

1) Family number: 8373004 (US4973791A)

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Title: PROCESS OF OXIDIZING ALIPHATIC HYDROCARBONS EMPLOYING AN ALKALI-PROMOTED MOLYBDATE CATALYST

Abstract: A process for the production of unsaturated aliphatic hydrocarbons, such as diolefins, comprising contacting an aliphatic hydrocarbon, such as an alkane or a monoolefin, with a solid heterogeneous catalyst containing labile oxygen under reaction conditions such that a more highly unsaturated aliphatic hydrocarbon is selectively formed in a high space-time yield. The catalyst comprises an oxide of magnesium, an oxide of molybdenum, an alkali metal promoter, and optionally an oxide of vanadium. For example, butane is oxidized in the presence of magnesium molybdate doped with alkali metal oxide to a mixture of products including predominantly butadiene and cis-2-butene and trans-2-butene.

Classifications:

International (IPC 8-9): B01J21/00 B01J21/14 B01J23/02 B01J23/22 B01J23/28 B01J37/00 C03C14/00 C07B61/00 C07C11/00 C07C11/167 C07C5/333 C07C5/42 C07C5/48 (Advanced/Invention); C07B61/00 C07C11/00 (Advanced/Non-invention); B01J23/02 B01J23/16 B01J37/00 C03C14/00 C07B61/00 C07C11/00 C07C5/00 (Core/Invention)

International (IPC 1-7): B01J21/00 B01J21/08 B01J21/10 B01J21/14 B01J23/00 B01J23/02 B01J23/04 B01J23/16 B01J23/22 B01J23/28 B01J29/28 B01J31/04 B01J32/00 B23P21/00 C03C14/00 C07B33/00 C07B61/00 C07C11/00 C07C11/04 C07C11/06 C07C11/08 C07C11/09 C07C11/12 C07C11/16 C07C11/167 C07C15/04 C07C2/00 C07C2/10 C07C2/84 C07C5/09 C07C5/327 C07C5/333 C07C5/42 C07C5/48 C08F4/00

CPC: Y10S502/524 C03C14/004 B01J23/28 B01J37/0018 C03C2214/04 C07C5/42 C07C2521/04 C07C2521/08 C07C2521/10 C07C2523/04 C07C2523/28

European: B01J23/28 B01J37/00B2 C03C14/00D C07C5/42 M03C214/04 M07C521/04 M07C521/08 M07C521/10 M07C523/04 M07C523/28

US: 502/254 502/255 502/306 502/524 585/624 585/630 585/631 585/658 585/663

PatBase - RU2032648_C1

Таблица 1				
Показатель	Промо/катализатор*			
	2a/E1	4a/E3	2b/E1	4b/E3
Сред. нел. %	1,3	1,4	1,2	1,4
T, °C	570	568	540	583
Объемный расход газа за 1 ч	1084	1044	990	993
Конверсия, %	19,50	20,26	27,46	41,79
Избирательность, %:				
1-бутен	10,90	6,70	7,80	6,50
т-2-бутен	8,85	5,11	5,86	3,99
цис-2-бутен	9,20	5,06	7,23	3,94
бутдиен	67,80	66,71	68,48	64,56
Сумма С ₄	97,80	82,68	89,25	78,41
пропан	0,08	0,88	1,27	0,75
ацетилен	3,40	2,89	3,67	4,61
Полезные продукты крекинга	3,48	3,87	4,94	4,76
CO	4,10	9,18	4,88	10,91
CO ₂	0,60	2,16	0,85	3,49
Продукты глубокого окисления	4,10	11,34	5,71	14,39
Бутилбензол	0,09	1,20	0,00	1,36
Некактанов	0,00	0,00	0,00	0,49
Общая к-та жидких веществ	0,00	1,25	0,00	3,43
Полная С-баланс	100,0	100,0	101,1	98,8
С ₄ /у, кг/м ³ ·ч	9,108	0,143	0,128	0,169
Время, %	18,19	27,82	24,55	22,77

* Катализатор: 10 см³.

Таблица 2			
Показатель	Катализатор*		
	E-50	E-50	E-50
Расход, г	49,8	47,00	48,40
Мр. нел. %	20	49	44
МоО ₂ нел. %	21,20	20,23	20,07

Family:

Publication number	Publication date	Application number	Application date
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AU199331456 A1	19930628	AU19930031456	19921124
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CN1026099 C	19941005	CN19901004757	19900719
CN1048843 A	19910130	CN19901004757	19900719
CN1052172 C	20000510	CN19931021074	19931224
CN1074894 A	19930804	CN19921011841	19921126
CN1093948 A	19941026	CN19931021074	19931224
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EP0409355 A1	19910123	EP19900201980	19900719
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JP3074335 A2	19910328	JP19900192849	19900720
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US5302773 A	19940412	US19910797882	19911126
WO9311092 A1	19930610	WO1992US10080	19921124

Priority:

US19890383107 19890720 US19900505751 19900406 CA19902021573 19900719
US19910797882 19911126 US19920890972 19920529 WO1992US10080 19921124

Probable Assignee: DOW CHEMICAL CO
Assignee(s): (std): DOW CHEMICAL CO ; DOW CHEMICAL LTD
Assignee(s): DZE DAU KEMIKAL KOMPANI ; DOW CHEMICAL CO A OF DE CORP ; DOW CHEMICAL COMPANY THE ; KHAZAI BIJAN ; DOW CHEMICAL CO THE ; VAC ACQUISITION CORP ; VOUGHT AIRCRAFT CO ; THE DOW CHEMICAL COMPANY ; THE DOW CHEMICAL CO ; THE DOW CHEMICAL CO MIDLAND MICH US ; MURCHISON CRAIG B ; VRIELAND G EDWIN ; CITICORP NORTH AMERICA INC ; CITICORP NORTH AMERICA INC A DE CORP ; DOW CHEM CO ; DOW CHEM CO THE
Inventor(s): (std): MURCHISON CRAIG B ; DIXIT RAVI S ; WEIHL EDWIN D ; MURCHISON GRAIG B ; VRIELAND G EDWIN ; DOKTYCZ STEPHEN J ; KHAZAI BIJAN ; G EDVIN VRAJLAND ; KRAJG B MARCHISON ; MURCHISON B ; BIDZHAN KAZAJ ; BIJIYAN KUHAZAI ; JII EDOUIN BURIIRANDO ; KUREIGU BII MAACHISON ; VRIELAND EDWIN G ; AL BIJAN KHAZAI ET ; EDWINVRIELAND G
Inventor(s): B MURCHISON ; G EDWINVRIELAND ; STEPHEN J DOKTYCZ ; BIJAN KHAZAI ET AL ; GRAIG B MURCHISON ; KHAZAI BIJAN MIDLAND MICHIGAN 48640 US ; GEDVIN VRAJLAND ; KRAJG BMARCHISON ; VRIELAND G ; BIJAN KHAZAI ; G EDWIN VRIELAND ; CRAIG B MURCHISON
Agent(s): PHILLIPS ORMONDE FITZPATRICK; SMART AND BIGGAR
Designated states: AT AU BE BR CA CH DE DK ES FR GB GR IE IT JP KR LI LU MC NL PT RU SE UA

2) Family number: 11300014 (US5248408A)

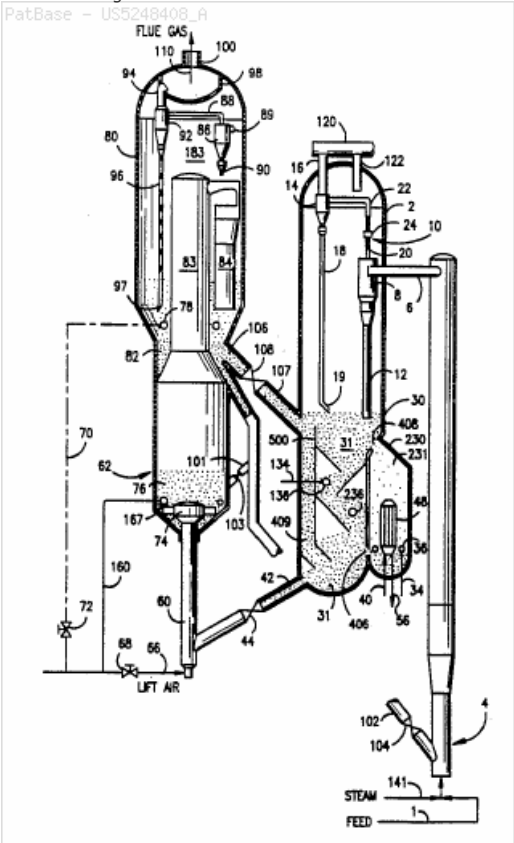
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Title: Catalytic cracking process and apparatus with refluxed spent catalyst stripper

Abstract: A fluidized catalytic cracking process and apparatus operates with a single or multi- stage refluxed catalyst stripper. Recycle, or reflux, of stripped catalyst to the stripping zone improves stripping. Preferably, a two stage hot stripper is used. Addition of regenerated catalyst to spent catalyst from the reactor heats spent catalyst in a first stripping stage, which preferably uses stripping steam. Catalyst from the first stripping stage passes up through a second stage stripping zone with a heat removal means, e.g., a stab-in tube bundle. Steam or flue gas fluidizes catalyst, improves heat transfer and strips the catalyst. Some catalyst from the second stage stripper is preferably recycled to the inlet to the first stripping stage. Additional hot regenerated catalyst may be added downstream of the first catalyst stage to heat the second stripping stage, added to catalyst removed from the primary stripping zone which is sent to the regeneration zone.

Classifications:

International (IPC 8-9): B01J8/00 B01J8/34
C10G11/18 (Advanced/Invention);
B01J8/00 B01J8/24 C10G11/00 (Core/Invention)
International (IPC 1-7): B01J8/18 C10G11/02 C10G11/04 F27B15/00
CPC: B01J8/0055 B01J8/34 C10G11/18 C10G11/182
European: B01J8/00J2 B01J8/34 C10G11/18 C10G11/18A
US: 208/113 208/120 208/120.01 422/143 422/144 422/145 422/146 422/147 502/41 502/44



Family:

Publication number	Publication date	Application number	Application date
US5248408 A	19930928	US19910674241	19910325

Priority:

US19910674241 19910325

Probable Assignee: MOBIL OIL CORP
Assignee(s): (std): MOBIL OIL CORP
Inventor(s): (std): OWEN HARTLEY

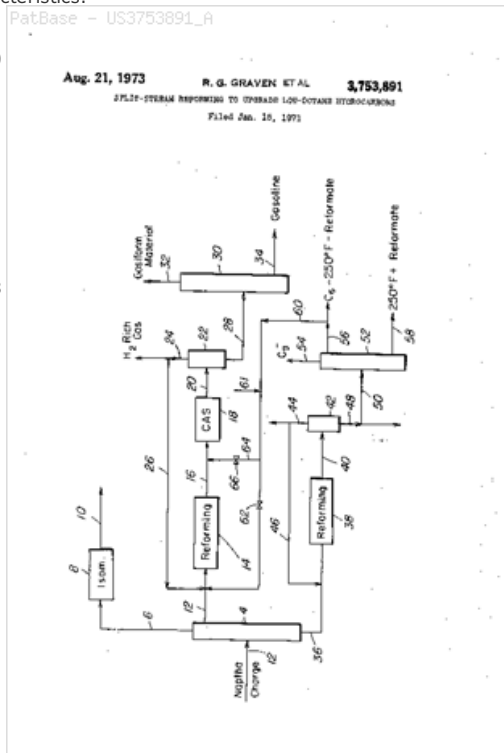
3) Family number: 31445038 (US3753891A)

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Title: SPLIT-STREAM REFORMING TO UPGRADE LOW-OCTANE HYDROCARBONS

Abstract: ABSTRACT OF THE DISCLOSURE

US: 123/0.3 123/3 123/557 148/DIG.117 148/DIG.122 148/DIG.53
208/120.01 208/13.4 208/13.5 208/134 208/135 208/137 208/138
208/139 208/6.2 208/62 208/63 208/65 208/66 208/79 208/80
208/92 208/93 208/DIG.2 257/409 257/E21.252 257/E21.552
438/301 438/551



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US3770614 A	19731106		19710115
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Priority:

US19700027253 19700413 US19700027563 19700413 US19700101231 19701224
US19710106837 19710115 US19710106819 19710115 US19710119047 19710225
US19710125749 19710319 US19710126025 19710319 US19710126218 19710319
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AU19720037909 19720114 AU19720039919 19720313

Probable Assignee: ITT CORP

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Inventor(s): (std): HARLOW J ; SWANN R ; PENTON J ; BAKKER M ; CHEN N ; WEISZ P ; LUCKI S ; GRAVEN RICHARD GEORGE ; HEINEMANN HEINZ ; HARLOW JUSTIN EDWARDS III ; SWANN RICHARD CHARLES GEORGE ; PENTON JACK IRWIN ; BAKKER MARTIN BEN ; CHEN N Y ; GRAVEN R G ; GRAVEN R ; HEINEMANN H ; WEISZ PAUL B ; CHEN NAI YUEN ; LUCKI STANLEY J ; GEORGE GRAVEN RICHARD ; SWANN RICHARD C G ; ELDRIDGE PETER G ; PENTON JACK I ; CHEN N US ; NY CHEN ; RG GRAVEN ; H HEINEMANN ; HEINZ HEINEMANN ; CHEN N Y US ; RICHARD GEORGE GRAVEN ; JUSTIN EDWARDS HARLOW III ; RICHARD CHARLES GEORGE SWANN ; MARTIN BEN BAKKER ; JACK IRWIN PENTON ; YUEN CHEN N

