

1) Family number: 59449041 (US2015158796A)

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Title:	METHOD AND SYSTEM FOR SEPARATING A FEED STREAM WITH A FEED STREAM DISTRIBUTION MECHANISM					
Priority:	US20130912957P 20131206	US20130912959P 20131206	US20130912975P 20131206	US20130912964P 20131206	US20130912978P 20131206	US20130912986P 20131206
	US20130912983P 20131206	US20130912984P 20131206	US20130912986P 20131206	US20130912987P 20131206	US20140516686 20141017	US20140516686 20141017
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	WO2014US61017 20141017	WO2014US61011 20141017	WO2014US61039 20141017	WO2014US61031 20141017	WO2014US61021 20141017	WO2014US61021 20141017
	WO2014US61002 20141017					

Family:	Publication number	Publication date	Application number	Application date
	AU2014357663 AA	20160623	AU20140357663	20141017
	AU2014357663 BB	20161222	AU20140357663	20141017
	AU2014357665 AA	20160623	AU20140357665	20141017
	AU2014357665 BB	20170622	AU20140357665	20141017
	AU2014357666 AA	20160623	AU20140357666	20141017
	AU2014357666 BB	20170810	AU20140357666	20141017
	AU2014357667 AA	20160623	AU20140357667	20141017
	AU2014357667 BB	20171005	AU20140357667	20141017
	AU2014357668 AA	20160623	AU20140357668	20141017
	AU2014357668 BB	20170525	AU20140357668	20141017
	AU2014357669 AA	20160623	AU20140357669	20141017
	AU2014357669 BB	20171221	AU20140357669	20141017
	AU2014357670 AA	20160707	AU20140357670	20141017
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	CA2924695 C	20181002	CA20142924695	20141017
	CA2925404 AA	20160323	CA20142925404	20141017
	CA2925404 C	20180206	CA20142925404	20141017
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	CA2925406 C	20171121	CA20142925406	20141017
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	CA2925410 C	20180206	CA20142925410	20141017
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	NO20160904 A	20160526	NO20160000904	20160526

US2015158796 AA	20150611	US20140516709	20141017
US2015159939 AA	20150611	US20140516686	20141017
US2015159940 AA	20150611	US20140516705	20141017
US2015159941 AA	20150611	US20140516713	20141017
US2015159942 AA	20150611	US20140516731	20141017
US2015159943 AA	20150611	US20140516683	20141017
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US2015159945 AA	20150611	US20140516717	20141017
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US9874395 BB	20180123	US20140516713	20141017
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WO15084494 A2	20150611	WO2014US61002	20141017
WO15084494 A3	20160121	WO2014US61002	20141017
WO15084495 A2	20150611	WO2014US61004	20141017
WO15084495 A3	20160317	WO2014US61004	20141017
WO15084496 A2	20150611	WO2014US61011	20141017
WO15084496 A3	20151126	WO2014US61011	20141017
WO15084497 A2	20150611	WO2014US61017	20141017
WO15084497 A3	20151223	WO2014US61017	20141017
WO15084498 A2	20150611	WO2014US61021	20141017
WO15084498 A3	20151217	WO2014US61021	20141017
WO15084499 A2	20150611	WO2014US61031	20141017
WO15084499 A3	20151126	WO2014US61031	20141017
WO15084500 A1	20150611	WO2014US61034	20141017
WO15084501 A2	20150611	WO2014US61039	20141017
WO15084501 A3	20160225	WO2014US61039	20141017

Probable Assignee: EXXON MOBIL CORP

Assignee(s):(std): CULLINANE J TIM ; DECKMAN HARRY W ; DENTON ROBERT D ; EXXONMOBIL UPSTREAM RES CO ; MAHER DAVID W ; GRAVE EDWARD J ; EXXONMOBIL UPSTREAM RES COMPNAY ; EXXONMOBIL UPSTREAM RESEACH CO ; EXXON MOBIL CORP ; VALENCIA JAIME A ; NORTHROP PAUL SCOTT ; NOTHROP PAUL SCOTT ; SMITH RANSDALL K ; SMITH RANSDALL KEITH ; MART CHARLES J ; WILKINS JAMES T

Assignee(s): EXXONMOBIL UPSTREAM RESEARCH COMPNAY ; EXXONMOBIL UPSTREAM RESEARCH CO ; CULLINANE J

Inventor(s):(std): CULLINANE J TIM ; DECKMAN HARRY W ; DENTON ROBERT D ; GRAVE EDWARD J ; MAHER DAVID W ; MART CHARLES J ; NORTHROP PAUL SCOTT ; NOTHROP PAUL SCOTT ; SMITH RANSDALL K ; SMITH RANSDALL KEITH ; VALENCIA JAIME A ; VALENCIA JAMIE A ; WILKINS JAMES T

Inventor(s): PAUL SCOTT NORTHROP ; RANSDALL KEITH SMITH ; HARRY W DECKMAN ; JAIME A VALENCIA ; JAMES T WILKINS ; DAVID W MAHER ; CHARLES J MART ; CULLINANE J

Agent(s): WATERMARK PATENT AND TRADE MARKS ATTORNEYS; WATERMARK INTELLECTUAL PROPERTY PTY LTD; BORDEN LADNER GERVAIS LLP; ADRIO RIVADI SETIAWAN LLB; WINITA E KUSNANDAR SH MBA; GATOT SANYOTO WA SH; GATOT SANYOTO WAHYU ADI SH; EXXONMOBIL UPSTREAM RESEARCH CO LAW DEPARTMENT; EXXONMOBIL UPSTREAM RESEACH CO LAW DEPARTMENT; LOBATO RYAN L 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 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

International class (IPC 8-9): B01D1/20 B01D3/00 B01D3/14 B01D3/22 B01D3/24 B01D3/32 B01D3/42 C07C7/05 C09D127/18 C10G31/06 C10L3/10 C25F3/16 F25J1/00 F25J3/00 F25J3/02 F25J3/06 F25J3/08 (Advanced/Invention); C10L3/10 F25J3/08 (Advanced/Non-invention)

