

Search query (2): [SP]: 1. a process for separating coal particles from ash-forming component particles comprising: generating bubbles within a quantity of water in a flotation cell introducing an aqueous slurry of coal fines comprising discrete particles of coal and particles of ash-forming components into the bubbles within the coal flotation cell in a manner that causes the bubbles to capture and float the coal particles and form a coal-froth, wherein the coal fines in the aqueous slurry have a particle size less than about 750 micro m and collecting the coal-froth, wherein the coal-froth comprises at least 15 weight percent solid particles and wherein the solid particles comprise coal particles and ash-forming component particles, with a flotation efficiency greater than 92 percent, such that the coal particles in the coal-froth represent a combustible recovery of coal fines greater than 90 percent. 2. the process according to claim 1, further comprising the steps of: stopping the introduction of the aqueous slurry of coal fines into the coal flotation cell and continuing to generate bubbles and coal-froth for a period of time to separate coal particles remaining in the quantity of water from ash-forming component particles. 3. the process according to claim 2, further comprising the step of draining the quantity of water in the coal flotation cell. 4. the process according to claim 3, further comprising the step of recovering the solid particles from the drained water for further processing. 5. the process according to claim 4, further comprising the step of recycling the water from which the solid particles are recovered for use in the coal flotation cell. 6. the process according to claim 2, further comprising the step of monitoring a content of solid particles in the quantity of water in the coal flotation cell, wherein the solid particles comprise ash-forming component particles and coal particles, and stopping the introduction of the aqueous slurry of coal fines into the coal flotation cell when the content of solid particles in the quantity of water in the coal flotation cell exceeds a predetermined weight percentage. 7. the process according to claim 6, wherein the predetermined weight percentage of solid particles in the quantity of water is between 3 weight percent and 6 weight percent. 8. the process according to claim 6, wherein the content of solid particles in the quantity of water in the coal flotation cell determines a content of ash-forming component particles in the coal-froth. 9. the process according to claim 1, wherein the coal fines in the aqueous slurry have a particle size less than about 500 micro m. 10. the process according to claim 1, wherein the coal fines in the aqueous slurry have a particle size less than about 300 micro m. 11. the process according to claim 1, wherein the coal fines in the aqueous slurry have a particle size less than about 500 micro m, and wherein the bubbles are generated and the aqueous slurry is introduced into the bubbles such that the coal particles in the coal-froth represent a combustible recovery of coal fines greater than 95 percent. 12. the process according to claim 1, wherein the coal-froth comprises at least 25 weight percent solid particles. 13. the process according to claim 1, wherein the coal-froth comprises at least 45 weight percent solid particles. 14. the process according to claim 1, further comprising the step of balancing an input volume of aqueous slurry to an output volume of coal-froth. 15. the process according to claim 1, wherein the bubbles are generated with one or more bubble generators, wherein the bubble generators comprise a porous material having an average pore size less than 30 micro m. 16. the process according to claim 1, wherein the bubbles are generated with one or more bubble generators, wherein the bubble generators comprise a porous material having an average pore size less than 10 micro m. 17. a process for separating coal particles from ash-forming component particles comprising: generating bubbles within a quantity of water in a coal flotation cell with one or more bubble generators, wherein the bubble generators comprise a porous material having an average pore size less than 30 micro m introducing an aqueous slurry of coal fines comprising particles of coal and particles of ash-forming components into the bubbles within the coal flotation cell in a manner that causes the bubbles to capture and float the coal particles and form a coal-froth, wherein the coal fines in the aqueous slurry have a particle size less than about 500 micro m, wherein the bubbles are generated and the aqueous slurry is introduced into the bubbles such that the flotation rate of coal fines is greater than 1.5 mph/m³. 18. the process according to claim 17, wherein the coal fines in the aqueous slurry have a particle size less than about 300 micro m. 19. the process according to claim 17, wherein the coal fines in the aqueous slurry have a particle size less than about 150 micro m. 20. the process according to claim 17, wherein the aqueous slurry of coal fines contains about 40 plus or minus 15 weight percent coal fines. 21. the process according to claim 17, wherein the bubble generators comprise a porous material having an average pore size less than 10 micro m. 22. the process according to claim 17, wherein the bubbles are generated and the aqueous slurry is introduced into the bubbles such that the combustible recovery of coal fines is greater than 95 percent. 23. an aqueous slurry of coal fines comprising: discrete particles of coal discrete particles of ash-forming components and a quantity of water, wherein the aqueous slurry contains greater than 25 weight percent solid particles comprising particles of coal and particles of ash-forming components, and wherein the particles of coal and particles of ash-forming components collectively have a particle size less than about 500 micro m. 24. the aqueous slurry according to claim 23, wherein the aqueous slurry contains greater than 45 weight percent particles of coal and particles of ash-forming components. 25. the aqueous slurry according to claim 23, wherein the particles of coal and particles of ash-forming components collectively have a particle size less than about 300 micro m. 26. the aqueous slurry according to claim 23, wherein the particles of coal and particles of ash-forming components collectively have a particle size less than about 150 micro m. 27. a coal-froth generated in a coal flotation cell comprising at least 15 weight percent solid particles and wherein the solid particles comprise coal particles and ash-forming component particles, of which less than 8 weight percent of the solid particles are ash-forming component particles. 28. the coal-froth according to claim 27, wherein the coal-froth comprises at least 25 weight percent solid particles. 29. the coal-froth according to claim 27, wherein the coal-froth comprises at least 35 weight percent solid particles. 30. the coal-froth according to claim 27, wherein the coal-froth comprises at least 45 weight percent solid particles. 31. the coal-froth according to claim 27, wherein less than 5 weight percent of the solid particles are ash-forming component particles. 32. a process for separating ash-forming component particles from coal particles comprising: generating bubbles within a quantity of water in a coal flotation cell introducing an aqueous slurry of coal fines comprising particles of coal and particles of ash-forming components into the bubbles within the coal flotation cell in a manner that enables the bubbles to capture and float the coal particles and form a coal-froth and maintaining a height of the coal-froth less than about 18 inches (0.45 m). 33. the process according to claim 32, wherein the coal-froth comprises at least 25 weight percent solid particles and wherein the solid particles comprise coal particles and ash-forming component particles, of which less than 8 weight percent of the solid particles are ash-forming component particles. 34. the process according to claim 32, wherein the coal-froth comprises at least 45 weight percent solid particles and wherein the solid particles comprise coal particles and ash-forming component particles, of which less than 8 weight percent of the solid particles are ash-forming component particles.

