

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization

International Bureau

(43) International Publication Date
17 March 2022 (17.03.2022)



(10) International Publication Number
WO 2022/054023 A1

(51) International Patent Classification:
C10M 141/10 (2006.01)

(21) International Application Number:
PCT/IB2021/058338

(22) International Filing Date:
14 September 2021 (14.09.2021)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
63/078,009 14 September 2020 (14.09.2020) US

(71) Applicant: **CHEVRON JAPAN LTD.** [JP/JP]; Atago
Green Hills Mori Tower 18F, 2-5-1 Atago Minato-Ku,
Tokyo, 105-6218 (JP).

(72) Inventors: **FUCHI, Masami**; Atago Green Hills Mori
Tower 18F, 2-5-1 Atago Minato-Ku, TOKYO, 105-6218
(JP). **SASAKI, Naoya**; Atago Green Hills Mori Tower 18F,
2-5-1 Atago Minato-Ku, TOKYO, 105-6218 (JP). **NAKA-
GAWA, Takahiro**; Atago Green Hills Mori Tower 18F,
2-5-1 Atago Minato-Ku, TOKYO, 105-6218 (JP). **OHTA,
Satoshi**; Atago Green Hills Mori Tower 18F, 2-5-1 Atago
Minato-Ku, TOKYO, 105-6218 (JP). **MASUDA, Nao-
ki**; Atago Green Hills Mori Tower 18F, 2-5-1 Atago Mi-
nato-Ku, TOKYO, 105-6218 (JP). **KUBO, Koichi**; Atago
Green Hills Mori Tower 18F, 2-5-1 Atago Minato-Ku,
TOKYO, 105-6218 (JP).

(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, DJ, DK, DM, DO,
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,
HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH, KN,
KP, KR, KW, KZ, LA, LC, LK, LR, LS, 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, ST, SV, SY, TH, TJ, TM, TN,
TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, 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, ST, 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).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:

- with international search report (Art. 21(3))
- in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE



WO 2022/054023 A1

(54) Title: LUBRICATING OIL CONTAINING ALKYL PHOSPHONIC ACID



(I)

(57) Abstract: This disclosure describes a zinc-free lubricating oil composition. The composition includes a major amount of an oil of lubricating viscosity having a kinematic viscosity at 100°C in a range of about 1.5 to about 35 mm²/s and an anti-wear mixture having one or more ashless dispersants and an alkyl phosphonic acid having a structure given by (I) wherein R is a C₃-C₂₀ hydrocarbyl group. The initial pH of the anti-wear mixture is between 5-9.5 as measured by ASTM D664.