Inventor(s): GRAVEN R US ; HEINEMANN H US ; YUEN CHEN N US ; N Y CHEN ; R G GRAVEN ; RICHARD GEORGE GRAVEN AND HEINZ HEINEMANN ; HEINEMANN HEINZ PRINCETON N J ; GRAVEN RICHARD GEORGE WESTMONT N J ; ELDRIDGE PETER G BISHOPS STORTFORD HERTFORDSHIRE G ; SWANN RICHARD C G HARLOW ESSEX GB ; PENTON JACK I WEST PALM BEACH FLA US ; NAI YUEN CHEN ; SWANN RICHARD CG ; GRAVEN RICHARD GEORGE WESTMONT NJ ; HEINEMANN HEINZ PRINCETON NJ ; HARLOW J US ; SWANN R US ; PENTON J US ; BAKKER M US ; CHEN NAI YUEN HOPEWELL TOWNSHIP ; NJ ; WEISZ P US ; LUCKI S US

4) Family number: 32383060 (US2005241991A)

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Title: EBULLATED BED HYDROPROCESSING METHODS AND SYSTEMS AND METHODS OF UPGRADING AN EXISTING EBULLATED BED SYSTEM

Abstract: An ebullated bed hydroprocessing system, and also a method for upgrading a pre-existing ebullated bed hydroprocessing system, involves introducing a colloidal or molecular catalyst, or a precursor composition capable of forming the colloidal or molecular catalyst, into an ebullated bed reactor. The colloidal or molecular catalyst is formed by intimately mixing a catalyst precursor composition into a heavy oil feedstock and raising the temperature of the feedstock to above the decomposition temperature of the precursor composition to form the colloidal or molecular catalyst in situ. The improved ebullated bed hydroprocessing system includes at least one ebullated bed reactor that employs both a porous supported catalyst and the colloidal or molecular catalyst to catalyze hydroprocessing reactions involving the feedstock and hydrogen. The colloidal or molecular catalyst provides catalyst in what would otherwise constitute catalyst free zones within the ebullated bed hydroprocessing system. Asphaltene or other hydrocarbon molecules too large to diffuse into the pores of the supported catalyst can be upgraded by the colloidal or molecular catalyst. A slurry phase reactor may be positioned upstream from one or more ebullated bed reactors or converted from a pre-existing ebullated bed reactor.

Classifications:

International (IPC 8-9): B01F13/00 B01F15/02 B01F15/04 B01F3/14 B01F5/06 B01J19/00 B01J27/047 B01J27/051 B01J35/00 B01J37/00 B01J37/02 B01J37/04 B01J37/08 B01J37/20 B01J38/00 B01J38/68 B01J8/00 B01J8/08 B01J8/18 B01J8/20 B01J8/22 C10C1/00 C10G11/00 C10G45/00 C10G45/16 C10G45/34 C10G45/46 C10G45/56 C10G47/00 C10G47/02 C10G47/06 C10G47/24 C10G47/26 C10G47/30 C10G49/00 C10G49/04 C10G49/10 C10G49/12 C10G49/16 C10G65/00 C10G65/02 C10G65/10 C10G65/12 C10G67/08 G01S19/06 G01S19/12 G01S19/46 H04W64/00 (Advanced/Invention); B01J38/68 C10G47/02 C10G47/26 C10G65/02 (Advanced/Non-invention); C10G45/00 C10G47/00 (Core/Invention)

International (IPC 1-7): B01F3/14 B01J27/047 B01J27/051 B01J8/18 C10G45/00 C10G47/00 C10G47/02 C10G47/26 C10G65/02 C10G65/10

CPC: C10G67/08 H04W64/00 G01S5/02 G01S19/252 B01J8/226 C10G49/12 C10G2300/1033 C10G2300/107 C10G2300/1077 C10G2300/206 C10G2300/703 C10G2300/802 C10G45/04 C10G45/34 C10G45/46 B01J8/22 C10G2300/202 C10G65/00 B01J27/047 B01J27/051 B01J35/0013 B01J37/02 B01J37/086 B01J38/00 B01J38/68 C10G45/00 C10G47/00 C10G49/04 C10G65/12 B01F3/088 B01F2003/105 B01J8/0015 B01J2208/00752 C10G47/26 C10G65/02 C10G45/16 C10G45/56 C10G2300/4056 C10G2300/70 C10G49/005 B01J8/08 C10G47/06

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US: 208/100 208/108 208/108P 208/108S 208/109 208/110 208/111 208/111.3 208/112 208/112P 208/211 208/213 208/222 208/420 208/421 208/48.00RP 208/48R 208/59 208/89 208/90 208/97 366/141 366/141P 366/190 366/190S 366/336 366/336S 366/342 366/342S 422/129 422/129S 422/140 422/140S 422/187 422/187P 422/190 422/224 422/224S 422/225 422/225S

PatBase - US2005241991_A1

Patent Application Publication Nov. 3, 2005 Sheet 1 of 27 US 2005/0241991 A1

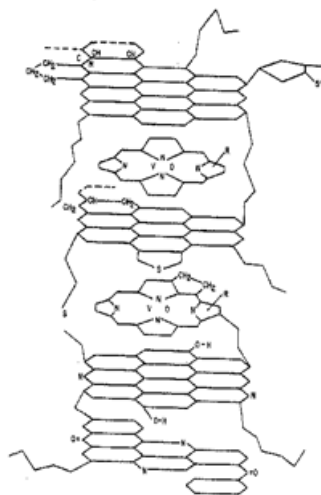


Fig. 1

Family:

Publication number	Publication date	Application number	Application date
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Probable Assignee: HEADWATERS HEAVY OIL LLC

Assignee(s): (std): HEADWATERS TECH INNOVATION LLC ; LEE LAP KEUNG ; HEADWATERS HEAVY OIL LLC ; KHEDUOTERS KHEHVI OJL LLS ; KHEHVI OJL EHLEHLSI ; HYDROCARBON TECH AND INNOVATION LLC ; LOTT ROGER K ; QUALCOMM INC

Assignee(s): LOTT ROGER K10819-18 AVENUEEDMONTONA1T6J 6P2CA ; TAPCO INT A MICHIGAN CORP ; TAPCO INT CORP ; DEUTSCHE BANK NEW YORK BRANCH ADMINISTRATIVE AGENT AG AS ; WILMINGTON TRUST FSB COLLATERAL AGENT AS ; HEADWATERS HEAVY OIL LLC A UTAH CORP ; HEADWATERS HEAVY OIL LLC SOUTH JORDAN ; HEADWATERS HEAVY OIL LLC300 - 10653 SOUTH RIVER FRONT PARKWAYSOUTH JORDANUT84095US ; HEADWATERS TECHNOLOGY INNOVATION LLC ; HEADWATERS INC GRANTOR AS ; HEADWATERS RESOURCES INC A UTAH CORP ; HEADWATERS TECHNOLOGY INNOVATION GROUP INC A UTAH CORP ; HEADWATERS INC ; HEADWATERS RESOURCES INC ; HYDROCARBON TECHNOLOGY AND INNOVATION LLC

Inventor(s): (std): LOTT ROGER K ; LEE LAP KEUNG ; ROGER K LOTT ; MARC ICHER ; LALITAPRASAD V DAITA ; THOMAS K ROWLAND ; LOTT ROGER ; LI LAP KEUNG ; LOTT RODZHER K ; KEUNG LOTT ROGER K LEE LAP

Inventor(s): LI LAP-KEUNG ; LEE LAP KEUNG WEST WINDSOR ; LOTT ROGER K EDMONTON ; LAP KEUNG LEE ; LOTT ROGER K10819-18 AVENUEEDMONTONA1T6J 6P2CA ; LEE LAP KEUNGUS

Agent(s): CASSAN MACLEAN; SMART AND BIGGAR; CASSAN MACLEAN IP AGENCY INC; ADAM HOLGER; ADAM HOLGER ET AL; LEHMANN MARIA ISABEL; SULEIMAN I AL AMMAR LAW OFFICE; WORKMAN NYDEGGER, (F/K/A WORKMAN NYDEGGER AND SEELEY); WORKMAN NYDEGGER F K A WORKMAN NYDEGGER AND SEELEY; WORKMAN NYDEGGER; WORKMAN NYDEGGER,1000 EAGLE GATE TOWER; WORKMAN NYDEGGER 1000 EAGLE GATE TOWER

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM 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 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 TN TR TT TI UA UG US UZ VC VN YU ZA ZM ZW

5) Family number: 42759132 (US2009001316A)

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Title: SYSTEM AND PROCESS FOR PRODUCTION OF LIQUID PRODUCT FROM LIGHT GAS

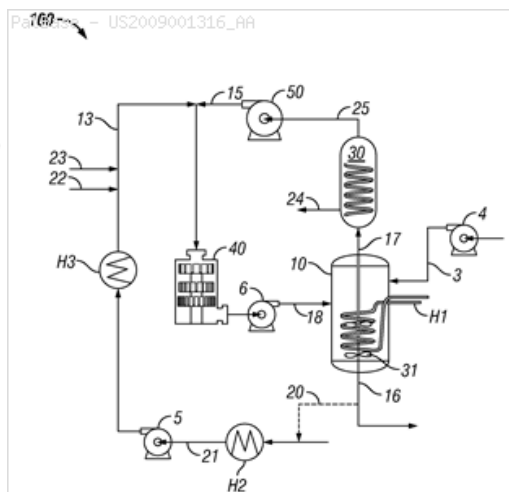
Abstract: A method for producing a product comprising at least one selected from C2+ hydrocarbons, oxygenates, and combinations thereof from light gas comprising one or more of carbon dioxide, methane, ethane, propane, butane, pentane, and methanol by forming a dispersion of light gas in a liquid feed, wherein the dispersion is formed at least in part with high shear forces and wherein at least one of the liquid feed and the light gas is a hydrogen source. A system for carrying out the method is also presented.

Classifications:

International (IPC 8-9): B01D53/00 B01F13/10 B01F15/02 B01F3/04 B01F3/12 B01F7/00 B01F7/26 B01J19/00 B01J19/18 B01J21/06 B01J23/00 B01J23/44 B01J23/889 B01J31/20 B01J35/02 B01J37/02 B01J37/03 B01J8/00 B01J8/02 B01J8/20 B01J8/22 C01B3/02 C01B3/38 C01B3/40 C07C1/04 C07C15/00 C07C15/02 C07C15/073 C07C15/08 C07C15/24 C07C15/46 C07C2/84 C07C2/86 C07C27/00 C07C27/06 C07C27/10 C07C29/151 C07C29/48 C07C31/00 C07C31/04 C07C31/08 C07C31/10 C07C31/12 C07C31/20 C07C41/01 C07C43/10 C07C43/11 C07C43/13 C07C45/28 C07C49/10 C07C6/08 C07C9/00 C09K3/00 C10G2/00 C10G3/00 C10G31/00 C10G50/00 C10J3/00 C10J3/46 C10L3/08 (Advanced/Invention); B01J37/03 C07B61/00 C10J3/48 (Advanced/Non-invention); B01F7/26 B01J21/00 B01J35/00 C07C29/00 C07C31/00 C09K3/00 (Core/Invention)

International (IPC 1-7): B01J21/06

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Probable Assignee: H R D CORP

Assignee(s): (std): ANTHONY RAYFORD G ; BAGHERZADEH EBRAHIM ; BORSINGER GREGORY ; BORSINGER GREGORY G ; H R D CORP ; HASSAN AZIZ ; HASSAN ABBAS ; HRD CORP

Inventor(s): (std): ANTHONY RAYFORD G ; HASSAN AZIZ ; BORSINGER GREGORY ; BAGHERZADEH EBRAHIM ; HASSAN ABBAS ; EBRAHIM BAGHERZADEH ; GREGORY BORSINGER ; ABBAS HASSAN ; AZIZ HASSAN ; RAYFORD G ANTHONY ; ANTHONY RAYFORD GAINES ; GREGORY G BORSINGER ; BORSINGER GREGORY G

Agent(s): PIZZEYS; DARK IP; RIDOUT AND MAYBEE LLP; SCHWAN SCHWAN SCHORER; DAUNCEY MARK PETER; CONLEY ROSE PC DAVID A ROSE; PORTER HEDGES LLP; TIMOTHY S; WESTBY TIMOTHY 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 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

Title: Gasoline upgrading process

Abstract: Low sulfur gasoline is produced from a catalytically cracked, sulfur-containing naphtha by fractionating the naphtha feed into a number of fractions of differing boiling range and hydrosulfurizing them by feeding them into a hydrosulfurization reactor at spaced locations along the length of the reactor in order of descending boiling range, with the highest boiling fraction first. Staged introduction of the feed into the hydrosulfurization reactor in this way promotes desulfurization of the sulfur-rich, olefin poor back end of the feed while reducing the saturation of the high octane olefins in the olefin-rich, sulfur-poor front end, so preserving octane while achieving the desired desulfurization. The hydrosulfurization is followed by treatment over an acidic catalyst, preferably an intermediate pore size zeolite such as ZSM-5. The treatment over the acidic catalyst in the second step restores octane loss which takes place as a result of the hydrogenative treatment and results in a low sulfur gasoline product with an octane number comparable to that of the feed naphtha.

