

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/JP2018/024929

**A. CLASSIFICATION OF SUBJECT MATTER**  
 Int.Cl. B01J23/89(2006.01) i, B01D53/86(2006.01) i, B01J37/00(2006.01) i,  
 B01J37/08(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)  
 Int.Cl. B01J23/89, B01D53/86, B01J37/00, B01J37/08

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)  
 JSTPlus (JDreamIII), JST7580 (JDreamIII), JSTChina (JDreamIII)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	CN 105013508 A (ZHEJIANG UNIVERSITY) 04 November 2015, claims 1-6, examples 1-3, 6, 7, paragraphs [0055], [0056], fig. 1-5 (Family: none)	1, 3-5 2
A	JP 2011-224546 A (TOKYO METROPOLITAN INDUSTRIAL TECHNOLOGY RESEARCH INSTITUTE) 10 November 2011 (Family: none)	1-5
A	JP 6140326 B1 (RYUKI ENGINEERING INC.) 31 May 2017 & JP 2017-159203 A	1-5

Further documents are listed in the continuation of Box C.       See patent family annex.

* Special categories of cited documents:	"I" 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	

Date of the actual completion of the international search 13 September 2018 (13.09.2018)	Date of mailing of the international search report 02 October 2018 (02.10.2018)
---	--

Name and mailing address of the ISA/ Japan Patent Office 3-4-3, Kasumigaseki, Chiyoda-ku, Tokyo 100-8915, Japan	Authorized officer  Telephone No.
--	---

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2018/024929

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2008-86987 A (KOCH, Christian) 17 April 2008 & US 2008/0085830 A1 & WO 2008/040265 A1 & EP 1911512 A1 & DE 102006046884 A1 & CA 2605097 A1 & CN 101157042 A & KR 10-2008-0031649 A & BR PI0700119 A & RU 2007105466 A & MX 2007000657 A	1-5
A	JP 2001-187343 A (TOYOTA CENTRAL RESEARCH AND DEVELOPMENT LABORATORIES, INC.) 10 July 2001 & US 6492298 B1 & EP 1040870 A2	1-5
A	JP 2003-225568 A (MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.) 12 August 2003 (Family: none)	1-5
A	JP 10-511602 A (ENGELHARD CORPORATION) 10 November 1998 & US 5578283 A & US 5653949 A & WO 1996/020787 A1 & EP 800420A1 & AT 225681 T & AU 2910895 A & BR 9510173 A & CN 1171748 A & MX 9704907 A & KR 10-0384349 B1	1-5
A	US 2008/0233039 A1 (SYMYX TECHNOLOGIES, INC.) 25 September 2008 & WO 2006/130858 A2 & EP 1890805 A2	1-5