

1) Family number: 57414072 (US2016030856A)

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Title: DISTILLATION REACTOR MODULE

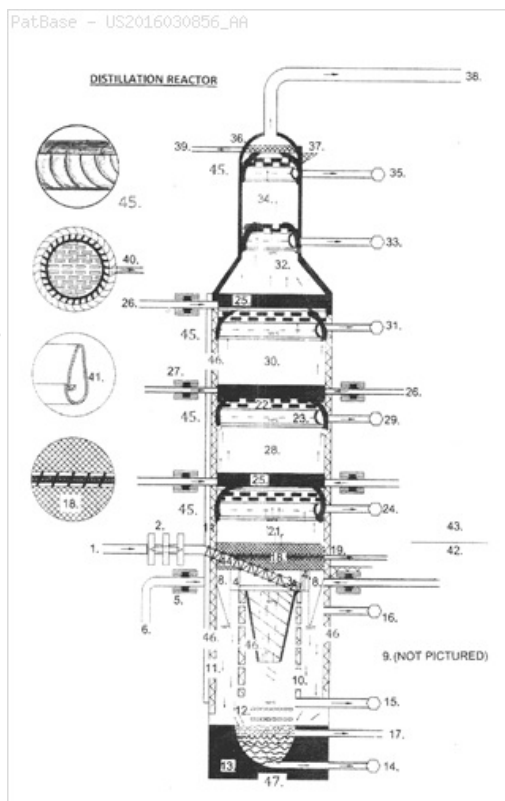
Abstract: The distillation reactor consists of a reactor apparatus with corresponding method of upstream distilling and purification of carbon based liquid or liquidized streams for use as fuels, lubricating oils and or gaseous energy and electricity production. The distillation reactor consolidates the atmospheric and vacuum distillation processes along with desalting, defueling, deasphalting, fractionation, thin/wiped film evaporation and Hydro finishing into an advanced high velocity, high volume single reactor system. Carbon based feed streams include either a single stream or preferably, a combined stream of liquefied coal slurries, crude oils, spent oils, Pyrolytic oils and or peat or other plant carbon derived liquids, vapors, mists or gases. The method further consists of controlling the mix ratio, flow velocity, sequential fractionation and filtration technology and processing atmospheres of the carbon feeds with the reactor apparatus. The combined apparatus and method allows for a refinery to consistently produce a finished barrel of oil well below traditional costs and at a higher efficiency than current art and prior art.

Classifications:

International (IPC 8-9): B01D3/00 B01D3/06 B01D3/10 B01D3/26 B01D3/32 B01D39/20 B01D53/48 B01D53/62 B01D59/04 B01J B01J19/24 B01J19/26 B01J2/00 B01J6/00 B01J8/24 B02C23/00 B03C1/00 B22F3/10 B22F9/00 B29B17/00 C01B17/027 C01B17/74 C02F1/00 C10B49/12 C10G1/00 C10G11/18 C10G33/00 C10G45/00 C10G57/00 C10G7/00 C10G7/06 C10G9/04 C10J3/72 C10L9/10 C22B13/00 C22B15/00 C22B21/00 C22B7/00 C22B9/00 F03G7/00 F27B17/00 G21C1/02 G21D5/00 H01M10/54 H01M8/00 H02K55/02 H02K7/09 (Advanced/Invention)

CPC: Y02E30/40 G21D1/00 B01J19/0093 B01J2219/00864 B01J2219/00867 B01J2219/00871 C01G21/02 C01B3/32 C01B13/02 C01B17/02 C01B2203/0205 C01B2203/0283 C01B2203/043 C01B2203/0445 C01B2203/0475 C10G1/02 C10G1/10 C10G31/08 C10G75/04 Y02P20/129 B09B5/00 Y02P30/446 Y02E30/30 B01D3/10 B01D3/006 B01D3/06 B01D39/2027 F03G7/00 B01D3/009 C10G7/06 G21C1/00 G21D5/00 C10G7/00 C10G57/00 C10G7/003 C10L9/10 C10J3/72 C10G1/00 C01B17/027 C01B17/74 B01J6/008 B01J2/00 B01J19/24 B01D53/48 B01D53/62 C22B9/00 F27B17/00 C02F1/00 C22B7/00 B29B17/00 B22F3/10 B22F9/00 C22B21/00 C22B15/00 C22B13/00 H01M8/00 H01M10/54 H02K55/02 H02K7/09 B02C23/00 B03C1/00 C10L2290/544 C10J2300/093 C10J2300/0946 B22F2009/001 C01B17/48 C10G11/18 C10G33/00 C10G45/00 Y02E20/16 Y02E20/18 Y02W10/33 Y02W10/37 Y02W30/84 C01B32/05 C01B32/20 C01B32/50 Y02P10/143

US: 196/46 202/232 209/213 210/251 241/301 241/65 266/160 310/90.5 422/129 422/170 422/187 422/198 422/255 423/522 423/567.1 429/49 505/163 505/166 60/698



Family:

Publication number	Publication date	Application number	Application date
CA2907677 AA	20150921	CA20142907677	20140318
EP2969180 A2	20160120	EP20140762668	20140318
EP2969180 A4	20161005	EP20140762668	20140318
IL242590 A0	20160131	IL20140242590	20140318
JP2016512165 T2	20160425	JP20160502609T	20140318
US2016030856 AA	20160204	US20140776734	20140318
US2016032904 AA	20160204	US20140776736	20140318
US2016045841 AA	20160218	US20140776732	20140515
WO14146129 A2	20140918	WO2014US31118	20140318
WO14146129 A3	20150129	WO2014US31118	20140318
WO14153570 A2	20140925	WO2014US38290	20140515
WO14153570 A3	20150219	WO2014US38290	20140515
WO14153570 A9	20150806	WO2014US38290	20140515
WO14200605 A2	20141218	WO2014US31116	20140318
WO14200605 A3	20150326	WO2014US31116	20140318
WO14200605 A4	20150430	WO2014US31116	20140318
WO14200605 A9	20150205	WO2014US31116	20140318

Priority:

US20130800209P 20130315	US20130801170P 20130315	US20130801491P 20130315
US20140776734 20140318	US20140776736 20140318	WO2014US31118 20140318
WO2014US31116 20140318	US20140776732 20140515	WO2014US38290 20140515

Probable Assignee: TRANSTAR GROUP LLC

Assignee(s): (std): BRADLEY RANDALL ; KALPAN ALLEN ; KAPLAN ALLEN ; TRANSTAR GROUP LTD

Assignee(s): TRANSTAR GROUP LLC

Inventor(s): (std): KALPAN ALLEN ; BRADLEY RANDALL ; KAPLAN ALLEN

Agent(s): ADE AND CO INC; NELLIGAN OBRIEN PAYNE LLP; PERRONACE ANDREA; HERSHKOVITZ ABRAHAM ET AL; HERSHKOTIZ ABRAHAM ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

2) Family number: 32610188 (US2010163226A) © PatBase

Title: SUPERCRITICAL FLUID RECOVERY AND REFINING OF HYDROCARBONS FROM HYDROCARBON-BEARING FORMATIONS APPLYING FUEL CELL GAS IN SITU

Abstract: A plume of combined gases are infused into hydrocarbon-bearing formations, "inert" as the major gas and "reactive" as the minor gas, where the minor gas reacts with hydrocarbons to fully saturate hydrocarbons with supercritical fluid, which migrate hydrocarbons out of formations, even at great distances from the regulated fuel cell source. Coal, tar sands, petroleum-contaminated soil, and/or oil wells that have lost gas pressure can also be desorbed by this in-situ method.

Classifications:

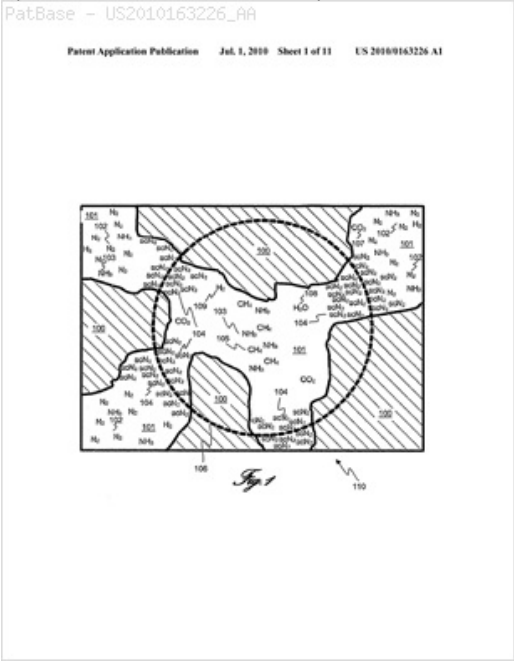
International (IPC 8-9): B64C1/40 C09K8/594 E21B33/10 E21B43/08 E21B43/16 E21B43/22 E21B43/24 E21B43/243 E21B43/25 E21B47/00 F03D3/00 H01M8/18 (Advanced/Invention); B64C1/00 C09K8/58 E21B33/10 E21B43/16 E21B43/25 E21B47/00 F03D3/00 H01M8/18 (Core/Invention)

International (IPC 1-7): H01M8/18

CPC: H01M8/186 Y02E60/528 E21B36/02 E21B43/243 Y02B10/30 Y02B90/16 E21B43/2401 E21B41/0085 H01M8/04022 H01M8/0612 H01M8/0643 H01M2250/405 Y02P20/544 E21B43/168 B64C1/068 H01M8/244 H01M8/2425

European: B64C1/06S E21B36/02 E21B41/00R E21B43/16G2 E21B43/243 E21B43/24B H01M8/04B2C H01M8/06B2 H01M8/06B2G H01M8/18C2 H01M8/24B2H T01M250/40D Y02B10/30 Y02B90/18 Y02E60/52J

US: 166/227 166/227S 166/268 166/271 166/272.1 166/302 166/302S 166/307 166/307S 166/309 166/371 166/67 166/67S



CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN
IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW
MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ
TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

3) Family number: 55797193 (US2014046105A)

© PatBase

Title: UNDERGROUND REACTOR SYSTEM

Abstract: An underground reactor for creating hydrocarbons and chemicals from organic material can include a heat recovery device. Some embodiments of the present disclosure include at least one tube that injects biomass underground and at least one second tube that collects reacted biomass on the surface. Further tubes are also disclosed for the ability to control temperature and pressure and collect minerals and carbon dioxide. In another embodiment, a super-critical fluid is injected into the underground reactor. Methods for utilizing the reactor are additionally provided. Further embodiments include methods of using the reactor such as, for example, methods of creating fuel from algae and methods of using the minerals and carbon dioxide as food for an algae farm that will be used as biomass for the reactor.