Classifications:

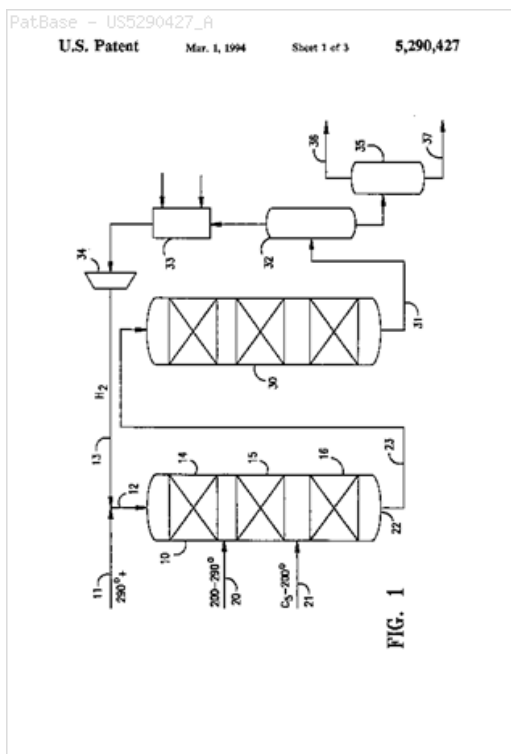
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US: 208/134 208/211 208/212 208/213 208/58 208/59 208/60 208/70 208/87 208/88 208/89 208/92 208/96



Family:

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Probable Assignee: MOBIL OIL CORP

Assignee(s): (std): EXXON MOBIL CORP ; MOBIL OIL ; MOBIL OIL CORP ; EXXONMOBIL OIL CORP

Assignee(s): COLLINS NICK A ; DIEZ DOUGLAS S ; DEGNAN THOMAS F JR ; DURAND PAUL PIERCE ; ANGEVINE PHILIP J ; APELIAN MINAS R ; BOYD SHERRI LYNNE ; CHAWLA BIRBAL ; MOOBIRU OIRU CORP ; MOBILE OIL CORP ; MOBIL OIL FAIRFAX VA US CORP ; MOBIL OIL A OF NEW YORK CORP ; MOBIL OIL A NY CORP CORP ; MOBIL OIL A CORP OF NEW YORK CORP ; MOBIL OIL CORP FAIRFAX VA US ; SARLI MICHAEL SEBASTIAN ; SHIH STUART SHAN SAN ; TIMKEN HYE KYUNG C ; OWEN HARTLEY ; SARLI MICHAEL S ; SHIH STUART S ; TIMKEN HYE KYUNG CHO ; TEITMAN GERALD JOSEPH ; RUMSEY DAVID WAYNE ; PAPPAL DAVID ANDREW ; WILMINGTON TRUST LONDON LTD ; EXXONMOBIL RESEARCH AND ENGINEERING CO ; EXXONMOBIL RESEARCH AND ENGINEERING ; EXXONMOBIL OIL CORP FAIRFAX ; MAZZONE DOMINICK NICHOLAS ; LISSY DARIA N ; FLETCHER DAVID L ; MCGOVERN STEPHEN J ; HILBERT TIMOTHY L ; HARANDI MOHSEN N ; KONDIS EDWARD F ; KEVILLE KATHLEEN M ; FLETCHER DAVID LEE ; HILBERT TIMOTHY LEE

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Agent(s): PHILLIPS ORMONDE FITZPATRICK; KIRBY EADES GALE BAKER; GOWLING LAFLEUR HENDERSON LLP

Designated states: AT AU BE CA CH DE DK ES FI FR GB GR IE IT JP KR LU MC MX NL NO PT SE SG

7) Family number: 30856289 (AU199178205A)

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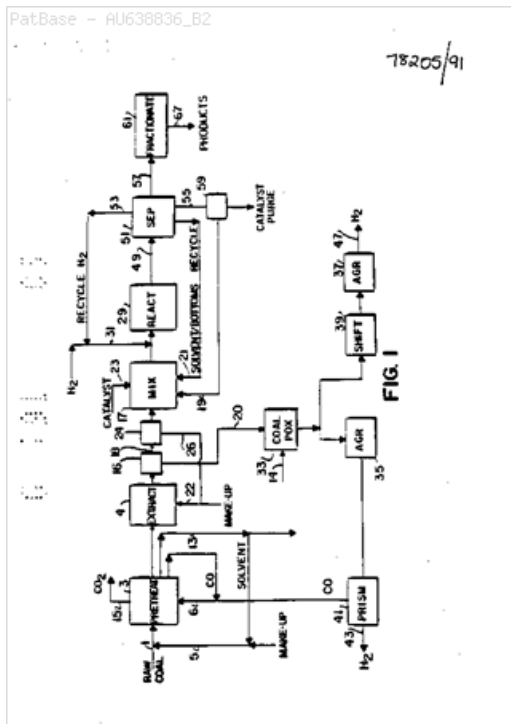
Title: COAL EXTRACT HYDROCONVERSION PROCESS COMPRISING SOLVENT ENHANCED CARBON MONOXIDE PRETREATMENT

Abstract: 1. A process for hydroconverting coal to produce a hydrocarbonaceous liquid, which comprises: in a pretreatment zone, forming a slurry of water-containing coal in an organic solvent, wherein the ratio of water-to- dry coal at conditions is below 0.5:1, and subjecting the slurry to an effective amount of carbon monoxide at a temperature in the range of 550 degrees -700 0 F. and an elevated pressure to cause depolymerization and hydrogenation of the coal thereby increasing the coal's solubility in the solvent and to extract a portion of the coal into the organic solvent; separating the pretreated coal slurry into two phases, an organic solvent phase comprising a substantial amount of soluble hydrocarbonaceous materials extracted from the coal, and a second solid residue phase comprising substantially all of the inorganic ash from the coal; /4

Classifications:

International (IPC 8-9): C10G1/06 (Advanced/Invention);
C10G1/00 (Core/Invention)

International (IPC 1-7): C10G1/06

**Family:**

Publication number	Publication date	Application number	Application date
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Priority:

AU19910078205 19910606

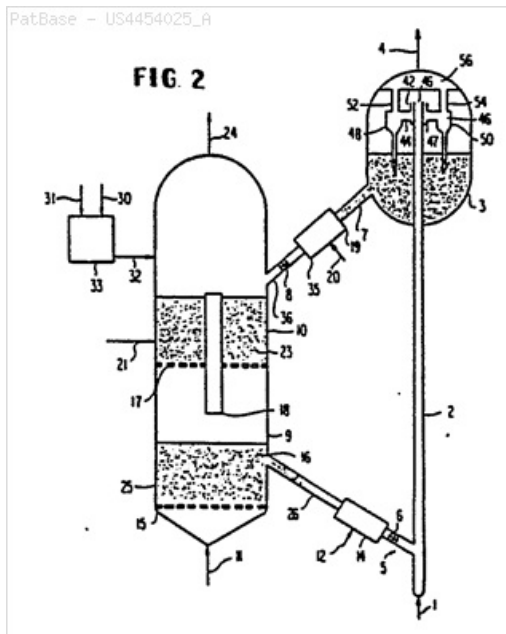
Probable Assignee: EXXON MOBIL CORP**Assignee(s):** EXXON MOBIL CORP ; EXXON RESEARCH AND ENGINEERING CO ; EXXON RESEARCH AND ENGINEERING COMPANY**Inventor(s):** CLAUDE CLARENCE CULROSS ; STEPHEN DAVID REYNOLDS ; REYNOLDS STEPHEN DAVID ; CULROSS CLAUDE CLARENCE**Agent(s):** WATERMARK PATENT AND TRADE MARKS ATTORNEYS; WATERMARK INTELLECTUAL PROPERTY PTY LTD**8) Family number: 4389301 (US4454025A)**

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Title: PASSIVATING HEAVY METALS IN CARBO-METALLIC OIL CONVERSION

Abstract: A process for economically converting carbo-metallic oils to lighter products. The carbo-metallic oils contain 650 DEG F. plus material which is characterized by a carbon residue on pyrolysis of at least about 1 and a Nickel Equivalents of heavy metals content of at least about 4 parts per million. This process comprises flowing the carbo-metallic oil together with particulate cracking catalyst through a progressive flow type reactor having an elongated reaction chamber, which is at least in part vertical or inclined, for a predetermined vapor riser residence time in the range of about 0.5 to about 10 seconds, at a temperature of about 900 DEG to about 1400 DEG F., and under a pressure of about 10 to about 50 pounds per square inch absolute sufficient for causing a conversion per pass in the range of about 50 percent to about 90 percent while producing coke in amounts in the range of about 6 to about 14 percent by weight based on fresh feed, and laying down coke on the catalyst in amounts in the range of about 0.3 to about 3 percent by weight. The spent, coke-laden catalyst is separated from the stream of hydrocarbons formed by vaporized feed and resultant cracking products and regenerated in one or more regeneration beds in one or more regeneration zones by burning the coke on the spent catalyst with oxygen. The regenerated catalyst is recycled to the reactor and contacted with fresh carbo-metallic oil. Compounds of aluminum, silicon, zirconium or titanium or a mixture of two or more of those metal compounds is added to the catalyst in an amount and in a form sufficient to reduce the amount of gas formation caused by heavy metals deposited on the catalyst during the conversion reaction.

Classifications:**International (IPC 8-9):** C10G11/02 C10G11/18 (Advanced/Invention); C10G11/00 (Core/Invention)**International (IPC 1-7):** C10G11/18**CPC:** Y02P30/446 C10G11/18 C10G11/02 C10G2300/705**European:** C10G11/02 C10G11/18 M10G300/70C**US:** 208/113 208/120 208/120.01 208/121 502/22

**Family:**

Publication number	Publication date	Application number	Application date
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US4454025 A	19840612	US19810263395	19810513

Priority:

US19810263395 19810513 EP19820104041 19820510

Probable Assignee: ASHLAND OIL INC

Assignee(s): (std): ASHLAND OIL INC

Assignee(s): ASHLAND OIL INC A CORP

Inventor(s): (std): HETTINGER JR WILLIAM P ; HETTINGER WILLIAM P ; HETTINGER WILLIAM P JR

Designated states: AT BE CH DE FR GB IT LI LU NL SE

9) Family number: 22008353 (US2689821A)

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Title: HYDROCARBON CONVERSION PROCESS

Abstract: (Claim 1) A process for the conversion of hydrocarbons which comprises passing a hydrogenatable hydrocarbon feed stock, a dehydrogenatable hydrocarbon feed stock and hydrogen into a reaction zone, said reaction zone containing a continuously replenished bed of a carrier-supported 7,5 e6balt-11rrolybdate catalyst, maintaining conditions in said reaction zone which cause said hydrogenatable hydrocarbon feed stock to be hydrogenated and said dehydrogenatable hydrocarbon feed stock to be dehydrogenated, continuously controlling the relative concentrations of hydrogen, hydrogenatable hydrocarbon feed at 81xck and dehydrogenatable hydrocarbon feed stock in said reaction zone by injecting at least of 'Poilits along said reaction zone, so as to decrease itenperature changes through the reaction zone and withdrawing products from said reaction zone.

Classifications:

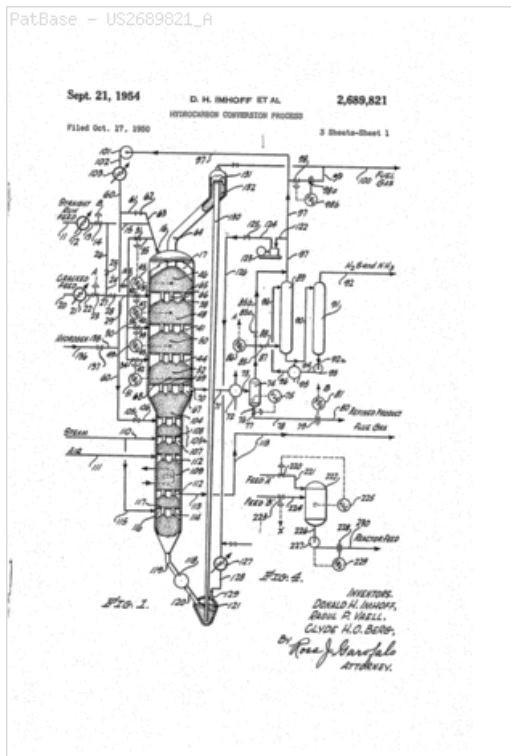
International (IPC 8-9): C10G35/12 (Advanced/Invention); C10G35/00 (Core/Invention)

International (IPC 1-7): C01B3/24 C10G11/02 C10G23/02

CPC: B01J8/12 C10G35/12

European: B01J8/12 C10G35/12

US: 196/132 208/136 208/141 208/145 208/159 208/175 208/64 208/67 208/78 422/216 422/223 502/46 585/319 585/401 585/407

**Family:**

Publication number	Publication date	Application number	Application date
US2689821 A	19540921	US19500190496	19501017

Priority:

US19500190496 19501017

Probable Assignee: UNION OIL CO**Assignee(s):** (std): UNION OIL CO**Assignee(s):** UNION OIL COMPANY**Inventor(s):** (std): BERG CLYDE H O ; IMHOFF DONALD H ; VALL RAOUL P**10) Family number: 41832359 (US2009145810A)**

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Title: ADDITION OF A REACTOR PROCESS TO A COKING PROCESS**Abstract:** A reactor process added to a coking process to modify the quantity or yield of a coking process product and/or modify certain characteristics or properties of coking process products.**Classifications:**

