



(51) International Patent Classification:

C07C 29/136 (2006.01) **C12P 7/26** (2006.01)
C07C 2/12 (2006.01) **C10L 1/04** (2006.01)

(21) International Application Number:

PCT/US2009/066419

(22) International Filing Date:

2 December 2009 (02.12.2009)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/119,250 2 December 2008 (02.12.2008) US

(71) Applicant (for all designated States except US): **THE TEXAS A&M UNIVERSITY SYSTEM** [US/US]; 3369 Tamu, College Station, TX 77843-3369 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **HOLTZAPPLE, Mark, T.** [US/US]; 1805 Southwood Drive, College Station, TX 77840 (US). **GRANDA, Cesar, B.** [EC/US]; 603 Aster Drive, College Station, TX 77845 (US). **TACO, Sebastian** [EC/US]; 4110 College Main, #12 Tribeca Square, Bryan, TX 77801 (US). **ROSS, Michael, Kyle** [US/US]; 322 Greenleaf Lane, Bryan, TX 77808 (US). **LUCE, Gary** [US/US]; 9526 Arcade Drive, Spring, TX 77379 (US).

(74) Agents: **WESTBY, Timothy, S.** et al.; CONLEY ROSE, P.C., P. O. Box 3249, Houston, TX 77253-3267 (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, 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, KM, 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, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

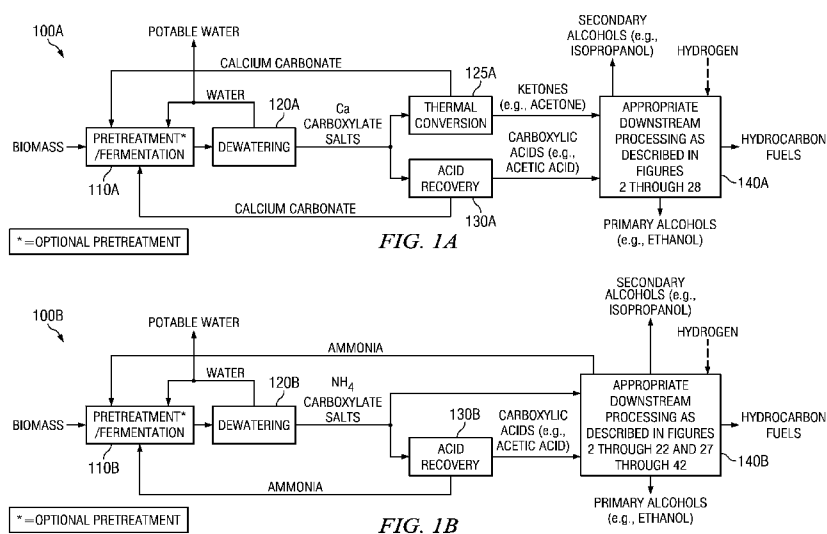
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

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

[Continued on next page]

(54) Title: ALTERNATIVE PATHS TO ALCOHOLS AND HYDROCARBONS FROM BIOMASS



(57) Abstract: A method of producing alcohols, hydrocarbons, or both from biomass by converting biomass into a carboxylic acid, reacting the carboxylic acid with an olefin to produce an ester and hydrogenolyzing the ester to produce alcohol. A method of producing hydrocarbons from biomass by converting at least a portion of the biomass into a carboxylic acid, a ketone, or an ammonium carboxylate salt, reacting at least one of a portion of the carboxylic acid, a portion of the ketone, or a portion of the ammonium carboxylate salt in an oligomerization reactor as at least part of a process that produces an oligomerization product and separating hydrocarbons from the oligomerization product.



— *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))*

(88) Date of publication of the international search report:

16 September 2010