CPC: F25J3/0635 F25J2290/12 F25J3/061 F25J2290/44 F25J3/0209 F25J3/08 F25J2220/66 C10L2290/28 C10L2290/38 F25J3/067 F25J2280/20 F25J3/02 C10L3/10 B01D3/14 B01D3/141 B01D3/146 B01D3/148 B01D3/22 B01D3/24 B01D3/26 B01D3/324 F25J1/0027 B01D3/4211 C10L2290/36 F25J3/0295 F25J2210/04 F25J2210/80 F25J2245/02 F25J2280/10 B01D1/20 B01D3/32 B01D3/42 C07C7/05 C10L2290/545 C10L2290/60 F25J1/0022 C10L3/101 C10L2290/141 C10L3/104 C10L3/106 C10L2290/06 C10L2290/08 C10L2290/541 C10L2290/542 F25J2205/50 F25J2280/02 F25J2220/68 F25J3/0266 F25J3/0233 F25J3/0223 B01D3/143 C10L3/103 B01D3/008 C10L3/102 C10L3/107 C10L2290/18 C10L2290/543 C10L2290/58 F25J2200/02 F25J2200/30 F25J2200/50 F25J2200/74 F25J2200/90 F25J2205/04 F25J2205/20 F25J2235/60 F25J2280/40 F25J2290/40 Y02C10/12

US class: 62/125 62/618 62/620 62/625 62/629

[Classification Explorer](#)

Cited documents: WO13142100 A1, WO13095828 A1, WO12015554 A1, WO11046658 A1, WO11026170 A1, WO10136442 A1, WO1010403, WO10096223 A1, WO10052299 A1, WO10023238 A1, WO10010403 A1, WO09096370 A1, WO09087206 A2, WO09029353 A1, WO09023605 A1, WO08152030 A1, WO08095258 A1, WO08034789 A1, WO04047956 A1, WO0239038 A1, WO0232536 A1, WO0054876 A1, US8529662 BB, US8500105 BB, US8475572 BB, US8428835 BB, US8388832 BB, US8381544 BB, US8372169 BB, US8325338 BA, US8312738 BB, US8308849 BB, US8303685 BB, US8136799 BB, US8133764 BB, US8020408 BB, US8002498 BB, US7955496 BB, US7901583 BB, US7879135 BB, US7814975 BB, US7806965 BB, US7795483 BB, US7770872 BB, US7729976 BB, US7722289 BB, US7691239 BB, US7662215 BB, US7641717 BB, US7637987 BB, US7637984 BB, US7635408 BB, US7597746 BB, US7575624 BB, US7550064 BB, US7536873 BB, US7493779 BB, US7442233 BB, US7442231 BB, US7437889 BB, US7424808 BB, US7325415 BB, US7285225 BB, US7219512 BA, US7211701 BB, US7211128 BB, US7152431 BB, US7128276 BB, US7128150 BB, US7121115 BB, US7073348 BB, US7066986 BB, US7004985 BB, US7001490 BB, US6962061 BB, US6958111 BB, US6946017 BB, US6883327 BB,

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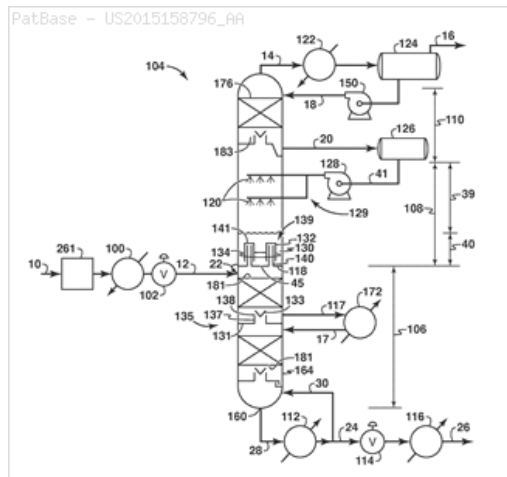
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CN1623074 A, CN1401735 A, CN1238232 A, CN1151011 A, CN102803881 A, CN102471188 A, CN102405275 A,

Forward Citations: WO17093377, WO17052922, WO17052922, US9823017, US2017191748, US10151528, US10006700,

Abstract:

The present disclosure provides a distillation tower for separating a feed stream. The distillation tower includes a controlled freeze zone section having a controlled freeze zone upper section and a controlled freeze zone lower section below the controlled freeze zone upper section. The controlled freeze zone section includes: (a) a spray assembly in the controlled freeze zone upper section; (b) a melt tray assembly in the controlled freeze zone lower section; (c) a feed stream distribution mechanism between the spray assembly and the melt tray assembly. The feed stream distribution mechanism is constructed and arranged to uniformly distribute the feed stream in the controlled freeze zone section.



2) Family number: 59291973 (US2016303502A)

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Title: AN APPARATUS AND METHOD FOR PARTICULATE CAPTURE FROM GAS STREAMS AND A METHOD OF REMOVING SOLUBLE PARTICULATE FROM A GAS

Priority: US20130904500P 20131115 US20140036714 20141114 WO2014NL50784 20141114

Family:

Publication number	Publication date	Application number	Application date
AU2014351079 AA	20160609	AU20140351079	20141114
AU2014351079 BB	20180816	AU20140351079	20141114
CA2930649 AA	20160513	CA20142930649	20141114
CN105916838 A	20160831	CN201480073189	20141114
EA201691005 A1	20160930	EA20160091005	20141114
EP3080076 A1	20161019	EP20140802220	20141114
IN201647018691 A	20160831	IN201647018691	20160531
US2016303502 AA	20161020	US20140036714	20141114

Probable Assignee:

Assignee(s):(std):

Assignee(s):

Inventor(s):(std):

Agent(s):

Designated states:

STAMICARBON BV

STAMICARBON

STAMICARBON BV ; HIGGINS BRIAN SAYRE

HIGGINS BRIAN SAYRE

PHILLIPS ORMONDE FITZPATRICK; FETHERSTONHAUGH AND CO; VO; JANSEN CM

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

International class (IPC 8-9):

CPC:

US class:

Classification Explorer

Cited documents:

Forward Citations:

B01D47/05 B01D47/06 B01D47/10 B01D47/12 B01D53/54 B03C3/013 C07C273/02 (Advanced/Invention)

