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(51) International Patent Classification ⁶ : C10M 161/00, 169/04 // (C10M 161/00 127:02, 129:72, 129:74, 137:10, 137:10 139:00, 145:14, 147:02), (C10M 169/04 101:00, 105:04, 129:72, 129:74, 137:10 137:10, 139:00, 145:14, 147:02), C10N 10:12, 40:25	A3	(11) International Publication Number: WO 96/15211 (43) International Publication Date: 23 May 1996 (23.05.96)
(21) International Application Number: PCT/US95/14186 (22) International Filing Date: 3 November 1995 (03.11.95) (30) Priority Data: 08/334,513 4 November 1994 (04.11.94) US 08/455,353 31 May 1995 (31.05.95) US (60) Parent Application or Grant (63) Related by Continuation US 08/455,353 (CIP) Filed on 31 May 1995 (31.05.95) (71) Applicant (for all designated States except US): ASHLAND INC. [US/US]; 3499 Dabney Drive, Lexington, KY 40509 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): BAUMGART, Richard, J. [US/US]; 1418 Johnson Avenue, Ashland, KY 41101 (US). DITURO, Michael, A. [US/US]; 461 Linden Circle,	Huntington, KY 25705 (US). LOCKWOOD, Frances, E. [US/US]; 5326 Paris Pike, Georgetown, KY 40324 (US). (74) Agent: CARRITHERS, David, W.; Middleton & Reutlinger, 2500 Brown & Williamson Tower, Louisville, KY 40202 (US). (81) Designated States: AL, AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT, UA, UG, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, LS, MW, SD, SZ, UG). Published <i>With international search report.</i> (88) Date of publication of the international search report: 8 August 1996 (08.08.96)	
(54) Title: LUBRICANT ADDITIVE FORMULATION		
(57) Abstract <p>A lubricant additive formulation for addition to conventional motor oil to improve the lubricating properties of the engine oil and enhance the performance of the engine. The engine treatment oil additive comprises a synergistic blend of an oil soluble molybdenum additive, polyalphaolefin, ester such as a polyolester or diester, polytetrafluoroethylene, dispersant inhibitor containing zinc dithiophosphate, mineral oil base stock, viscosity index improvers, and borate ester used in combination with a conventional crankcase lubricant at about a 20 to about a 25 % volume/percent. The improved performance of the engine additive in comparison with conventional crankcase lubricants is attributable to the effect of optimizing the design parameters for each of the individual chemical constituents and combining the chemical constituents according to the present invention to obtain surprisingly good results including improved: wear, oxidation resistance, viscosity stability, engine cleanliness, fuel economy, cold starting, and inhibition of acid formation.</p>		

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INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US 95/14186

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 C10M161/00 C10M169/04 //(C10M161/00,127:02,129:72,129:74,
137:10,137:10,139:00,145:14,147:02),(C10M169/04,101:00,105:04,
129:72,129:74,137:10,137:10,139:00,145:14,147:02),C10N10:12,40:25

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)

IPC 6 C10M

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 practical, 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	US,A,4 349 444 (REICK) 14 September 1982 see column 6, line 1-8; claim 1	10,11
Y	---	1-18
Y	EP,A,0 452 998 (IDEMITSU KOSAN COMPANY LTD.) 23 October 1991 see page 4, line 11-45; claims 1,6-8	1-18
Y	---	
Y	EP,A,0 304 011 (KYODO OIL TECH RES) 22 February 1989 see claims 1-4	1-18
Y	---	
Y	US,A,5 356 547 (ARAI K ET AL) 18 October 1994 see column 3, line 37-58	1-18

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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+ 31-70) 340-3016

Authorized officer

Kazemi, P

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US,A,4 333 840 (REICK) 8 September 1982 cited in the application see column 4, line 38-45; claims 1,5,6 ---	1-18
A	US,A,4 857 220 (HASHIMOTO) 15 August 1989 see column 3, line 20-68 ---	1-18
A	US,A,4 859 352 (WAYNICK J A) 22 August 1989 cited in the application -----	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 95/14186

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US-A-4349444	14-09-82	US-A- 4284518	18-08-81
		US-A- 4421658	20-12-83
		US-A- 4284519	18-08-81
		US-A- 4333840	08-06-82

EP-A-452998	23-10-91	JP-A- 63210197	31-08-88
		JP-A- 63210198	31-08-88
		DE-A- 3873376	10-09-92
		DE-D- 3889929	07-07-94
		DE-T- 3889929	29-09-94
		EP-A,B 0280260	31-08-88
		US-A- 4776967	11-10-88

EP-A-0304011	22-02-89	JP-A- 1048895	23-02-89
		JP-B- 7000795	11-01-95
		US-A- 4925596	15-05-90

US-A-5356547	18-10-94	JP-A- 5186787	27-07-93

US-A-4333840	08-06-82	US-A- 4284518	18-08-81
		US-A- 4284519	18-08-81
		US-A- 4349444	14-09-82

US-A-4857220	15-08-89	JP-A- 63280797	17-11-88

US-A-4859352	22-08-89	NONE	
