

(51) International Patent Classification:
C10M 125/02 (2006.01)(21) International Application Number:
PCT/US2013/051592(22) International Filing Date:
23 July 2013 (23.07.2013)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/679,872 6 August 2012 (06.08.2012) 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: HAQUE, Tabassumul; 186 Mary Court, Bridgewater, NJ 08807 (US). WEBSTER, Martin, N.; 5 Harbourn Ridge Drive, Pennington, NJ 08534 (US). TSOU, Andy, H.; 3381 Pheasant Hill Drive, Allentown, PA 18104 (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, 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, 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.

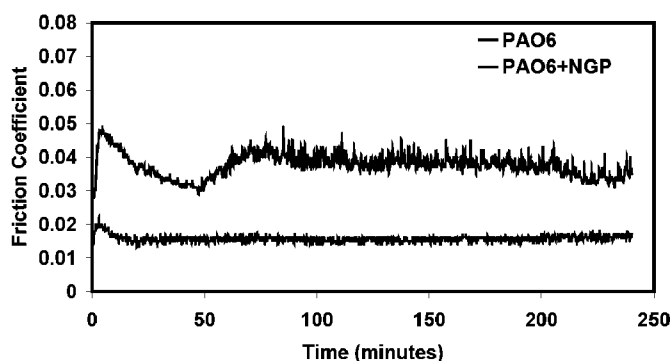
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, 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: IMPROVED ANTI-WEAR PERFORMANCE OF LUBRICANTS USING CARBON NANOPATELETS

Study of Friction Performance on DLC Coating using Nanographene Platelets (NGP) in PAO



(57) Abstract: Provided are a lubricating engine oil and a method of improving wear protection in an engine lubricated with such lubricating oil. The method includes using as the lubricating oil a formulated oil comprising a lubricating oil base stock as a major component, an antiwear additive as a first minor component, and carbon nanoplatelets as a second minor component. The carbon nanoplatelets are dispersed in said lubricating oil base stock. Wear protection is improved as compared to wear protection achieved using a lubricating oil not containing carbon nanoplatelets as a second minor component. A synergy exists between carbon nanoplatelets and other major components of lubricants, especially with zinc dialkyldithiophosphate (ZDDP) or other phosphate antiwear additives, that helps to form a nano-composite wear resistant and low friction tribofilm both on ferrous and non-ferrous surfaces (e.g., carbon coatings, ceramic coatings, polymeric coatings, and the like) of engines/machines.