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- (71) 申请人 (对除美国外的所有指定国): **华为技术有限公司 (HUAWEI TECHNOLOGIES CO., LTD.)** [CN/CN]; 中国广东省深圳市龙岗区坂田华为总部办公楼, Guangdong 518129 (CN)。
- (72) 发明人: 及
- (75) 发明人/申请人 (仅对美国): **刘德坤 (LIU, Dekun)** [CN/CN]; 中国广东省深圳市龙岗区坂田华为总部办公楼, Guangdong 518129 (CN)。 **徐之光 (XU, Zhiguang)** [CN/CN]; 中国广东省深圳市龙岗区坂田华为总部办公楼, Guangdong 518129 (CN)。 **林华枫 (LIN, Huafeng)** [CN/CN]; 中国广东省深圳市龙岗区坂田华为总部办公楼, Guangdong 518129 (CN)。

- (74) 代理人: 北京中博世达专利商标代理有限公司 (BEIJING ZBSD PATENT & TRADEMARK AGENT LTD.); 中国北京市海淀区大柳树路 17 号富海大厦 B 座 501 室, Beijing 100081 (CN)。
- (81) 指定国 (除另有指明, 要求每一种可提供的国家保护): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, 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, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW。
- (84) 指定国 (除另有指明, 要求每一种可提供的地区保护): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), 欧亚 (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), 欧洲 (AL, 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,

[见续页]

(54) Title: WAVELENGTH DIVISION MULTIPLEXER AND PASSIVE OPTICAL NETWORK SYSTEM

(54) 发明名称: 波分复用器及无源光网络系统

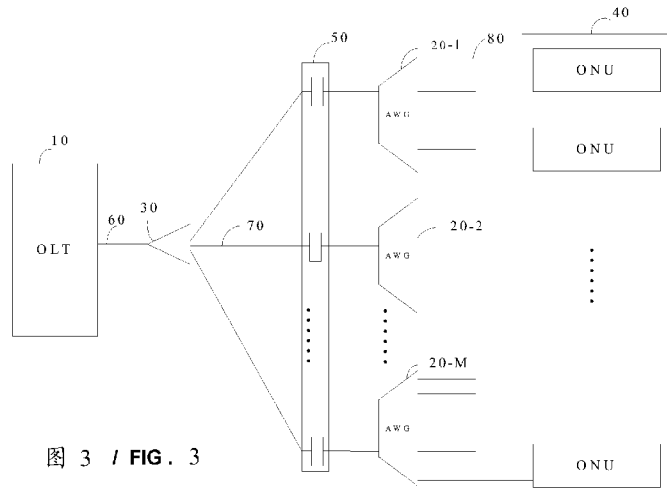


图 3 / FIG. 3

(57) Abstract: Relating to the field of optical communications and disclosed in the embodiments of the present invention are a wavelength division multiplexer and passive optical network system for use in optical fibre communication and resolving both the storage problems caused by wavelength division multiplexers requiring different final-stage center wavelengths, and difficulties of deployment. The multistage beam-splitting passive optical network system provided in the embodiments of the present invention comprises: an optical line terminal; beam-splitting components used to split received optical signals into M branches; M wavelength division multiplexers having M common ports and N branch ports, the M wavelength division multiplexers respectively using different common ports to receive a branch optical signal, then sending each such received optical signal downstream after splitting same; M partial reflectors, each disposed on one of the M branches respectively and also at one side near the beam-splitting components so as to constitute, with the wide spectral gain laser of the optical network unit, a self-injecting laser, and to send upstream the signals modulated by the laser.