B01D2247/04 B01D2247/102 B01D2247/103 B01D2247/107 C07C273/16 B01D53/58 B01D2251/506 B01D2252/103 B03C3/013 B01D47/05 B01D47/12 B01D47/06 B01D47/10

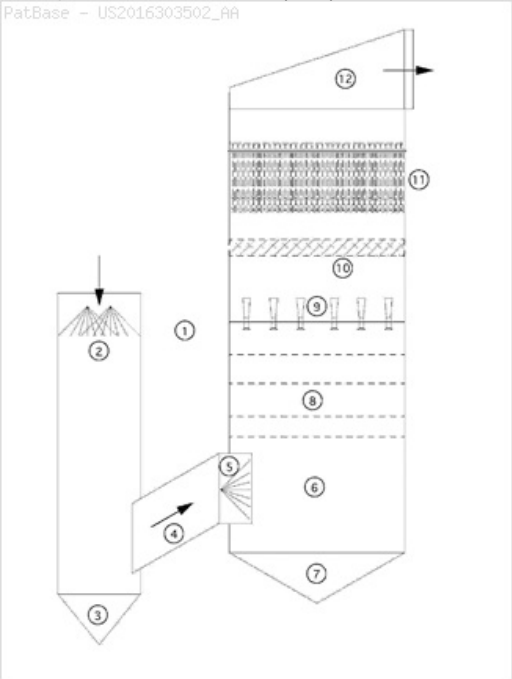
95/65

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WO17196167, WO17111588, WO17111585, US10207216, CN106823742, CN106680054, CN106390670,

Abstract:

Disclosed is a method for the removal of soluble particulate matter from a gas stream, such as urea dust from the off-gas of a finishing section of a urea production plant. The method comprises subjecting the off-gas to at least two quenching stages an aqueous quenching liquid. The quenching liquid used in a first, upstream quench stage, is allowed to have a higher concentration of dissolved particulate matter than the quenching liquid in the second, downstream quench stage. The quenched gas is led through a particle capture zone, typically comprising one or more of a wet scrubber, a Venturi scrubber, and a wet electrostatic precipitator.



3) Family number: 19702867 (US2681799A)

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Title:

Priority:

Family:

RADIAL SPRAY TYPE GAS AND LIQUID SCRUBBER

US19520293251 19520613 US19520295672 19520626

Publication number

Publication date

Application number

Application date

DE1163294 B

19640220

DE1953K018412

19530612

FR1085974 A

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GB721812 A

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GB19530002049

19530123

US2681799 A

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US19520295672

19520626

US2733054 A

19560131

US19520293251

19520613

Probable Assignee:

Assignee(s):(std):

Assignee(s):

Inventor(s):(std):

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HEINRICH KOPPERS GESELLSCHAFT MIT BESCHRAENKTER HAFTUNG ; HEINRICH KOPPERS GES MIT BESCHRAENKTER HAFTUNG ; HEINRICH KOPPERS GESELLSCHAFT MIT BESCHRAENKTER HA ; KOPPERS COMPANY ; KOPPERS COMPANY INC

ACKEREN JOSEPH VAN

International class (IPC) B01D47/06 (Advanced/Invention)

8-9):

International class (IPC) B01D47/06 B01D47/12 B01J10/00 B05B1/34 C10K1/06

1-7):

CPC: B01D47/06

European class: B01D47/06

US class: 261/117 261/21 261/36.1 96/313

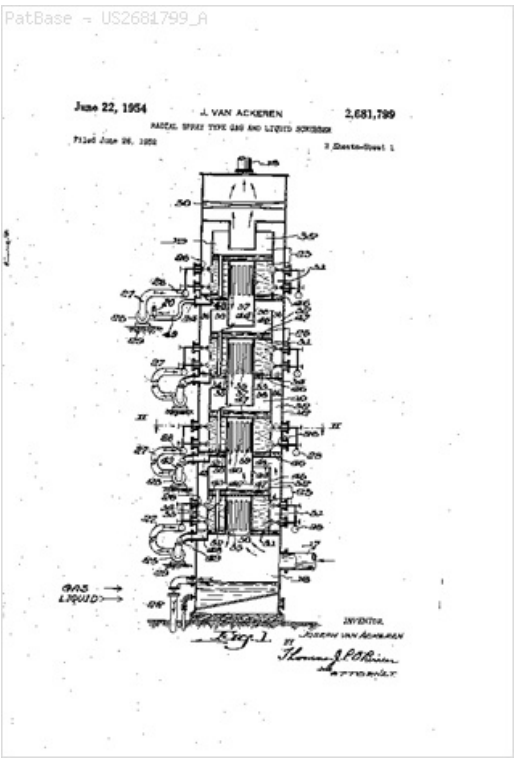
[Classification Explorer](#)

Cited documents: US2523441 A, US2315481 A, US2088817 A, US2070578 A, US1985010 A, US1722466 A, DE709008 A, CH172661 A,

Forward Citations: WO8500231, US8778064, US5527494, US4505722, US3894853, US3893829, US3631656, US3524302, US2868524, US2840182, US2807499, US2008282655, FR2501520, CN101966414,

Abstract:

721,812. Gas washers. KOPPERS CO., Inc. Jan. 23, 1953, [June 13, 1952.] No. 2049/53. Class 55 (2). A counterflow stage-wise gas washer apparatus comprises a tower with a lower gas inlet 17, and upper gas outlet 18, and the stages arranged one above another, each including a lower spray chamber 28 and an upper de-entrainment chamber 29, the spray chamber having one partition 31 with gas distributing inlets 32, and another 34 with restricted outlet orifices 35, the spray nozzles 25 being located close to and ordinarily terminating downstream of the orifices so as to cover them with the finest part of the spray, and the de-entrainment chamber being of such dimensions that the gas velocity therein is at least as low as that before the gas passed through the orifices. In the form shown the tower provides two passes 10, 11 with an intervening downcomer 13, and the gas rises vertically through each chamber of each stage. In another construction the partitions are vertically disposed near opposite ends of the spray chamber, the nozzles being mounted in the tower wall and directing spray through the orifices and across the chamber. Liquid collecting in the spray chambers is recirculated by pumps 24 to the nozzles, together with surplus brought down by overflow pipes 39 from the stage above, and that deposited in the de-entrainment chamber, which mingles with the spray in the orifices 35. A mist eliminator is provided beyond the last stage. The washer may be used for scrubbing benzol or other products from coke oven gas or as a cooler or for stripping liquid by means of gas, e.g. stripping phenol from ammonia liquor.