Classifications:

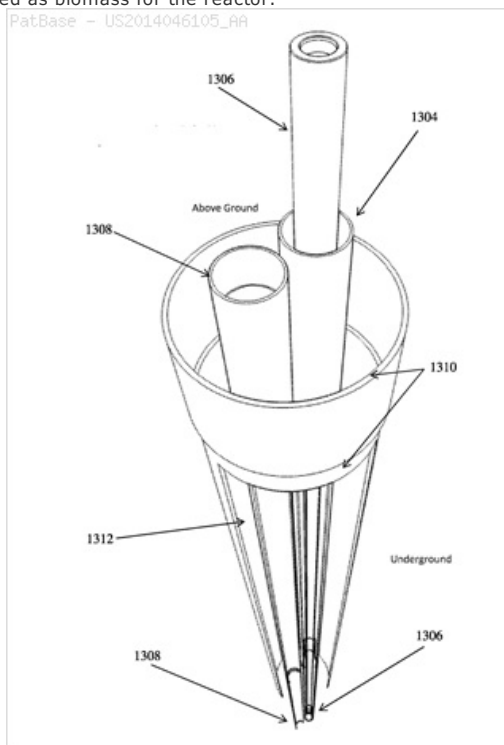
International (IPC 8-9): C10G1/04 (Advanced/Invention)

CPC: C10G1/045 C10G1/02 C10G2300/1011 B01J4/002

B01J19/1843 Y02P30/20

US: 208/400 422/187 422/208 585/240

PatBase - US2014046105_AA



Family:

Publication number	Publication date	Application number	Application date
US2014046105 AA	20140213	US20130963926	20130809

Priority:

US20120681850P 20120810 US20130963926 20130809

Probable Assignee: ADMINISTRATORS OF TULANE EDUCATIONAL FUND

Assignee(s): (std): IGLESIAS BRANDON J ; UNIV TULANE

Assignee(s): ADMINISTRATORS OF TULANE EDUCATIONAL FUND

Inventor(s): (std): IGLESIAS BRANDON J

4) Family number: 49158195 (US2011163011A)

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Title: USING SUPERCRITICAL FLUIDS TO REFINE HYDROCARBONS

Abstract: This is a method to reactively refine hydrocarbons, such as heavy oils with API gravities of less than 20 degrees and bitumen-like hydrocarbons with viscosities greater than 1000 cp at standard temperature and pressure using a selected fluid at supercritical conditions. The reaction portion of the method delivers lighter weight, more volatile hydrocarbons to an attached contacting device that operates in mixed subcritical or supercritical modes. This separates the reaction products into portions that are viable for use or sale without further conventional refining and hydro-processing techniques. This method produces valuable products with fewer processing steps, lower costs, increased worker safety due to less processing and handling, allow greater opportunity for new oil field development and subsequent positive economic impact, reduce related carbon dioxide, and wastes typical with conventional refineries.

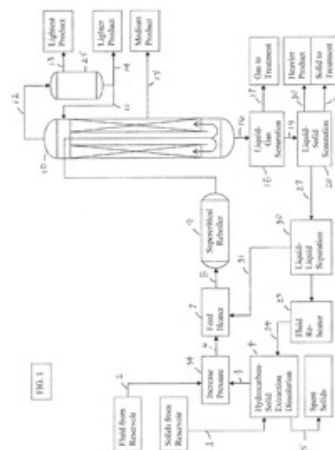
Classifications:

International (IPC 8-9): B01D3/00 C10G1/04 C10G21/06 C10G27/04 C10G29/00 C10G31/08 C10G47/32 C10G53/14 C10G55/04 C10G65/12 C10G9/00 C10K3/04 (Advanced/Invention)

CPC: C10G47/32 B01D3/009 C10G1/047 C10G9/00 C10G21/06 C10G27/04 C10G31/08 C10G53/14 C10G55/04 C10G2300/4006 C10G2300/4012 C10G2300/4043 C10G2300/405 C10K3/04 Y02P20/544 Y02P20/127

European: C10G1/04W C10G21/06 C10G31/08 M10G300/40A M10G300/40B

US: 1/1 196/46 196/46S 208/106 208/298 208/390 208/391 208/416 422/162

**Family:**

Publication number	Publication date	Application number	Application date
CA2846857 AA	20140915	CA20142846857	20140313
CA2846857 C	20180109	CA20142846857	20140313
US2011163011 AA	20110707	US20100978294	20101223
US2013206645 AA	20130815	US20130838746	20130315
US8894846 BB	20141125	US20100978294	20101223
US9051521 BB	20150609	US20130838746	20130315

Priority:

US20100978294 20101223 US20130838746 20130315

Probable Assignee: HEAVY OIL SOLUTIONS INC**Assignee(s):** (std): YARBRO STEPHEN LEE**Assignee(s):** YARBRO STEPHEN LEE531 ROVER BOULEVARDLOS ALAMOSNM87544US ; HEAVY OIL SOLUTIONS INC ; SNT VENTURES LLC**Inventor(s):** (std): YARBRO STEPHEN LEE**Inventor(s):** YARBRO STEPHEN LEE531 ROVER BOULEVARDLOS ALAMOSNM87544US**Agent(s):** UREN JOHN RUSSELL; ROD D**5) Family number: 34294324 (US2007056881A)**

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Title: METHOD FOR EXTRACTING AND UPGRADING OF HEAVY AND SEMI-HEAVY OILS AND BITUMENS

Abstract: Improvements in the selective extraction of relatively low molecular weight oils from coal, coal liquids, oil shales, shale oils, oil sands, heavy and semi-heavy oils, bitumens, and the like are provided by a continuous process involving contacting the material to be treated with supercritical water in a continuous operation at pressures of from 500 psi to 3000 psi, temperatures of 250 degrees centigrade to 450 degrees centigrade, and in-reactor dwell times generally in excess of 25 seconds and up to 10 minutes.

Classifications:**International (IPC 8-9):** C10G1/00 C10G29/02 C10G31/06

C10G9/18 (Advanced/Invention);

C10G1/00 (Core/Invention)

CPC: Y10S208/952 C10G2300/4006 C10G2300/4012 C10G2300/805

C10G1/047 C10G31/08

European: C10G1/04W C10G31/08**US:** 196/46 196/46P 208/106 208/208.00R 208/208R 208/251.00R

208/251R 208/254.00R 208/254R 208/298 208/414 208/414S

208/435 208/952 422/198

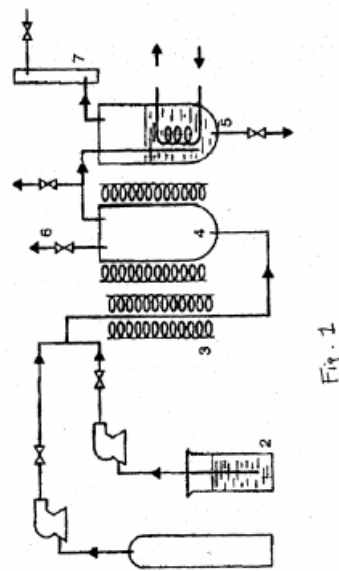


Fig. 1

Family:

Publication number	Publication date	Application number	Application date
US2007056881 AA	20070315	US20050225884	20050914
US2011266115 AA	20111103	US20110083627	20110411
US7947165 BB	20110524	US20050225884	20050914
US8372347 BB	20130212	US20110083627	20110411

Priority:

US20050225884 20050914 US20110083627 20110411

Probable Assignee: BERKOWITZ BRIAN**Assignee(s):** (std): BERKOWITZ BRIAN ; DROR ISHAI ; YEDA RES AND DEV CO LTD AT ; YEDA RES AND DEV ; DUNN STEPHEN R**Assignee(s):** YEDA RESEARCH AND DEVELOPMENT CO LTD AT THE WEIZMANN INSTITUTE OF SCIENCE ; YEDA RESEARCH AND DEVELOPMENT CO LTD AT WEIZMANN INST OF SCIENCE ; YEDA RESEARCH AND DEVELOPMENT COLTD ; YEDA RESEARCH AND DEVELOPMENT CO LTD ; YEDA RESEARCH AND DEVELOPMENT CO LTD AT THE WEIZMA ; YEDA RESERACH AND DEVELOPMENT CO LTD ; DUNN STEPHEN ; YEDA RESEARCH AND DEVELOPMENT CO LTD AT ; YEDA RESEARCH AND DEVELOPMENT CO LTD AT WEIZMANN I ; BERKOWITZ JONATHAN ; BERKOWITZ JONATHAN DR ; BALSHAYI CHERYL ; BALSHAYI CHERYL DR**Inventor(s):** (std): DUNN STEPHEN R ; DROR ISHAI ; DUNN STEPHEN ; BERKOWITZ BRIAN**Agent(s):** BROWDY AND NEIMARK PLLC 624 NINTH STREET NW; PEARL COHEN ZEDEK LATZER LLP; MARK S**6) Family number: 44921378** (GB2465911A)

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Title: SYSTEMS, METHODS, AND PROCESSES UTILIZED FOR TREATING SUBSURFACE FORMATIONS**Abstract:** Systems, methods, and/or heaters for treating a subsurface formation are described herein. Some embodiments also generally relate to heaters that have novel components therein. Such heaters may be obtained by using the systems and methods described.**Classifications:****International (IPC 8-9):** E21B44/00 E21B47/022 E21B7/04

E21C25/04 (Advanced/Invention);

E21B44/00 E21B47/02 E21B7/04 E21C25/00 (Core/Invention)

CPC: E21B43/2401 Y10T29/49083 E21B7/04 E21B44/00

E21B47/02216 H01F29/04 E21B43/24 H01F27/38 H01J37/32926

H01J37/32935 E21B36/04 E21B43/30

European: E21B43/24 E21B7/04 H01F29/04 H01J37/32S2

H01J37/32S4 T01F27/38

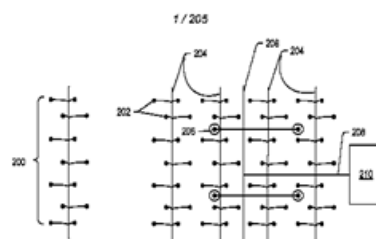


FIG. 1

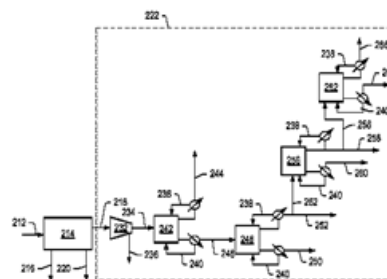


FIG. 2

Family:

Publication number	Publication date	Application number	Application date
AU2008312713 AA	20090423	AU20080312713	20081013
AU2008312713 BB	20120614	AU20080312713	20081013
AU2012203096 AA	20120614	AU20120203096	20120525
AU2012203096 BB	20141113	AU20120203096	20120525
CA2701169 AA	20090423	CA20082701169	20081013
GB201004134 A0	20100428	GB20100004134	20081013
GB2465911 A1	20100609	GB20100004134	20081013

Priority:

US20070999839P 20071019 US20080046329P 20080418 AU20080312713 20081013
 WO2008US79728 20081013 AU20120203096 20120525

Probable Assignee: SHELL INT RESEARCH**Assignee(s):** (std): SHELL INT RESEARCH**Assignee(s):** SHELL INT RESEARCH MIJ BV ; SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ B V

