

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2018/031062

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. F25B1/00 (2006.01) i, B60H1/32 (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. F25B1/00, B60H1/32

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	WO 2017/098795 A1 (DENSO CORP.) 15 June 2017, paragraphs [0022]-[0024], [0048]-[0182], [0210], fig. 1, 15 & JP 2017-110898 A & CN 108369042 A	1-8
Y	JP 2015-183872 A (DENSO CORP.) 22 October 2015, claims, paragraphs [0070]-[0088], fig. 1-5 (Family: none)	1-8
Y	JP 2008-261603 A (DENSO CORP.) 30 October 2008, claims, fig. 4 (Family: none)	1-8
Y	JP 2000-002468 A (MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.) 07 January 2000, claims, paragraph [0010] (Family: none)	1-8

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	“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
“E” earlier application or patent but published on or after the international filing date	“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
“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)	“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
“O” document referring to an oral disclosure, use, exhibition or other means	“&” document member of the same patent family
“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 05.11.2018	Date of mailing of the international search report 13.11.2018
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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 2003-166764 A (DENSO CORP.) 13 June 2003, claims, fig. 7-9 & US 2003/0051494 A1, claims, fig. 7-9 & DE 10243374 A1	1-8
Y	JP 2004-101143 A (DENSO CORP.) 02 April 2004, claims, fig. 1-5 (Family: none)	1-8
Y	US 2010/0064700 A1 (GM GLOBAL TECHNOLOGY OPERATIONS, INC.) 18 March 2010, paragraph [0029], fig. 1, 7A-7B & DE 102009040796 A1 & CN 101672557 A	1-8
Y	JP 2001-208435 A (SANYO ELECTRIC CO., LTD.) 03 August 2001, claims (Family: none)	1-8
A	WO 2012/118198 A1 (SANDEN CORP.) 07 September 2012, entire text, all drawings & US 2015/0040594 A1 & US 2016/0375743 A1 & US 2017/0028815 A1 & US 2017/0028816 A1 & US 2017/0028817 A1 & US 2017/0080777 A1 & CN 103534539 A & CN 104972866 A & CN 105020920 A & CN 105150796 A	1-8
A	JP 2015-101180 A (DENSO CORP.) 04 June 2015, entire text, all drawings & US 2016/0297283 A1 & WO 2015/075872 A1 & CN 105764727 A	1-8
A	WO 2015/111379 A1 (DENSO CORP.) 30 July 2015, entire text, all drawings & JP 2015-137778 A	1-8
A	JP 2009-047389 A (DENSO CORP.) 05 March 2009, entire text, all drawings (Family: none)	1-8