Results: 12

Search history

Search PN=(WO2016048793) (Results 1)

1:

Search [SP]: 1. a process for separating coal particles from ash-forming component particles comprising: generating bubbles within a quantity of water in a flotation cell introducing an aqueous slurry of coal fines comprising discrete particles of coal and particles of ash-forming components into the bubbles within the coal flotation cell in a manner that causes the bubbles to capture and float the coal particles and form a coal-froth, wherein the coal fines in the aqueous slurry have a particle size less than about 750 micro m and collecting the coal-froth, wherein the coal-froth comprises at least 15 weight percent solid particles and wherein the solid particles comprise coal particles and ash-forming component particles, with a flotation efficiency greater than 92 percent, such that the coal particles in the coal-froth represent a combustible recovery of coal fines greater than 90 percent. 2. the process according to claim 1, further comprising the steps of: stopping the introduction of the aqueous slurry of coal fines into the coal flotation cell and continuing to generate bubbles and coal-froth for a period of time to separate coal particles remaining in the quantity of water from ash-forming component particles. 3. the process according to claim 2, further comprising the step of draining the quantity of water in the coal flotation cell. 4. the process according to claim 3, further comprising the step of recovering the solid particles from the drained water for further processing. 5. the process according to claim 4, further comprising the step of recycling the water from which the solid particles are recovered for use in the coal flotation cell. 6. the process according to claim 2, further comprising the step of monitoring a content of solid particles in the quantity of water in the coal flotation cell, wherein the solid particles comprise ash-forming component particles and coal particles, and stopping the introduction of the aqueous slurry of coal fines into the coal flotation cell when the content of solid particles in the quantity of water in the coal flotation cell exceeds a predetermined weight percentage. 7. the process according to claim 6, wherein the predetermined weight percentage of solid particles in the quantity of water is between 3 weight percent and 6 weight percent. 8. the process according to claim 6, wherein the content of solid particles in the quantity of water in the coal flotation cell determines a content of ash-forming component particles in the coal-froth. 9. the process according to claim 1, wherein the coal fines in the aqueous slurry have a particle size less than about 500 micro m. 10. the process according to claim 1, wherein the coal fines in the aqueous slurry have a particle size less than about 300 micro m. 11. the process according to claim 1, wherein the coal fines in the aqueous slurry have a particle size less than about 500 micro m, and wherein the bubbles are generated and the aqueous slurry is introduced into the bubbles such that the coal particles in the coal-froth represent a combustible recovery of coal fines greater than 95 percent. 12. the process according to claim 1, wherein the coal-froth comprises at least 25 weight percent solid particles. 13. the process according to claim 1, wherein the coal-froth comprises at least 45 weight percent solid particles. 14. the process according to claim 1, further comprising the step of balancing an input volume of aqueous slurry to an output volume of coal-froth. 15. the process according to claim 1, wherein the bubbles are generated with one or more bubble generators, wherein the bubble generators comprise a porous material having an average pore size less than 30 micro m. 16. the process according to claim 1, wherein the bubbles are generated with one or more bubble generators, wherein the bubble generators comprise a porous material having an average pore size less than 10 micro m. 17. a process for separating coal particles from ash-forming component particles comprising: generating bubbles within a quantity of water in a coal flotation cell with one or more bubble generators, wherein the bubble generators comprise a porous material having an average pore size less than 30 micro m introducing an aqueous slurry of coal fines comprising particles of coal and particles of ash-forming components into the