Inventor(s): (std): MILLER DAVID SCOTT ; MO WEIJAN ; MO WEIJIAN ; MUYLLE MICHEL SERGE MARIE ; NAIR VIJAY ; NGUYEN SCOTT VINH ; OCAMPOS ERNESTO RAPHAEL FONSECA ; DEN BOESTERT JOHANNES LEENDERT WILLEM CORNELIS ; FONSECA OCAMPOS ERNESTO RAPHAEL ; PATNI SANDEEP ; PRINCE WRIGHT ROBERT GEORGE ; RAGHU DAMODARAN ; RENKEMA DUURT ; RYAN ROBERT CHARLES ; SANBERG CHESTER LEDLIE ; SANDBERG CHESTER LEDLIE ; SHEN CHONGHUI ; SON JAIME SANTOS ; STANECKI JOHN ANDREW ; ROES AUGUSTINUS WILHELMUS MARIA ; UWECHUE UZO PHILLIP ; VENDITTO JAMES JOSEPH ; VINEGAR HAROLD J ; XIE XUEYING ; MCKINZIE II BILLY JOHN ; MCKINZIE BILLY JOHN II ; MASON STANLEY LEROY ; MARWEDE JOCHEN ; MANSURE ARTHUR JAMES ; MANSURE ARTHUR J ; MACDONALD DUNCAN CHARLES ; LINEY DAVID JOHN ; LI BUSHENG ; KIM DONG SUB ; KARANIKAS JOHN MICHAEL ; JYE HORNG ; HARVEY III ALBERT DESTREHAN ; HARVEY ALBERT DESTREHAN III ; HARRIS CHRISTOPHER KELVIN ; HWANG HORNG JYE JAY ; GUIMERANS ROSALVINA RAMONA ; FOWLER THOMAS DAVID ; FONSECA OCAMPOS ; ERNESTO RAPHAEL ; EDBURY DAVID ALSTON ; CARROLL MARK THOMAS ; CARDINAL PAUL GREGORY ; CAO RENFANG RICHARD ; BURNS DAVID BOOTH ; BRAVO JOSE LUIS ; BOESTERT JOHANNES LEENDERT WILLEM CORNELIS DEN ; BOESTERT JOHANNES LEENDERT WILLEM CORNELIS ; CRUZ ANTONIO MARIA GUIMARAES LEITE ; CRUZ ANTONIO MARIA GUIMARAES ; COSTELLO MICHAEL SCOTT ; BEER GARY LEE ; BASS RONALD J ; AYODELE OLUROPO RUFUS ; ARORA DHRUV

Inventor(s): ANTONIO MARIA GUIMARAES CRUZ ; XUEYING XIE ; SCOTT VINH NGUYEN ; ROBERT GEORGE PRINCE WRIGHT ; RENFANG RICHARD CAO ; PAUL GREGORY CARDINAL ; MICHAEL SCOTT COSTELLO ; MARK THOMAS CARROLL ; JOHN MICHAEL KARANIKAS ; JOHANNES LEENDERT WILLEM CORNELIS DEN BOESTERT ; JOCHEN MARWEDE ; JAMES JOSEPH VENDITTO ; HORNG JYE JAY HWANG ; ERNESTO RAPHAEL FONSECA OCAMPOS ; CHONGHUI SHEN ; BUSHENG LI ; AUGUSTINUS WILHELMUS MARIA ROES ; ARTHUR JAMES MANSURE ; ANTONIO MARIA GUIMARAES LEITE CRUZ ; ALBERT DESTREHAN HARVEY III ; ARTHUR J MANSURE ; CHRISTOPHER KELVIN HARRIS ; CHESTER LEDLIE SANDBERG ; CHESTER LEDLIE SANBERG ; BILLY JOHN MCKINZIE II ; BILLY JOHN II MCKINZIE ; DUURT RENKEMA ; DUNCAN CHARLES MACDONALD ; DONG SUB KIM ; DHRUV ARORA ; DAVID SCOTT MILLER ; DAVID JOHN LINEY ; DAVID BOOTH BURNS ; DAVID ALSTON EDBURY ; DAMODARAN RAGHU ; GARY LEE BEER ; HORNG JYE ; HAROLD J VINEGAR ; JOSE LUIS BRAVO ; JOHN ANDREW STANECKI ; JOHANNES LEENDERT WILLEM CORNELIS BOESTERT ; JAIME SANTOS SON ; WEIJAN MO ; WEIJIAN MO ; VIJAY NAIR ; UZO PHILLIP UWECHUE ; RONALD J BASS ; ROSALVINA RAMONA GUIMERANS ; STANLEY LEROY MASON ; THOMAS DAVID FOWLER ; SANDEEP PATNI ; ROBERT CHARLES RYAN ; HARVEY ALBERT DESTREHAN ; MCKINZIE BILLY JOHN ; MICHEL SERGE MARIE MUYLLE ; OLUROPO RUFUS AYODELE

Agent(s): SPRUSON AND FERGUSON

Abstract: Heavy hydrocarbons are upgraded more efficiently to lighter, more valuable, hydrocarbons with lower amounts of solid carbonaceous by-products in supercritical water using two heating stages, the first stage at a temperature up to about 775K and the second stage at a temperature from about 870K to about 1075K. The temperature is preferably raised from the first temperature to the second temperature by internal combustion using oxygen.

Classifications:

International (IPC 8-9): B01J19/00 C10G47/00

C10G49/18 (Advanced/Invention);

B01J19/00 C10G47/00 C10G49/00 (Core/Invention)

CPC: B01J3/008 B01F5/0604 B01J19/0053 B01J2219/00006

B01J2219/00777 C10G9/38 C10J3/80 C10J2300/0979

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European: B01F5/06B2B B01J19/00D B01J3/00S C10G9/38

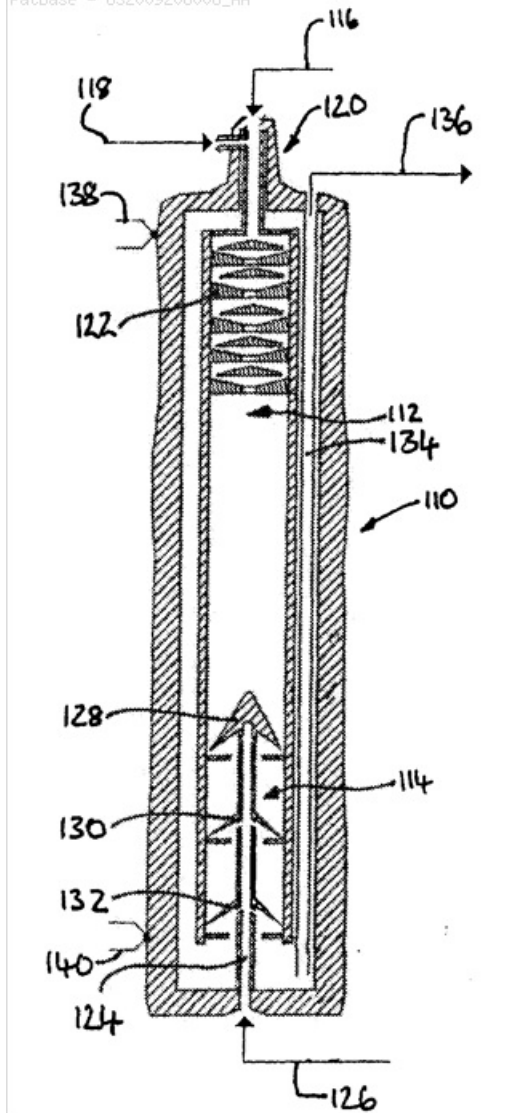
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M10J300/09H4 Y02E20/18

US: 208/107 208/130 208/132 208/132S 208/428 208/435 422/187

422/187S 422/198 422/198P

PatBase - US2009206006_AA



Family:

Publication number	Publication date	Application number	Application date
US2009206006 AA	20090820	US20080033933	20080220
US2010189610 AA	20100729	US20100754865	20100406
US7754067 BB	20100713	US20080033933	20080220

Priority:

US20080033933 20080220 US20100754865 20100406

Probable Assignee: AIR PRODUCTS AND CHEMICALS INC

Assignee(s): (std): AIR PROD AND CHEM

Assignee(s): AIR PRODUCTS AND CHEMICALS INC

Inventor(s): (std): ALLAM RODNEY JOHN

Agent(s): AIR PRODUCTS AND CHEMICALS INC PATENT DEPARTMENT; WILLARD

8) Family number: 43678404 (CA2622466A)

© PatBase

Title: PROCESS AND APPARATUS FOR UPGRADING HEAVY HYDROCARBONS USING SUPERCRITICAL WATER

Abstract: Heavy hydrocarbons are upgraded more efficiently to lighter, more valuable, hydrocarbons with lower amounts of solid carbonaceous by-products in supercritical water using two heating stages, the first stage at a temperature up to about 775K and the second stage at a temperature from about 870K to about 1075K. The temperature is preferably raised from the first temperature to the second temperature by internal combustion using oxygen.

Classifications:

International (IPC 8-9): B01J19/24 C10G67/12

C10G69/06 (Advanced/Invention);

B01J19/24 C10G67/00 C10G69/00 (Core/Invention)

CPC: C10G2300/4006 C10G2300/805 C10G9/38 B01J3/008

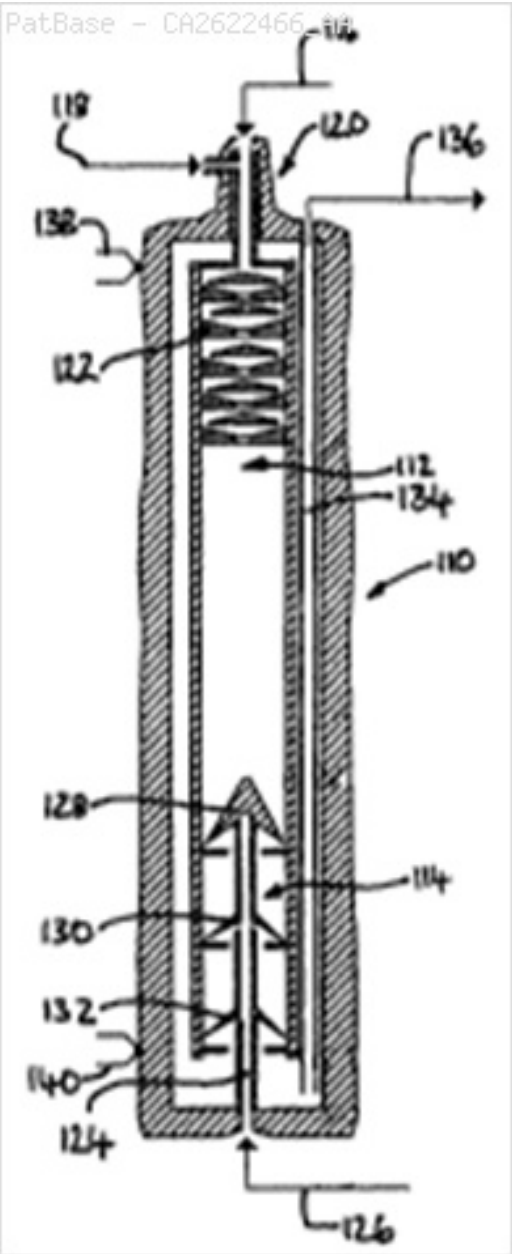
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B01J2219/185 B01J2219/1943 C10G69/06 Y02P20/544