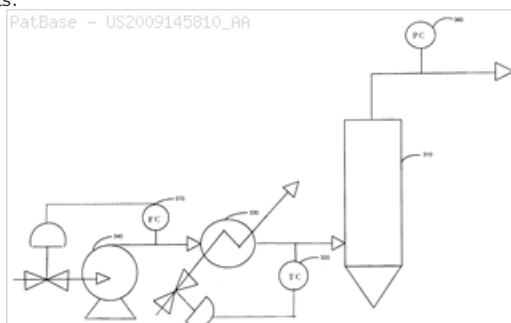
International (IPC 8-9): B01J14/00 C07C4/02 C07C4/06 C10B55/00 C10B55/02 C10B57/04 C10B57/06 C10B57/12 C10C3/02 C10G1/00 C10G11/00 C10G11/02 C10G11/14 C10G11/18 C10G29/00 C10G47/00 C10G47/02 C10G47/12 C10G47/22 C10G47/24 C10G47/32 C10G47/36 C10G51/04 C10G55/04 C10G57/00 C10G59/04 C10G69/06 C10G9/00 C10G9/02 C10G9/14 C10G9/28 C10G9/34 F17D3/00 G01C21/00 (Advanced/Invention); C10B55/02 C10B55/04 (Advanced/Non-invention); C07C4/00 C10B55/00 C10B57/00 C10C3/00 C10G11/00 C10G47/00 C10G55/00 C10G59/00 C10G9/00 G01C21/00 (Core/Invention)

International (IPC 1-7): C10G59/04 C10G9/14

CPC: C10G51/04 C10G47/02 C10G47/00 C10G2300/1059 C10G2300/1096 C10G2300/80 C10G2300/805 C10G2300/807 C10G2400/06 C10B55/02 C10G47/32 C10G1/002 C10G47/12 C10G57/00 Y10T137/0318 C10G29/00 C10G9/005 C10G11/18 C10G11/187 C10G2300/701 C10G2300/708 C10G2400/02 C10G2400/04 C10G2400/08 C10G1/00 Y10T29/49718 C10G11/14 C10G11/00 F17D3/00 C10B55/10 B01J29/06 B01J29/084 C07C4/06 C10B55/00 C10B57/06 C10B57/12 C10G2400/10 C10G2400/20 C10G2400/22 C10G11/05 C10G75/00

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US: 1/1 137/1 201/20 208/106 208/108 208/109 208/112 208/113 208/118 208/121 208/131 208/132 208/132 208/40 208/40P 208/435 208/50 208/51 208/52.00R 208/52.00RP 208/52CT 208/52R 208/53 208/54 208/55 208/55P 208/67 208/68 208/69 208/70 208/71 208/72 208/73 208/74 208/75 208/76 208/77 208/95 29/402.01 422/119 423/450 423/453 423/454 423/458 585/653 585/653P

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Priority:

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Assignee(s): (std): ETTER ROGER G ; QUINONES AUGUSTO ; QUINONES AUGUSTO RODOLFO ; ROGER G ETTER

Inventor(s): (std): QUINONES AUGUSTO RODOLFO ; QUINONES AUGUSTO ; ROGER G ETTER ; AUGUSTO RODOLFO
QUINONES ; RODOLFO QUINONES AUGUSTO ; ETTER ROGER G

Agent(s): GASTLE AND ASSOCIATES; BOYCE CONOR; TRANTER ANDREW DAVID; SUMIYOSHI KATSUHIKO;
STANDLEY LAW GROUP LLP; NORRIS JEFFREY C; NORRIS JEFFREY C 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 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

Title: Resid hydrotreating with high temperature flash drum recycle oil

Abstract: Resid hydrotreating conversion of resid can be substantially increased by blending the resid with high-temperature flash drum oil before being hydrotreated in a train of ebullated bed reactors. The high-temperature flash drum oil also improves the overall thermal efficiency of the process.

Classifications:

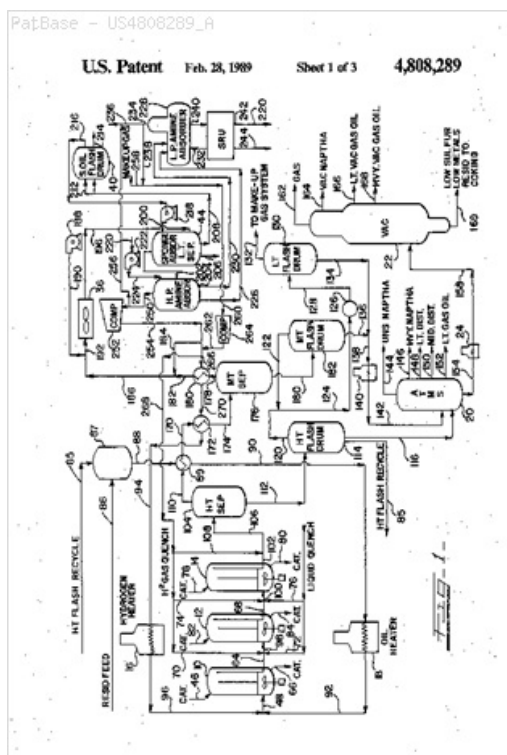
International (IPC 8-9): C10G45/16 C10G49/00
C10G65/04 (Advanced/Invention);
C10G45/02 C10G49/00 C10G65/00 (Core/Invention)

International (IPC 1-7): C10G65/04

CPC: C10G45/16 C10G49/007 C10G65/04

European: C10G45/16 C10G49/00H C10G65/04

US: 208/100 208/102 208/108 208/112 208/131 208/155 208/162
208/210 208/212 208/251H 208/254H



Family:

Publication number	Publication date	Application number	Application date
CA1306969 A1	19920901	CA19880571126	19880705
US4808289 A	19890228	US19870071477	19870709

Priority:

US19870071477 19870709 CA19880571126 19880705

Probable Assignee: AMOCO A CORP OF INDIANA CORP

Assignee(s): (std): AMOCO CORP

Assignee(s): BOENING ROBERT E ; MCDANIEL NORMAN K ; VASTI NICHOLAS C ; WOODS NORMAN R ; AMOCO A CORP OF INDIANA CORP

Inventor(s): (std): BOENING ROBERT E ; MCDANIEL NORMAN K ; VASTI NICHOLAS C ; WOODS NORMAN R

Agent(s): GOWLING LAFLEUR HENDERSON LLP

12) Family number: 9024504 (US5013427A)

© PatBase

Title: Resid hydrotreating with resins

Abstract: A hydrotreating process if provided in which resid and resins are hydrotreated with hydrogen-rich gases in the presence of a hydrotreating catalyst in an ebullated bed reactor.

Classifications:

International (IPC 8-9): B01J19/00 C08J11/08 C10C3/00 C10G21/00
C10G21/14 C10G45/00 C10G45/02 C10G49/00 C10G65/02
C10G67/04 C10G67/14 C10G69/04 (Advanced/Invention);
B01J19/00 C08J11/00 C10C3/00 C10G21/00 C10G45/00 C10G45/02
C10G49/00 C10G65/00 C10G67/00 C10G69/00 (Core/Invention)

International (IPC 1-7): C08J11/08 C10C3/00 C10G1/00 C10G21/00
C10G21/14 C10G45/00 C10G45/02 C10G45/04 C10G49/00
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CPC: B01J19/00 C10G67/049 C10G21/003 C10G67/0463 C10C3/00
C10G2300/107 C10G11/18 C10G21/14 C10G49/12 C10G67/0454
Y02W30/701 Y02P20/584

European: B01J19/00 C10C3/00 C10G11/18 C10G21/00A
C10G21/14 C10G49/12 C10G67/04F C10G67/04F12 C10G67/04F2
C10G69/04 M10G300/10H

US: 208/108 208/143 208/144 208/162 208/208 208/208R 208/211
208/211.2 208/212 208/216R 208/221 208/222 208/229 208/251H
208/254H 208/264 208/309 208/313 208/314 208/315 208/317
208/339 208/39 208/49 208/50 208/52CT 208/52R 208/61 208/81
208/86 208/87 208/89 208/92 208/94 208/96 208/97

Title: HYDROCARBON CONVERSION PROCESS AND APPARATUS

Abstract: 1. A process for the simultaneous contacting of two fluid streams of substantially different physical properties with moving beds of granular solid contact material in a single conversion zone which comprises dividing a stream of granular solid contact material into a first and a second stream at the top of said conversion zone, passing the first solids stream downwardly as a moving bed through a first treating zone maintained at a relatively low contacting temperature and in direct contact with fluids passing therethrough, then passing said first solids stream downwardly therefrom through and in indirect heat exchange relation with a subjacent second treating zone maintained at a relatively high contacting temperature and out of direct contact with fluids passing therethrough whereby said solids stream is indirectly heated, simultaneously passing said second solids stream downwardly as a moving bed through and in indirect heat exchange relation with said first treating zone and out of contact with fluids passing therethrough, then passing said second solids stream therefrom downwardly through and in direct contact with fluids passing through said second treating zone, combining said first and second solids streams in and passing them together through a third treating and solids stripping zone, further stripping the combined solids stream with a stripping gas prior to removal of said solids from said conversion zone, transferring the spent stripped solids thus formed through a regeneration zone and regenerating said solids therein, elutriating fines from the regenerated solids, contacting said regenerated solids with a treating gas immediately prior to introducing said solids into said conversion zone for repassage therethrough, passing the higher boiling fluid stream at said relatively low contacting temperature through said first treating zone, passing the lower boiling fluid at said relatively higher temperature first through said third treating and stripping zone in direct contact with the combined first and second solids streams to effect an initial fluid conversion and to strip residual quantities of said higher boiling fluid from the combined solids stream therein, then passing the lower boiling fluid through said second treating zone to contact said second solids stream for further conversion, and then passing said lower boiling fluid through said first treating zone at said relatively low temperature to contact said first solids stream together with said higher boiling fluid, and removing a combined converted fluid effluent from the top of said conversion zone,

Classifications:

International (IPC 8-9): C10G35/12 (Advanced/Invention); C10G35/00 (Core/Invention)

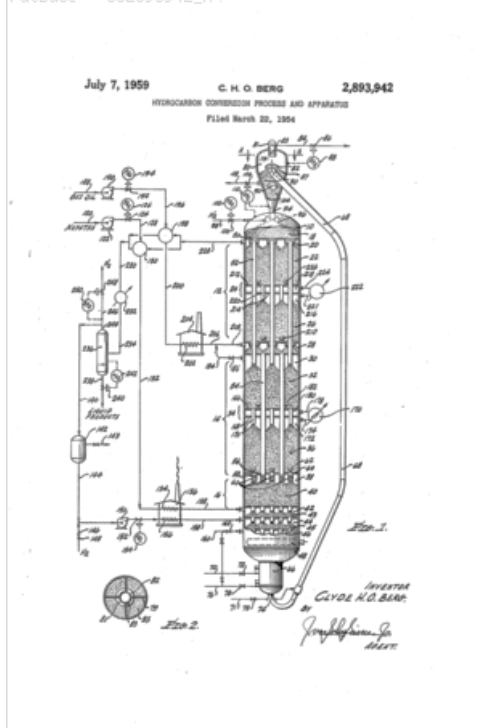
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CPC: B01J8/12 C10G35/12

European: B01J8/12 C10G35/12

US: 208/169 208/213 208/66 209/139.1 422/191 422/610

PatBase - US2893942_A

**Family:**

Publication number	Publication date	Application number	Application date
US2893942 A	19590707	US19540417567	19540322

Priority:

US19540417567 19540322

Probable Assignee: UNION OIL CO

Assignee(s): (std): UNION OIL CO

Assignee(s): UNION OIL CO OF CALIFORNIA ; UNION OIL COMPANY OF CALIFORNIA

Inventor(s): (std): BERG CLYDE H O

Title: SPOX-ENHANCED PROCESS FOR PRODUCTION OF SYNTHESIS GAS

Abstract: A method, system and catalysts for improving the yield of syngas from the catalytic partial oxidation of methane or other light hydrocarbons is disclosed. The increase in yield and selectivity for CO and H₂ products results at least in part from the substitution of H₂S partial oxidation to elemental sulfur and water for the combustion of light hydrocarbon to CO₂ and water.