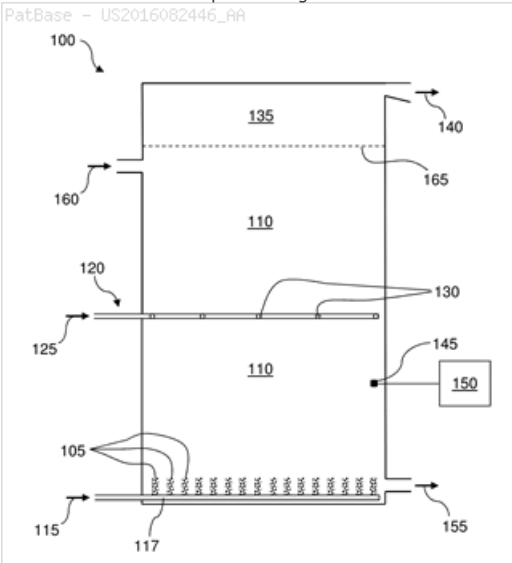
bubbles within the coal flotation cell in a manner that causes the bubbles to capture and float the coal particles and form a coal-froth, wherein the coal fines in the aqueous slurry have a particle size less than about 500 micro m, wherein the bubbles are generated and the aqueous slurry is introduced into the bubbles such that the flotation rate of coal fines is greater than 1.5 m³/m³. 18. the process according to claim 17, wherein the coal fines in the aqueous slurry have a particle size less than about 300 micro m. 19. the process according to claim 17, wherein the coal fines in the aqueous slurry have a particle size less than about 150 micro m. 20. the process according to claim 17, wherein the aqueous slurry of coal fines contains about 40 plus or minus 15 weight percent coal fines. 21. the process according to claim 17, wherein the bubble generators comprise a porous material having an average pore size less than 10 micro m. 22. the process according to claim 17, wherein the bubbles are generated and the aqueous slurry is introduced into the bubbles such that the combustible recovery of coal fines is greater than 95 percent. 23. an aqueous slurry of coal fines comprising: discrete particles of coal discrete particles of ash-forming components and a quantity of water, wherein the aqueous slurry contains greater than 25 weight percent solid particles comprising particles of coal and particles of ash-forming components, and wherein the particles of coal and particles of ash-forming components collectively have a particle size less than about 500 micro m. 24. the aqueous slurry according to claim 23, wherein the aqueous slurry contains greater than 45 weight percent particles of coal and particles of ash-forming components. 25. the aqueous slurry according to claim 23, wherein the particles of coal and particles of ash-forming components collectively have a particle size less than about 300 micro m. 26. the aqueous slurry according to claim 23, wherein the particles of coal and particles of ash-forming components collectively have a particle size less than about 150 micro m. 27. a coal-froth generated in a coal flotation cell comprising at least 15 weight percent solid particles and wherein the solid particles comprise coal particles and ash-forming component particles, of which less than 8 weight percent of the solid particles are ash-forming component particles. 28. the coal-froth according to claim 27, wherein the coal-froth comprises at least 25 weight percent solid particles. 29. the coal-froth according to claim 27, wherein the coal-froth comprises at least 35 weight percent solid particles. 30. the coal-froth according to claim 27, wherein the coal-froth comprises at least 45 weight percent solid particles. 31. the coal-froth according to claim 27, wherein less than 5 weight percent of the solid particles are ash-forming component particles. 32. a process for separating ash-forming component particles from coal particles comprising: generating bubbles within a quantity of water in a coal flotation cell introducing an aqueous slurry of coal fines comprising particles of coal and particles of ash-forming components into the bubbles within the coal flotation cell in a manner that enables the bubbles to capture and float the coal particles and form a coal-froth and maintaining a height of the coal-froth less than about 18 inches (0.45 m). 33. the process according to claim 32, wherein the coal-froth comprises at least 25 weight percent solid particles and wherein the solid particles comprise coal particles and ash-forming component particles, of which less than 8 weight percent of the solid particles are ash-forming component particles. 34. the process according to claim 32, wherein the coal-froth comprises at least 45 weight percent solid particles and wherein the solid particles comprise coal particles and ash-forming component particles, of which less than 8 weight percent of the solid particles are ash-forming component particles. (Results 12)

