



- (51) **International Patent Classification:**
F04C 2/10 (2006.01) *F04C 14/14* (2006.01)
- (21) **International Application Number:**
PCT/EP2012/054037
- (22) **International Filing Date:**
8 March 2012 (08.03.2012)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
11157522.1 9 March 2011 (09.03.2011) EP
- (71) **Applicant (for all designated States except US):** **VOLVO CAR CORPORATION** [SE/SE]; SE-405 31 Goteborg (SE).
- (72) **Inventors; and**
- (75) **Inventors/Applicants (for US only):** **FORSSELL, Jonas** [SE/SE]; Kallhedsangen 7, SE-423 63 Torslanda (SE). **ODENMARCK, Christer** [SE/SE]; Bjorlanda Strand 21, SE-423 61 Torslanda (SE). **KASPER, Lewis** [US/US]; 2970 Western Reserve Road, Poland, Ohio 44514 (US). **WHITE, Steve** [US/US]; 141 Autumn Woods, Kings Mountain, North Carolina 28086 (US). **ROEBER, Tom** [US/US]; 20 Hilltop Circle, Yarmouth, Maine 04096 (US).

RYDBERG, Karl-Erik [SE/SE]; Troskaregatan 80, SE-583 34 Linköping (SE).

(74) **Agent:** **ALBIHNS ZACCO AB**; Box 142, SE-401 22 Goteborg (SE).

(81) **Designated States** (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) **Designated States** (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on nextpage]

(54) **Title:** GEOROTOR HYDRAULIC DEVICE WITH CAPACITY CONTROL VALVE PROVIDED WITHIN THE SHAFT

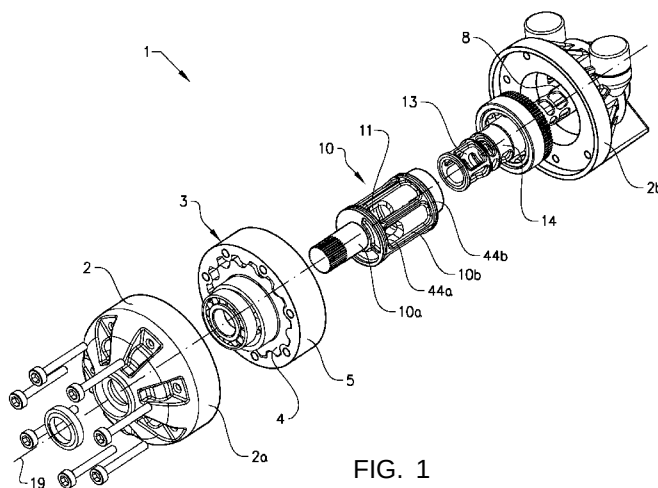


FIG. 1

(57) **Abstract:** A hydraulic device (1) comprising a housing (2) and a gerotor (3) contained within the housing (2), the gerotor (3) having an inner rotor (4) eccentrically disposed within an outer ring (5), the outer ring having a central axis (19), the outer ring (5) being fixed to the housing, the inner rotor (4) having external lobes (4a) extending radially outwardly engaging the outer ring (5) having internal lobes (4b) extending radially inwardly, the inner rotor (4) being arranged for orbital and rotational movement relative to the outer ring (5), wherein the orbital and rotational movement will define a plurality of expanding and contracting volume pressure chambers (7) between the inner rotor (4) and the outer ring (5). The hydraulic device (1) comprises a fluid feeder tube (8) with a central axis (19), the fluid feeder tube (8) is provided with at least one fluid inlet line (8a, 8c) and at least one fluid outlet line (8b, 8d), the inner rotor (4) is adapted to slide against a drive shaft cylinder (10b), the drive shaft cylinder (10b) having a circumference which is eccentrically disposed relative to the central axis (19), the inner rotor (4) comprises at least one radial fluid feeder channel disposed radially from the centre of and through the inner rotor (4) and out to at least one of the plurality of expanding and contracting volume pressure chambers (7), wherein said fluid inlet line (8a, 8c) and said fluid outlet line (8b, 8d) respectively are radially connectable to said radial fluid feeder channel (9) for fluid communication into and out from said expanding and contracting volume pressure chambers (7).

Published:**(88) Date of publication of the international search report:**

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

4 July 2013

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2012/054037

A. CLASSIFICATION OF SUBJECT MATTER
INV. F04C2/10 F04C14/14
ADD..

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)
F04C F01C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal , WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/076345 A1 (HANSEN GUNNAR L [DK]) 20 June 2002 (2002-06-20) paragraph [0031] - paragraph [0033] ; figures 1-7 paragraph [0040] -----	I - 3 , II - 19, 21, 22
A	GB 768 933 A (OTTO NUEBLING) 20 February 1957 (1957-02-20) the whole document -----	1-22
A	GB 793 089 A (HANOMAG AG) 9 April 1958 (1958-04-09) the whole document -----	1-22
A	DE 879 942 C (THEODOR KLATTE) 18 June 1953 (1953-06-18) the whole document -----	1-22



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

13 May 2013

Date of mailing of the international search report

22/05/2013

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Alquezar Getan, M

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2012/054037

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 2002076345	A l	20-06-2002	DE 10056975 A l	06-06-2002
			US 2002076345 A l	20-06-2002

GB 768933	A	20-02-1957	NONE	

GB 793089	A	09-04-1958	NONE	

DE 879942	C	18-06-1953	NONE	