Classifications:

International (IPC 8-9): B01D50/00 B01D53/38 B01D53/52

B01D53/86 B01J10/00 B01J12/00 B01J19/00 B01J19/24 B01J23/40

B01J23/63 B01J35/04 B01J37/08 B01J8/00 B01J8/02 C01B17/04

C01B17/16 C01B3/00 C01B3/26 C01B3/36 C01B3/38 C01B3/40

C01B31/18 C01B7/00 C07C1/02 (Advanced/Invention);

B01J35/00 B01J35/04 B01J37/02 (Advanced/Non-invention);

B01D53/48 B01D53/86 B01J12/00 B01J19/00 B01J19/24 B01J23/40

B01J23/54 B01J35/00 B01J37/00 B01J8/02 C01B17/00

C01B3/00 (Core/Invention);

B01J35/00 B01J37/00 (Core/Non-invention);

C08G (Subclass/Non-invention)

International (IPC 1-7): B01D50/00 B01D53/52 B01D53/86
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C07C5/00 C08G
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European: B01D53/86B6 B01D53/86W B01J12/00P B01J19/24D4
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US: 208/250 208/250P 252/373 422/129 422/168 422/168S 422/169 422/169S 422/177 422/179 422/180 422/183 422/184.1
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423/439 423/439S 423/573.1 423/573.100P 423/574.1 423/576.2 423/576.200P 423/576.8 423/576.800P 423/648.1 423/650
423/651 423/651S 48/127.9 48/127.900S 48/198.2 48/198.200S 48/DIG.005 48/DIG.5 48/DIG.5S 502/302 502/326 502/327
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Family:

Publication number	Publication date	Application number	Application date
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EP1355719 A4	20050223	EP20010993300	20011218
EP1355719 B1	20090624	EP20010993300	20011218
EP1355720 A1	20031029	EP20010993301	20011218
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PatBase - US2002110521_AA

Patent Application Publication Aug. 15, 2002 Sheet 1 of 2 US 2002/0110521 A1

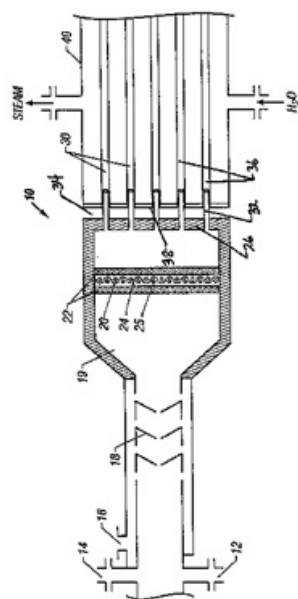


FIG. 1

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WO07032850 A3	20090522	WO2006US31762	20060815
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Priority:

US19990146635P 19990730	US20000625710 20000725	WO2000US40489 20000726
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Probable Assignee: PHILLIPS 66 CO

Assignee(s): (std): CONOCO INC ; CONOCOPHILIPS CO ; CONOCOPHILIPS COMPANY ; CONOCOPHILLIPS CO ; KELLER ALFRED E ; RAMANI SRIRAM ; PANJALA DEVADAS

Assignee(s): PRUITT TERRY D ; ALLISON JOE D ; PHILLIPS 66 CO ; CONOCOPHILLIPS COMPANY ; KELLER ALFRED

Inventor(s): (std): KELLER ALFRED E ; ALLISON JOE D ; RAMANI SRIRAM ; KELLER ALFRED ; PRUITT TERRY D ; PANJALA DEVADAS ; ALFRED E KELLER ; SRIRAM RAMANI ; ALFRED KELLER ; ALLISON JOE ; PRUITT TERRY

Inventor(s): DEVADAS PANJALA ; JOE D ALLISON ; TERRY D PRUITT

Agent(s): PIZZEYS PATENT AND TRADE MARK ATTORNEYS PTY LTD ; PIZZEYS ; RIDOUT AND MAYBEE LLP ; TOWLER PHILIP DEAN ; CONOCOPHILIPS COMPANY ; CONOCOPHILLIPS CO ; CONLEY ROSE ; CONLEY ROSE PC

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR 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 MG MK ML MN MR MW MX NZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

15) Family number: 3509549 (US4940529A)

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Title: CATALYTIC CRACKING WITH DEASPHALTED OIL

Abstract: A process is provided in which solvent-extracted oil or other deasphalted oil derived from hydrotreated resid is catalytically cracked to increase the yield of gasoline and other high value products.

Classifications:

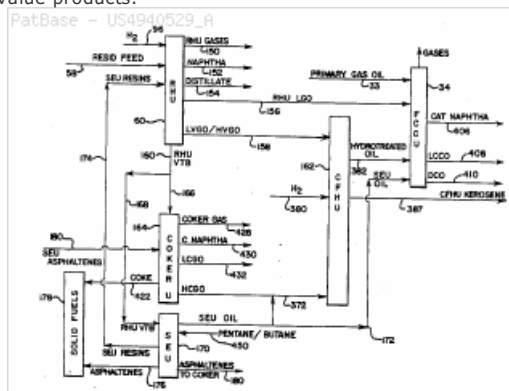
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International (IPC 1-7): C10G49/00

CPC: C10G67/0463 C10G2300/1074 C10G2300/205 C10G2300/206 C10G2300/708 C10G69/04

European: C10G69/00 C10G69/04

US: 208/108 208/143 208/211 208/212 208/251H 208/254H 208/61 208/78 208/86 208/87 208/92



Family:

Publication number	Publication date	Application number	Application date
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Priority:

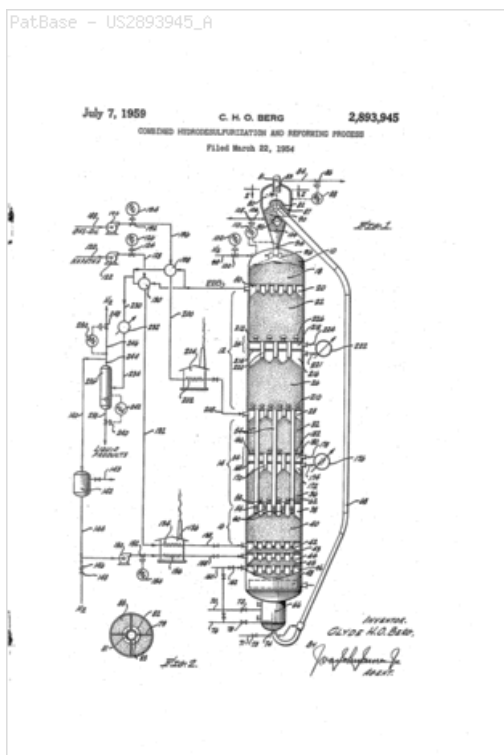
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Probable Assignee: AMOCO CORP**Assignee(s):** (std): AMOCO CORP**Assignee(s):** TOA NENRYO KOGYO A CORP OF JAPAN KK ; TOA NENRYO KOGYO KK ; AMOCO A CORP OF INDIANA CORP**Inventor(s):** (std): MOSBY JAMES F ; PECK LAWRENCE B ; TAYLOR JAMES L ; BEATON WILLIAM I**16) Family number: 21951582** (US2893945A)

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Title: COMBINED HYDRODESULFURIZATION AND REFORMING PROCESS

Abstract: (Claim 1) 1. In a moving-bed isobaric catalytic contacting process wherein granular reforming and desulfurization catalyst is circulated downwardly through an upper low temperature desulfurization Zone and then through a subjacent high-temperature reforming zone, and wherein naphtha plus hydrogen is contacted countercurrently with the catalyst in said reforming zone, and the reformed naphtha is then admixed with a gas oil and the resulting mixture of gas oil, naphtha and hydrogen is then passed upwardly through said desulfurization zone to effect desulfurization, the improved method for obtaining controlled relative catalyst treating capacity in each of said contacting zones While still effectively utilizing said naphtha feed to strip residual gas oil from all of said catalyst prior to regeneration, which comprises passing a controlled first portion of the catalyst from said desulfurization zone through the upper major portion of said reforming zone in indirect heat exchange therewith and out of contact with the major stream of naphtha flowing therethrough, passing the remainder of said catalyst from the desulfurization zone through the entire reforming zone in contact with said naphtha, and recombining said first portion of catalyst with said remainder of catalyst in the lower portion of said reforming zone, whereby the relative amount of catalytic reforming capacity is readily controllable in response to variations in quantity and nature of feeds, and the entire catalyst stream is effectively stripped of residual gas oil by the naphtha and hydrogen vapors in said lower portion of the reforming zone.

Classifications:**International (IPC 8-9):** C10G35/12 (Advanced/Invention); C10G35/00 (Core/Invention)**International (IPC 1-7):** C10G34/00**CPC:** B01J8/12 C10G35/12**European:** B01J8/12 C10G35/12**US:** 208/150 208/165 208/169 208/216.00R 208/216R 208/99 422/191 422/216 422/619**Family:**

Publication number	Publication date	Application number	Application date
US2893945 A	19590707	US19540417569	19540322

Priority:

US19540417569 19540322

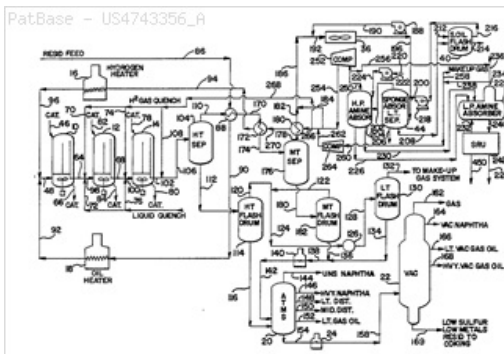
Probable Assignee: UNION OIL CO**Assignee(s):** (std): UNION OIL CO**Assignee(s):** UNION OIL CO OF CALIFORNIA ; UNION OIL COMPANY OF CALIFORNIA**Inventor(s):** (std): BERG CLYDE H O**17) Family number: 3794634** (US4743356A)

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Title: Increasing resid hydrotreating conversion

Abstract: Resid hydrotreating conversion of resid can be substantially increased by decreasing the feed gas rate and simultaneously increasing the concentration of hydrogen in the feed gases. Hydrogen purity can be increased by increasing the flow rate of lean sponge oil into the sponge oil absorbers, bleeding some of the recycled reactor tail gases, and increasing the makeup gas rate.

Classifications:**International (IPC 8-9):** C10G47/26 C10G47/30 (Advanced/Invention); C10G47/00 (Core/Invention)**International (IPC 1-7):** C10G47/00 C10G47/26 C10G49/00



Publication number	Publication date	Application number	Application date
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US4743356 A	19880510	US19860911102	19860924

US19860911102 19860924 CA19870547659 19870923

Agent(s): GOWLING LAFLEUR HENDERSON LLP

18) Family number: 30380659 (US2006248800A)

Abstract: The invention relates to a new and improved process and apparatus for the production of high purity hydrogen by steam reforming. The apparatus is an integrated flameless distributed combustion-membrane steam reforming (FDC-MSR) or reactor for steam reforming of a vaporizable hydrocarbon to produce H_2 and CO_2 , with minimal CO , and minimal CO in the H_2 stream. The flameless distributed combustion drives the steam reforming reaction which pro-vides great improvements in heat exchange efficiency and load following capabilities. The reactor may contain multiple flameless distributed combustion chambers and multiple hydrogen-selective, hydrogen-permeable, membrane tubes. The feed and reaction gases may flow through the reactor either radially or axially. A further embodiment of the invention involves producing high purity hydrogen by dehydrogenation using an integrated FDC-membrane de-hydrogenation reactor. A still further embodiment of the invention involves a zero emission hybrid power system wherein the produced hydrogen is used to power a high-pressure, internally manifolded molten carbonate fuel cell. In addition, the design of the FDC-SMR powered fuel cell makes it possible to capture good concentrations of CO_2 for sequestration or use in other processes.

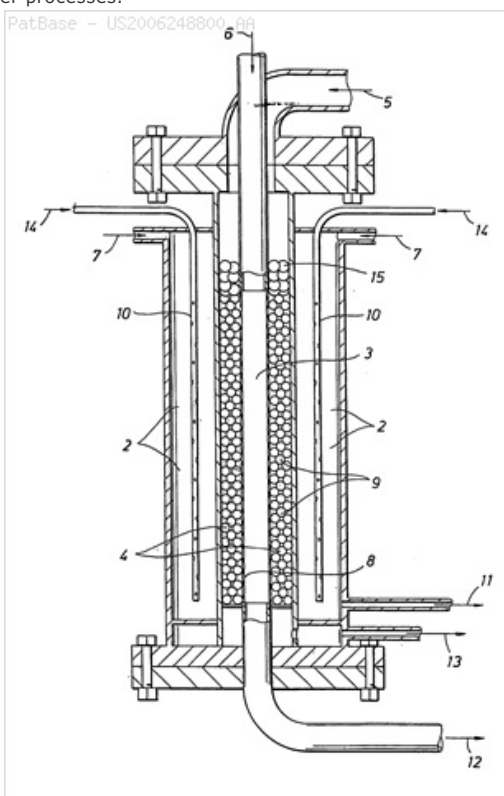
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International (IPC 1-7): B01J19/24 B01J8/06 C01B3/26 C01B3/32 C01B3/34 C01B3/38 C01B3/48 C01B3/50 C01B31/20 C07C5/333 H01M8/06

CPC: F23C3/002 B01J8/009 B01B1/005 B01D53/22 B01D63/06
B01D2257/108 B01D2313/22 B01D2313/42 B01J8/0214 B01J8/0257
B01J8/0278 B01J8/0285 B01J8/062 B01J8/065 B01J19/2475
B01J23/755 B01J35/065 B01J2208/00212 B01J2208/00309
B01J2208/00495 B01J2208/00504 B01J2208/0053 B01J2219/00006
B01J2219/00265 C01B3/384 C01B3/501 C01B2203/0233
C01B2203/0283 C01B2203/041 C01B2203/047 C01B2203/0475
C01B2203/0811 C01B2203/1247 C01B2203/86 C07C5/3337
F23C2900/99001 H01M8/0612 H01M8/0618 H01M8/0631 H01M8/0662
Y02E20/342 Y02P20/126 Y02P20/152 Y02P20/51 Y02P30/30
Y02P20/52 C01B32/50

European: B01B1/00 B01D53/22 B01D63/06 B01J19/24P
B01J8/00L4 B01J8/02B2 B01J8/02D4 B01J8/02F B01J8/02H
B01J8/06B B01J8/06F C01B3/38B C01B3/50B C01B31/20
C07C5/33D2 H01M8/06B2 H01M8/06B2A H01M8/06B2B2
H01M8/06C L01D257/108 L01D313/22 L01D313/42
L01J208/00C2D4F L01J208/00C2D8 L01J208/00C2P4 L01J208/00C2R
L01J208/00C2Z L01J219/00A2B L01J219/00B40L6 L01J23/755
L01J35/06B M01B203/02B4B M01B203/02H M01B203/04B2
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M01B203/86 R23C900/99001 T01M8/06C Y02E20/34B Y02F60/50

US: 423/648.1 423/648.100S 48/127.9 48/127.900S 48/198.1 48/198.100S 48/198.3 48/198.300S 48/198.7 48/198.700P



Family:

Publication number	Publication date	Application number	Application date
AU2003268522 AA	20040329	AU20030268522	20030905
AU2003268522 AH	20040329	AU20030268522	20030905
CA2497441 AA	20050302	CA20032497441	20030905
CA2497441 C	20131119	CA20032497441	20030905
EP1534627 A2	20050601	EP20030749491	20030905
JP2005538022 T2	20051215	JP20040534713T	20030905
JP4782423 B2	20110928	JP20040534713T	20030905
NO20051646 A	20050419	NO20050001646	20050404
NO20051646 L	20050419	NO20050001646	20050404
US2006248800 AA	20061109	US20030526915	20030905
WO04022480 A2	20040318	WO2003US27995	20030905
WO04022480 A3	20041007	WO2003US27995	20030905
WO04022480 B1	20041216	WO2003US27995	20030905

Priority:

US20020408427P 20020905 US20030526915 20030905 WO2003US27995 20030905
US20050526915 20050701

Probable Assignee: SHELL OIL CO

Assignee(s): (std): CLOMBURG LLOYD A JR ; CLOMBURG LLOYD ANTHONY ; ELLIOTT GLENN W ; ELLIOTT GLENN WILLIAM ; GROENEVELD MICHIEL J ; GROENEVELD MICHIEL JAN ; JEAN RONG HER ; MATZAKOS ANDREAS N ; SHELL OIL CO ; MATZAKOS ANDREAS NICHOLAS ; VEENSTRA PETER ; MUNSHI ABDUL WAHID ; MIGLIN MARIA THERESE ; WELLINGTON SCOTT L ; MIGLIN MARIA T ; MUNSHI ABDUL W ; SHELL OIL COMPANY ; SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ BV ; SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ B V ; SHELL INT RESEARCH ; WELLINGTON SCOTT LEE

Assignee(s): SHELL INT RESEARCHMAATSCHAPPIJ BV ; SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ BESLOTEN VENNOOTSCHAP ; MIGLIN MARIE THERESE ; SHELL INT RESEARCH MIJ BV

Inventor(s): (std): MATZAKOS ANDREAS NICHOLAS ; WELLINGTON SCOTT LEE ; CLOMBURG LLOYD ANTHONY ; VEENSTRA PETER ; MUNSHI ABDUL WAHID ; JEAN RONG HER ; ELLIOTT GLENN WILLIAM ; GROENEVELD MICHIEL JAN ; MIGLIN MARIA THERESE ; MATZAKOS ANDREAS NIKOLAOS ; ELLIOTT GLEN WILLIAM ; ELLIOTT GLENN W ; WELLINGTON SCOTT L ; MIGLIN MARIA T ; MATZAKOS ANDREAS N ; CLOMBURG LLOYD A JR ; MUNSHI ABDUL W ; GROENEVELD MICHIEL J ; SCOTT LEE WELLINGTON ; ABDUL WAHID MUNSHI ; MICHIEL JAN GROENEVELD ; GLENN WILLIAM ELLIOTT ; LLOYD ANTHONY CLOMBURG ; RONG HER JEAN ; ANDREAS NICHOLAS MATZAKOS ; PETER VEENSTRA ; MIGLIN MARIE THERESE

Inventor(s): CLOMBURG LLOYD AJR ; MATZAKOS ANDREAS ; GROENEVELD MICHIEL ; MUNSHI ABDUL ; CLOMBURG LLOYD ; MIGLIN MARIA ; WELLINGTON SCOTT ; ELLIOTT GLENN

Agent(s): OGILVY RENAULT LLP SENCRL SRL; NORTON ROSE FULBRIGHT CANADA LLP SENCRL SRL; SHELL OIL COMPANY; SHELL OIL CO

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

19) Family number: 44153665 (US2009325789A)

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Title: CATALYST COMPOSITION WITH NANOMETER CRYSTALLITES FOR SLURRY HYDROCRACKING

Abstract: A process and apparatus is disclosed for converting heavy hydrocarbon feed into lighter hydrocarbon products. The heavy hydrocarbon feed is slurried with a catalyst comprising iron oxide and alumina to form a heavy hydrocarbon slurry and hydrocracked to produce lighter hydrocarbons. The iron sulfide crystallites have diameters in the nanometer range.

Classifications:

International (IPC 8-9): B01J27/043 B01J35/00 C01B17/00 C01G49/12 C07C4/02 C10G45/04 C10G45/16 C10G47/06 C10G47/26 (Advanced/Invention);

B01J27/04 C01G49/12 C07C4/00 C10G45/02 (Core/Invention)

CPC: B01J27/043 B01J35/006 B01J35/023 B01J35/1019 B82Y30/00 C01G49/12 C01P2002/60 C01P2004/03 C01P2004/62 C01P2004/64 C10G47/06 C10G47/26 B01J23/745 B01J35/0013 B01J35/002

European: B01J23/745 B01J27/043 B01J35/00C B01J35/00D B01J35/00D8D B01J35/02B B01J35/10A6 B82Y30/00 C01G49/12 C10G47/06 C10G47/26 M01P2/60 M01P4/03 M01P4/62 M01P4/64

US: 208/108 208/208.00R 208/208R 208/217 208/244 208/295 423/561.1 428/402 502/222 502/400 502/406 502/414 502/415 585/653 585/653P 977/777

**Family:**

Publication number	Publication date	Application number	Application date
CA2727167 AA	20100107	CA20092727167	20090616
CA2727167 C	20160503	CA20092727167	20090616
CN102076611 A	20110525	CN200980125314	20090616
CN102076611 B	20140226	CN200980125314	20090616
EP2291328 A2	20110309	EP20090774033	20090616
EP2291328 A4	20111207	EP20090774033	20090616
MX2010013835 A1	20110121	MX20100013835	20090616
US2009325789 AA	20091231	US20080165197	20080630
US2009326304 AA	20091231	US20080165192	20080630
US2011000820 AA	20110106	US20100884374	20100917

US7820135 BB	20101026	US20080165197	20080630
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US8709966 BB	20140429	US20100884374	20100917
WO10002581 A2	20100107	WO2009US47476	20090616
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Priority:

US20080165192 20080630 US20080165197 20080630 WO2009US47476 20090616
US20100884374 20100917

Probable Assignee: UOP LLC

Assignee(s): (std): BHATTACHARYYA ALAKANANDA ; MEZZA BECKAY J ; UNIVERSAL OIL PRODUCTS CO ; UOP LLC

Inventor(s): (std): MEZZA BECKAY J ; BHATTACHARYYA ALAKANANDA ; ALAKANANDA BHATTACHARYYA

Inventor(s): BECKAY J MEZZA

Agent(s): MACRAE AND CO; HAYES ADRIAN CHETWYND; HONEYWELL/UOP,PATENT SERVICES; HONEYWELL UOP PATENT SERVICES; JAMES C; UOP LLC

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 TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

20) Family number: 12172693 (US5453552A)

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Title: Isomerization and adsorption process with benzene saturation

Abstract: An advantageous integration of benzene saturation for a light paraffin containing feedstock in a light paraffin isomerization and adsorption system maintains isomerization conversion while reducing benzene levels. The process improves the efficiency of the isomerization and saturation zones by saturating benzene from a light paraffin containing stream and adsorbing normal hydrocarbons from the saturation zone effluent stream together with normal hydrocarbons from an isomerization zone effluent. The isomerization zone effluent comprises converted hydrocarbons from a light paraffin containing feedstream having a relatively low benzene concentration. Saturating the high benzene feed in a first step of saturation and passing the low benzene containing feedstream through the isomerization zone independent of the benzene saturation removes normal hydrocarbons from the isomerization step to improve equilibrium and provides a gaseous phase for desorption and a heavier hydrocarbon phase for adsorption to improve product recovery and normal paraffin recovery.

Classifications:

International (IPC 8-9): C10G59/00 C10G67/06

C10G69/08 (Advanced/Invention);

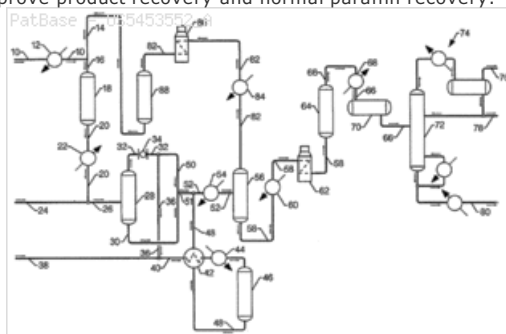
C10G59/00 C10G67/00 C10G69/00 (Core/Invention)

International (IPC 1-7): C07C5/13 C07C5/22 C07C7/163

CPC: C10G59/00 C10G67/06 C10G69/08

European: C10G59/00 C10G67/06 C10G69/08

US: 585/253 585/266 585/737 585/738



Family:

Publication number	Publication date	Application number	Application date
US5453552 A	19950926	US19930109558	19930820

Priority:

US19930109558 19930820

Probable Assignee: UOP

Assignee(s): (std): UOP INC

Assignee(s): UOP ; UOP 25 EAST ALGONQUIN ROAD PO BOX

Inventor(s): (std): TUROWICZ MARK S ; RICE LYNN H ; HAZMANN ROBERT S

21) Family number: 28638709 (US4820404A)

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Title: Cooling of stripped catalyst prior to regeneration in cracking process

Abstract: A fluid catalytic cracking process and apparatus is described which includes a high temperature stripper (hot stripper) to control the carbon level and sulfur on spent catalyst, followed by catalyst cooling to control the regeneration inlet temperature. The high temperature stripper operates at a temperature between 100 DEG F. above the temperature of a catalyst-hydrocarbon mixture exiting a riser and 1500 DEG F. The regenerator inlet temperature is controlled to obtain the desired regeneration temperature, regenerator outlet temperature, and degree of regeneration. The regenerator is maintained at a temperature between 100 DEG F. above that of the catalyst in the high temperature stripper and 1600 DEG F. The present invention has the advantage that it separates hydrogen from catalyst to eliminate hydrothermal degradation, and separates sulfur from catalyst as hydrogen sulfide and mercaptans which are easy to scrub. The catalyst cooler enables the regenerator and high temperature stripper to be run independently at respective desired temperatures.

Classifications:

International (IPC 8-9): B01J38/06 B01J38/12 B01J38/32 B01J8/18

B01J8/26 C10G11/18 (Advanced/Invention);

B01J38/00 B01J8/24 C10G11/00 (Core/Invention);

B01J C10G (Subclass/Invention)

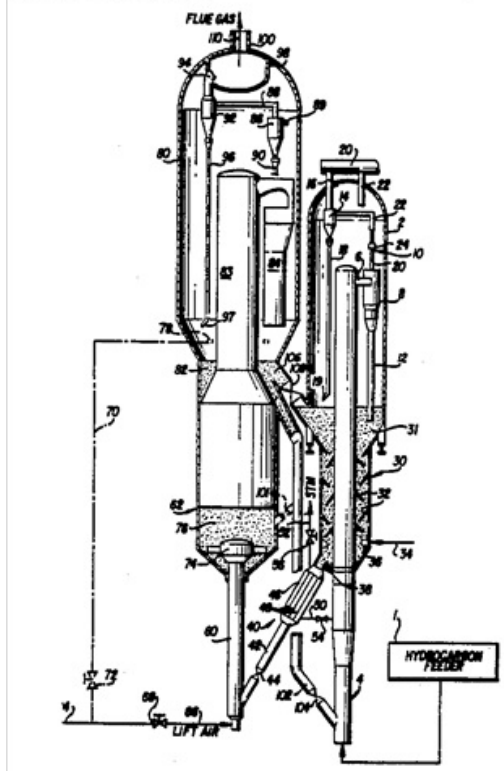
International (IPC 1-7): B01J29/38 B01J38/06 B01J38/12 B01J38/32

B01J8/18 B01J8/26 C10G11/18 F27B15/08 F27B15/12 F27B15/16

CPC: C10G11/182 C10G11/18 C10G11/187

European: C10G11/18 C10G11/18A C10G11/18R

US: 165/104.16 208/113 208/151 208/155 208/159 208/160 208/164

**Family:**

Publication number	Publication date	Application number	Application date
AU198932807 A1	19900926	AU19890032807	19890303
AU199055257 A1	19901105	AU19900055257	19900410
AU627306 B2	19920820	AU19900055257	19900410
AU633480 B2	19930204	AU19890032807	19890303
CA1320924 A1	19930803	CA19890593136	19890308
CA2029909 AA	19901121	CA19902029909	19900410
DE68909234 D1	19931021	DE19896009234	19890303
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DE69002907 D1	19930930	DE19906002907	19900410
DE69002907 T2	19931223	DE19906002907T	19900410
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EP0415935 B1	19930915	EP19890903557	19890303
EP0420967 A1	19910410	EP19900906711	19900410
EP0420967 A4	19910911	EP19900906711	19900410
EP0420967 B1	19930825	EP19900906711	19900410
JP3505345 T2	19911121	JP19900506464	19900410
JP3505594 T2	19911205	JP19890503373	19890303
US4820404 A	19890411	US19870014964	19870217
US4917790 A	19900417	US19890335643	19890410
US4973452 A	19901127	US19890319443	19890306
US5128109 A	19920707	US19900464069	19900112
WO9009842 A1	19900907	WO1989US01012	19890303
WO9012077 A1	19901018	WO1990US01947	19900410
ZA8901738 A	19901128	ZA19890001738	19890307

Priority:

US19850814714 19851230	US19870014964 19870217	AU19890032807 19890303
EP19890903557 19890303	WO1989US01012 19890303	US19890319443 19890306
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US19900464069 19900112	WO1990US01947 19900410	

Probable Assignee: MOBIL OIL CORP**Assignee(s):** (std): MOBIL OIL CORP ; OWEN HARTLEY**Assignee(s):** MOBIL OIL CORP NEW YORK N Y US**Inventor(s):** (std): OWEN HARTLEY ; HARTLEY OWEN**Inventor(s):** OWEN HARTLEY BELLE MEAD NJ 08502 US**Agent(s):** PHILLIPS ORMONDE FITZPATRICK; KIRBY EADES GALE BAKER**Designated states:** AT AU BE CA CH DE DK ES FR GB IT JP LU NL SE**22) Family number: 5008732** (US5110450A)

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Title: Coal extract hydroconversion process comprising solvent enhanced carbon monoxide pretreatment**Abstract:** An improved process for the hydroconversion of coal, wherein coal is slurried in an organic solvent and subjected

to pretreatment with carbon monoxide, followed by separation of a solvent-soluble phase comprising hydrocarbon material from the coal, and subsequently hydroconverting the extracted material in a hydroconversion reactor. The extracted material consists of a relatively hydrogen-rich material which is readily hydroconverted to valuable liquid products in high yield. The coal residue is relatively hydrogen deficient material which can be gasified to produce hydrogen and carbon monoxide for the hydroconversion and pretreatment stages, respectively.