Title: FLOTATION SEPARATION OF FINE COAL PARTICLES FROM ASH-FORMING PARTICLES

Abstract: Coal fines are processed by flotation separation to separate coal particles from ash-forming component particles. Coal fines are mixed water under high shear mixing conditions to form an aqueous slurry of coal fines containing between 15 weight percent and 55 weight percent coal fines. The aqueous slurry is introduced into a coal flotation cell to separate coal particles from ash-forming component particles by flotation separation, wherein the coal fines have a particle size less than 500 micro m, and more preferably less than 300 micro m. Bubbles are generated in the coal flotation cell having a bubble size and bubble quantity selected to float the coal particles and to form a coal-froth containing at least 15 weight percent solid particles. The solid particles include coal particles and ash-forming component particles. The coal-froth is collected for further processing.

Classifications:

International (IPC 8-9): B03D B03D1/00 B03D1/02 B03D103/08
C10L1/32 C10L5/00 (Advanced/Invention);
B03D103/08 (Advanced/Non-invention)
CPC: B03D1/025 C10L1/326 C10L2250/06 C10L2290/54 C10L5/04
C10L5/366 C10L9/00 B03D1/028 B03D1/1456 B03D1/24 B03D2203/08
US: 209/165 44/280 44/504



Family:

Publication number	Publication date	Application number	Application date
AU2015321681 AA	20160331	AU20150321681	20150917
CA2965996 AA	20170426	CA20152965996	20150917
CN106999954 A	20170801	CN201580063816	20150917
CO20170003893 A2	20170711	CO20170003893	20170421
ID201802829 A	20180323	ID2017P0002551	20150917
IN201717013926 A	20170818	IN201717013926	20170419
US2016082446 AA	20160324	US20140495657	20140924
WO16048793 A1	20160331	WO2015US50737	20150917
ZA201702836 A	20180725	ZA20170002836	20150917

Priority:

US20140495657 20140924 WO2015US50737 20150917

Probable Assignee: EARTH TECHNOLOGIES USA LTD

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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

Title: PROCESS AND APPARATUS FOR SEPARATING FINE PARTICLES BY MICROBUBBLE FLOTATION TOGETHER WITH A PROCESS AND APPARATUS FOR GENERATION OF MICROBUBBLES

Abstract: A method and apparatus are disclosed for the microbubble flotation separation of very fine particles, especially coal, so as to produce a high purity and large recovery efficiently. This is accomplished through the use of a high aspect ratio flotation column, microbubbles, and a countercurrent use of wash water to gently wash the froth. Also, disclosed are unique processes and apparatus for generating microbubbles for flotation in a high efficient and inexpensive manner using either a porous tube or an in-line static generator.

Classifications:

International (IPC 8-9): B01F3/04 B01F5/04 B01F5/06 B03D1/14 B03D1/24 C02F3/20 (Advanced/Invention);

B01F3/04 B01F5/04 B01F5/06 B03D1/14 C02F3/20 (Core/Invention)

International (IPC 1-7): B03D1/02 B03D1/14 B03D1/24

CPC: Y10S261/75 B01F3/04113 B01F3/04106 B01F3/04099 B01F5/0408

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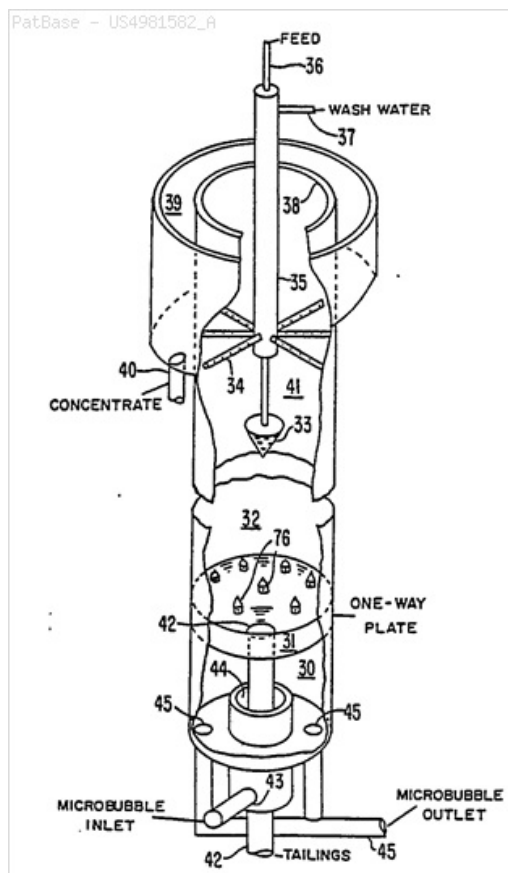
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US: 209/10 209/164 209/168 209/170 210/221.2 261/121.1 261/122