European: B01J19/00D2 B01J19/24D B01J3/00S B01J4/00B2

C10G69/06 C10G9/38 L01J219/00B2D6B L01J219/00B2H2



Family:

Publication number	Publication date	Application number	Application date
CA2622466 AA	20090820	CA20082622466	20080220
CA2622466 C	20121204	CA20082622466	20080220

Priority:

CA20082622466 20080220

Probable Assignee: AIR PROD AND CHEM

Assignee(s): (std): AIR PROD AND CHEM

Assignee(s): AIR PRODUCTS AND CHEMICALS INC ; ALLAM RODNEY JOHN

Inventor(s): (std): ALLAM RODNEY JOHN

Agent(s): MCFADDEN FINCHAM; OSLER HOSKIN AND HARCOURT LLP

9) Family number: 59608432 (US2016312129A)

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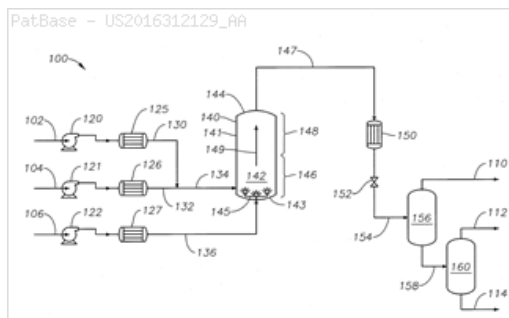
Title: PRODUCTION OF UPGRADED PETROLEUM BY SUPERCRITICAL WATER

Abstract: A method for upgrading a petroleum feedstock using a supercritical water petroleum upgrading system includes introducing the petroleum feedstock, water and an auxiliary feedstock. The method includes operating the system to combine the petroleum feedstock and the water to form a mixed petroleum feedstock and introducing separately and simultaneously into a lower portion of an upflowing supercritical water reactor. The auxiliary feedstock is introduced such that a portion of a fluid contained within the upflowing reactor located proximate to the bottom does not lack fluid momentum. An embodiment of the method includes operating the supercritical water petroleum upgrading system such that the upflowing reactor product fluid is introduced into an upper portion of a downflowing supercritical water reactor. The supercritical water petroleum upgrading system includes the upflowing supercritical water reactor and optionally a downflowing supercritical water reactor.

Classifications:

International (IPC 8-9): B01D11/04 B01J13/00 B01J3/00 C10G31/06 C10G31/08 C10G45/08 C10G45/26 C10G47/02 C10G47/32 C10G49/00 C10G49/04 C10G49/18 C10G55/00 C10G55/06 (Advanced/Invention)

CPC: C10G55/00 C10G2300/4006 C10G2300/202 C10G2300/308



Family:

Publication number	Publication date	Application number	Application date
CN106170532 A	20161130	CN201480069847	20141212
CN106170532 B	20180925	CN201480069847	20141212
CN109097101 A	20181228	CN201810953212	20141212
EP3083903 A1	20161026	EP20140824274	20141212
JP2017504685 T2	20170209	JP20160541321T	20141212
JP6479816 B2	20190306	JP20160541321T	20141212
KR101881235 B1	20180723	KR20167019495	20141212
KR101986968 B1	20190607	KR20187020417	20141212
KR20160116332 A	20161007	KR20167019495	20141212
KR20180084158 A	20180724	KR20187020417	20141212
SG10201802140R A1	20180530	SG20181002140	20141212
SG11201604582Y A1	20160728	SG20161104582	20141212
US2016312129 AA	20161027	US20130132226	20131218
US2017342332 A	20171130	US20170678631	20170816
US2018037828 AA	20180208	US20170678591	20170816
US9771527 BB	20170926	US20130132226	20131218
US10059891 BB	20180828	US20170678631	20170816
WO15094948 A1	20150625	WO2014US69954	20141212
WO15094948 A8	20160121	WO2014US69954	20141212

Priority:

US20130132226 20131218 CN201480069847 20141212 WO2014US69954 20141212
US20170678631 20170816 US20170678591 20170816

Probable Assignee: SAUDI ARABIAN OIL CO

Assignee(s): (std): ARAMCO SERVICES CO ; SAUDI ARABIAN OIL CO

Inventor(s): (std): LEE JOO HYEONG ; ALSHAREEF ALI H ; GARHOUSH MOHAMMAD S ; CHOI KI HYOUNG

Agent(s): DAUNCEY MARK PETER; MARKS AND CLERK SINGAPORE LLP; BRACEWELL LLP; CONSTANCE GALL; RHEBERGEN CONSTANCE GALL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

10) Family number: 59067456 (US2016244346A)

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Title: BLOWDOWN RECYCLE METHOD AND SYSTEM FOR INCREASING RECYCLE AND WATER RECOVERY PERCENTAGES FOR STEAM GENERATION UNITS

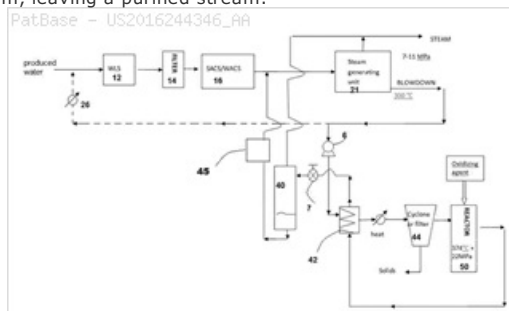
Abstract: A boiler blowdown recycle method and system for increasing recycle and water recovery percentages for steam generation units used in thermal hydrocarbon recovery processes such as SAGD and CSS methods. Blowdown from a steam generating unit is elevated to supercritical temperatures and pressures, and an oxidizing agent added, thereby oxidizing organic and inorganic compounds in the blowdown and simultaneously reducing solubility of inorganics therein the blowdown allowing them to precipitate out or be more easily separated therefrom, leaving a purified stream.

Classifications:

International (IPC 8-9): C02F1/02 C02F1/72 E21B43/24 E21B43/40 F22G3/00 (Advanced/Invention)

CPC: F22B27/00 C02F1/727 E21B43/2406 C02F1/02 C02F2101/10 C02F2101/30 C02F2103/10 C02F2301/106 C02F2303/18 E21B43/24 E21B43/40

US: 166/267



Family:

Publication number	Publication date	Application number	Application date
CA2927287 AA	20160413	CA20142927287	20141017
CA2927287 C	20170509	CA20142927287	20141017
US2016244346 AA	20160825	US20140030137	20141017
WO15054773 A1	20150423	WO2014CA00746	20141017

Priority:

Probable Assignee: HUSKY OIL OPERATIONS LTD**Assignee(s):** (std): HUSKY OIL OPERATIONS LTD**Assignee(s):** BERNAR RODGER FRANCESCO ; DOUGLAS SHELDON WALLACE**Inventor(s):** (std): DOUGLAS SHELDON ; BERNAR RODGER FRANCESCO ; DOUGLAS SHELDON WALLACE**Agent(s):** MACPHERSON LESLIE AND TYERMAN LLP; MLT AIKINS LLP; DAVIDSON SCOTT E**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW**11) Family number: 28648477** (US4714032A)

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Title: Pollution-free pressurized combustion utilizing a controlled concentration of water vapor

Abstract: In a continuous pressurized process for the combustion, in the presence of steam and alkali, of solid fuels charged as aqueous slurries, the improvements comprising the elevation of inlet zone temperature in an entrained phase reactor by recirculating hot solid products to the zone, maintaining increased temperature and/or reduced steam partial pressure in the reactor and/or utilizing contaminated water from an associated fuels processing apparatus as a source of slurry and/or reactor temperature control water. An embodiment suitable for a coal-fired gas turbine locomotive is described and illustrated.

Classifications:

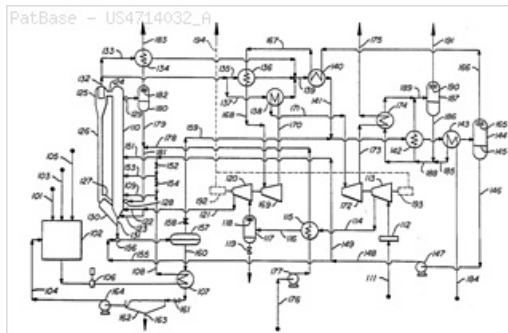
International (IPC 8-9): C02F11/08 C08J11/00 C10B53/00 C10G31/06 C10L1/00 C10L1/32 C10L9/00 F01K17/00 F01K17/02 F01K23/10 F01K3/18 F02C3/26 F02C3/28 F02C6/18 F23C10/10 F23C10/16 F23C99/00 F23G5/027 F23G7/00 F23G7/04 F23K1/00 F23K1/04 F23K3/00 F23K3/02 (Advanced/Invention); C08J11/00 F01K17/00 F01K23/10 F23G7/00 F23G7/04 F23K3/00 (Advanced/Non-invention); F23G7/00 (Core/Non-invention)

International (IPC 1-7): C08J11/00 C10B53/00 C10L1/32 F01K17/00 F01K17/02 F01K23/10 F01K27/00 F02C3/26 F02C3/28 F02C6/18 F02C7/00 F23C11/00 F23D1/00 F23G5/027 F23G7/00 F23G7/04 F23K1/04 F23K3/00 F23K3/02

CPC: Y02E20/16 Y02T50/672 C02F11/086 C10G31/06 C10L1/00 C10L1/326 C10L9/00 F01K3/188 F02C3/26 F23C10/10 F23C10/16 F23C99/00 F23C2206/101 F23G2201/603 F23G2201/80 F23G2900/50214 F23K1/00 Y02E20/12 Y02T50/671

European: C02F11/08D C10G31/06 C10L1/00 C10L1/32C C10L9/00 F01K3/18F F02C3/26 F23C10/10 F23C10/16 F23C99/00 F23K1/00 R01K135/46 R01K181/35 R22B201/16 R22B204/02 R23C206/101 R23G201/603 R23G201/80 R23G900/50214 Y02E20/12 Y02E20/14 Y02E20/16 Y02E20/18 Y02T50/67B Y02T50/67B2

US: 110/238 110/346 110/347 110/348 122/2 122/31.1 122/7.00C 122/7C 431/4 44/280 44/281 60/39.12 60/39.464 60/39.55 60/648 60/649 60/655 60/676 60/775

