



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
19.11.2008 Bulletin 2008/47

(51) Int Cl.:
F04B 35/04 (2006.01) **F04B 49/06** (2006.01)
F04B 39/00 (2006.01)

(43) Date of publication A2:
29.10.2008 Bulletin 2008/44

(21) Application number: **08251536.2**

(22) Date of filing: **28.04.2008**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA MK RS

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(30) Priority: **28.04.2007 CN 200710100946**

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(54) **Solenoid pump**

(57) A method of reducing or eliminating vibration in a linear reciprocating solenoid pump 10, the method comprising the steps of providing a solenoid pump 10 having a linear reciprocating plunger 14 and providing an electric

circuit 48 to energize electro-motion means 16 of the solenoid pump 10, the electric circuit 48 energizing the electro-motion means 16 with an increased frequency of n times the frequency of normal mains electricity.

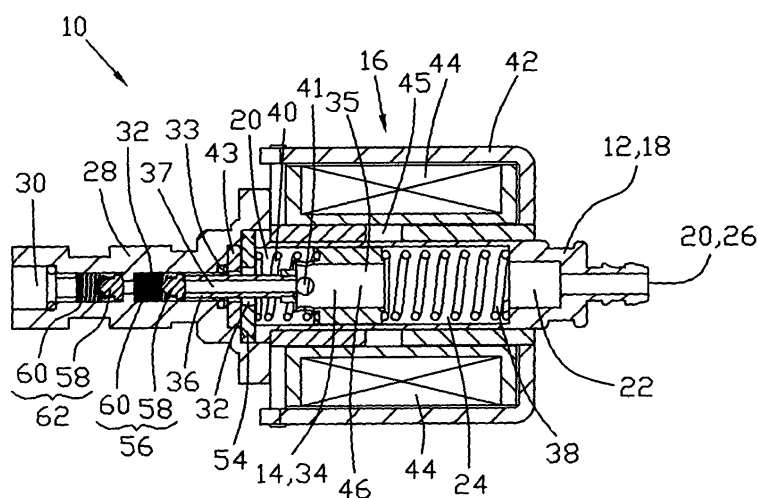


FIG. 1



EUROPEAN SEARCH REPORT

Application Number
EP 08 25 1536

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 3 461 806 A (BARTHALON MAURICE) 19 August 1969 (1969-08-19) * column 9, line 75 - column 10, line 5 * * column 3, line 60 - line 74; claims 4,5 *	1,2,5-7, 10,11	INV. F04B35/04 F04B49/06 F04B39/00
Y	* column 4, line 16 - line 21 * * column 19, line 65 - line 70; figures 25-27 *	4,9	
X	DE 10 2004 010846 A1 (BSH BOSCH SIEMENS HAUSGERAETE [DE]) 22 September 2005 (2005-09-22)	1-3	
Y	* paragraph [0022] - paragraph [0024]; claim 13; figure 2 *	6-8,10	
Y	FR 2 465 903 A (ULKA SRL [IT]) 27 March 1981 (1981-03-27) * page 4, line 14 - page 6, line 36; figures 1,2 *	6-8,10	
Y	WO 02/077453 A (LG ELECTRONICS INC [KR]; YOO JAE-YOO [KR]; SONG GYE-YOUNG [KR]; HUR KY) 3 October 2002 (2002-10-03) * page 2, line 6 - page 3, line 20; figure 1 *	4,9	TECHNICAL FIELDS SEARCHED (IPC) F04B
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 10 October 2008	Examiner Jurado Orenes, A
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 08 25 1536

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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10-10-2008

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3461806 A	19-08-1969	BE 677331 A	05-09-1966
		CH 442496 A	31-08-1967
		DE 1513748 A1	23-07-1970
		DE 6609196 U	16-03-1972
		FR 1472032 A	10-03-1967
		GB 1145171 A	12-03-1969
		NL 6603163 A	13-09-1966
		OA 2208 A	05-05-1970
		SE 333972 B	05-04-1971
DE 102004010846 A1	22-09-2005	CN 1930764 A	14-03-2007
		EP 1726082 A1	29-11-2006
		WO 2005086327 A1	15-09-2005
		KR 20070000485 A	02-01-2007
		US 2007236160 A1	11-10-2007
FR 2465903 A	27-03-1981	ES 252076 U	01-02-1981
WO 02077453 A	03-10-2002	AT 287043 T	15-01-2005
		BR 0111190 A	08-04-2003
		CN 1430702 A	16-07-2003
		DE 60108427 D1	17-02-2005
		DE 60108427 T2	05-01-2006
		EP 1373728 A1	02-01-2004
		JP 3917526 B2	23-05-2007
		JP 2004519579 T	02-07-2004
		KR 20020075565 A	05-10-2002
		US 2003143080 A1	31-07-2003