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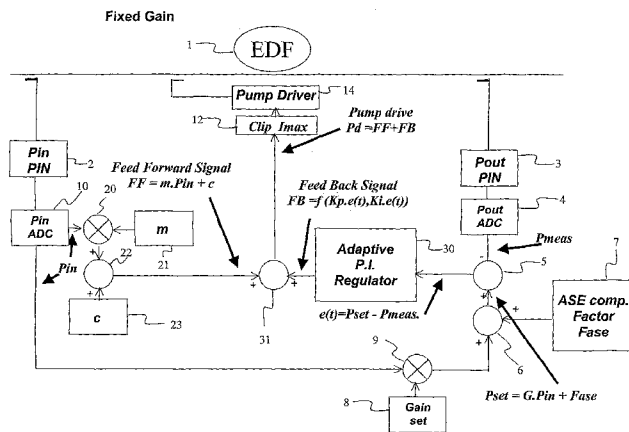
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(54) Title: VARIABLE GAIN OPTICAL AMPLIFIERS



(57) Abstract: A variable gain optical amplifier comprises an EDFA for amplifying optical signals at different wavelengths and a pump driver (14) for optically pumping the EDFA to provide optical gain. An input detector (2) is provided for monitoring the power Pin of input signals to the EDFA, and an output detector (3) is provided for monitoring the power Pout of output signals from the EDFA. A gain control arrangement is provided for supplying a drive signal to the pump driver 14 to control the optical gain including a feed forward arrangement (20, 21, 22, 23) for supplying a feed forward signal dependent on the monitored input power Pin, and a feed back arrangement (5, 6, 7, 8, 9, 30) for supplying a feed back signal dependent on the monitored output power Pout. In order to ensure rapid gain control the feed back arrangement comprises an adaptive proportional-integral (PI or PID) controller (30) for controlling the optical gain at a required gain set point in accordance with proportional and integral control coefficients Kp and Ki corresponding to a required gain profile, at least one of which is dynamically variable in dependence on the monitored output power Pout, the output signal from the controller (30) and the feed forward signal being added in an adder (31) to produce the drive signal for the pump driver (14).

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B. FIELDS SEARCHED

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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, INSPEC, COMPENDEX

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2004/051938 A1 (CHAN LES YU CHUNG [CA] ET AL) 18 March 2004 (2004-03-18) paragraphs [0034] - [0037], [0062] - [0071]; figure 2	1-15
A	US 6 975 449 B1 (MOK FRANZ [CA] ET AL) 13 December 2005 (2005-12-13) cited in the application column 8, line 5 - line 47; figure 5	1-15
A	US 6 894 832 B1 (AWEYA JAMES [CA] ET AL) 17 May 2005 (2005-05-17) column 2, line 34 - line 52 column 4, line 65 - column 5, line 41 column 6, line 65 - column 7, line 28 figure 1	1
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See patent family annex.

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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A	US 2004/021932 A1 (MAURER ERICH K [AT] ET AL) 5 February 2004 (2004-02-05) paragraphs [0042] - [0048], [0053], [0093]; figure 3 -----	1

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 2004051938	A1	18-03-2004	NONE
US 6975449	B1	13-12-2005	NONE
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US 2004021932	A1	05-02-2004	NONE