**Family:**

Publication number	Publication date	Application number	Application date
AU199510546 A1	19950613	AU19950010546	19941114
AU199662628 A1	19961230	AU19960062628	19960605
AU695627 B2	19980820	AU19960062628	19960605
BRPI9609015 A	19991214	BR1996PI09015	19960605
CA2173454 AA	19950601	CA19942173454	19941114
CA2173454 C	20071009	CA19942173454	19941114
CA2223937 AA	19971205	CA19962223937	19960605
CA2223937 C	20021105	CA19962223937	19960605
CN1055741 C	20000823	CN19941094126	19941114
CN1135249 A	19961106	CN19941094126	19941114
EP0729545 A1	19960904	EP19950901224	19941114
EP0729545 A4	19980128	EP19950901224	19941114
IN02241MA1997 A	20050902	IN1997MA02241	19971008
IN205637 B	20070629	IN1997MA02241	19971008
JP3529385 B2	20040524	JP19950515104T	19941114
JP9505878 T2	19970610	JP19950515104T	19941114
KR100383288 B1	20030710	KR19960702562	19941114
KR19960706010 A	19961108	KR19960702562	19941114
KR19990022338 A	19990325	KR19970708818	19960605
KR960706010 A	19961108	KR19960702562	19960515
MX9709610 A1	19980731	MX19970009610	19971205
RU2161168 C2	20001227	RU19970117455	19960605
RU97117455 A	19990627	RU19970117455	19971017
TW296421 B	19970121	TW19960107752	19960627
US4714032 A	19871222	US19850813486	19851226
US4898107 A	19900206	US19890294424	19890109
US5000099 A	19910319	US19880290368	19881229
US5050375 A	19910924	US19890388069	19890721
US5261225 A	19931116	US19910763000	19910920
US5485728 A	19960123	US19930152796	19931115
US5685153 A	19971111	US19950486026	19950607
VN2294 A1	20011025	VN19960002001	19960511
WO9514850 A1	19950601	WO1994US13009	19941114
WO9641070 A1	19961219	WO1996US09580	19960605

Priority:

US19850813486 19851226 US19870100531 19870924 US19870123280 19871120

US19880290368 19881229 US19890294424 19890109 US19890388069 19890721
US19910763000 19910920 US19930152796 19931115 WO1994US13009 19941114
US19950486026 19950607 WO1996US09580 19960605

Probable Assignee: SGC ADVISORS LLC

Assignee(s): (std): DICKINSON NORMAN L ; DIPAC ASSOCIATES ; EHNTERTEK EHNVAJRONMENTAL INK ; MURRAY ROBERT G ; KLOSKY MICHAEL K ; ENERTECH ENVIRONMENTAL INC

Assignee(s): ENERTECH ENVIRONMENTAL INC (DELAWARE C CORP) ; ENERTECH ENVIRONMENTAL INC DELAWARE C CORP ; SGC ADVISORS LLC ; ENERTECH ENVIRONMENTAL INCUS

Inventor(s): (std): MICHAEL K KLOSKY ; NORMAN L DICKINSON ; ROBERT G MURRAY ; N L DICKINSON ; DICKINSON N L ; KLOSKY MICHAEL K ; MURRAY ROBERT G ; DICKINSON NORMAN L ; DIKINSON NORMAN L ; KLOSKI MAJKL K ; MJURREHJ ROBERT G

Inventor(s): ROBERT G MURRAY

Agent(s): SPRUSON AND FERGUSON; ASPEN PHARMA PTY LTD; FETHERSTONHAUGH AND CO

Designated states: AL AM AT AU AZ BB BE BF BG BJ BR BY CA CF CG CH CI CM CN CZ DE DK EE ES FI FR GA GB GE GN GR HU IE IL IS IT JP KE KG KP KR KZ LI LK LR LS LT LU LV MC MD MG MK ML MN MR MW MX NE NL NO NZ PL PT RO RU SD SE SG SI SK SN SZ TD TG TJ TM TR TT UA UG US UZ VN

12) Family number: 50438500 (US2013205652A)

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Title: BALLISTIC HEATING PROCESS

Abstract: The invention relates generally to the field of biofuel synthesis. More specifically, the invention relates to processes for the synthesis of biofuels from organic materials including lignocellulosic biomass and coal. Also provided are biofuel products obtained from processes of the invention.

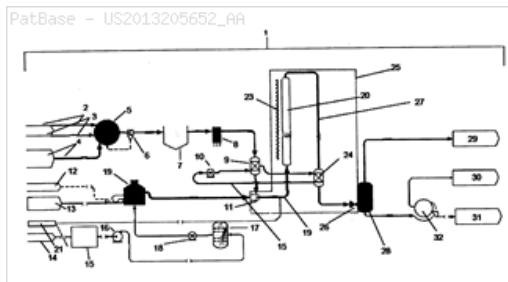
Classifications:

International (IPC 8-9): B01J19/00 C10G1/00 C10G1/04 C10G1/08 C10G3/00 C10L1/00 C10L1/02 C10L1/04 C10L5/44 (Advanced/Invention)

CPC: C10G1/04 C10G1/002 C10G1/047 C10G1/08 C10G3/44 C10G2300/1014 C10G2300/4006 C10G2300/4012 C10G2300/44 C10L1/02 C10L1/04 Y02E50/13 Y02E50/30 Y02E50/343 Y02P30/20

European: C10G1/00B C10G1/04 C10G1/04W C10G3/00 C10G3/44 C10L1/02 C10L1/04 M10G300/10B2 Y02E50/30

US: 44/307 44/639



Family:

Publication number	Publication date	Application number	Application date
AR082072 AA	20121107	AR2011P102368	20110701
AU2011274308 AA	20120105	AU20110274308	20110629
AU2011274308 BB	20150226	AU20110274308	20110629
CA2803633 AA	20121221	CA20112803633	20110629
CA2803633 C	20180417	CA20112803633	20110629
EP2588566 A1	20130508	EP20110799964	20110629
EP2588566 A4	20160413	EP20110799964	20110629
US2013205652 AA	20130815	US20110807451	20110629
US10100258 BB	20181016	US20110807451	20110629
UY33477 A1	20111230	UY20110033477	20110701
WO12000033 A1	20120105	WO2011AU00802	20110629

Priority:

AU20100902938 20100701 AU20110274308 20110629 WO2011AU00802 20110629

Probable Assignee: IGNITE RESOURCES PTY LTD

Assignee(s): (std): BENNETT MATHEW ; HUMPHREYS LEONARD JAMES ; IGNITE ENERGY RESOURCES LTD ; KLATT PETER WALDEMAR ; IGNITE RESOURCES PTY LTD ; LICELLA FIBRE FUELS PTY LTD ; LICELLA PTY LTD

Assignee(s): IGNITE ENERGY RESOURCES ENGINEERING PTY LTD ; IGNITE ENERGY RESOURCES LIMITED ; CANFOR PULP LTD

Inventor(s): (std): KLATT PETER WALDEMAR ; HUMPHREYS LEONARD JAMES ; MATHEW BENNETT ; BENNETT MATHEW

Inventor(s): PETER WALDEMAR KLATT ; LEONARD JAMES HUMPHREYS

Agent(s): SPRUSON AND FERGUSON; BORDEN LADNER GERVAIS LLP; CABINET PLASSERAUD; MCDONNELL BOEHNEN HULBERT AND BERGHOFF LLP

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

13) Family number: 43167512 (WO09052054A1)

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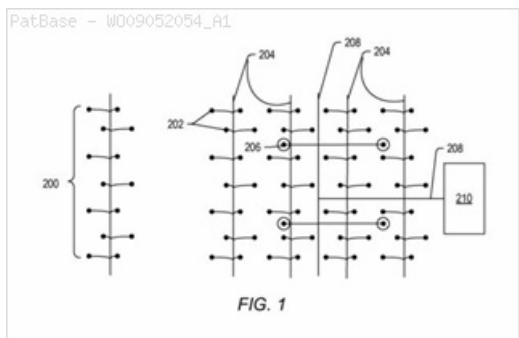
Title: SYSTEMS, METHODS, AND PROCESSES UTILIZED FOR TREATING SUBSURFACE FORMATIONS

Abstract: Systems, methods, and/or heaters for treating a subsurface formation are described herein. Some embodiments also generally relate to heaters that have novel components therein. Such heaters may be obtained by using the systems and methods described.

Classifications:

International (IPC 8-9): E21C25/04 (Advanced/Invention); E21C25/00 (Core/Invention)

CPC: H01F29/04 E21B43/24 H01F27/38 H01J37/32926 H01J37/32935 Y10T29/49083 E21B36/04 E21B43/30



Family:

Publication number	Publication date	Application number	Application date
WO09052054 A1	20090423	WO2008US79728	20081013

Priority:

US20070999839P 20071019 US20080046329P 20080418

Probable Assignee: SHELL OIL CO

Assignee(s): (std): ARORA DHRUV ; AYODELE OLUROPO RUFUS ; BASS RONALD J ; BEER GARY LEE ; BRAVO JOSE LUIS ; BURNS DAVID BOOTH ; COSTELLO MICHAEL SCOTT ; DEN BOESTERT JOHANNES LEENDERT WILLEM CORNELIS ; FONSECA OCAMPOS ERNESTO RAPHAEL ; GUIMERANS ROSALVINA RAMONA ; CRUZ ANTONIO MARIA GUIMARAES LEITE ; EDBURY DAVID ALSTON ; CAO RENFANG RICHARD ; CARROLL MARK THOMAS ; FOWLER THOMAS DAVID ; HARVEY ALBERT DESTREHAN III ; HARRIS CHRISTOPHER KELVIN ; CARDINAL PAUL GREGORY ; SHELL INT RESEARCH ; RAGHU DAMODARAN ; KIM DONG SUB ; MO WEIJAN ; MILLER DAVID SCOTT ; PATNI SANDEEP ; KARANIKAS JOHN MICHAEL ; LI BUSHENG ; MACDONALD DUNCAN CHARLES ; RYAN ROBERT CHARLES ; MARWEDE JOCHEN ; MANSURE ARTHUR JAMES ; MUYLLE MICHEL SERGE MARIE ; HWANG HORNG JYE JAY ; MCKINZIE BILLY JOHN II ; NAIR VIJAY ; NGUYEN SCOTT VINH ; LINEY DAVID JOHN ; MASON STANLEY LEROY ; PRINCE WRIGHT ROBERT GEORGE ; ROES AUGUSTINUS WILHELMUS MARIA ; RENKEMA DUURT ; SANDBERG CHESTER LEDLIE ; VINEGAR HAROLD J ; SON JAIME SANTOS ; XIE XUEYING ; STANECKI JOHN ANDREW ; UWECHUE UZO PHILLIP ; SHEN CHONGHUI ; SHELL OIL CO ; VENDITTO JAMES JOSEPH

Assignee(s): SHELL INT RESEARCH MIJ BV ; SHELL OIL COMPANY ; SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ B V

Inventor(s): (std): COSTELLO MICHAEL SCOTT ; DEN BOESTERT JOHANNES LEENDERT WILLEM CORNELIS ; RAGHU DAMODARAN ; BURNS DAVID BOOTH ; KIM DONG SUB ; MO WEIJAN ; VINEGAR HAROLD J ; FONSECA OCAMPOS ERNESTO RAPHAEL ; GUIMERANS ROSALVINA RAMONA ; EDBURY DAVID ALSTON ; MILLER DAVID SCOTT ; SON JAIME SANTOS ; PATNI SANDEEP ; BASS RONALD J ; KARANIKAS JOHN MICHAEL ; CRUZ ANTONIO MARIA GUIMARAES LEITE ; XIE XUEYING ; LI BUSHENG ; MACDONALD DUNCAN CHARLES ; RYAN ROBERT CHARLES ; STANECKI JOHN ANDREW ; BEER GARY LEE ; SHEN CHONGHUI ; MARWEDE JOCHEN ; MANSURE ARTHUR JAMES ; SANDBERG CHESTER LEDLIE ; RENKEMA DUURT ; CARDINAL PAUL GREGORY ; ROES AUGUSTINUS WILHELMUS MARIA ; PRINCE WRIGHT ROBERT GEORGE ; VENDITTO JAMES JOSEPH ; HARRIS CHRISTOPHER KELVIN ; HARVEY ALBERT DESTREHAN III ; FOWLER THOMAS DAVID ; MASON STANLEY LEROY ; CARROLL MARK THOMAS ; LINEY DAVID JOHN ; UWECHUE UZO PHILLIP ; NAIR VIJAY ; BRAVO JOSE LUIS ; MCKINZIE BILLY JOHN II ; HWANG HORNG JYE JAY ; ARORA DHRUV ; MUYLLE MICHEL SERGE MARIE ; AYODELE OLUROPO RUFUS ; NGUYEN SCOTT VINH ; CAO RENFANG RICHARD

Agent(s): CHRISTENSEN DEL S ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

14) Family number: 55110597 (US2015087031A)

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Title: METHODS FOR TREATING LIGNOCELLULOSIC MATERIALS

Abstract: The present invention relates to methods of processing lignocellulosic material to obtain hemicellulose sugars, cellulose sugars, lignin, cellulose and other high-value products. Also provided are hemicellulose sugars, cellulose sugars, lignin, cellulose, and other high-value products.

