

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2017/030366

A. CLASSIFICATION OF SUBJECT MATTER

G02B6/02(2006.01)i, H01S3/067(2006.01)i

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)

G02B6/02-6/036, G02B6/10, G02B6/44, H01S3/00-3/02, H01S3/04-3/0959, H01S3/098-3/102, H01S3/105-3/131, H01S3/136-3/213, H01S3/23-4/00

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

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2017
Kokai Jitsuyo Shinan Koho	1971-2017	Toroku Jitsuyo Shinan Koho	1994-2017

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

IEEE Xplore

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	JP 2001-257422 A (Sumitomo Electric Industries, Ltd.), 21 September 2001 (21.09.2001), paragraphs [0028], [0033] to [0035]; fig. 1, 3, 7 & US 2001/0021210 A1 paragraphs [0058], [0063] to [0065]; fig. 1, 3, 7 & EP 1133036 A2	1, 3-4 2, 5-6
Y	US 2010/0080499 A1 (SAHLGREN et al.), 01 April 2010 (01.04.2010), paragraph [0048]; fig. 2 & US 8218922 B2 & WO 2008/101636 A1 & EP 1962119 A1 & CA 2621783 A1	2

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:

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- "E" earlier application or patent but published on or after the international filing date
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- "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
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- "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

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INTERNATIONAL SEARCH REPORT

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PCT/JP2017/030366

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2002-6148 A (Sumitomo Osaka Cement Co., Ltd.), 09 January 2002 (09.01.2002), paragraph [0007] (Family: none)	2
Y	JP 2004-109928 A (Sumitomo Electric Industries, Ltd.), 08 April 2004 (08.04.2004), paragraphs [0016] to [0018], [0022], [0025] to [0028]; fig. 1, 4, 6 & US 2004/0109638 A1 paragraphs [0032] to [0034], [0038], [0041] to [0042]; fig. 5, 8, 11 & US 6952511 B2	5-6
A	JP 2011-91107 A (Sumitomo Electric Industries, Ltd.), 06 May 2011 (06.05.2011), entire text; all drawings & US 2011/0090931 A1 entire text; all drawings & JP 5552793 B2 & US 8243768 B2	1-6
A	JP 11-326669 A (Oki Electric Industry Co., Ltd.), 26 November 1999 (26.11.1999), entire text; all drawings & JP 3693494 B2	1-6
A	JP 2007-94350 A (Electronics and Telecommunications Research Institute), 12 April 2007 (12.04.2007), entire text; all drawings & US 2007/0071389 A1 entire text; all drawings & US 7412133 B2 & KR 10-2007-0035913 A	1-6