



(51) International Patent Classification:
H01L 51/52 (2006.01) H01S 5/34 (2006.01)

(21) International Application Number:
PCT/US2017/022478

(22) International Filing Date:
15 March 2017 (15.03.2017)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
62/308,585 15 March 2016 (15.03.2016) US
15/457,991 13 March 2017 (13.03.2017) US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,

(54) Title: MAGNETO PHOTONIC ENCODER

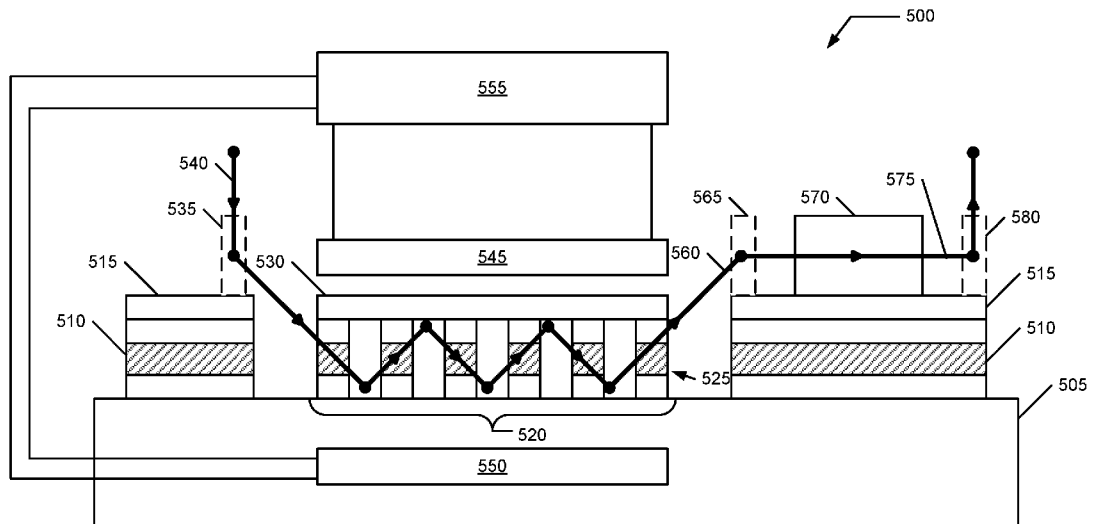


FIG. 5

(57) Abstract: A magneto photonic encoder, in plane, includes a set of periodic structures of magneto photonic crystals for rotating a polarization of a beam of light responsive to a controllable magnetic field as it is transmitted through the periodic structures. The rotated polarization, in cooperation with a non-reciprocal-mode conversion device produces an encoded signal without use of crossed polarizers. Path optics guide the light beam into the periodic structures for polarization rotation and then to direct the modified beam of light into the non-reciprocal-mode conversion device. Depending upon the implementation, the encoded output may serve as display image primitive precursor to produce an image constituent signal.



EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

Published:

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:

26 October 2017 (26.10.2017)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 17/22478

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - H01L 51/52; H01S 5/34 (2017.01)
CPC - B82Y 20/00; H01L 51/5262; H01L 51/5278; H01S 5/041; H01S 5/105; H01S 5/18319

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)

See Search History Document

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

See Search History Document

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

See Search History Document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|---|-----------------------|
| A | EP 1 503 328 A1 (HITACHI, Ltd.) 29 July 2003 (29.07.2003), para [0035], [0056]-[0057], [0060], [0070], [0088]-[0090], [0094]-[0095], [0098]-[0099], [0277]-[0278], | 1-25 |
| A | SCHONBRUN et al., "Total internal reflection photonic crystal prism." Optics Express, Vol. 15, No. 13, 13 June 2007 (13.06.2007), pp 8066, 8068 [online] <URL: http://proxy.osapublishing.org/DirectPDFAccess/C381B16F-A193-9FBE-CB596DA83B1B91C7_138507/oe-15-13-8065.pdf?da=1&id=138507&seq=0&mobile=no > | 1-25 |
| A | US 2009/0269005 A1 (SIGALAS et al.) 29 October 2009 (29.10.2009), para [0006], [0054], [0060] | 1-25 |
| A | AMEMIYA et al., "Nonreciprocal polarization conversion in asymmetric magneto optic waveguide." IEEE Journal of Quantum Electronics, Vol. 46, No. 11, November 2010 (11.11.2010), pp 1666 [online] <URL: http://ieeexplore.ieee.org/document/5565359/ > | 1-25 |

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

"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

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

"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

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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

"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

"&" document member of the same patent family

Date of the actual completion of the international search

15 July 2017

Date of mailing of the international search report

31 AUG 2017

Name and mailing address of the ISA/US

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 17/22478

Box No. 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.: 26-27
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. 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:

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 additional fees, this Authority did not invite payment of additional fees.
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 and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.