4) Family number: 19783358 (GB731230A)

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Title: Improvements in or relating to a method and apparatus for contacting liquid and vaporous materials

Priority: 19530522

Family:

Publication number	Publication date	Application number	Application date
GB731230 A	19550601	GB19530026337	19530924

Probable Assignee: STANDARD OIL DEV CO

Assignee(s):(std): STANDARD OIL DEV CO

Assignee(s): STANDARD OIL DEVELOPMENT COMPANY

International class (IPC) B01D47/06 (Advanced/Invention);

8-9): B01D47/06 (Core/Invention)

CPC: B01D47/06

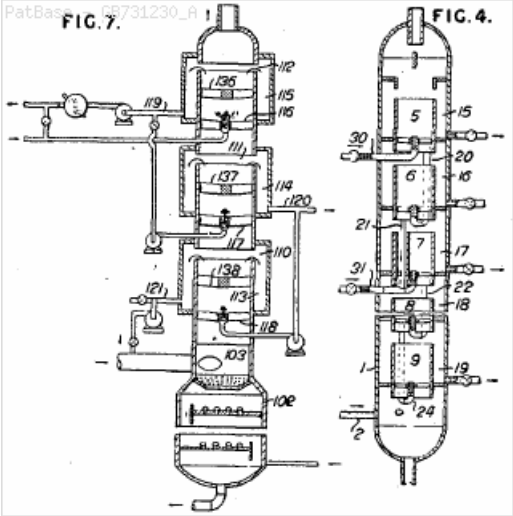
European class: B01D47/06

[Classification Explorer](#)

Forward Citations: US2847083,

Abstract:

731,230. Centrifugal machines. STANDARD OIL DEVELOPMENT CO. Sept. 24, 1953 [May 22, 1953], No. 26337/53. Class 23. [Also in Group XII] Liquids and vapours are brought into contact in fractionation or absorbing processes c. by causing a vapour stream to progress spirally through a cylindrical zone and disperse into droplets a liquid stream introduced at a point on the longitudinal axis, the droplets being flung to and propelled along the zone wall and collected as they pass through an opening in it. The angle of swirl of the vapour stream is maintained by at least one set of transverse vanes extending radially from the axis to the periphery of the zone. A mixed vapour and liquid feed is introduced tangentially through a pipe 2 into a fractionation vessel 1 in which superposed tubes 5... 9 provide a succession of contact zones each having near their inlet radial and preferably overlapping vanes which may be flat curved or hollow, for causing the vapour to swirl at an angle of about 30-55 degrees above the horizontal. Condensate escapes over the top of the tubes into annular spaces 15... 19 from which it is drawn off, or some or all may be returned to the preceding zone through downcomers 20, 21, 22, 24; supplementary liquid may be fed through lines 30, 31. In a modification liquid is introduced through the vanes into a hollow hub whence it falls on to a dispersion plate. Another construction has a preceding stripping section 102 of bubble cap plates c. and a flash zone 103 into which feed material is tangentially introduced. The contact zones are separated by circumferential gaps 110, 111, 112, opening into receiver chambers 113, 114, 115 having condensate draw-off pipes 121, 120, 119, and in addition to vaned elements 116, 117, 118 at the upstream end of the zone, similar elements 136, 137, 138 are provided between the inlet and outlet of the zone. Externally driven rotary vanes may replace the stationary vanes.



5) Family number: 47904061 (US2012097031A)

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Title: GAS SCRUBBER APPARATUS AND METHOD
Priority: US20090200352P 20090625 US20090220352P 20090625 EP20100791121 20100625
WO2010CA00988 20100625 US20100380449 20100625

Family:	Publication number	Publication date	Application number	Application date
	AP201206097 A0	20120229	AP20120006097	20100625
	AU2010265768 AA	20101229	AU20100265768	20100625
	CA2798881 AA	20121108	CA20102798881	20100625
	CA2798881 C	20171114	CA20102798881	20100625
	CL2011003303 A1	20120713	CL20110003303	20111226
	CL51075 B	20150803	CL20110003303	20111226
	CN102497918 A	20120613	CN201080037844	20100625
	CN102497918 B	20140604	CN201080037844	20100625
	CO6491064 A2	20120731	CO20120008050	20120120
	CR20120046 A	20120601	CR20120000046	20120124
	CU20110242 A7	20120621	CU20110000242	20111226
	DE602010022647 D1	20150409	DE201060022647T	20100625
	DOP2011000401 A	20120815	DO20110000401	20111222
	EA021020 B1	20150331	EA20120070072	20100625
	EA201270072 A1	20120629	EA20120070072	20100625
	EP2509701 A1	20121017	EP20100791121	20100625
	EP2509701 A4	20131016	EP20100791121	20100625
	EP2509701 B1	20150225	EP20100791121	20100625
	IL217126 A0	20120229	IL20100217126	20100625
	IN00662DN2012 A	20160831	IN2012DN00662	20120123
	JP2012530593 T2	20121206	JP20120516453T	20100625
	JP5631985 B2	20141126	JP20120516453T	20100625
	KR101742834 B1	20170615	KR20127001887	20100625
	KR20120096457 A	20120830	KR20127001887	20100625
	MA33456 B1	20120703	MA20120034567	20120123
	MX2012000085 A1	20120717	MX20120000085	20100625
	MY160053 A	20170215	MY20110006251	20100625
	NZ597780 A	20140131	NZ20100597780	20100625
	PE09222012 A1	20120802	PE20110002170	20100625
	PE12422013 A1	20131116	PE20130000522	20100625
	SG176980 A1	20120228	SG20110095841	20100625
	TN2011000665 A1	20130524	TN20110000665	20111223
	UA110014 C2	20151110	UA20120000781	20100625

