



(51) International Patent Classification:

G01N 30/46 (2006.01) G01N 30/86 (2006.01)
G01N 30/72 (2006.01) H01J 49/16 (2006.01)
G01N 33/28 (2006.01) H01J 49/44 (2006.01)

(21) International Application Number:

PCT/US2014/058784

(22) International Filing Date:

2 October 2014 (02.10.2014)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

14/061,086 23 October 2013 (23.10.2013) 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: WANG, Frank, C.; 9 Cambridge Drive, Annandale, NJ 08801 (US). QIAN, Kuangnan; 74 Durham Road, Skillman, NJ 08558 (US). EDWARDS, Kathleen, E.; 45 Parkside Drive, Freehold, NJ 07728 (US).

(74) Agents: WARD, Andrew, T. 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, 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, 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).

Published:

- 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))

(54) Title: INTEGRATED HYDROCARBON ANALYSIS

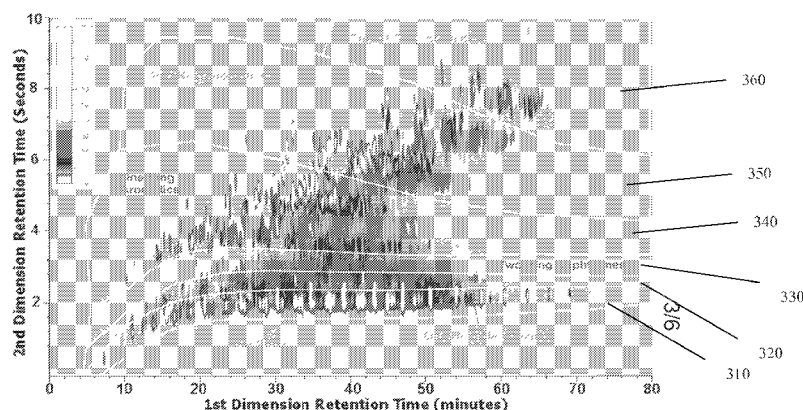


FIG. 3

(57) Abstract: Petroleum or other hydrocarbon samples can be analyzed in parallel by 1) GC-field ionization Time of Flight Mass Spectrometer (GC-FI-TOF MS) and 2) two dimensional gas chromatography (2D-GC) equipped with a flame ionization detector (FID). The combined techniques allow for improved quantitative characterization of the compounds within a hydrocarbon sample. The techniques can be combined by correlating the 2D-GC FID data with the GC-FI-TOF MS data based on correlation of compound classes, correlation of retention windows within a compound class, correlation of individual compounds, such as paraffins, or a combination thereof.