Classifications:

International (IPC 8-9): A61L15/16 B01D11/00 B01D15/18 B01D15/36 B01J39/26 C01B3/02 C07C1/20 C07C15/08 C07C51/48 C07G1/00 C07H C07H1/08 C07H3/02 C07H3/06 C08B1/00 C08B37/00 C08B37/14 C08H7/00 C08H8/00 C08J3/20 C08K3/00 C08K5/00 C08L1/02 C08L31/00 C08L33/20 C08L5/14 C08L63/00 C08L67/00 C08L77/00 C08L77/02 C08L95/00 C08L97/00 C08L97/02 C10G3/00 C10L1/02 C12P1/00 C12P13/00 C12P19/02 C12P19/14 C12P21/00 C12P7/02 C12P7/10 C12P7/40 C13B20/00 C13K1/00 C13K1/02 C13K1/04 C13K11/00 C13K13/00 D01F6/54 D01F9/00 D01F9/12 D01F9/17 D01H1/00 D21C1/00 D21C11/00 D21C9/00 D21H17/23 (Advanced/Invention); C07H3/02 C07H3/06 C08L95/00 (Advanced/Non-invention); C07H1/08 (Core/Invention)

International (IPC 1-7): C08H7/00

CPC: C07H1/08 C07G1/00 C13K1/04 C12P19/14 C12P19/02 C12P2203/00 C12P2201/00 C13K1/00 C13K13/00 C13K11/00 C13K13/002 B01D15/1821 B01D2215/023 B01D2215/024 C10L1/02 C10L1/023 D21C11/0007 C08L5/14 C08B1/003 B01D15/1828 C13K1/02 C13K13/007 B01D15/362 B01J39/26 D21C11/0042 D21C11/005 C08H6/00 C08H8/00 C08L97/005 C08L77/02 C08L31/00 C08B37/0003 C08B37/0057 C08L1/02 C08L33/20 C08L63/00 C08L67/00 C08L77/00 C08L95/00 C08L97/02 C10G3/00 C10G2400/30 C10L1/026 D01F6/54 D01F9/00 D01F9/17 D21H17/23 Y02E50/13 Y02P30/20 Y02T50/678

US: 106/287.26 127/30 127/36 127/37 127/46.1 127/53 127/55

252/601 252/62 423/648.1 435/128 435/134 435/136 435/140
 435/142 435/145 435/146 435/148 435/155 435/158 435/160
 435/162 435/165 435/99 44/605 442/181 442/327 502/401 514/777
 516/9 524/556 524/72 526/317.1 526/348 526/351 526/352 528/361
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PatBase - US2015087031_AA

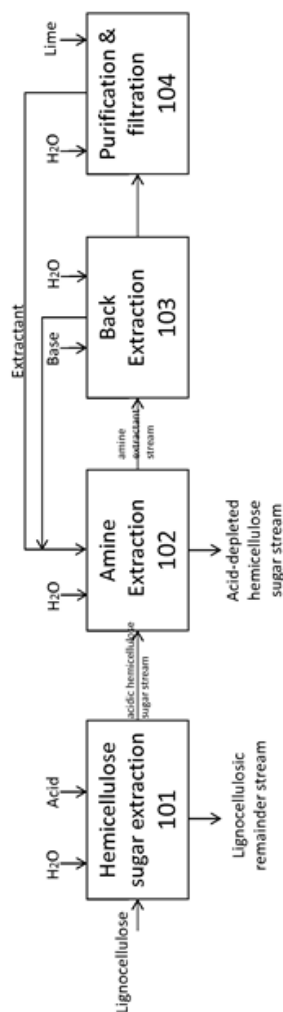


Fig. 1

Family:

Publication number	Publication date	Application number	Application date
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Priority:

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JP20180136785	20180720				

Probable Assignee: VIRDIA INC

Assignee(s): (std): BAUER TIMOTHY ALLEN ; BELMAN ZIV VLADIMIR ; BURKE LUKE ; CARDEN ADAM ; EYAL AHARON M ; GERSHINSKY YELENA ; JANSEN ROBERT ; GREGOIRE CLAIRE ; HALLAC BASSEM ; HAR TAL Yael ; ELIAHU SHAY ; MADSEN LEE ; VIRDIA INC ; LAWSON JAMES ALAN ; MCWILLIAMS PAUL ; TRAVISANO PHILIP ; LAPIDOT NOA ; SADE HAGIT ; MATIS NETA ; VIRDIA LTD ; VIRDIA INK ; LAWSON SUSAN ; ZVIELY MICHAEL ; VIRDIA LTD AND VIRDIA INC

Assignee(s): LAWSON JAMES ALLEN ; PERRY ROTEM ; VIRIDA INC ; VIRDIA LTD6 GALGALE HAPLADAP.O. BOX 1242446733HERZELIAIL ; VIRDIA INC600 - 303 TWIN DOLPHIN DRIVE,REDWOOD CITYCA94065US ; HCL CLEANTECH INC

Inventor(s): (std): HAGIT SADE ; CLAIRE GREGOIRE ; NETA MATIS ; NOA LAPIDOT ; JAMES ALAN LAWSON ; ADAM CARDEN ; BASSEM HALLAC ; AHARON M EYAL ; YELENA GERSHINSKY ; ROBERT JANSEN ; LEE MADSEN ; Yael HAR TAL ; LUKE BURKE ; TIMOTHY ALLEN BAUER ; ZIV VLADIMIR BELMAN ; PAUL MCWILLIAMS ; SHAY ELIAHU ; GERSHINSKY YELENA ; MICHAEL ZVIELY ; HAR TAL Yael MIRIAM ; CARDEN ADA ; TRAVISANO PHILLIP ; ELIAKHU SHEJ ; ZVILI MAJKL ; BAUER TIMOTI ALLEN ; GREGUAR KLER ; MAKUILLYAMS POL ; BERK LYUK ; GERSHINSKI ELENA ; TRAVIZANO FILIP ; MEDSEN LI ; KHAR TAL Yael ; PHILIP TRAVISANO ; LAWSON JAMES ALLEN ; ZVIELY MICHAEL ; PERRY ROTEM ; BAUER TIMOTHY ALLEN ; ELIAHU SHAY ; MATIS NETA ; SADE HAGIT ; LAPIDOT NOA ; HAR TAL Yael ; BURKE LUKE ; TRAVISANO PHILIP ; HALLAC BASSEM ; MCWILLIAMS PAUL ; GREGOIRE CLAIRE ; JANSEN ROBERT ; GERSHINSKY YELENA ; LAWSON JAMES ALAN ; CARDEN ADAM ; EYAL AHARON M ; MADSEN LEE ; BELMAN ZIV VLADIMIR ; KARDEN ADAM ; KHALLAK BASSEM ; SADE KHAGIT ; EYAL AKHARON M ; DZHENSEN ROBERT ; LOUSON DZHEJMS ALAN ; EYAL AHARON

Inventor(s): HARTAL Yael ; BELMAN ZIVVLADIMIR ; JANSEN ; ROBERT ; GREGOIRE ; CLAIRE ; TRAVISANO ; PHILIP ; MADSEN ; LEE ; MATIS ; NETA ; HAR TAL ; Yael ; ELIAHU ; SHAY ; LAWSON ; JAMES ; ALAN ; LAPIDOT ; NOA ; BURKE ; LUKE ; EYAL ; AHARON ; M ; BAUER ; TIMOTHY ; ALLEN ; SADE ; HAGIT ; MCWILLIAMS ; PAUL ; BELMAN ; ZIV VLADIMIR ; HALLAC ; BASSEM ; GERSHINSKY ; YELENA ; CARDEN ; ADAM ; PERRY ; ROTEM ; ROTEM PERRY ; JAMES ALLEN LAWSON ; MATIS NETAIL ; MCWILLIAMS PAULUS ; ELIAHU SHAYIL ; LAWSON JAMES ALANUS ; CARDEN ADAMUS ; TRAVISANO PHILIPUS ; SADE HAGITIL ; BAUER TIMOTHY ALLENUS ; EYAL AHARON MIL ; GERSHINSKY YELENAIL ; MADSEN LEEUS ; JANSEN ROBERTUS ; HAR TAL YaelIL ; GREGOIRE CLAIREFR ; LAPIDOT NOAIL ; ZVIELY MICHAELIL ; BURKE LUKEUS ; HALLAC BASSEMIL ; BELMAN ZIV VLADIMIRIL

Agent(s): PIZZEYS PATENT AND TRADE MARK ATTORNEYS ; PIZZEYS PATENT AND TRADE MARK ATTORNEYS PTY LTD ; GOWLING LAFLEUR HENDERSON LLP ; GOWLING WLG CANADA LLP ; ROQUES SARAH ELIZABETH ; J A KEMP ; SRINIVASAN RAVI CHANDRAN ; NABILA AM BADAR SH LLM ; OOO YURIDICHESKAYA GORODISSKIJ I PARTNER Y FA ; WILSON SONSINI GOODRICH AND ROSATI ; CHEN SHENG FENG ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG

15) Family number: 12540644 (US5516952A)

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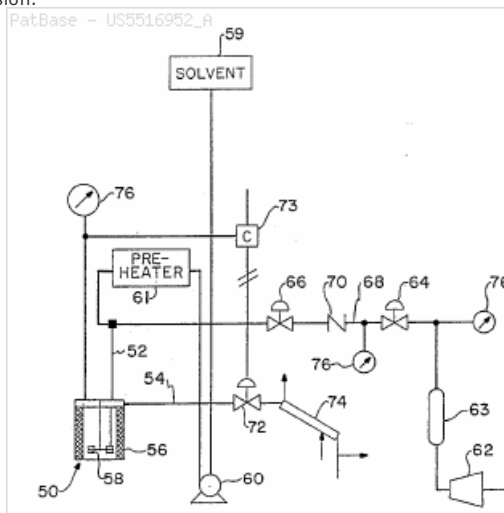
Title: OXIDATIVE DECOUPLING OF SCRAP RUBBER

Abstract: A process for breaking down rubber polymer materials by selective oxidative decoupling of carbon-carbon, carbon-sulfur and sulfur-sulfur bonds at supercritical or near supercritical conditions for water and wherein supercritical water or water near supercritical conditions is used as a solvent and reforming agent, is used to produce relatively high yields of lower molecular weight hydrocarbons and oxygenated hydrocarbons which are suitable for use as a fuel or which can be separated or further refined to produce various commodity chemicals, specialty chemicals or both. The invention provides an environmentally friendly process for recycling rubber waste materials such as waste tires to generate valuable fuels or chemical feedstocks in a closed oxidation process which is free of hazardous stack emissions. The rubber polymer materials which can be recycled in accordance with the process can include typical amounts of conventional compounding ingredients and other impurities without significantly affecting the overall conversion.