US2012097031 AA	20120426	US20100380449	20100625
US8940079 BB	20150127	US20100380449	20100625
VN17132 A1	20170825	VN20120001553	20100625
WO10148513 A1	20101229	WO2010CA00988	20100625
ZA201200629 A	20121031	ZA20120000629	20120125

Probable Assignee: PACIFIC GREEN TECHNOLOGIES INC

Assignee(s):(std): AL MAGHRIBI RIAD ISSA ; ENVIRORESOLUTIONS INC ; ENVIRORESOLUTIONS INC ; MCCLELLAND KENNETH JAMES ; SICHEL LTD ; PACIFIC GREEN TECHNOLOGIES INC

Assignee(s): ENVIRORESOLUTIONS INC VANCOUVER ; SICHEL LIMITED

Inventor(s):(std): JAMES MCCLELLAND KENNETH ; KENNETH JAMES MCCLELLAND ; MCCLELLAND KENNETH JAMES

Inventor(s): MCCLELLAND KENNETH JAMES

Agent(s): PATENT ATTORNEY SERVICES; BURRI STEPHEN R; MONSALVE PI AND CIA ABOGADOS; ELIANA MARIA REYES FERNANDEZ; KRAJNYAK ANDRAS; ISLAND IP LAW; STEPHEN R; BURRI STEPHEN ROBERT

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 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

International class (IPC 8-9): B01D B01D19/00 B01D46/00 B01D47/00 B01D47/02 B01D47/06 B01D51/00 B01D53/14 B01D53/18 B01D53/34 B01D53/48 B01D53/50 B01D53/54 B01D53/60 B01D53/62 B01D53/77 B01D53/78 F23R (Advanced/Invention); B01D (Subclass/Invention)

International class (IPC 1-7): B01D47/02 B01D47/06 B01D53/14 B01D53/18 B01D53/48 B01D53/54 B01D53/62

CPC: B01D47/028 B01D53/18 B01D47/06 B01D53/34 B01D2247/04 B01D2257/302 B01D2257/404 B01D2257/504 B01D2257/90 B01D2258/012 Y02P70/34 B01D53/78

European class: B01D47/02 B01D47/06 B01D53/18 L01D247/04 L01D251/404 L01D257/302 L01D257/404 L01D257/504 L01D257/90 L01D258/01D

US class: 261/115 261/115S 95/186 95/186P 95/210 95/213 95/226 95/242 951/186 951/210 951/226 951/242 96/273 96/297 96/300

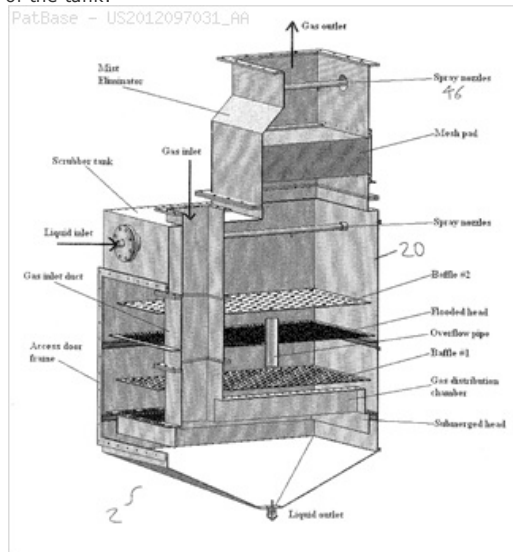
[Classification Explorer](#)

Cited documents: WO9617670 A1, WO10076853, WO03031013 A1, US5478507 A, US5298228 A, US3855368 A, US3739555 A, US3045989 A, KR20060127512, KR20020038194, JP8206450 A2, JP64012625 U1, JP64012625 U, JP48073872 A2, GB1333877 A, GB1023620 A, CN2443789 Y, CN1359310 A, CN1141820 A,

Forward Citations: WO18089214, WO16191846, TWI614057, JP9010304, JP3186518, GB2563621, GB2561848, CN106807159, CN105879519,

Abstract:

A scrubber for removing contaminants from a gas stream, comprising a tank, a submerged head extending horizontally, wherein the submerged head comprises a plate having slots extending throughout, four solid joined vertical walls inset from the walls of the tank below the plate to form an open ended box under the plate, and openings along each edge of the plate between the walls of the tank and the vertical walls of the submerged head; a first baffle above the submerged head and means for spraying scrubbing fluid. The scrubber may comprise a flooded head extending horizontally above the first baffle and head having narrow slots extending throughout; and a second baffle extending horizontally between the four walls of the tank.



6) Family number: 20843096 (US1880018A)

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Title: APPARATUS FOR CLEANING GASES
Priority: US19290390902 19290907

Family:	Publication number	Publication date	Application number	Application date
	US1880018 A	19320927	US19290390902	19290907

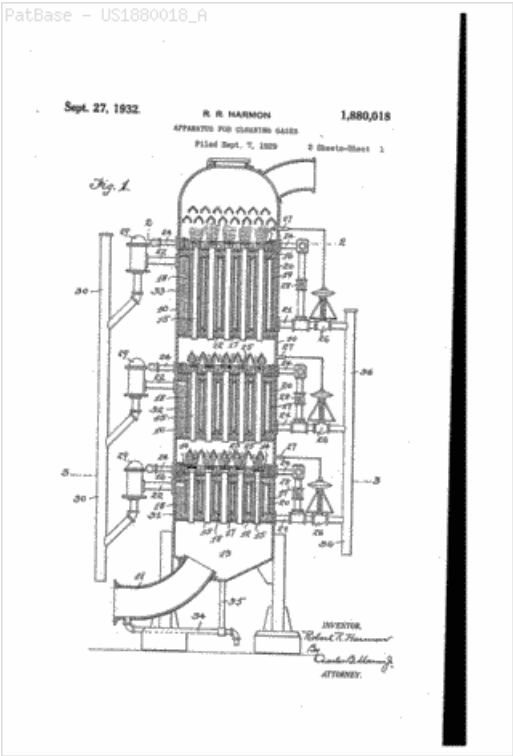
Probable Assignee: PEABODY ENGINEERING CORP