261/122.1 261/DIG.75 366/338 366/339



Family:

Publication number	Publication date	Application number	Application date
AU198931913 A1	19890825	AU19890031913	19890123
AU198943843 A1	19900222	AU19890043843	19891027
AU635503 B2	19930325	AU19890043843	19891027
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Priority:

US19880148871 19880127	AU19890031913 19890123	WO1989US00237 19890123
CA19890589293 19890126	AU19890043843 19891027	US19900574794 19900830
US19920982890 19921130	US19940354830 19941208	US19960641778 19960430

Probable Assignee: VIRGINIA TECH INTELLECTUAL PROPERTIES INC

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Assignee(s): VIRGINIA TECH INTELLECTUAL PROPERTIES INC ; VIRGINIA TECH INTELLECTUAL PROPERTY INC ; VIRGINIA TECH INTELLECTUAL PROPERTIES INC A CORP O ; YOON ROE HOAN ; VIRGINIA TECH INTELLECTUAL PROPERTIES INC A CORP OF VA ; VIRGINIA POLYTECHNIC INST AND STATE U ; VIRGINIA POLYTECHNIC INST AND STATE UNIV ; VIRGINIA POLYTECHNIC INSTITUTE AND STATE U ; ADEL GREGORY T ; LUTTRELL GERALD H ; VIRGINIA POLYTECHNIC INST

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Inventor(s): ROE HOAN YOON ; GERALD H LUTTRELL ; GREGORY T ADEL

Agent(s): DAVIES COLLISON CAVE; DAVIES COLLISON CAVE PTY LTD; GOWLING LAFLEUR HENDERSON LLP

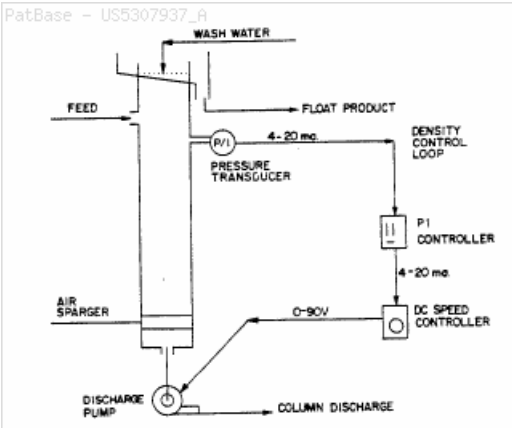
Designated states: AT AU BE CH DE FI FR GB IT JP KR LU NL NO SE SU

Title: HIGH THROUGHPUT FLOTATION COLUMN PROCESS

Abstract: A high efficiency method for the recovery of relatively coarse constituent utilizing a flotation column is provided. The method broadly includes the steps of (1) establishing and maintaining a net upward flow of water (negative bias) through the upper portion of the flotation column which is maintained below a predetermined critical limit; (2) establishing and maintaining an upwardly moving stream of diffuse air which is introduced at the lower portion of the flotation column and which has a superficial air velocity between about 0.5 and 2.0 cm/sec.; (3) introducing a feed stream comprising a slurry of the ore into the upper portion of the flotation column wherein the mineral particles therein substantially range between about 20 mesh (840 microns) and about 325 mesh (44 microns) in size; (4) establishing and maintaining the percent solids in the flotation column between about 35 and 50 percent; (5) establishing and maintaining column throughput of the slurry between 1.8 and 4.0 tons/hour/sq. ft.; and (6) recovering the desired mineral particles from the upper portion of the flotation column.

