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- (74) **Agent:** KOSAKOWSKI, Richard H.; CANTOR COLBURN LLP, 20 Church St., 22nd Floor, Hartford, Connecticut 06103-3207 (US).
- (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, BR, BW, BY, BZ,

CA, CH, CL, 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, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, 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.

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Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:

- with international search report (Art. 21(3))

(88) **Date of publication of the international search report:**
14 March 2013

(54) **Title:** SIX DEGREE-OF-FREEDOM LASER TRACKER THAT COOPERATES WITH A REMOTE LINE SCANNER

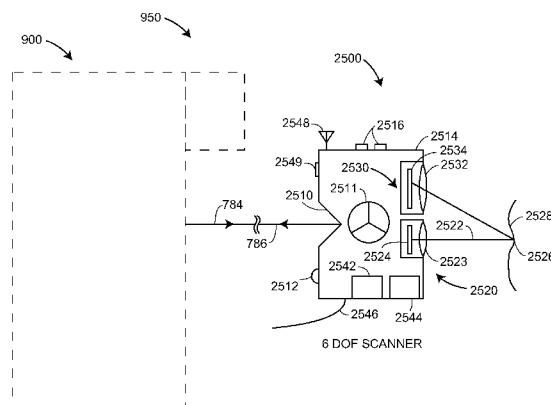


FIGURE 15

(57) **Abstract:** A method of measuring surface sets on an object surface with a coordinate measurement device and a target scanner, includes providing the scanner having a body, a first retroreflector incorporating a pattern, a projector, a camera, and a processor, providing the device, selecting the source pattern of light; projecting the source pattern of light onto the object to produce the object pattern of light; imaging the object pattern of light onto the photosensitive array to obtain the image pattern of light; obtaining the pixel digital values for the image pattern of light; sending the first beam of light from the device to the first retroreflector; receiving the second beam of light from the first retroreflector; measuring the orientational and translational sets based at least in part on the second beam of light; determining the surface sets corresponding to the plurality of collinear pattern elements; and saving the surface sets.



INTERNATIONAL SEARCH REPORT

International application No
PCT/US2012/032972

A. CLASSIFICATION OF SUBJECT MATTER
INV. G01B5/012 G01B11/00 G01B11/25
ADD.
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)
G01B

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)
EPO-Internal, 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 Y	US 2006/145703 A1 (STEINBICHLER MARCUS [DE] ET AL) 6 July 2006 (2006-07-06) abstract; figures 1-7,10 paragraphs [0013], [0014], [0017], [0025] - paragraphs [0039], [0052] - [0060]	1-3,5,6, 13-16 4
X Y	DE 20 2006 020299 U1 (DEUTSCH ZENTR LUFT & RAUMFAHRT [DE]) 24 April 2008 (2008-04-24) abstract; figure 1 paragraph [0005] - paragraph [0032]	1-3,6,7, 13-16 4
X Y	US 2007/247615 A1 (BRIDGES ROBERT E [US]) 25 October 2007 (2007-10-25) abstract; figures 3,6 paragraphs [0027] - [0037], [0045] - paragraphs [0046], [0056] - [0067]	1-3,5-7, 13-16 4
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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
- "E" earlier application or patent but published on or after the international filing date
- "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)
- "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
- "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
- "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

Date of the actual completion of the international search 13 November 2012	Date of mailing of the international search report 28/11/2012
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Stanciu, C
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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2012/032972

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01/77613 A1 (BAE SYSTEMS PLC [GB]; GOOCH RICHARD MICHAEL [GB]) 18 October 2001 (2001-10-18)	1-3,5,6, 13-16
Y	abstract; figure 1 page 7 - page 13	4
Y	----- US 7 800 758 B1 (BRIDGES ROBERT E [US] ET AL) 21 September 2010 (2010-09-21) cited in the application the whole document	4
Y	----- WO 2008/052348 A1 (NORTHERN DIGITAL INC [CA]; VANDERKOOY GEOFFREY E [CA]; FISHER TERRY HA) 8 May 2008 (2008-05-08) the whole document	1,8-13
Y	----- EP 2 177 868 A2 (HEXAGON METROLOGY INC [US]) 21 April 2010 (2010-04-21) abstract; figure 2 paragraph [0003] - paragraphs [0007], [0035], [0047], [0048]	1,8-13
Y,P	----- US 2011/173827 A1 (BAILEY BRENT [US] ET AL) 21 July 2011 (2011-07-21) abstract; figures 1A, 10-12 paragraphs [0033], [0041], [0061] - paragraph [0064]	1,8-13

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/032972

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.:
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:

see additional 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 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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-7, 13-16

A method of measuring 3D coordinates of an object surface with a coordinate measurement device tracking a pattern projector as a target scanner, whereby the coordinate measurement device includes a first motor, a second motor, a first angle measuring device, a second angle measuring device, a distance meter and a position detector.

2. claims: 8-12

A method of measuring 3D coordinates of an object surface with a coordinate measurement device tracking a pattern projector as a target scanner, whereby the target scanner further comprises a tactile probe.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2012/032972

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