Classifications:**International (IPC 8-9):** C07C1/00 C07C1/32 C07C319/00

C10G1/10 (Advanced/Invention);

C07C1/00 C07C319/00 C10G1/00 (Core/Invention)

International (IPC 1-7): C07C1/00**CPC:** C10G1/10 C07C1/00 C07C1/322 Y02P20/544**European:** C07C1/00 C07C1/32B2 C07C319/00 C10G1/10**US:** 585/241 585/832**Family:**

Publication number	Publication date	Application number	Application date
US5516952 A	19960514	US19940354526	19941213

Priority:

US19930105881 19930811 US19940354526 19941213

Probable Assignee: OF AKRON UNIV**Assignee(s):** (std): UNIV AKRON**Assignee(s):** OF AKRON UNIV ; THE UNIVERSITY OF AKRON**Inventor(s):** (std): AZZAM FOUAD O ; KOCHER BRIAN S ; LEE SUNGGYU**16) Family number: 40970741** (US2007289898A)

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Title: SUPERCRITICAL WATER PROCESSING OF EXTRA HEAVY CRUDE IN A SLURRY-PHASE UP-FLOW REACTOR SYSTEM

Abstract: A system and method for upgrading heavy crude oil. The system comprises: a system for blending a catalyst with the heavy crude to produce a crude/catalyst slurry, a source of supercritical water, a system for blending the supercritical water with the crude/catalyst slurry, injecting the feed slurry into the bottom of an up-flow reactor, carrying out a reaction between the water and the crude to produce treated hydrocarbons, and separating the treated hydrocarbons into a heavy stream and a light stream. The first separator is in fluid communication with the tipper half of the reactor. A second separator receives the light stream and separates it into gases, liquid hydrocarbons, and water. A system and method of generating hydrogen for the process through in situ shift reaction, generating carbon monoxide either in situ through the injection of air inside the reactor or externally by gasification of unreacted resid or produced gases.

Classifications:**International (IPC 8-9):** C01B3/02 C10G31/00 C10G47/00

C10G47/02 (Advanced/Invention);

C10G31/00 (Core/Invention)

CPC: C10G11/16 C10G11/20 C10G45/04 C10G45/26 C10G47/02

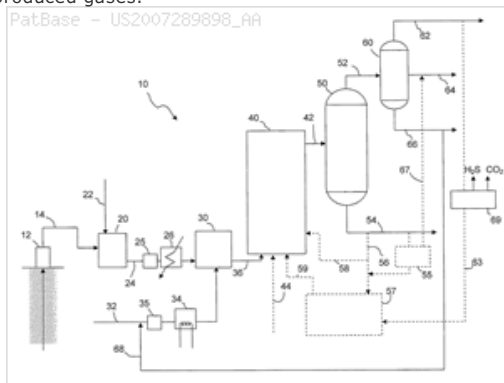
C10G47/26 C10G47/32 C10G2300/1033 C10G2300/107

C10G2300/1077 C10G2300/42

European: C10G11/16 C10G11/20 C10G45/04 C10G45/26

C10G47/02 C10G47/26 C10G47/32 M10G300/10F M10G300/10H

M10G300/10K M10G300/42

US: 208/108 208/108S 208/112 208/177 208/89 252/373 252/373P**Family:**

Publication number	Publication date	Application number	Application date
US2007289898 AA	20071220	US20060424196	20060614
US2010314583 AA	20101216	US20090633232	20091208

Priority:

US20060424196 20060614 US20090633232 20091208

Probable Assignee: PHILLIPS 66 CO

Assignee(s): (std): CONOCOPHILLIPS CO

Assignee(s): CONOCOPHILLIPS COMPANY ; PHILLIPS 66 CO

Inventor(s): (std): BANERJEE DWIJEN K

Agent(s): CONOCOPHILLIPS CO DAVID A ROSE; CONOCOPHILLIPS COMPANY - IP SERVICES GROUP,ATTENTION: DOCKETING; CONOCOPHILLIPS CO IP SERVICES GROUP ATTENTION DOCKETING

17) Family number: 56294768 (US2014109465A)

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Title: HIGH RATE REACTOR SYSTEM

Abstract: A process and system for upgrading an organic feedstock including providing an organic feedstock and water mixture, feeding the mixture into a high-rate, hydrothermal reactor, wherein the mixture is rapidly heated, subjected to heat, pressure, and turbulent flow, maintaining the heat and pressure of the mixture for a residence time of less than three minutes to cause the organic components of the mixture to undergo conversion reactions resulting in increased yields of distillate fuels, higher-quality kerosene and diesel fuels, and the formation of high octane naphtha compounds. Hydrocarbon products are cooled at a rate sufficient to inhibit additional reaction and recover of process heat, and depressurizing the hydrocarbon products, and separating the hydrocarbon products for further processing. The process and system can include devices to convert olefinic hydrocarbons into paraffinic hydrocarbons and convert olefinic byproduct gas to additional high-octane naphtha and/or heavier hydrocarbons by one of hydrogenation, alkylation, or oligomerization.

Classifications:

International (IPC 8-9): B01J B01J19/24 C10G C10G1/00 C10G3/00 C10G31/06 C10G31/08 C10G45/00 C10G47/00 C10G50/00 C10G57/02 C10G69/06 C10G9/36 (Advanced/Invention)

CPC: B01J19/2405 B01J3/008 B01J19/2415 B01J2219/00103 B01J2219/00123 B01J2219/00132 B01J2219/00157 B01J2219/00159 C10G29/205 C10G45/26 C10G45/60 C10G45/68 C10G47/32 C10G2300/205 C10G2300/206 C10G2300/305 C10G2300/42 C10G2400/02 C10G45/04 Y02P30/20

US: 208/113 208/130 422/187 44/307

PatBase - US2014109465_AH

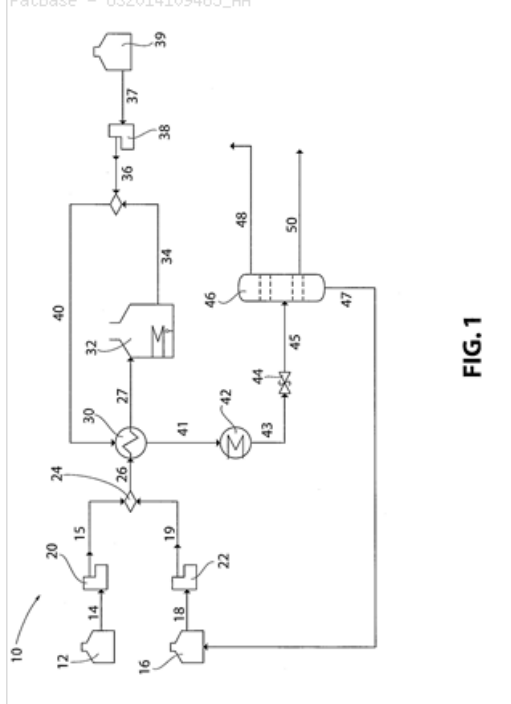


FIG. 1

Family:

Publication number	Publication date	Application number	Application date
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ID201603875 A	20160610	ID2015P0002998	20131022
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JP2016500731 T2	20160114	JP20150538136T	20131022
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WO14066396 A1	20140501	WO2013US66191	20131022
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Priority:

US20120716636P 20121022 US20130824167P 20130516 JP20150538136T 20131022
US20130060225 20131022 WO2013US66191 20131022 US20130716636P 20131022

Probable Assignee: APPLIED RESEARCH ASSOCIATES INC

Assignee(s): (std): APPLIED RES ASS INC ; APPLIED RES ASSOCIATES INC

Assignee(s): APPLIED RESEARCH ASS INC ; APPLIED RESEARCH ASSOCIATES INC ; RED CHARLES JR ; COPPOLA EDWARD N ; NANA SANJAY

Inventor(s): (std): EDWARD N COPPOLA ; SANJAY NANA ; CHARLES RED JR ; RED CHARLES ; RED JR CHARLES ; NANA SANJAY ; COPPOLA EDWARD N ; RED CHARLES JR

Inventor(s): COPPOLA EDWARD

Agent(s): GOWLING LAFLEUR HENDERSON LLP; GOWLING WLG CANADA LLP; HYLARIDES PAUL JACQUES; NADIA AM BADAR SH; MEDER JULIE M ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

18) Family number: 43868844 (WO09129143A1)

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Title: SYSTEMS, METHODS, AND PROCESSES UTILIZED FOR TREATING HYDROCARBON CONTAINING SUBSURFACE FORMATIONS

Abstract: Systems, methods, processes, and/or heaters for treating a subsurface formation are described herein. Some embodiments also generally relate to heaters that have novel components therein. Such heaters may be obtained by using the systems and methods described. Some embodiments also generally relate to systems, methods, and/or processes for treating fluid produced from the subsurface formation.

