

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/JP2017/009506

**A. CLASSIFICATION OF SUBJECT MATTER**

B25J9/22(2006.01)i, B25J15/06(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)

B25J9/22, B25J15/06

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)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2015/178377 A1 (Hitachi, Ltd.), 26 November 2015 (26.11.2015), paragraphs [0016] to [0087]; fig. 1 to 17 (Family: none)	1-11
Y	JP 2015-100866 A (Mitsubishi Electric Corp.), 04 June 2015 (04.06.2015), paragraphs [0009] to [0063], [0079] to [0082]; fig. 1 to 8 (Family: none)	1-11

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent but published on or after the international filing date	"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
"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)	"&" document member of the same patent family
"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	

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Name and mailing address of the ISA/  
Japan Patent Office  
3-4-3, Kasumigaseki, Chiyoda-ku,  
Tokyo 100-8915, Japan

Authorized officer  
  
Telephone No.

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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 2013-512522 A (Korea Institute of Industrial Technology), 11 April 2013 (11.04.2013), paragraph [0038]; fig. 5 & US 2012/0265498 A1 paragraph [0042]; fig. 5 & WO 2011/068356 A2 & KR 10-2011-0061749 A	4
Y	WO 2013/014961 A1 (Mitsubishi Electric Corp.), 31 January 2013 (31.01.2013), paragraph [0024]; fig. 3 & US 2014/0081431 A1 paragraph [0052]; fig. 3 & DE 112012003108 T5 & CN 103688262 A	4, 9
Y	JP 10-161730 A (Toshiba Corp.), 19 June 1998 (19.06.1998), paragraphs [0002] to [0010]; fig. 12 to 15 (Family: none)	5
Y	Hirohiko ARAI, Hiroyuki ABE, Yoshihiro KIKUSHIMA, "Handling of Flat Object by Non-contact Suction Hand : Planning of Handling Trajectory for Suppressing Sideslip", JSME Conference on Robotics and Mechatronics conference 2013 digest, The Japan Society of Mechanical Engineers, 2013, 1A1-K02, particularly, 1. Introduction	6
Y	JP 7-256578 A (Hitachi, Ltd.), 09 October 1995 (09.10.1995), paragraph [0021]; fig. 7 to 8 (Family: none)	8
Y	WO 2003/038688 A1 (Kawasaki Heavy Industries, Ltd.), 08 May 2003 (08.05.2003), page 9, line 9 to page 11, line 1; page 17, line 10 to page 18, line 14; fig. 1 to 2, 9 & US 2004/0199434 A1 paragraphs [0047] to [0052], [0071] to [0075]; fig. 1 to 2, 9 & EP 1443430 A1 & JP 3565839 B2	10-11
X	US 9393693 B1 (GOOGLE INC.), 19 July 2016 (19.07.2016), column 3, line 31 to column 20, line 67; fig. 1 to 7 (Family: none)	12

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International application No.

PCT/JP2017/009506

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2016/0221187 A1 (INDUSTRIAL PERCEPTION, INC.), 04 August 2016 (04.08.2016), entire text; all drawings (Family: none)	5
A	JP 11-33955 A (Matsushita Electric Industrial Co., Ltd.), 09 February 1999 (09.02.1999), entire text; all drawings (Family: none)	5
A	JP 10-260713 A (Mazda Motor Corp.), 29 September 1998 (29.09.1998), entire text; all drawings (Family: none)	6