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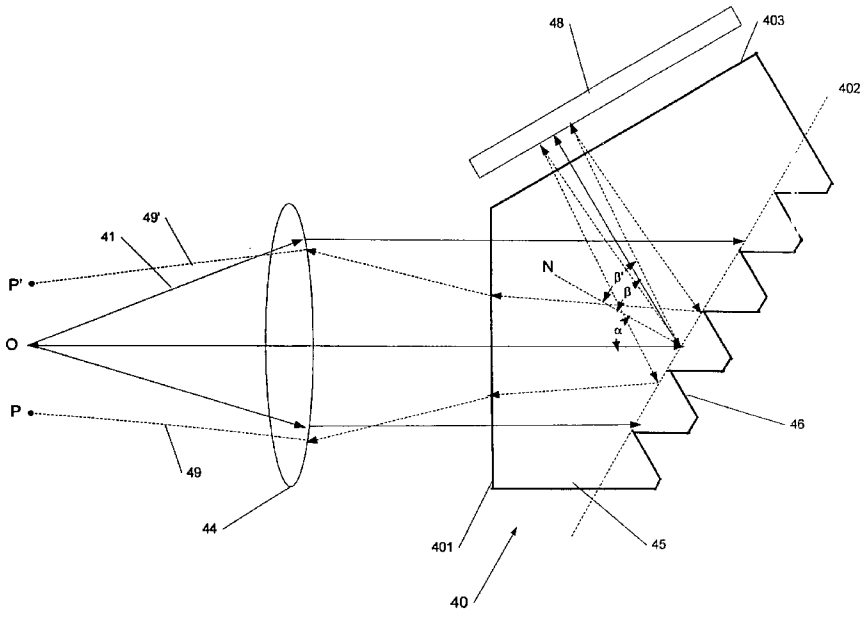
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: DIFFRACTIVE STRUCTURE FOR HIGH-DISPERSION WDM APPLICATIONS



(57) Abstract: A grating structure (26, 26a, 36, 46, 66) useful for WDM multiplexer/demultiplexer applications is described. The grating structure (26, 26a, 36, 46, 66) has a substantially polarization-independant diffraction efficiency over a predetermined useful wavelength range, for example, between 1.4 and 1.6 μm. Each grating period includes a triangular section (72, 92) and a flat-topped section (76, 96), with the width of the flat-topped section (76, 96) between 20 and 50% of the grating period. The disclosed grating structure can be formed in any material that is substantially transparent over the useful wavelength range and used in either a Littrow and a Littman-Metcalf configuration.

WO 2002/086571 A3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US02/12868

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :G02B 6/34

US CL :385/37, 33, 36

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)

U.S. : 385/37, 33, 36, 11, 16, 24, 31, 32, 34, 35

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

NONW

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

USPTO APS

search terms: prism and grating and (flat adj top)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4,736,360 A (MCMAHON) 05 April 1988 (05.04.1988), fig. 6.	20
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A		1-19
A	US 4,741,588 A (NICIA et al) 03 May 1988 (03.05.1988), see entire document.	1-20
A	US 4,652,080 A (CARTER et al) 24 March 1987 (24.03.1987), see entire document.	1-20

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

*	Special categories of cited documents:	"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
"A"	document defining the general state of the art which is not considered to be of particular relevance	"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
"E"	earlier document published on or after the international filing date	"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
"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)	"&"	document member of the same patent family
"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		

Date of the actual completion of the international search 12 JUNE 2002	Date of mailing of the international search report 23 SEP 2002
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer PHAN T. H. PALMER Telephone No. (703) 308-4848

Form PCT/ISA/210 (second sheet) (July 1998)★

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US02/12868

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international 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 II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

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

Please See Extra 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.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US02/12868

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING
This ISA found multiple inventions as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.
Group I, claims 1-19, drawn to an optical multiplexer/demultiplexer having a prism.
Group II, claim 20, drawn to a surface relief grating for diffracting optical radiation.

The inventions listed as Groups I and Group II do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:
The Group I discloses a device having a prism, while the Group II discloses a device with a grating.