Classifications:

International (IPC 8-9): C10G1/00 E21B43/00 (Advanced/Invention); C10G1/00 E21B43/00 (Core/Invention)

CPC: E21B7/068 E21B3/00 E21B4/04 E21B47/06 C10G21/22 C10G21/28 C10G2300/207 C10G2300/301 C10G2300/302 C10G2300/308 C10G2300/4006 C10G2300/4012 C10G2300/42 C10G2300/807 C10G2400/02 E21B7/18 E21B10/003 E21B19/08 E21B21/00 E21B21/08 E21B36/001 E21B36/02 E21B36/04 E21B43/119 E21B43/2401 E21B43/2403 E21B43/243 E21B43/281 E21B43/30 E21B43/305 E21B47/022

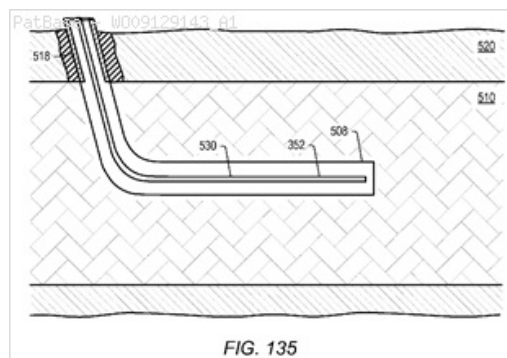


FIG. 135

Family:

Publication number	Publication date	Application number	Application date
WO09129143 A1	20091022	WO2009US40217	20090410
WO09146158 A1	20091203	WO2009US40139	20090410

Priority:

US20080046329P 20080418 US20080104974P 20081013

Probable Assignee: SHELL OIL CO

Assignee(s): (std): ARORA DHRUV ; AYODELE OLUROPO RUFUS ; BASS RONALD J ; BROS ROBERT ; BROUWER ROALD ; EDBURG DAVID ALSTON ; DE ST REMEY ED ; CAO RENFANG RICHARD ; DEN BOESTERT JOHANNES LEENDERT WILLEM CORNELIS ; DINDORUK DENIZ ; CRUZ ANTONIO MARIA GUIMARAES LEITE ; COLOMENARES TULIO ; DE ROUFFINGNAC ERIC PIERRE ; FONSECA OCAMPOS ERNESTO RAPHAEL ; BURNS DAVID BOOTH ; JAISWAL NAMIT ; GINESTRA JEAN CHARLES ; MASON STANLEY LEROY ; MCNEIL BOB ; MARWEDE JOCHEN ; KIM DONG SUB ; FOWLER THOMAS DAVID ; MACDONALD DUNCAN CHARLES ; KARANIKAS JOHN MICHAEL ; HARLEY GUY ; MCKINZIE BILLY JOHN II ; LI ZHEN ; KOENDERS BURGARD ; HARRIS CHRISTOPHER KELVIN ; HWANG HORNG JYE JAY ; HARVEY ALBERT DESTREHAN III ; LO KING HIM ; KILGORE JAMES ; MCDONALD DUNCAN CHARLES ; HWANG HORNG JYE ; SHELL OIL CO ; ZHENG JANE Q ; RYAN ROBERT CHARLES ; SANDBERG CHESTER LEDLIE ; ROES AUGUSTINUS WILHELMUS MARIA ; NGUYEN SCOTT VINH ; VINEGAR HAROLD J ; XIE XUEYING ; SON JAIME SANTOS ; NAIR VIJAY ; PRINCE WRIGHT ROBERT GEORGE ; MUYLLE MICHEL SERGE MARIE ; MO WEIJAN ; STANECKI JOHN ANDREW ; RAGHU DAMODARAN ; SYIHAB ZUHER ; POLLARD RICHARD ; VENDITTO JAMES JOSEPH ; PINO HENRY ; PATNI SANDEEP ; RENKEMA DUURT ; SHELL INT RESEARCH

Assignee(s): SHELL INT RESEARCH MIJ BV ; SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ B V ; SHELL OIL COMPANY

Inventor(s): (std): RENKEMA DUURT ; MCDONALD DUNCAN CHARLES ; HWANG HORNG JYE ; BURNS DAVID BOOTH ; PATNI SANDEEP ; KILGORE JAMES ; PINO HENRY ; LO KING HIM ; VENDITTO JAMES JOSEPH ; FONSECA OCAMPOS ERNESTO RAPHAEL ; POLLARD RICHARD ; SYIHAB ZUHER ; HARVEY ALBERT DESTREHAN III ; RAGHU DAMODARAN ; DE ROUFFINGNAC ERIC PIERRE ; COLOMENARES TULIO ; CRUZ ANTONIO MARIA GUIMARAES LEITE ; DINDORUK DENIZ ; DEN BOESTERT JOHANNES LEENDERT WILLEM CORNELIS ; STANECKI JOHN ANDREW ; MO WEIJAN ; HWANG HORNG JYE JAY ; HARRIS CHRISTOPHER KELVIN ; KOENDERS BURGARD ; BASS RONALD J ; MUYLLE MICHEL SERGE MARIE ; PRINCE WRIGHT ROBERT GEORGE ; LI ZHEN ; CAO RENFANG RICHARD ; NAIR VIJAY ; SON JAIME SANTOS ; MCKINZIE BILLY JOHN II ; HARLEY GUY ; KARANIKAS JOHN MICHAEL ; DE ST REMEY ED ; MACDONALD DUNCAN CHARLES ; EDBURG DAVID ALSTON ; XIE XUEYING ; VINEGAR HAROLD J ; NGUYEN SCOTT VINH ; FOWLER THOMAS DAVID ; ROES AUGUSTINUS WILHELMUS MARIA ; KIM DONG SUB ; AYODELE OLUROPO RUFUS ; MARWEDE JOCHEN ; ARORA DHRUV ; SANDBERG CHESTER LEDLIE ; MCNEIL BOB ; RYAN ROBERT CHARLES ; MASON STANLEY LEROY ; BROS ROBERT ; BROUWER ROALD ; ZHENG JANE Q ; GINESTRA JEAN CHARLES ; JAISWAL NAMIT

Agent(s): CHRISTENSEN DEL S ET AL ; CHRISTENSEN DEL S

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

19) Family number: 53194858 (US2014309416A)

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Title: EFFICIENT USE OF IONIC LIQUIDS

Abstract: In one aspect, provided herein are efficient methods for using ionic liquids. In some embodiments, only a small amount of ionic liquid is lost in a chemical process. For example, described herein is a method for separating one or more biomass components from an ionic liquid comprising contacting a composition comprising an ionic liquid and a biomass component with a fluid.

Classifications:

International (IPC 8-9): B01D11/04 B01D15/40 B01D61/42
B09B5/00 C08B1/00 C08B1/08 C08B3/02 C08H8/00 C10L1/182
C12P7/10 C13K1/04 C13K13/00 (Advanced/Invention)
CPC: C11B1/104 C13K1/04 C08H8/00 C07H1/08 C12P2203/00
C08B1/003 C13K13/007 C12P7/10 B09B5/00 C12P2201/00
Y02E50/16 Y02E50/343 B01D11/0411 B01D61/422
US: 127/30 127/36 127/37 127/46.1 252/182.12 435/165 530/500
536/127

PatBase - US2014309416_AA

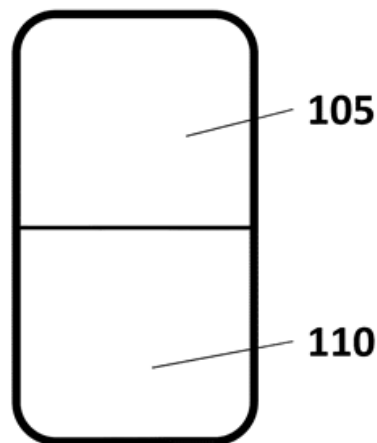


FIG. 1

Family:

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WO13036863 A3	20130711	WO2012US54302	20120907
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Priority:

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WO2014US20375 20140304	US20140772319 20140304	US20140343832 20140702
US20150772319 20150902	US20170460001 20170315	

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PARTG MBB; MACDOUGALL CHRISTINA A ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR
CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID
IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN
MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG
SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

20) Family number: 3874950 (US5170727A)

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Title: SUPERCRITICAL FLUIDS AS DILUENTS IN COMBUSTION OF LIQUID FUELS AND WASTE MATERIALS

Abstract: The present invention is directed to processes and apparatus in which supercritical fluids are used as viscosity reduction diluents for liquid fuels or waste materials which are then spray atomized into a combustion chamber. The addition of supercritical fluid to the liquid fuel and/or waste material allows viscous petroleum fractions and other liquids such as viscous waste materials that are too viscous to be atomized (or to be atomized well) to now be atomized by this invention by achieving viscosity reduction and allowing the fuel to produce a combustible spray and improved combustion efficiency. Moreover, the present invention also allows liquid fuels that have suitable viscosities to be better utilized as a fuel by achieving further viscosity reduction that improves atomization still further by reducing droplet size which enhances evaporation of the fuel from the droplets.

Classifications:

International (IPC 8-9): B05B7/32 B05D1/02 C10L1/00 F23C99/00 F23D11/10 F23G7/04 F23G7/05 F23K5/10 (Advanced/Invention); B05B7/24 B05D1/02 C10L1/00 F23C99/00 F23D11/10 F23G7/04 F23G7/05 F23K5/02 (Core/Invention)
International (IPC 1-7): C10L1/00 F23C11/00 F23D11/10 F23G7/04 F23G7/05 F23K5/10
CPC: B05D1/025 B05D2401/90 C10L1/00 B05B7/32
European: B05B7/32 B05D1/02C C10L1/00 L05D401/90
US: 110/238 110/346 110/347 239/5 431/2

PatBase - US5170727_R

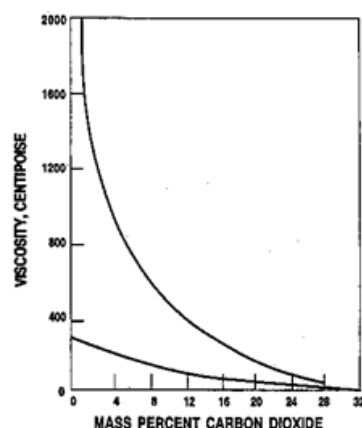
U.S. Patent

Dec. 15, 1992

Sheet 1 of 9

5,170,727

Fig. 1



Family:

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DK0506069 T3	19951227	DK19920105287T	19920327
EP0506069 A1	19920930	EP19920105287	19920327
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JP5302701 A2	19931116	JP19920100222	19920327
US5170727 A	19921215	US19910677104	19910329

Priority:

US19910677104 19910329

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Designated states: AT BE CH DE DK ES FR GB GR IT LI LU MC NL PT SE

21) Family number: 43623998 (US2009200025A)

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Title: HIGH TEMPERATURE METHODS FOR FORMING OXIDIZER FUEL

Abstract: A method of treating a formation fluid includes providing formation fluid from a subsurface in situ heat treatment process. The formation fluid is separated to produce a liquid stream and a first gas stream. The first gas stream includes carbon dioxide, hydrogen sulfide, hydrocarbons, hydrogen or mixtures thereof. Molecular oxygen is separated from air to form a molecular oxygen stream comprising molecular oxygen. The first gas stream is combined with the molecular oxygen stream to form a combined stream comprising molecular oxygen and the first gas stream. The combined stream is provided to one or more downhole burners.

Classifications:

International (IPC 8-9): E21B36/02 E21B43/24 E21B43/34

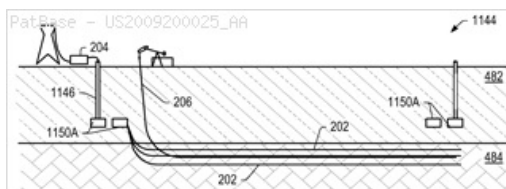
E21B43/40 (Advanced/Invention);

E21B36/00 E21B43/16 E21B43/34 (Core/Invention)

CPC: Y10T29/49083 H01F29/04 E21B43/24 H01F27/38 H01J37/32926 H01J37/32935 E21B36/04 E21B43/30

European: E21B43/24 H01F29/04 H01J37/32S2 H01J37/32S4 T01F27/38

US: 166/265 166/267 166/302 166/59 166/59S 166/75.12



Family:

Publication number	Publication date	Application number	Application date
US2009200025 AA	20090813	US20080250360	20081013
US7866388 BB	20110111	US20080250360	20081013

Priority:

US20070999839P 20071019 US20080046329P 20080418 US20080250360 20081013

Probable Assignee:

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Inventor(s): (std):

BRAVO JOSE LUIS

Agent(s):

SHELL OIL COMPANY; SHELL OIL CO