ick

Telephone No 82-42-481-5770



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2009/001159

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---------------------|---|--|
| WO 2007-014055 A 1 | 01.02.2007 | US 2007-0019956 A 1 | 25.01.2007 |
| US 2007-258716 A 1 | 08.11.2007 | None | |
| US 2007-258716 A 1 | 08.11.2007 | None | |
| US 07209660 B 1 | 24.04.2007 | AU 2002-245453 A 8 AU 2002-217957 A 8 AU 2002-17957 A 1 AU 2001-32663 A 1 AU 2002-245453 A 1 US 2007-0133993 A 1 US 2006-0291868 A 1 US 2002-0097469 A 1 US 07447436 B 2 US 07146103 B 2 WO 2001-048954 A 3 WO 2001-048954 A 2 WO 2002-045297 A 3 WO 2002-045297 A 2 WO 2002-061981 A 3 | 30.01.2002 27.11.2001 27.11.2001 22.12.2000 12.08.2002 14.06.2007 28.12.2006 25.07.2002 04.11.2008 05.12.2006 05.07.2001 05.07.2001 06.06.2002 06.06.2002 08.08.2002 |