Assignee(s):(std): PEABODY ENGINEERING CORP
Inventor(s):(std): HARMON ROBERT R
International class (IPC 8-9): B01D47/02 (Advanced/Invention);
B01D47/02 (Core/Invention)
International class (IPC 1-7): B01D53/00
CPC: B01D47/021
European class: B01D47/02
US class: 261/113 261/124 261/129 261/148 261/152

[Classification Explorer](#)

Forward Citations: US4394139, DE1278998,

Abstract:
1. An apparatus for cleaning gas having a plurality of separately arranged tubular means one in advance of another for separately and successively dividing the gas into streams and condensing out vapor in the gas streams on suspended particles therein and forming particle-centered droplets, means between each set of tubular means for liquid filtering the gas to remove particle-centered droplets formed in the preceding condensing operation and means for thermostatically controlling the condensing operation at each of the tubular means independently of the others. _



7) Family number: 51596443 (US2013291724A)

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Title: PROCESS FOR CAPTURING ACID GASES
Priority: AU20110900159 20110118 EP20120736819 20120118 WO2012AU00033 20120118
Family:

Publication number	Publication date	Application number	Application date
AU2012208952 AA	20120726	AU20120208952	20120118
AU2012208952 BB	20170105	AU20120208952	20120118
CA2824882 AA	20130716	CA20122824882	20120118
CN103328073 A	20130925	CN201280005771	20120118
CN103328073 B	20150902	CN201280005771	20120118
DE602012036935 D1	20171019	DE201260036935T	20120118
EP2665543 A1	20131127	EP20120736819	20120118
EP2665543 A4	20140820	EP20120736819	20120118
EP2665543 B1	20170906	EP20120736819	20120118
JP2014506526 T2	20140317	JP20130549675T	20120118
JP6013367 B2	20161025	JP20130549675T	20120118
KR20140006881 A	20140116	KR20137021478	20120118
PL2665543 T3	20180330	PL20120736819T	20120118
US2013291724 AA	20131107	US20120980161	20120118
US9586174 BB	20170307	US20120980161	20120118
WO12097406 A1	20120726	WO2012AU00033	20120118
ZA201306179 A	20141029	ZA20130006179	20120118

Probable Assignee: COMMW SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION
Assignee(s):(std): COMMW SCIENT AND INDUSTRIAL RES ORGANISATION ; COMMW SCIENT IND RES ORG ; FERON PAUL ;

MEULEMAN ERIK EVERHARDUS BERNARDUS ; PUXTY GRAEME

Assignee(s): COMMW SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION ; COMMW SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION ; COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION

Inventor(s):(std): FERON PAUL ; MEULEMAN ERIK EVERHARDUS BERNARDUS ; PUXTY GRAEME

Inventor(s): MEULEMAN ERIK EVERHARDUS BERNARDUS BENTLEIGH ; PUXTY GRAEME MAYFIELD ; FERON PAUL FLORAVILLE ; PUXTY GRAEME DOUGLAS

Agent(s): FREEHILLS PATENT ATTORNEYS; PHILLIPS ORMONDE FITZPATRICK; BORDEN LADNER GERVAIS LLP; WUESTHOFF AND WUESTHOFF PATENTANWAELTE PARTG MBB; ZIJLSTRA ROBERT WIEBO JOHAN; SCHEUERMANN ERIK; KITA AOYAMA INT PATENT BUREAU; MERCHANT AND GOULD PC; FREEHILLS PATENT AND TRADE MARK ATTORNEYS

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 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

International class (IPC 8-9): B01D B01D53/14 B01D53/18 B01D53/34 B01D53/40 B01D53/46 B01D53/50 B01D53/52 B01D53/56 B01D53/62 B01D53/68 B01D53/74 B01D53/75 B01D53/77 B01D53/78 B01F3/04 B01J4/00 (Advanced/Invention); B01D (Subclass/Invention)

CPC: B01D53/1406 B01D53/1456 B01D53/1462 B01D53/1475 B01D2252/204 B01D2252/20484 B01D2252/20489 B01D2257/2045 B01D2257/2047 B01D2257/302 B01D2257/304 B01D2257/404 B01D2257/504 B01D2258/0283 Y02C10/04 Y02C10/06

European class: B01D53/14H L01D252/204 L01D257/204C L01D257/204F L01D257/302 L01D257/304 L01D257/404 L01D257/504 L01D258/02K

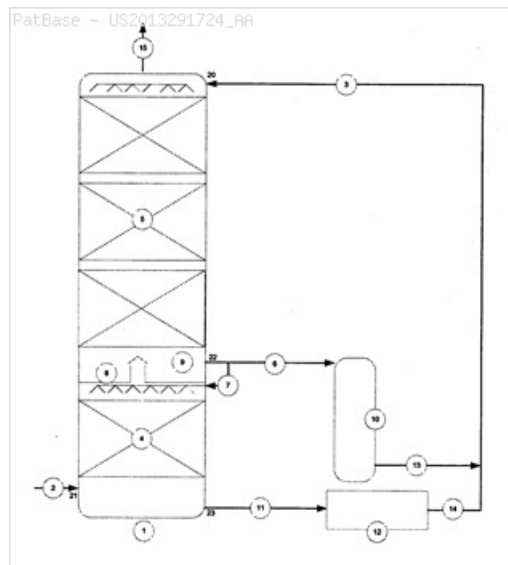
US class: 261/160 261/74 95/186 95/199 96/234

[Classification Explorer](#)

Cited documents: WO9507750 A1, WO09091437 A1, WO09091437 A1, WO06136016 A1, WO06136016, WO0074816 A1, WO0074816 A1, US3927178 A, US3531917 A, US3531917 A, US3362133 A, US3362133 A, US2435089 A, US2010101249 AA, US2010101249 AA, US2010011249 AA, US2004253159 AA, JP5601923 B1, JP56001923 B4, JP53131972 A2, JP53131972, JP5146625 A2, JP2009226365 A2, JP2009226365 A2, JP2006527153 T2, JP2006527153, JP10244120 A2, JP10244120, FR2961115 A1, FR2961115 A1, CN1780677 A, CN1133568 A, CN101703880 A,

