

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/JP2018/019240

**A. CLASSIFICATION OF SUBJECT MATTER**

Int.Cl. G01C15/00 (2006.01) i, G01C21/14 (2006.01) i, G06T7/20 (2017.01) i,  
G06T7/246 (2017.01) 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)

Int.Cl. G01C1/00-1/14, 5/00-15/14, 21/00-25/00, G06T7/00-7/90, G01B11/00-11/30

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

Published examined utility model applications of Japan	1922-1996
Published unexamined utility model applications of Japan	1971-2018
Registered utility model specifications of Japan	1996-2018
Published registered utility model applications of Japan	1994-2018

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 A	JP 11-051650 A (FUJI HEAVY INDUSTRIES LTD.) 26 February 1999, paragraphs [0041]-[0138], fig. 1-23 & US 6025790 A, column 5, line 54 to column 20, line 65, fig. 1-23 & EP 896267 A2 & DE 69836522 T2	1, 3-5, 7 2, 6
Y	JP 2002-003110 A (DENSO CORP.) 07 January 2013, paragraphs [0032]-[0074], fig. 2-8 (Family: none)	1, 3-5, 7

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  
21 August 2018 (21.08.2018)

Date of mailing of the international search report  
04 September 2018 (04.09.2018)

Name and mailing address of the ISA/  
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## 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 2010-003253 A (EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZURICH) 07 January 2010, paragraphs [0018]-[0030], fig. 2-4 & US 2010/0027847 A1, paragraphs [0026]-[0038], fig. 2-4	1, 3-5, 7
A	US 2014/0333741 A1 (REGENTS OF THE UNIVERSITY OF MINNESOTA) 13 December 2014, paragraphs [0021]-[0096], fig. 1-10 & US 2017/0294023 A1	1-7
A	大津恭平, 久保田 孝, 特徴の少ない地形における惑星探査ローバのビジュアルオドメトリ法, 日本ロボット学会誌, 15 November 2014, vol. 32, no. 9, pp. 61-67, non-official translation (OTSU, Kyohei, KUBOTA, Takashi, "Visual Odometry for Planetary Exploration Rovers in Untextured Terrains", Journal of the Robotics Society of Japan)	1-7