

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2010/069036

A. CLASSIFICATION OF SUBJECT MATTER

H05B3/48(2006.01) i, F23Q7/00(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)

H05B3/48, F23Q7/00

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	1996-2010
Kokai Jitsuyo Shinan Koho	1971-2010	Toroku Jitsuyo Shinan Koho	1994-2010

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	JP 10-110951 A (Denso Corp.),	1-3
Y	28 April 1998 (28.04.1998), paragraph [0025]; fig. 1 & US 2002/0036192 A1 & EP 834652 A1 & WO 1997/038223 A1	4-7
Y	JP 2005-340034 A (Kyocera Corp.), 08 December 2005 (08.12.2005), paragraph [0028]; fig. 2, 3 & US 2008/0210684 A1 & EP 1711034 A1 & WO 2005/069690 A1 & KR 10-2008-0108372 A	4
Y	JP 2007-265893 A (Kyocera Corp.), 11 October 2007 (11.10.2007), paragraph [0019]; fig. 1 to 5, 9 to 13 (Family: none)	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
22 December, 2010 (22.12.10)Date of mailing of the international search report
11 January, 2011 (11.01.11)Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2010/069036

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 2003-40678 A (NGK Spark Plug Co., Ltd.), 13 February 2003 (13.02.2003), paragraph [0023]; fig. 4 & US 2003/0029856 A1 & EP 1282341 A2	6

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2010/069036

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

The inventions in claims 1 - 3 cannot be considered to be novel in the light of the invention described in the document 1 (JP 10-110951 A (Denso Corp.), 28 April 1998 (28.04.1998), paragraph [0025], fig. 1), and does not have a special technical feature. Therefore, the following five inventions (invention groups) are involved in claims.

Meanwhile, the inventions in claims 1 - 3 having no special technical feature are classified into invention 1.

(continued to extra sheet)

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2010/069036

Continuation of Box No.III of continuation of first sheet (2)

(Invention 1) the inventions in claims 1 - 3, and the portion of the invention in claim 4 referring to all claims 1 - 3

(Invention 2) the portion of the invention in claim 4 referring to claim 3 which refers to claim 1

(Invention 3) the invention in claim 5

(Invention 4) the invention in claim 6

(Invention 5) the invention in claim 7