Classifications:

International (IPC 8-9): B03B13/00 B03D1/02
B03D1/24 (Advanced/Invention);
B03B13/00 B03D1/00 B03D1/14 (Core/Invention)
International (IPC 1-7): B03B13/00 B03D1/02 B03D1/24
CPC: B03D1/245 B03B13/00 B03D1/02 B03D1/028 B03D1/082 B03D1/24 B03D1/1475
European: B03B13/00 B03D1/02 B03D1/24
US: 209/1 209/164 209/166 209/170



Family:

Publication number	Publication date	Application number	Application date
US5307937 A	19940503	US19930019153	19930217

Priority:

US19930019153 19930217

Probable Assignee: NORTH CAROLINA STATE UNIV

Assignee(s): (std): UNIV NORTH CAROLINA STATE

Assignee(s): NORTH CAROLINA STATE UNIV ; NORTH CAROLINA STATE UNIVERSITY

Inventor(s): (std): HUTWELKER JOEL F

Abstract: A method is proposed for processing high-ash coal sludges by flotation of a slurry in the cells of flotation units, particularly for processing gas coal and open burning coal which are difficult to float, in which the coal slurry to be processed flows through the cells of the flotation unit pre-conditioned and controllably, particularly with control of the dwell time. In a preferred embodiment, the control of the dwell time occurs by a controlled distribution of the slurry to cells of the flotation unit which operate in parallel. For the purpose of controlling the dwell time of the slurry in a flotation unit, cells which are traversed in parallel are additionally connected or disconnected as a function of operating parameters, such as slurry density or solids content or solids distribution.



Priority:

DE19813108913 19810309

Probable Assignee: RAG FOUNDATION

Assignee(s): (std): RAG FOUNDATION ; RUHRKOHL AG

Assignee(s): RUHRKOHLE AKTIENGESELLSCHAFT ; RUHRKOLE A GERMAN CORP AG ; RUHRKOLE AG

Inventor(s): (std): HELLMANN KARL ; KARL HELLMANN ; HELLMANN KARL DR ING

Title: METHOD AND APPARATUS FOR COLUMN FLOTATION OF MINERAL MATTER

Abstract: Apparatus for the separation of components of a slurry by froth flotation is disclosed. The apparatus includes a flotation column having an upper section, an intermediate section and a lower section, a spray bar, mounted in the intermediate section of the flotation column, for providing a downwardly directed fine mist in the intermediate section of said flotation column, and at least one spray nozzle mounted in the lower section of the flotation column, the at least one spray nozzle provided with aerating means. A method for the separation of the components of a slurry employing the present apparatus is also disclosed.

Classifications:

International (IPC 8-9): B03D1/02 B03D1/24

B03D1/26 (Advanced/Invention);

B03D1/00 B03D1/14 (Core/Invention)

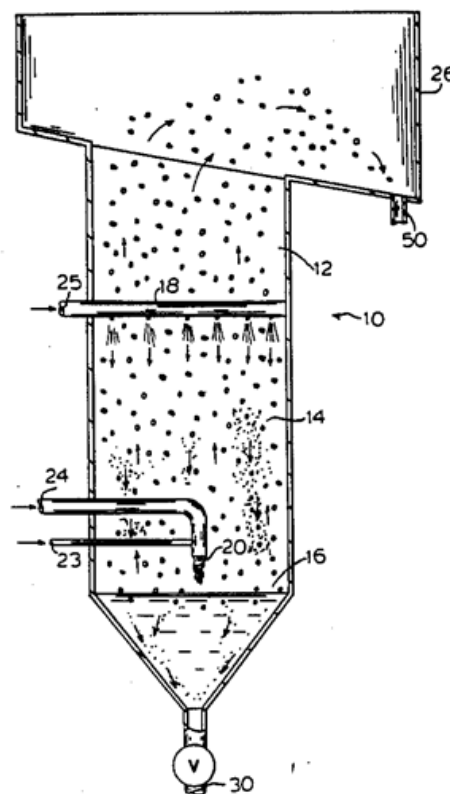
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CPC: B03D1/082 B03D1/1456 B03D1/02 B03D1/247

European: B03D1/02 B03D1/24

US: 209/164 209/168 209/169

PatBase - US4966687_A



Family:

Publication number	Publication date	Application number	Application date
AU198662503 A1	19870702	AU19860062503	19860905
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DK611586 A	19870620	DK19860006115	19861218
DK611586 A0	19861218	DK19860006115	19861218
FI864254 A0	19861021	FI19860004254	19861021
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JP62144771 A2	19870627	JP19860234729	19861003
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US4966687 A	19901030	US19850810864	19851219
ZA8606804 A	19880525	ZA19860006804	19860908

Priority:

US19850810864 19851219 US19850810864 19851229

Probable Assignee: STANDARD OIL CO OHIO

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

Assignee(s): STANDARD OIL CO THE ; STANDARD OIL COMPANY THE ; THE STANDARD OIL CO ; THE STANDARD OIL COMPANY ; STANDARD OIL CO

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Inventor(s): R D TRIGG ; RICHARD DARRELL TRIGG

Title: FIBER OPTIC DETECTOR FOR FLOTATION CELL PROCESSING

Abstract: An apparatus for determining the reflectivity of the tailings from a coal flotation cell to optimize the cell operation. A bifurcated fiber optic cable has ends connected to a light source and a photoconductor, with a scanner end of the cable being submersed in a coal slurry. Light transmitted to the scanner end of the cable is backscattered to the photoconductor to function as a detector to determine the coal content of the tailings and through a process controller, frother and collector addition to the cell is monitored. An ultrasonic energy vibration is periodically transmitted to the scanner end of the cable to remove deposits thereon to optimize detector operation.

