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(71) Applicant *(for all designated States except US)*: **SRG GLOBAL, INC.** [US/US]; 23751 Amber Ave., Warren, Michigan 48089 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **FENCHAK, Patrick, Joseph** [US/US]; 828 Ironstone Dr., Rochester Hills, Michigan 48309 (US). **WILKINSON, Kim, Stuart** [GB/US]; 7889 Ann Arbor St., Dexter, Michigan 48130 (US).

(74) Agents: **SIMINSKI, Robert, M.** et al.; Harness, Dickey & Pierce, P.L.C., P.O. Box 828, Bloomfield Hills, Michigan 48303 (US).

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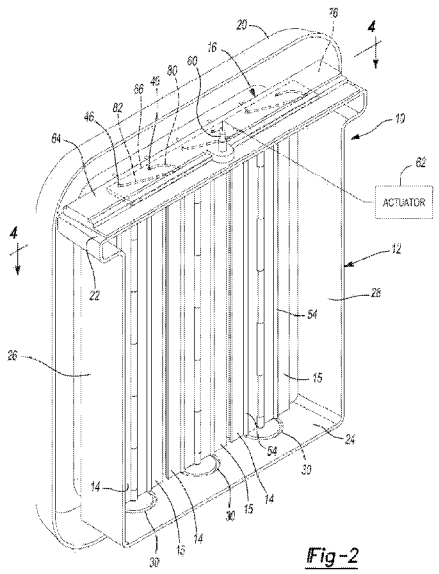


Fig-2

(57) Abstract: An apparatus for use with a vehicle grille may include a frame, a shutter, and a drive mechanism. The shutter may be connected to the frame and may be pivotable relative thereto between a first position and a second position. The shutter may include a pivot axis and an engagement member. The shutter may restrict airflow through a vehicle grille in the first position and allow airflow through the vehicle grille in the second position. The drive mechanism may drive the shutter between the first and second positions. The drive mechanism may include a drive shaft rotating relative to the frame and a drive member engaging the drive shaft and moving linearly relative to the frame. The drive member may include an arcuate slot slidably engaging the engagement member.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

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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)
B60K 11/08; F24F 13/06; F01P 7/10; B60K 11/04; B60K 11/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean utility models and applications for utility models
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS(KIPO internal) & Keywords: grille, frame, shutter, drive, shaft, axis, actuator.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 01-277616 A (KAISHA CO.LTD.) 08 November 1989 See page 96 (left lower column), line 17 - page 100 (right lower column), line 5; claim 1 and figure 1-4 and 15.	1-8,9,10-16
A	US 2007-0077880 A1 (HSIEH-KUN LEE et al.) 05 April 2007 See paragraph [0020] - paragraph [0029]; claim 1 and figure 2.	1-16
A	WO 2006-056359 A1 (BEHR GMBH & CO. KG et al.) 01 June 2006 See page 9, line 14 - page 14, line 31; abstract and figures 1-4.	1-16
A	US 2002-0153182 A1 (CLAUDE VAILLANCOURT et al.) 24 October 2002 See paragraph [0028] - paragraph [0056]; claim 1 and figures 1-6.	1-16

☐ 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
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"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

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Name and mailing address of the ISA/KR	Authorized officer
Korean Intellectual Property Office Government Complex-Daejeon, 189 Cheongsa-ro, Seo-gu, Daejeon 302-701, Republic of Korea	CHO, Jihun
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Information on patent family members

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