Forward Citations: US9776127, CN106669361, CN106669360, CN106669360, CN105833698, CN105833698,

Abstract:
An absorption column 1 for separating CO2 and a second acid gas from a gas stream, the column comprising a first and second section (4, 5) for the absorption of CO2 and the second acid gas; a solvent inlet in the second section for the addition of liquid stream 3 including an absorbent liquid for CO2 and the second acid gas; a gas inlet (21) in the first section for the addition of a gas stream (2) containing CO2 and the second acid gas; a gas outlet (15) in the second section of the column; a first solvent outlet (22) for the removal of at least a portion of the solvent (6) from the second section of the column and a second solvent outlet (23) for solvent stream (11) from the first section of the column; and a liquid flow distributor arrangement (8) to allow a portion of the solvent to flow from the second section of the column to the first section. A method of operating the apparatus and method of solvent extraction is also disclosed.



8) Family number: 65667083 (CN106621780A)

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Title: EFFICIENT SINGLE-TOWER DOUBLE-CIRCULATION DEVULCANIZING DUST REMOVING DEVICE

Priority: CN201710118117 20170301

Family:	Publication number	Publication date	Application number	Application date
	■ CN106621780 A	20170510	CN201710118117	20170301

Probable Assignee: WUHAN LEAWAY ENG TECH CO LTD

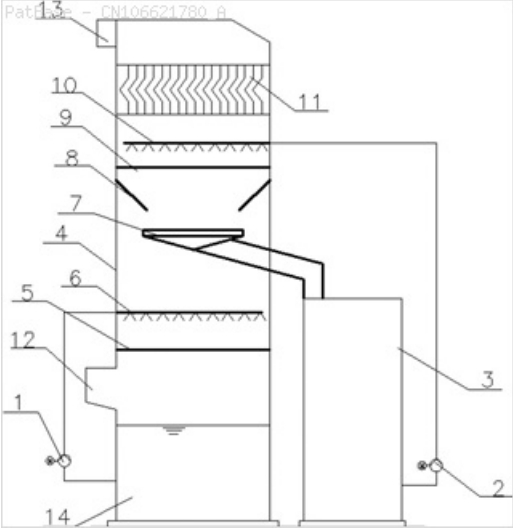
Assignee(s):(std): WUHAN LEAWAY ENG TECH CO LTD

Assignee(s): WUHAN LEAWAY ENGINEERING TECHNOLOGY CO ; WUHAN LIXIN ENGINEERING TECHNOLOGY CO LTD

Inventor(s):(std): LIU YAQIONG ; QIN FEIFEI ; REN YAQIN ; XIONG WEI ; ZHANG XINMIN
International class (IPC 8-9): B01D47/06 B01D53/18 B01D53/50 B01D53/68 B01D53/80 (Advanced/Invention)
CPC: B01D53/80 B01D47/06 B01D53/1406 B01D53/1425 B01D53/1456 B01D53/1481 B01D53/1493 B01D53/18 B01D53/502 B01D53/504 B01D53/68 B01D2247/04 B01D2247/10 B01D2251/404 B01D2251/608 B01D2252/103 B01D2257/2045 B01D2257/2047 B01D2258/0283

[Classification Explorer](#)

Abstract:
The invention discloses an efficient single-tower double-circulation devulcanizing dust removing device. A flue gas inlet is formed at the bottom of an adsorption tower; a flue gas outlet is formed at the top of the adsorption tower; a slurry tank is arranged at the bottom end of the adsorption tower; a primary circulation spraying device and a secondary circulation spraying device are sequentially arranged from bottom to top at positions inside the adsorption tower, which are positioned between the flue gas inlet and the flue gas outlet, in a mode of covering an inner section of the adsorption tower; the slurry tank is connected to the primary circulation spraying device by a pipeline with a slurry circulation pump; a clear water tank is arranged outside the adsorption tower and is connected to the secondary circulation spraying device by a pipeline with a clear water circulation pump; an inverted frustum-shaped flow guide plate is arranged below the secondary circulation spraying device and the edge of the upper end of the flow guide plate is installed in a coincided mode on the inner wall of the adsorption tower; the lower end of the flow guide plate is completely positioned in a space above a draining device; the draining device is communicated to the clear water tank by a pipeline. The efficient single-tower double-circulation devulcanizing dust removing device disclosed by the invention solves the problem of further removing dust when the adsorption tower implements devulcanization, and is low in cost and high in dust removal efficiency.



9) Family number: 14870638 (US3905774A)

© PatBase

Title: Apparatus for the removal of malodorous components from gases
Priority: DE19722226955 19720602 NL19720008540 19720622
Family:

Publication number	Publication date	Application number	Application date
AT350037 B	19790510	AT19720005141	19720615
AT514172 A	19781015	AT19720005141	19720615
BE788091 A	19721218	BE19720788091	19720828
CH547119 A	19740329	CH19720012040	19720815
DE2226955 A1	19731213	DE19722226955	19720602
DK139930 B	19790521	DK19720003111	19720622
DK139930 C	19791022	DK19720003111	19720622
FR2187395 A1	19740118	FR19720029722	19720818
FR2187395 B1	19761029	FR19720029722	19720818
GB1359421 A	19740710	GB19720040068	19720829
IT961233 A	19731210	IT19720025920	19720620
NL7208540 A	19731204	NL19720008540	19720622
SE369845 B	19740923	SE19720008033	19720619
SE369845 C	19750109	SE19720008033	19720619
US3905774 A	19750916	US19720273398	19720720

Probable Assignee: STEULER INDUSTRIEWERKE GMBH
Assignee(s):(std): STELLER IND GMBH ; STEULER INDUSTRIEWERKE GMBH
Assignee(s): STEULER INDUSTRIEWERKE GMBH 5410 HOEHR GRENZHAUSEN ; STEULER INDUSTRIEWERKE GMBH DT ; STEULER INDUSTRIEWERKE G M B H 5410 HOHR GRENZHAUS ; STEULER INDUSTRIEWERKE G M B H 5410 HOHR GRENZHAUSEN ALLEMAGNE ; STEULER IND GMB ; STEULER IND GMB DT ; STEULER INDUSTRIEWERKE G M B H ; CIVILINGENIOER M GREGERSEN
Inventor(s):(std): KOETTING W ; KOETTING WOLFGANG DIPL CHEM DR ; KOBLENZ K ; KOTTING W ; KOTTING WOLFGANG
Inventor(s): WOLFGANG KOETTING ; KOBLENZ K DT ; KOETTING WOLFGANG DIPL CHEM DR RER NAT ; KOETTING WOLFGANG DIPL CHEM DR RER NAT 5400 KOBLENZ