Classifications:

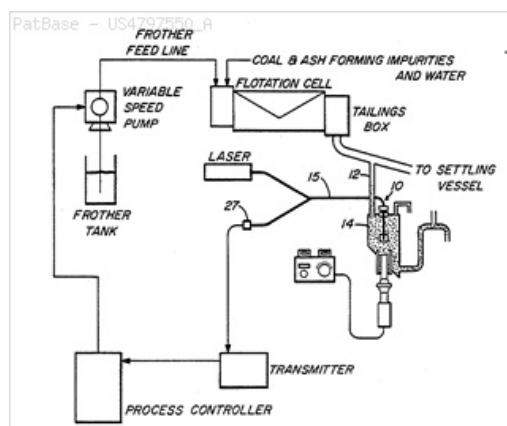
International (IPC 8-9): B03B13/02 B03D1/00 B03D1/14 G01N21/15 G01N21/49 G01N21/85 (Advanced/Invention); G01N21/15 (Advanced/Non-invention); B03B13/00 B03D1/14 G01N21/85 (Core/Invention); G01N21/15 (Core/Non-invention)

International (IPC 1-7): B03B13/02 B03D1/00 B03D1/02 B03D1/14 G01N21/15 G01N21/27 G01N21/47 G01N21/49 G01N21/88 H01J40/14 H01J5/16

CPC: B03D1/028 B03B13/02 B03D1/14 G01N21/8507 G01N2021/154

European: B03B13/02 B03D1/14 G01N21/85B S01N21/15D

US: 209/166 250/226 250/227 250/574 356/402 356/442



Family:

Publication number	Publication date	Application number	Application date
AU198823393 A1	19890511	AU19880023393	19881004
AU609193 B2	19910426	AU19880023393	19881004
CA1292296 A1	19911119	CA19880578907	19880928
CN1013929 B	19910918	CN19881007712	19881105
CN1033016 A	19890524	CN19881007712	19881105
DE3837557 A1	19890518	DE19883837557	19881104
GB2212263 A1	19890719	GB19880025524	19881101
GB2212263 B2	19920102	GB19880025524	19881101
GB8825524 A0	19881207	GB19880025524	19881101
US4797550 A	19890110	US19870117263	19871106
ZA8807644 A	19900627	ZA19880007644	19881013

Priority:

US19870117263 19871106 CA19880578907 19880928

Probable Assignee: CONSOLIDATION COAL CO

Assignee(s): (std): CONSOLIDATION COAL CO

Assignee(s): CONSOLIDATION COAL CO LIBRARY PA US ; CONSOLIDATION COAL CO PITTSBURGH PENNSYLVANIA A CORP OF DE ; CONSOLIDATION COAL COMPANY ; NELSON MICHAEL G ; OBLAD HAYWARD B

Inventor(s): (std): MICHAEL G NELSON ; HAYWARD B OBLAD ; OBLAD HAYWARD B ; NELSON MICHAEL G

Inventor(s): OBLAD HAYWARD B BETHEL PARK PA US

Agent(s): GRIFFITH HACK; RIDOUT AND MAYBEE LLP

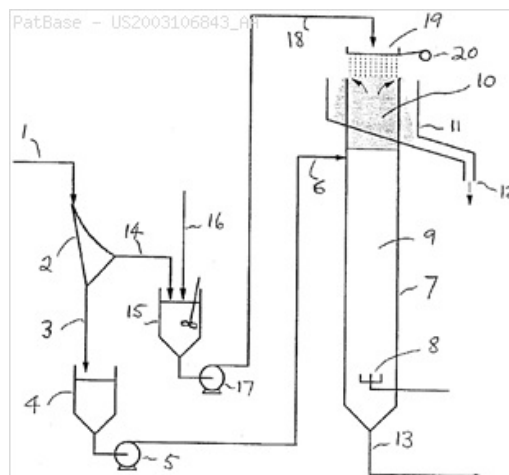
Title: FROTH FLOTATION PROCESS AND APPARATUS

Abstract: A froth flotation process typically used to separate particulate materials such as coal, has a mixed size feed (1) separated in a sieve bend (2) into a stream of relatively fine particles (3) and a stream of relatively coarse particles (14). The fine particles are fed to a flotation cell (7) in the normal manner, while the coarse particles are mixed with wash water (16) and distributed onto or into the froth layer (10) by wash water distribution apparatus (19, 20). Alternative variations of wash water distribution apparatus able to handle coarse particles are also described.

