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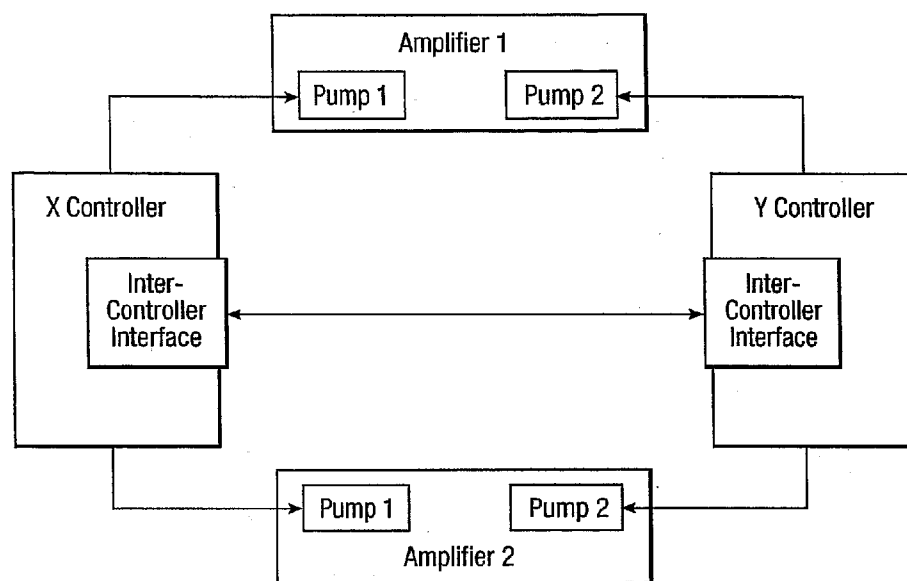
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: TWIN OPTICAL AMPLIFIER WITH DUAL PUMP POWER CONTROL



(57) Abstract: An apparatus for amplifying optical communications systems is provided in which one or more amplifier modules, each containing an optical amplifier and at least two pump lasers, are optically isolated from a plurality of control modules. Each control module controls a single pump laser in one or more of the amplifier modules. A control module can thus be removed without disabling any amplifier module, while the plurality of pump lasers in each amplifier module allow for effective operation even if one of the pump lasers should fail. The pump lasers in each module are controlled by a master-slave relationship, whereby the master pump laser is adjusted to optimise overall output, while the slave laser(s) are adjusted to equalize the power output of the lasers.

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INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2006/002752A. CLASSIFICATION OF SUBJECT MATTER
INV. H01S3/131 H01S3/067

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)
H01S H04B

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 practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 595 395 A (PIRELLI CAVI S.P.A) 4 May 1994 (1994-05-04) column 3, lines 5-40 column 7, line 40 - column 8, line 20; figure 1	1-10
Y	US 5 995 275 A (SUGAYA ET AL) 30 November 1999 (1999-11-30) column 4, lines 1-13; figures 1,6,9	1-10
Y	EP 0 525 684 A (FUJITSU LIMITED) 3 February 1993 (1993-02-03) abstract	11-15
Y	US 2003/174390 A1 (KAKUI MOTOKI) 18 September 2003 (2003-09-18) paragraph [0162]	11-15
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 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 document 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 another 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

17 January 2007

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INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2006/002752

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2003/206335 A1 (PAN JING-JONG ET AL) 6 November 2003 (2003-11-06) paragraph [0040]; figure 8a -----	1-11
A	US 2002/186952 A1 (GAO RENFENG ET AL) 12 December 2002 (2002-12-12) paragraph [0019]; figure 3 -----	1, 11

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2006/002752

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-10

apparatus for amplifying optical communication signals
comprising pump lasers and multiple separated control
modules

2. claims: 11-15

Method of adjusting the gain of an optical amplifier
comprising electing and adjusting a master control module

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/GB2006/002752

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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