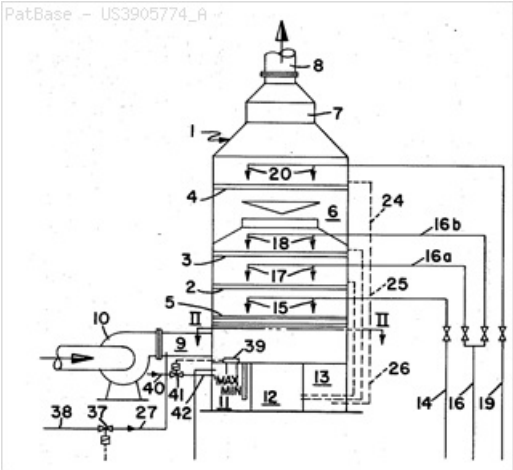
International class (IPC 8-9): B01D47/06 B01D53/18 B01D53/34 (Advanced/Invention); B01D47/06 B01D53/18 B01D53/34 (Core/Invention)
International class (IPC 8-9): B01D47/06 B01D53/00 B01D53/14 B01D53/34 B01J10/00

1-7):
CPC: B01D47/06 B01D53/18 B01D53/34
European class: B01D47/06 B01D53/18 B01D53/34
US class: 232/830 261/94 422/172 423/210 96/299

[Classification Explorer](#)

Cited documents: US3665677 A, US3593497 A, US3411864 A, US3409409 A, US3049527 A, US3028295 A, US2234385 A, US2113198 A, US1725925 A, US1410249 A, FR2089428 A5,
Forward Citations: WO0134288, US7112309, US7112309, US6440379, US5586995, US4460552, US4211541, US4131432, US4107268, US4002722, US2009165652, US2007059229, US2004115112, FR2837403, EP0152061, EP0152061, CN102805992, CN102716638, CN102716638,

Abstract:
A process for the removal of malodorous particulate matter, decomposition products of organic substances in particular, entrained in waste gases or fumes.



10) Family number: 1360111 (US4002722A)

© PatBase

Title: Process and apparatus for wet treatment of vent gas
Priority: JP19740030215 19740316
Family:

Publication number	Publication date	Application number	Application date
CH604854 A	19780915	CH19750003351	19750317
DE2511581 A1	19751009	DE19752511581	19750317
DE2511581 B2	19780713	DE19752511581	19750317
DE2511581 C3	19840216	DE19752511581	19750317
FR2263807 A1	19751010	FR19750008115	19750314
FR2263807 B1	19790622	FR19750008115	19750314
GB1507192 A	19780412	GB19750010968	19750317
JP50123078 A2	19750927	JP19740030215	19740316
JP51044898 B4	19761201	JP19740030215	19740316
JP975621 C3	19791030	JP19740030215	19740316
US4002722 A	19770111	US19750557451	19750312

Probable Assignee: SINTOKOGIO LTD
Assignee(s):(std): SINTOKOGIO LTD
Assignee(s): SINTOKOGIO LTD JA ; SINTOKOGIO LTD NAGOYA AICHI JAPAN ; SINTOKOGIO LTD NAGOYA AICHI JP
Inventor(s):(std): SUZUKI HIROSHI ; SHIBATA TUTOMU ; NISHIKAWA KAZUYUKI ; ITO SHIGERU
Inventor(s): HIROSHI SUZUKI ; ITO SHIGERU TOYOKAWA ; ITO SHIGERU TOYOKAWA JP ; NISHIKAWA KAZUYUKI AICHI ; NISHIKAWA KAZUYUKI AICHI JP ; SHIBATA TUTOMU TOYOKAWA ; SHIBATA TUTOMU TOYOKAWA JP ; SUZUKI HIROSHI KARIYA ; SUZUKI HIROSHI KARIYA JP ; TUTOMU SHIBATA ; SHIGERU ITO ; KAZUYUKI NISHIKAWA

International class (IPC 8-9): B01D53/38 B01D53/46 B01D53/72 B01D53/77 B01J19/08 (Advanced/Invention); B01D53/38 B01D53/46 B01D53/77 B01J19/08 (Core/Invention)

International class (IPC 1-7): B01D53/00 B01D53/14 B01D53/16 B01D53/34 B01K1/00 G05D21/02

CPC: B01D53/46
European class: B01D53/46
US class: 422/4 423/238 423/245.2

[Classification Explorer](#)

Cited documents: US3905774 A, US3021189 A, DE6804910 U, BE613590 A,
Forward Citations: WO16191846, WO0166230, WO0166230, US9574122, US9265854, US8758493, US8753566, US8409512, US7304187, US7112309, US7112309, US6655601, US6645450, US6540149, US6132678, US5893946, US5810918, US5769933, US5695554, US5688313, US5567402, US4595577, US4330510, US4172880, US2013202480, US2011189049, US2011104012, US2011048239, US2010258428, US2007081933, US2007059229, US2004115112, RU2639786, JP6031335, JP53031567, JP53015260, JP52123979, JP51083890, DE102004006367,

Abstract:

Vent gas containing disagreeable odor components consisting mainly of phenolic substances evolving from foundries using shell molding sand containing phenol resin as a binder is efficiently wet-treated by scrubbing the vent gas with an aqueous absorbent solution, to which a ferrous salt and hydrogen peroxide are added so that a ferrous ion concentration may be at least one-seventh of a hydrogen peroxide concentration, thereby making an oxidation-reduction potential of the aqueous absorbent solution have at least a value of $(540 - 60 \times \text{PH value}) \text{ mV}$, wherein the PH value is 5 or less.

