



- (51) **International Patent Classification:**
C10M 105/06 (2006.01)
- (21) **International Application Number:**
PCT/US2014/018139
- (22) **International Filing Date:**
25 February 2014 (25.02.2014)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
13/835,031 15 March 2013 (15.03.2013) US
- (71) **Applicant:** EXXONMOBIL RESEARCH AND ENGINEERING COMPANY [US/US]; 1545 Route 22 East, P.O. Box 900, Annandale, NJ 08801-0900 (US).
- (72) **Inventors:** HO, Suzzy Chen Hsi; 1066 Stuart Road, Princeton, NJ 08540 (US). COOPER, Kathleen K.; 39 Louis Street, South River, NJ 08882 (US). CHRISTENSEN, Gary; 1465 Glassboro Road, Wenonah, NJ 08090 (US).
- (74) **Agents:** MIGLIORINI, Robert A. et al.; Exxonmobil Research And Engineering Company, 1545 Route 22 East, P.O. Box 900, Annandale, NJ 08801-0900 (US).

(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, BN, 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, IR, IS, JP, KE, KG, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, 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, 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, KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) **Title:** METHOD FOR IMPROVING THERMAL -OXIDATIVE STABILITY AND ELASTOMER COMPATIBILITY

DSC Oxidation Test Results

Description	Source	DSC Oxidation Onset
		Temp. °C
1, 1'-Binaphthyl- 500 psi oxygen	Purchased	297
2, 2'-Binaphthyl - 500 psi oxygen	Purchased	312
Alkyl-1,1'-Binaphthyl	Method 3	280
Alkyl Perylene	Method 3	290
Bis a-methylnaphthalene methane	Method 2	263
Bis b-methylnaphthalene methane	Method 2	279
Alkylated bis a-methylnaphthalene methane	Method 3	269
1,1'-(1,2-ethanediyl)bis-naphthalene	Purchased	306
Alkylated 1,1'-(1,2-ethanediyl)bis-naphthalene	Method 3	285
AN 5	Purchased	233
Radical Coupled AN	Method 1	268
Radical Coupled AN	Method 1	268
AN 12	Purchased	230

FIG. 1

(57) **Abstract:** A method for improving thermo-oxidative stability and elastomer compatibility in an apparatus lubricated with a lubricating oil by using as the lubricating oil a formulated oil including a lubricating oil base stock. The lubricating oil base stock includes a multi-aromatic base stock of the formula: $R^1-R^2-(X-R^2)_n-R^1$ wherein each R^1 is the same or different and is a terminal group, each R^2 is the same or different and represents a substituted or unsubstituted aromatic moiety; each X is a linking moiety that is carbon-carbon single bond or a linking group, n is a number from 1 to 2000, and the ratio of the total number of aromatic ring carbon atoms to aliphatic carbon atoms in said formula is greater than 0.32:1. The multi-aromatic base stock has a kinematic viscosity greater than 20 mm²/s at 100°C.