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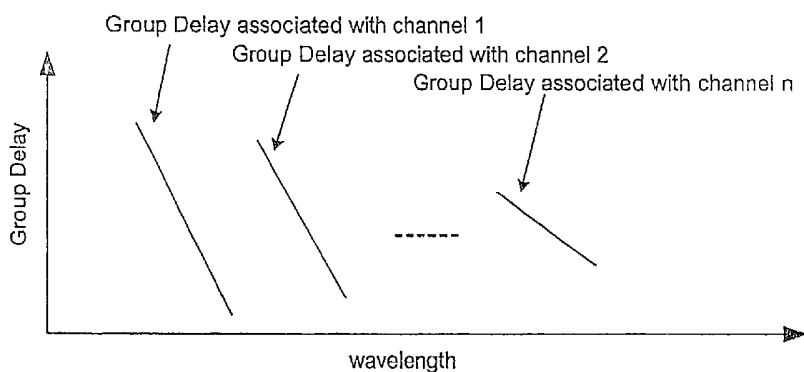
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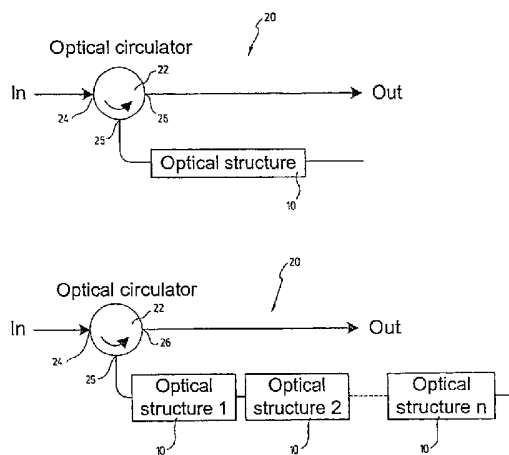
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[Continued on next page]

(54) Title: OPTICAL STRUCTURE FOR THE COMPENSATION OF CHROMATIC DISPERSION



(57) Abstract: An optical structure and devices based thereon for the compensation of chromatic dispersion in a multi-channel light signal are provided. The optical structure includes a waveguide and a Bragg grating provided therein. The Bragg grating has a plurality of grating components, each associated with one or a few of the channels to be compensated. The period of each grating component is selected to allow compensation of chromatic dispersion experienced by this particular channel or these particular channels, thereby taking into account the wavelength-dependent dispersion slope of the light signal. Tuning means may also be provided in order to adjust the dispersion of the grating components to the required values.



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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 7 G02B

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, INSPEC, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	AZANA J ET AL: "SUPERIMPOSED IN-FIBER GRATING STRUCTURES FOR OPTICAL SIGNAL PROCESSING IN WAVELENGTH-DIVISION-MULTIPLEXING SYSTEMS" OPTICAL FIBER COMMUNICATION CONFERENCE. (OFC). TECHNICAL DIGEST POSTCONFERENCE EDITION. BALTIMORE, MD, MARCH 7 - 10, 2000, NEW YORK, NY : IEEE, US, vol. VOL. 2 OF 4, 7 March 2000 (2000-03-07), pages WM8-1, XP001035913 ISBN: 0-7803-5952-6	1-18
X	US 5 987 200 A (LEMAIRE PAUL JOSEPH ET AL) 16 November 1999 (1999-11-16) ----- -/--	19-28

Further documents are listed in the continuation of box C.

Patent family members are listed in 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

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"&" document member of the same patent family

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 02/01159

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	AZANA J ET AL: "Real-time Fourier transformations performed simultaneously over multiwavelength signals" IEEE PHOTONICS TECHNOL. LETT. (USA), IEEE PHOTONICS TECHNOLOGY LETTERS, JAN. 2001, IEEE, USA, vol. 13, no. 1, January 2001 (2001-01), pages 55-57, XP002254383 ISSN: 1041-1135	
A	CAI J -X ET AL: "Sampled nonlinearly-chirped fiber-Bragg-grating for the tunable dispersion compensation of many WDM channels simultaneously" 1999, PISCATAWAY, NJ, USA, IEEE, USA, 21 February 1999 (1999-02-21), - 26 February 1999 (1999-02-26) pages 20-22 vol.4, XP002254384	
A	KOMUKAI T ET AL: "Fabrication of non-linearly chirped fiber Bragg gratings for higher-order dispersion compensation" OPTICS COMMUNICATIONS, NORTH-HOLLAND PUBLISHING CO. AMSTERDAM, NL, vol. 154, no. 1-3, 15 August 1998 (1998-08-15), pages 5-8, XP004146280 ISSN: 0030-4018	
A	KOMUKAI T ET AL: "THE DESIGN OF DISPERSION EQUALIZERS USING CHIRPED FIBER BRAGG GRATINGS" IEEE JOURNAL OF QUANTUM ELECTRONICS, IEEE INC. NEW YORK, US, vol. 36, no. 4, April 2000 (2000-04), pages 409-417, XP000964324 ISSN: 0018-9197	
A	EP 1 061 674 A (LUCENT TECHNOLOGIES INC) 20 December 2000 (2000-12-20)	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/CA 02/01159

Patent document cited in search report	Publication date	Publication date	Patent family member(s)
US 5987200	A	16-11-1999	NONE
EP 1061674	A	20-12-2000	US 2003156846 A1
			EP 1061674 A2
			JP 2001042232 A