Classifications:

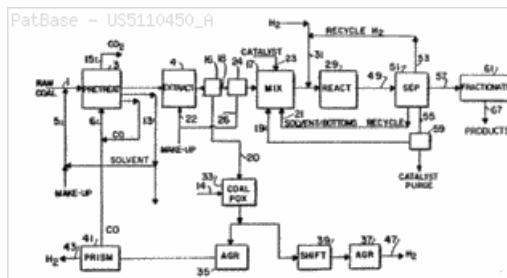
International (IPC 8-9): C10G1/00 C10G1/08 (Advanced/Invention); C10G1/00 (Core/Invention)

International (IPC 1-7): C10G1/02

CPC: C10G1/00 C10G1/006 C10G1/086

European: C10G1/00 C10G1/00D C10G1/08D

US: 208/412 208/413 208/414 208/420 208/424 208/430 208/433 208/435



Family:

Publication number	Publication date	Application number	Application date
US5110450 A	19920505	US19890455653	19891221

Priority:

US19890455653 19891221

Probable Assignee: EXXON MOBIL CORP

Assignee(s): (std): EXXON MOBIL CORP ; EXXON RESEARCH ENGINEERING CO

Assignee(s): EXXON RESEARCH AND ENGINEERING CO ; EXXON RESEARCH AND ENGINEERING COMPANY

Inventor(s): (std): CULROSS CLAUDE C ; REYNOLDS STEVE D

23) Family number: 44153745 (US2009326303A)

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Title: PROCESS FOR USING IRON OXIDE AND ALUMINA CATALYST FOR SLURRY HYDROCRACKING

Abstract: A process and apparatus is disclosed for converting heavy hydrocarbon feed into lighter hydrocarbon products. The heavy hydrocarbon feed is slurried with a catalyst comprising iron oxide and alumina to form a heavy hydrocarbon slurry and hydrocracked to produce lighter hydrocarbons. The iron oxide and alumina catalyst does not require as much iron content relative to non-gaseous material in the reactor to obtain useable products.

Classifications:

International (IPC 8-9): B01J21/04 B01J23/94 C07C4/02 C10G45/04 C10G47/04 C10G47/26 (Advanced/Invention);

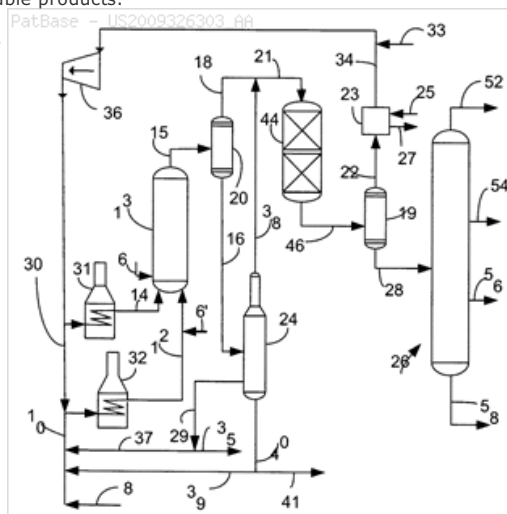
B01J21/00 B01J23/90 C07C4/00 C10G45/02 (Core/Invention)

CPC: C10G2300/301 C10G2300/4025 C10G47/04 B01J23/745

B01J27/043 C10G47/26

European: B01J23/745 B01J27/043 C10G47/04 C10G47/26

US: 208/208.00R 208/208R 208/217 208/244 208/295 502/400 502/406 502/414 502/415 585/653 585/653P



Family:

Publication number	Publication date	Application number	Application date
CA2727874 AA	20100107	CA20092727874	20090520
CA2727874 C	20150224	CA20092727874	20090520
CN102076825 A	20110525	CN200980125258	20090520
CN105694958 A	20160622	CN201610076814	20090520
EP2291490 A2	20110309	EP20090773966	20090520
EP2291490 A4	20140618	EP20090773966	20090520
MX2010013890 A1	20110121	MX20100013890	20090520
US2009326303 AA	20091231	US20080165184	20080630
US8123933 BB	20120228	US20080165184	20080630
WO10002514 A2	20100107	WO2009US44645	20090520
WO10002514 A3	20100225	WO2009US44645	20090520

Priority:

US20080165184 20080630

CN200980125258 20090520

WO2009US44645 20090520

Probable Assignee: UOP LLC

Assignee(s): (std): BHATTACHARYYA ALAKANANDA ; MEZZA BECKAY J ; UNIVERSAL OIL PRODUCTS CO ; UOP LLC

Inventor(s): (std): ALAKANANDA BHATTACHARYYA ; BHATTACHARYYA ALAKANANDA ; MEZZA BECKAY J

Inventor(s): BECKAY J MEZZA

Agent(s): MACRAE AND CO; HAYES ADRIAN CHETWYND; HONEYWELL/UOP,PATENT SERVICES; HONEYWELL UOP PATENT SERVICES; JAMES C; UOP LLC

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 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 ST SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

24) Family number: 50015821 (US2011293510A)

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Title: AMMONIA FLAME CRACKER SYSTEM, METHOD AND APPARATUS

Abstract: Apparatus, methods and systems reside in the decomposition of ammonia into a hydrogen gas mixture. A premixed, ammonia-rich gaseous mixture of anhydrous ammonia and air enters into a conduit within which combustion and decomposition of a portion of the mixture is initiated, thereby liberating heat and hydrogen. The hydrogen mixes with the bulk of the gas mixture and the liberated heat drives the combustion reaction to completion, including portions of the gas not associated with the initial combustion and decomposition process. A mixture of gaseous products resulting from the reaction is expelled from the outlet of the conduit, the mixture including non-combusted hydrogen gas, which may then be used for other purposes. In the preferred embodiment, combustion and decomposition of a portion of the mixture is initiated with a heating element disposed within the conduit.

Classifications:

International (IPC 8-9): B01D53/22 B01J19/00 B01J19/24 B01J7/00 C01B3/00 C01B3/02 C01B3/04 C01B3/06 C01C3/02

H01M8/06 (Advanced/Invention);

C01B3/04 (Advanced/Non-invention)

CPC: B01J19/2415 B01J19/244 B01J19/2485 B01J2219/00117

B01J2219/00153 B01J2219/00157 B01J2219/00159 F23D14/62

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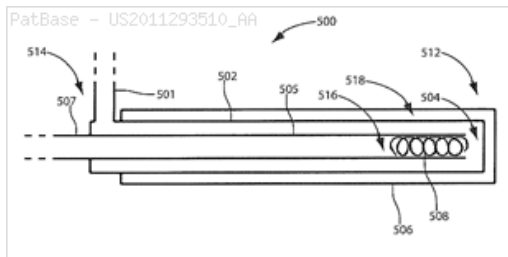
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European: C01B3/04C C01B3/22 M01B203/02F2 M01B203/02F4 M01B203/08B6

US: 422/105 422/105S 422/119 422/129 422/129S 422/187 422/198

422/198S 422/199 422/206 423/237 423/351 423/648.1 423/658.2 423/658.200P 423/658.200S 429/408 429/408P 429/415



Family:

Publication number	Publication date	Application number	Application date
US2011293510 AA	20111201	US20110117532	20110527
US2012148925 AA	20120614	US20120370910	20120210
US2012276463 AA	20121101	US20120537125	20120629
US2014105816 AA	20140417	US20130132953	20131218
US8623285 BB	20140107	US20120537125	20120629
US8691182 BB	20140408	US20120370910	20120210
US8961923 BB	20150224	US20130132953	20131218
WO11150370 A2	20111201	WO2011US38409	20110527
WO11150370 A3	20120329	WO2011US38409	20110527
WO13119281 A1	20130815	WO2012US62570	20121030

Priority:

US20100348898P 20100527 US20100419490P 20101203 US20110117532 20110527
US20120370910 20120210 US20120537125 20120629 US20130132953 20131218

Probable Assignee: GILLESPIE DONALD E

Assignee(s): (std): GILLESPIE DONALD E ; GRANNELL SHAWN

Inventor(s): (std): GILLESPIE DONALD E ; GRANNELL SHAWN

Agent(s): GIFFORD KRASS SPRINKLE ANDERSON AND CITKOWSKI PC; POSA JOHN G 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 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 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

25) Family number: 29324910 (US2003196932A)

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Title: PROCESS AND APPARATUS FOR UPGRADING FCC PRODUCT WITH ADDITIONAL REACTOR WITH THOROUGH MIXING

Abstract: A process and apparatus are disclosed contacting hydrocarbon feed with catalyst in a reactor vessel under conditions more vigorous than bubbling bed conditions and preferably fast fluidized flow conditions. The vigorous conditions assure thorough mixing of catalyst and feed to suppress formation of dry gas and the promotion of hydrogen transfer reactions.

Classifications:

International (IPC 8-9): B01J8/00 B01J8/06 B01J8/18 B01J8/24

B01J8/26 B01J8/28 C07C1/00 C07C1/20 C10G11/00 C10G11/18

C10G3/00 C10G51/06 F23C10/00 F27B15/00

F27B15/08 (Advanced/Invention);

F27B15/08 (Advanced/Non-invention);

B01J8/00 B01J8/24 C07C1/00 C10G11/00 C10G3/00 (Core/Invention)

International (IPC 1-7): B01J8/00 B01J8/18 B01J8/26 B01J8/28

C07C1/00 C07C1/20 C07C1/24 C07C1/32 C07C11/02 C10G11/00

C10G11/18 C10G3/00 C10G57/00 F23C11/02 F27B15/00 F27B15/08

CPC: B01J8/1854 B01J8/1863 B01J8/26 B01J8/34 B01J8/386

B01J8/388 C10G3/62 C10G3/42 C10G3/45 C10G3/57 C10G3/60

C10G3/49 C10G2300/802 C10G2400/20 C10G2400/22 B01J8/06

B01J8/065 B01J8/1818 B01J8/0065 B01J2208/00548

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C10G11/18 B01J8/1809 B01J8/0055 B01J8/1827 B01J8/28

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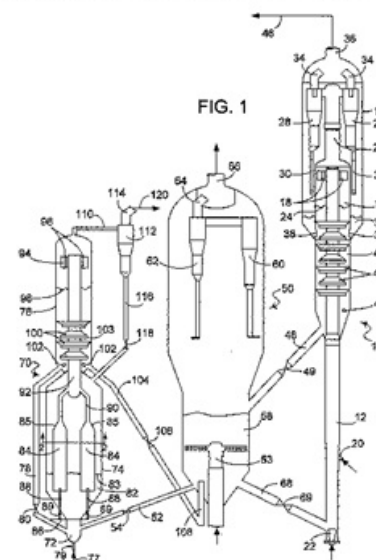
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US: 208/113 208/139 208/146 208/152 208/153 208/155 208/161 208/164 208/46 208/46S 208/67 208/67P 208/7 208/70 208/70S 208/73 208/74 208/75 208/76 208/77 208/78 208/78S 422/110 422/110S 422/139 422/139P 422/139S 422/140 422/141 422/141S 422/142 422/142S 422/143 422/144 422/144S 422/145 422/145P 422/145S 422/146 422/147 422/147S 422/196 422/197 502/34 502/38 585/638 585/639 585/640 585/641 585/642

PatBase - US2003196932_AA

Patent Application Publication Oct. 23, 2003 Sheet 1 of 2 US 2003/0196932 A1

FIG. 1



Family:

Publication number	Publication date	Application number	Application date
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CN1831091 A	20060913	CN200610007781	20030418
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US2004104148 AA	20040603	US20020327214	20021220
US2004104149 AA	20040603	US20020327279	20021220
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WO04058388 A2	20040715	WO2003US41203	20031219
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WO04058388 C2	20041229	WO2003US41203	20031219

Priority:

US19990378416 19990820 CA20002316325 20000818 US20000670661 20000927
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US20040006856 20041208 US20050291603 20051201 US20070668300 20070129

Probable Assignee: UOP LLC

Assignee(s): (std): LOMAS DAVID A ; MILLER LAWRENCE W ; UNIVERSAL OIL PRODUCTS CO ; UOP LLC

Assignee(s): UOP LLC DES PLAINES ; UOP LLC PO BOX

Inventor(s): (std): LOMAS DAVID A ; MILLER LAWRENCE W ; LAWRENCE W MILLER ; DAVID A LOMAS ; LOMAS DAVID A MILLER LAWRENCE

Inventor(s): MILLER LAWRENCE ; LOMAS DAVID A DES PLAINES ; MILLER LAWRENCE W DES PLAINES ; LOMAS DAVID ALFRED ; LOMAS DAVID ; UOP L L C ; DAVID ALFRED LOMAS

Agent(s): WATERMARK PATENT AND TRADE MARKS ATTORNEYS; WATERMARK INTELLECTUAL PROPERTY PTY LTD; MACRAE AND CO; VILLASECA; BOULT WADE TENNANT; CHUNG HSU MIN; JOHN G TOLOMEI PATENT DEPARTMENT UOP LLC; JOHN G TOLOMEI PATENT DEPARTMENT, UOP LLC; HONEYWELL INTELLECTUAL PROPERTY INC, PATENT SERVICES; HONEYWELL INTELLECTUAL PROPERTY INC PATENT SERVICES; JAMES C; JOHN G; PASCHALL JAMES C

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

26) Family number: 22772916 (US3193494A)

© PatBase

Title: PROGRESSIVE FLOW CRACKING OF CONTAMINATED HYDROCARBON FEEDSTOCKS

Abstract: (Claim 1) It is claimed-. 1. A method for cracking _hydrocarbons which comprises introducing a suspension of finely divided catalyst in the vapors of hydrocarbons boiling in the gasoil ran,_e, ht a catalytic cracking temperature into an elongated reaction path and at a later point in the said reaction path introducing a normally liquid heavy hydrocarbon containing more than about _one p.p.m.