(57) 摘要:

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RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)。

本国际公布:

— 包括国际检索报告(条约第 21 条(3))。

- 在修改权利要求的期限届满之前进行，在收到该修改后将重新公布(细则 48.2(h))。
- 根据申请人的请求，在条约第 21 条(2)(a)所规定的期限届满之前进行。

(88) 国际检索报告公布日期: 2013 年 2 月 28 日

本发明实施例公开了一种波分复用器及无源光网络系统，涉及光通信领域，应用于光纤通讯，解决了无源光网络中，末级需要不同中心波长的波分复用器带来的仓储问题和部署困难问题。本发明实施例提供的多级分光的无源光网络系统包括：光线路终端；分光器件，用于接收的光信号分成 M 个分支；M 个含有 M 个公共端口和 N 个分支端口的波分复用器，该 M 个波分复用器分别利用不同的公共端口接收一支光信号，将各自接收的光信号分路后向下发送；M 个部分反射器，该 M 个部分反射器分别位于 M 个分支的一支上，并且位于靠近分光器件的一侧，用于和光网络单元的宽谱增益激光器构成自注入激光器，并将激光器上调制的信号向上发送。

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2012/073595

A. CLASSIFICATION OF SUBJECT MATTER

See the extra sheet

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, G02B, H04J

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

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

CNABS, CPRSABS, CPRS, CNKI, EPODOC, VEN: WDM, MULTIPLEX+, DEMULTIPLEX+, WAVEGUIDE, FREQUENCY, WAVELENGTH+, AWG, ARRAY+, GRATING, INPUT, OUTPUT, INTERFACE?, PORT?, PUBLIC, NORMAL, STANDARD, COMMON+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2009220234 A1 (NATIONAL UNIVERSITY CORPORATION NAGOYA UNIVERSITY et al.) 03 Sep. 2009 (03.09.2009) description, paragraphs 137-139, figures 3-6	1-4
X	US 2003133641 A1 (UNIV CALIFORNIA) 17 Jul. 2003(17.07.2003) description, paragraphs 74-78, figures 8-9	1-4
A	CN 102388547 A (HUAWEI TECHNOLOGIES CO., LTD.) 21 Mar. 2012(21.03.2012) the whole document	1-11
A	CN 102204037 A (HUAWEI TECHNOLOGIES CO., LTD.) 28 Sep. 2011(28.09.2011) the whole document	1-11

Further documents are listed in the continuation of Box C.

See patent family annex.

<p>* Special categories of cited documents:</p> <p>“A” document defining the general state of the art which is not considered to be of particular relevance</p> <p>“E” earlier application or patent but published on or after the international filing date</p> <p>“L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>“O” document referring to an oral disclosure, use, exhibition or other means</p> <p>“P” document published prior to the international filing date but later than the priority date claimed</p>	<p>“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</p> <p>“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</p> <p>“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</p> <p>“&”document member of the same patent family</p>
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Date of the actual completion of the international search
28 Dec. 2012(28.12.2012)

Date of mailing of the international search report
10 Jan. 2013(10.01.2013)

Name and mailing address of the ISA
State Intellectual Property Office of the P. R. China
No. 6, Xitucheng Road, Jimenqiao
Haidian District, Beijing 100088, China
Facsimile No. (86-10) 62019451

Authorized officer
YE, Jian
Telephone No. (86-10) 62411445

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2012/073595

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
US 2009220234 A1	03.09.2009	JP 4822141 B2	24.11.2011
		WO 2007123157 A1	01.11.2007
		JP2008512137 T2	03.09.2009
US 2003133641 A1	17.07.2003	US 8244133 B2	14.08.2012
		WO 03062879 A1	31.07.2003
		AU 2003202289 A1	02.09.2003
		US 6768827 B2	27.07.2004
CN 102388547 A	21.03.2012	US 2004126057 A1	01.07.2004
		EP 2482472 A2	01.08.2012
		WO 2011110126 A2	15.09.2011
CN 102204037 A	28.09.2011	WO 2011110126 A3	08.03.2012
		WO 2011124164 A2	13.10.2011
		WO 2011124164 A3	12.04.2012

