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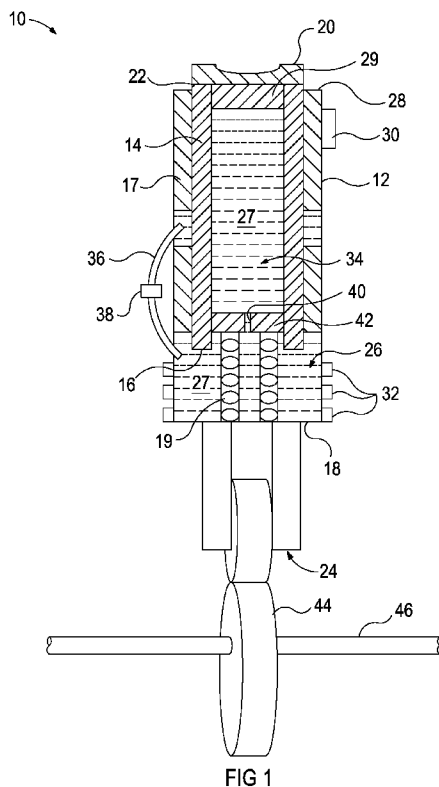
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[Continued on next page]

(54) Title: ELECTRONIC HYDRAULIC LIFTER AND METHOD



(57) Abstract: Electronic hydraulic lifter apparatus and methods, with the apparatus including a lifter body and a piston disposed at least partially within the lifter body and configured to translate longitudinally with respect thereto. The apparatus further includes a first fluid reservoir disposed at least partially within the lifter body, the piston, or both and configured to receive an end of the piston, and a smart fluid disposed within the first fluid reservoir and configured to communicate with at least the end of the piston. The apparatus also includes an electrical connection coupled to the first fluid reservoir and operatively communicating with the smart fluid, with the electrical connection being configured to vary a viscoelastic property of the smart fluid by applying a field thereto.



SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/027950**A. CLASSIFICATION OF SUBJECT MATTER****F01L 9/02(2006.01)i, F01L 9/04(2006.01)i, F01L 1/14(2006.01)i, F02M 21/02(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)

F01L 9/02; F01L 1/18; F01L 1/34

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: electrorheologic, magnetorheologic, fluid and cam

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y A	US 7044093 B2 (Tad L. Petrie.; Pontiac, IL) 16 May 2006 See abstract, columns 3,4 and figures 1-3	1-6 8-12 7,17,18
X Y A	US 05103779A A (HARE, SR.; NICHOLAS S.) 14 April 1992 See abstract, columns 6,9 and figures 1, 2	13-16,19,20 8-12 7,17,18
A	US 6637387 B1 (GECIM; BURAK ABDULKADIR et al.) 28 October 2003 See abstract, columns 2 and figures 1, 2	1-20
A	KR 10-2000-0028373 A (SAMSUNG ELECTRO-MECHANICS CO., LTD) 25 May 2000 See abstract, claims 1-4 and figure 3	1-20

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

* Special categories of cited documents:

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"P" document published prior to the international filing date but later than the priority date claimed

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"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

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"&" document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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US 6637387 B1	28.10.2003	None	
KR 10-2000-0028373 A	25.05.2000	None	