

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
28 February 2008 (28.02.2008)

PCT

(10) International Publication Number
WO 2008/024606 A3

(51) International Patent Classification:

G01D 5/34 (2006.01)

(21) International Application Number:

PCT/US2007/075076

(22) International Filing Date: 2 August 2007 (02.08.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/839,100 21 August 2006 (21.08.2006) US

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

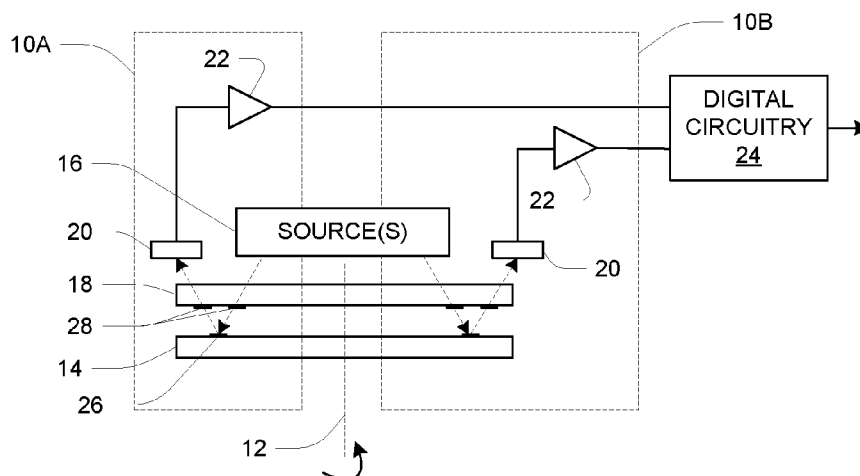
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

[Continued on next page]

(54) Title: ROTARY OPTICAL ENCODER EMPLOYING MULTIPLE SUB-ENCODERS WITH COMMON RETICLE SUBSTRATE



(57) Abstract: A rotary optical position encoder for detecting angular position includes a light source (16), a monolithic scale disk (14) including an optical scale pattern, a monolithic reticle substrate (18) including sets of reticle aperture patterns between the light source and the scale disk, detection and conversion circuitry, and digital processing circuitry. The light source, scale disk, reticle substrate, and detection and conversion circuitry form a plurality of optical sub-encoders (10A, 10B) at angular positions about the rotational axis, each sub-encoder having an optical path extending from the light source to the detection and conversion circuitry via a respective set of reticle aperture patterns and the optical scale pattern. The digital processing circuitry is operative to combine digital position output values of the sub-encoders to generate an encoder position output value. The optical sub-encoders can include incremental position encoders that provide high-resolution position indications with improved thermal stability due to the use of a shared reticle substrate. Additional optical sub-encoders provide zero-reference or "index" indications as well as a coarse absolute position.

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— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

— *with international search report*

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

10 July 2008

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/75076

A. CLASSIFICATION OF SUBJECT MATTER IPC: G01D 5/34 (2006.01) USPC: 250/231.13 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. : 250/231.13, 231.14, 231.15, 231.16, 221, 214R, 237R; 341/11, 13; 356/373, 374, 375 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 practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,129,725 A (ISHIZUKA et al) 14 July 1992 (14/07/92), see entire document.	1-25
Y	US 4,429,267 A (VEALE) 31 January 1984 (31/01/84), see entire document.	1-25
☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.		
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"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 27 March 2008 (27.03.2008)	Date of mailing of the international search report 04 APR 2008	
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