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2012/073595

A. CLASSIFICATION OF SUBJECT MATTER

H04B 10/02 (2006.01) i

G02B 6/26 (2006.01) i

A. 主题的分类		
参见附加页		
按照国际专利分类(IPC)或者同时按照国家分类和 IPC 两种分类		
B. 检索领域		
检索的最低限度文献(标明分类系统和分类号)		
IPC: H04B, G02B, H04J		
包含在检索领域中的除最低限度文献以外的检索文献		
在国际检索时查阅的电子数据库(数据库的名称, 和使用的检索词(如使用))		
CNABS,CPRSABS,CPRS,CNKI: 波分复用, WDM, 波导, AWG, 端口, 接口, 输入端, 波长, 频率, 阵列波导, 公共, 常用, 公用, 分支, 支路, 无源光, PON		
EPODOC, VEN: WDM, MULTIPLEX+, DEMULTIPLEX+, WAVEGUIDE, FREQUENCY, WAVELENGTH+, AWG, ARRAY+, GRATING, INPUT, OUTPUT, INTERFACE?, PORT?, PUBLIC, NORMAL, STANDARD, COMMON+		
C. 相关文件		
类 型*	引用文件, 必要时, 指明相关段落	相关的权利要求
X	US2009220234A1 (NATIONAL UNIVERSITY CORPORATION NAGOYA UNIVERSITY 等) 03.9 月 2009 (03.09.2009) 说明书第 137-139 段, 附图 3-6	1-4
X	US2003133641A1 (UNIV CALIFORNIA) 17.7 月 2003 (17.07.2003) 说明书第 74-78 段, 附图 8-9	1-4
A	CN102388547A (华为技术有限公司) 21.3 月 2012 (21.03.2012) 全文	1-11
A	CN102204037A (华为技术有限公司) 28.9 月 2011 (28.09.2011) 全文	1-11
<input type="checkbox"/> 其余文件在 C 栏的续页中列出。 <input checked="" type="checkbox"/> 见同族专利附件。		
* 引用文件的具体类型: “A” 认为不特别相关的表示了现有技术一般状态的文件 “E” 在国际申请日的当天或之后公布的在先申请或专利 “L” 可能对优先权要求构成怀疑的文件, 或为确定另一篇引用文件的公布日而引用的或者因其他特殊理由而引用的文件(如具体说明的) “O” 涉及口头公开、使用、展览或其他方式公开的文件 “P” 公布日先于国际申请日但迟于所要求的优先权日的文件 “T” 在申请日或优先权日之后公布, 与申请不相抵触, 但为了理解发明之理论或原理的在后文件 “X” 特别相关的文件, 单独考虑该文件, 认定要求保护的发明不是新颖的或不具有创造性 “Y” 特别相关的文件, 当该文件与另一篇或者多篇该类文件结合并且这种结合对于本领域技术人员为显而易见时, 要求保护的发明不具有创造性 “&” 同族专利的文件		
国际检索实际完成的日期 28.12 月 2012 (28.12.2012)		国际检索报告邮寄日期 10.1 月 2013 (10.01.2013)
ISA/CN 的名称和邮寄地址: 中华人民共和国国家知识产权局 中国北京市海淀区蓟门桥西土城路 6 号 100088 传真号: (86-10)62019451		授权官员 叶坚 电话号码: (86-10) 62411445

国际检索报告
关于同族专利的信息

国际申请号
PCT/CN2012/073595

检索报告中引用的 专利文件	公布日期	同族专利	公布日期
US2009220234A1	03.09.2009	JP4822141B2	24.11.2011
		WO2007123157A1	01.11.2007
		JP2008512137T2	03.09.2009
		US8244133B2	14.08.2012
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		AU2003202289A1	02.09.2003
		US6768827B2	27.07.2004
		US2004126057A1	01.07.2004
CN102388547A	21.03.2012	EP2482472A2	01.08.2012
		WO2011110126A2	15.09.2011
		WO2011110126A3	08.03.2012
CN102204037A	28.09.2011	WO2011124164A2	13.10.2011
		WO2011124164A3	12.04.2012

A. 主题的分类

H04B 10/02 (2006.01) i

G02B 6/26 (2006.01) i