Classifications:

International (IPC 8-9): C10G11/18 (Advanced/Invention); C10G11/00 (Core/Invention)

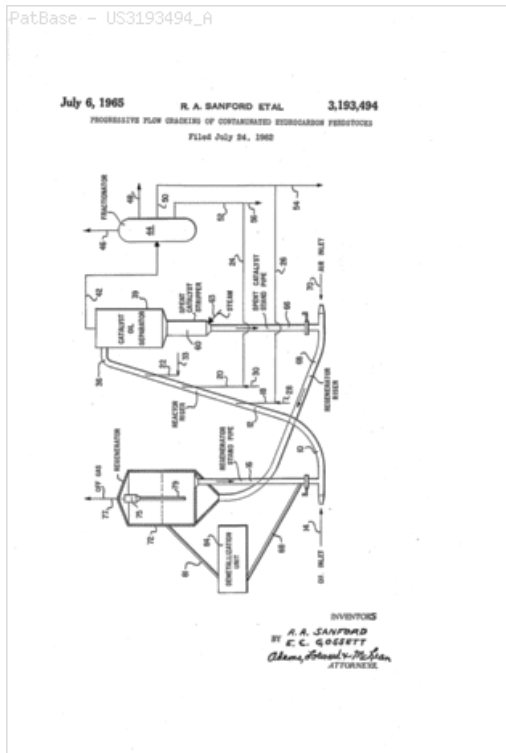
International (IPC 1-7): C10G11/16

CPC: C10G11/18

European: C10G11/18

US: 208/113 208/120.2 208/120.35

PatBase - US3193494_A



Family:

Publication number	Publication date	Application number	Application date
US3193494 A	19650706	US19620212054	19620724

Priority:

US19620212054 19620724

Probable Assignee: SINCLAIR RESEARCH INC
Assignee(s): (std): SINCLAIR RESEARCH INC
Inventor(s): (std): SANFORD ROBERT A ; GOSSETT EARL C

27) Family number: 3302935 (US5000841A)

© PatBase

Title: Heavy oil catalytic cracking process and apparatus

Abstract: A fluidized catalytic cracking process operates with a hot stripper to improve stripping of spent catalyst from the FCC process. The catalyst from the hot stripper is cooled by direct contact heat exchange with a source or cooled regenerated catalyst. Cooled catalyst may contact hot, stripped catalyst in the base of the stripper or downstream of the stripper. The cooled, stripped catalyst has reduced hydrogen, sulfur and coke content, improves regeneration efficiency, and reduces hydrothermal degradation of catalyst.

Classifications:

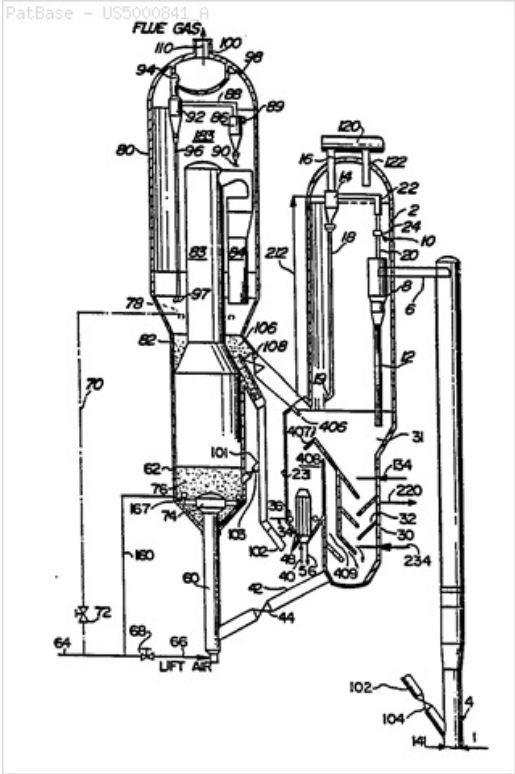
International (IPC 8-9): B01J29/08 B01J38/12 B01J8/18
C10G11/18 (Advanced/Invention);
B01J29/00 C10G11/00 (Core/Invention)

International (IPC 1-7): B01J29/08 B01J38/12 B01J38/32 B01J38/38
B01J8/18 C10G11/05 C10G11/18

CPC: C10G11/18

European: C10G11/18

US: 208/113 208/150 208/159 208/164 422/144 502/40 502/44



Family:

Publication number	Publication date	Application number	Application date
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AU626417 B2	19920730	AU19900054419	19900406
CA2029910 AA	19901121	CA19902029910	19900406
EP0419639 A1	19910403	EP19900906597	19900406
JP3505601 T2	19911205	JP19900506197T	19900406
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Priority:

US19890335642 19890410 WO1990US01881 19900406

Probable Assignee: MOBIL OIL CORP
Assignee(s): (std): MOBIL OIL CORP
Assignee(s): OWEN HARTLEY
Inventor(s): (std): OWEN HARTLEY
Inventor(s): HARTLEY OWEN
Agent(s): PHILLIPS ORMONDE FITZPATRICK; KIRBY EADES GALE BAKER
Designated states: AT AU BE CA CH DE DK ES FR GB IT JP LU NL SE

28) Family number: 23917947 (US2003068260A)

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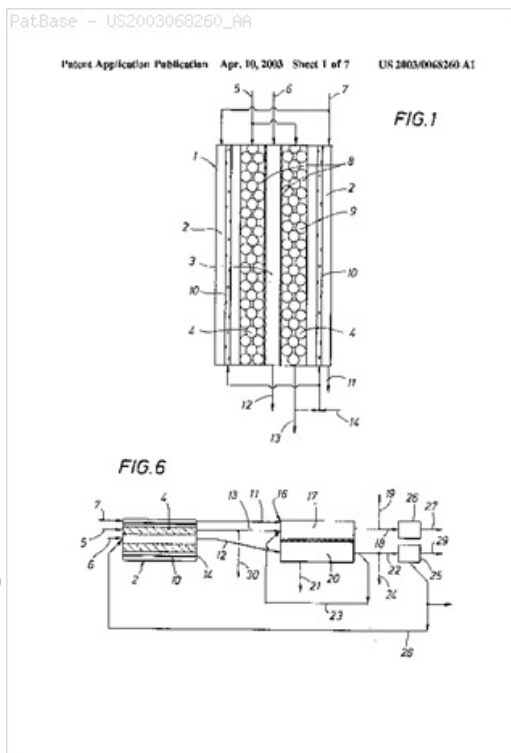
Title: INTEGRATED FLAMELESS DISTRIBUTED COMBUSTION/MEMBRANE STEAM REFORMING REACTOR AND ZERO EMISSIONS HYBRID POWER SYSTEM

Abstract: Disclosed is a new integrated flameless distributed combustion-membrane steam reforming (FDC-MSR) reactor apparatus for steam reforming of any vaporizable hydrocarbon to produce H₂ and CO₂, with minimal CO, and virtually no CO in the H₂ stream. The flameless distributed combustion drives the steam reforming reaction which provides great improvements in heat exchange efficiency and load following capabilities. A further embodiment of the invention involves a zero emission hybrid power system wherein the produced hydrogen is used to power a high-pressure internally manifolded molten carbonate fuel cell. In addition, the design of the FDC-SMR powered fuel cell makes it possible to capture good concentrations of CO₂ for sequestration or use in other processes.

Classifications:

International (IPC 8-9): B01D53/22 B01D69/10 B01D71/02

B01J19/24 B01J8/00 B01J8/02 B01J8/06 C01B3/32 C01B3/38
C01B3/48 C01B3/50 C01B3/56 C01B31/20 C01B32/50
H01M8/06 (Advanced/Invention);
B01J23/755 B01J35/06 (Advanced/Non-invention);
B01D53/22 B01D69/00 B01D71/00 B01J19/24 B01J8/00 B01J8/02
C01B3/00 C01B31/00 H01M8/06 (Core/Invention);
B01J23/755 B01J35/00 (Core/Non-invention)
International (IPC 1-7): B01D53/22 B01D69/10 B01D71/02
B01J19/24 B01J8/02 B01J8/04 B01J8/06 C01B3/00 C01B3/12
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CPC: H01M8/0618 B01D63/06 C01B2203/0475 C01B2203/048
Y02P20/126 Y02P20/129 Y02P20/152 Y02P30/30 B01D53/22
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US: 252/353 422/188 422/188S 422/189 422/189S 422/192 422/192P 422/600 422/600P 423/652 423/652P



Family:

Publication number	Publication date	Application number	Application date
AR032947 AA	20031203	AR2002P100783	20020305
AU2002249256 AA	20020919	AU20020249256	20020304
CA2439773 AA	20030904	CA20022439773	20020304
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EP1365990 A2	20031203	EP20020718175	20020304
JP2004531440 T2	20041014	JP20020569735T	20020304
NO20033904 A	20031031	NO20030003904	20030904
NO20033904 A0	20030904	NO20030003904	20030904
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US2003068260 AA	20030410	US20020091108	20020305
US2003068269 AA	20030410	US20020091104	20020305
US6821501 BB	20041123	US20020091104	20020305
WO02070402 A2	20020912	WO2002EP02367	20020304
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Priority:

US20010273353P 20010305 US20010273354P 20010305 WO2002EP02367 20020304
US20020091104 20020305 US20020091108 20020305

Probable Assignee: SHELL OIL CO

Assignee(s): (std): SHELL CANADA LTD ; SHELL INT RESEARCH ; SHELL OIL CO ; SHELL INT RESEARCH MIJ BV

Assignee(s): SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ BESLOTEN VENNOOTSAP ; WELLINGTON SCOTT LEE ; SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ BV ; WARD JOHN MICHAEL ; MATZAKOS ANDREAS NIKOLAOS ; MIKUS THOMAS ; SHELL CANADA LIMITED ; SHELL INT RESEARCHMAATSCHAPPIJ BV ; SHELL OIL COMPANY ; SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ B V ; SHELL INTERNATIONALE RESEARCHMAATSCHAPPIJ B V

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Inventor(s): THOMAS MIKUS ; SCOTT LEE WELLINGTON ; ANDREAS NIKOLAOS MATZAKOS ; JOHN MICHAEL WARD

Agent(s): SMART AND BIGGAR

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

29) Family number: 22071999 (US2844516A)

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Title: COMBINED HYDRODESULFURIZATION AND REFORMING PROCESS AND APPARATUS THEREFOR

Abstract: (Claim 1) 1. A process for the simultaneous desulfurization and reforming of gas-oil and naphtha hydrocarbon fractions in the presence of

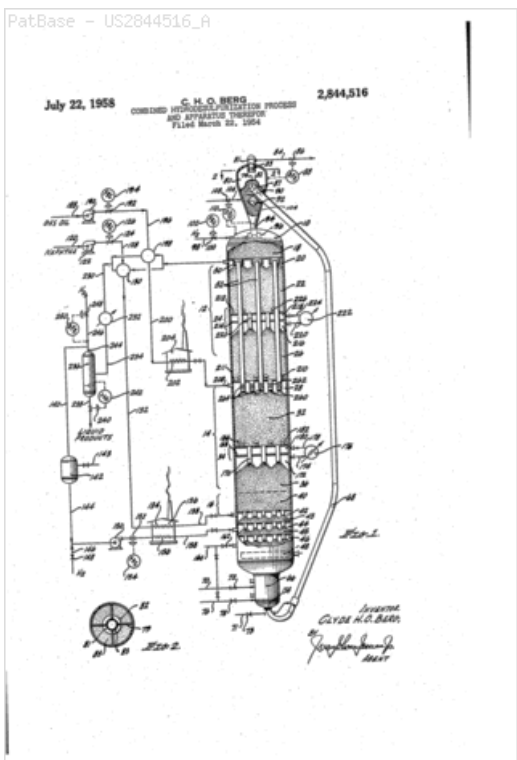
Classifications:

International (IPC 8-9): C10G35/12 C10G69/08 (Advanced/Invention);
C10G35/00 C10G69/00 (Core/Invention)

International (IPC 1-7): C10G34/00

CPC: B01J8/12 C10G35/12 C10G69/08

European: B01J8/12 C10G35/12 C10G69/08



Family:

Publication number	Publication date	Application number	Application date
US2844516 A	19580722	US19540417568	19540322

Priority:

US19540417568 19540322

Probable Assignee: UNION OIL CO

Assignee(s): (std) UNION OIL CO

Assignee(s): UNION OIL CO OF CALIFORNIA ; UNION OIL COMPANY OF CALIFORNIA

Inventor(s): (std) BERG CLYDE H O