

INTERNATIONAL SEARCH REPORT

International application No. PCT/JP2019/046162
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A. CLASSIFICATION OF SUBJECT MATTER
 F16K 24/04 (2006.01) i; F16K 31/18 (2006.01) i
 FI: F16K24/04 M; F16K31/18 C

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)
 F16K21/00-24/06; F16K31/18-31/34

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	1971-2020
Registered utility model specifications of Japan	1996-2020
Published registered utility model applications of Japan	1994-2020

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.
X Y	JP 2007-138988 A (TLV CO., LTD.) 07.06.2007 (2007-06-07) paragraphs [0003], [0008]-[0011]; fig. 1	1-3 4-7
X Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 180714/1982 (Laid-open No. 85470/1984) (MATSUSHITA ELECTRIC WORKS, LTD.) 09.06.1984 (1984-06-09) specification, page 2, lines 10-20, page 3, line 18 to page 5, line 4; fig. 2-3	1-2 4-7
Y	JP 2004-108411 A (TLV CO., LTD.) 08.04.2004 (2004-04-08) paragraphs [0004], [0007]-[0011]; fig. 1	4-7

<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.	<input checked="" type="checkbox"/> See patent family annex.
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* 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 05 February 2020 (05.02.2020)	Date of mailing of the international search report 18 February 2020 (18.02.2020)
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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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International application No.

PCT/JP2019/046162

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CD-ROM of the specification and drawings annexed to the request of Japanese Utility Model Application No. 39870/1993 (Laid-open No. 2683/1995) (HATAKEYAMA, Tadashi) 13.01.1995 (1995-01-13) paragraphs [0011]-[0013]; fig. 1	5-7
Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 80044/1984 (Laid-open No. 191774/1985) (ISHIKAWAJIMA-HARIMA HEAVY INDUSTRIES CO., LTD.) 19.12.1985 (1985-12-19) specification, page 4, line 4 to page 5, line 5; fig. 1	5-7
Y	CD-ROM of the specification and drawings annexed to the request of Japanese Utility Model Application No. 7658/1991 (Laid-open No. 8793/1994) (NIPPON DRY-CHEMICAL CO., LTD.) 04.02.1994 (1994-02-04) paragraphs [0006]-[0009]; fig. 1	6-7
Y	JP 59-201983 A (MITSUBISHI HEAVY INDUSTRIES, LTD.) 15.11.1984 (1984-11-15) page 1, lower left column, line 14 to page 1, lower right column, line 2, page 1, lower right column, line 19 to page 2, lower left column, line 6, page 2, lower right column, lines 10-15; drawings	6-7
A	JP 7-139655 A (MAEZAWA INDUSTRIES, INC.) 30.05.1995 (1995-05-30)	4
A	JP 56-109971 A (YAMAZAKI, Sadayoshi) 31.08.1981 (1981-08-31)	4

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
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Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
JP 2007-138988 A	07 Jun. 2007	(Family: none)	
JP 59-85470 U1	09 Jun. 1984	(Family: none)	
JP 2004-108411 A	08 Apr. 2004	(Family: none)	
JP 7-2683 U1	13 Jan. 1995	(Family: none)	
JP 60-191774 U1	19 Dec. 1985	(Family: none)	
JP 6-8793 U1	04 Feb. 1994	(Family: none)	
JP 59-201983 A	15 Nov. 1984	(Family: none)	
JP 7-139655 A	30 May 1995	(Family: none)	
JP 56-109971 A	31 Aug. 1981	(Family: none)	