Classifications:**International (IPC 8-9):** B03B11/00 B03D1/02

B03D1/14 (Advanced/Invention);

B03B11/00 B03D1/00 B03D1/14 (Core/Invention)

International (IPC 1-7): B03B5/60 B03D B03D1/02 B03D1/14**CPC:** B03D1/24 B03D1/14 B03D1/02 B03D1/082 B03D1/085**European:** B03B11/00 B03D1/02 B03D1/14**US:** 209/162 209/164 209/168 209/170 239/498 239/499 239/524**Family:**

Publication number	Publication date	Application number	Application date
AU2000005638 A0	20000309	AU2000PQ05638	20000215
AU2001233487 AA	20010827	AU20010233487	20010215
AU563800 A0	20000309	AU2000PQ05638	20000215
BRPI0108356 A	20030311	BR2001PI08356	20010215
CA2402400 AA	20020911	CA20012402400	20010215
CA2402400 C	20110712	CA20012402400	20010215
CN1229182 C	20051130	CN20018008134	20010215
CN1441705 A	20030910	CN20018008134	20010215
EP1259329 A1	20021127	EP20010905488	20010215
EP1259329 A4	20061122	EP20010905488	20010215
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US2003106843 AA	20030612	US20020203987	20021007
US7163105 BB	20070116	US20010203987	20010215
WO0160523 A1	20010823	WO2001AU00145	20010215
ZA200207329 A	20031212	ZA20020007329	20020912

Priority:

AU20000005638 20000215 AU2000PQ05638 20000215 WO2001AU00145 20010215
AU20010033487 20010215

Probable Assignee: UNIV NEWCASTLE RES ASS

Assignee(s): (std): JAMESON GRAEME JOHN ; LAMBERT NOEL WILIAM ALEXANDER ; LAMBERT NOEL WILLIAM ALEXANDER ; UNIV NEWCASTLE RES ASSOCIATES ; UNIV OF NEWCASTLE RES ASSOCIAT ; UNIV NEWCASTLE RES ASS ; THE UNIVERSITY OF NEWCASTLE RESEARCH ASSOCIATES LI ; THE UNIV OF NEWCASTLE RESEARCH ASSOCIATES LTD

Assignee(s): UNIVERSITY OF NEWCASTLE RESEARCH ASSOCIATES LTD ; THE UNIVERSITY OF NEWCASTLE RESEARCH ASSOCIATES LIMITED ; OF NEWCASTLE RESEARCH ASSOCIATES UNIV LTD ; UNIV OF NEWCASTLE RESEARCH ASSOCIATES LTD ; NEWCASTLE RESEARCH ASSOCIATES UNIV LTD ; NEWCASTLE RESEARCH ASSOCIATES UNIV OF LTD ; OF NEWCASTLE RESEARCH ASSOCIATES LTD UNIV

Inventor(s): (std): JAMESON GRAEME JOHN ; LAMBERT NOEL ; LAMBERT NOEL WILIAM ALEXANDER ; LAMBERT NOEL WILLIAM ALEXANDER ; NWA LAMBERT ; NOEL WILLIAM ALEXANDER LAMBERT ; LAMBERT G J JAMESON N W A ; GRAEME JOHN JAMESON ; GJ JAMESON ; G J JAMESON N W A LAMBERT ; LAMBERT N W A ; JAMESON G J

Inventor(s): N W A LAMBERT ; G J JAMESON

Agent(s): SHELSTON IP; SHELSTON IP PTY LTD; BLAKE CASSELS AND GRAYDON LLP; OSTROLENK FABER GERB AND SOFFEN LLP

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 CR CU CY CZ DE DK DM DZ EE ES FI FR GA GB GD GE GH GM GN GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NE NL NO NZ PL PT RO RU SD SE SG SI SK SL SN SZ TD TG TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW

Title: COAL-AQUEOUS MIXTURES

Abstract: Coal-aqueous mixture characterized by having high coal solids concentrations are provided. Selected polyalkyleneoxide nonionic surfactants are employed at low concentrations to disperse coal in an aqueous carrier medium to coal solids levels of 70 percent by weight, or higher. The selected polyalkyleneoxide nonionic surfactants are characterized by having a high molecular weight and a hydrophilic portion comprised of at least about 100 repeating units of ethylene oxide.

Classifications:

International (IPC 8-9): B03B9/00 B03D1/02 C10G1/00 C10G1/04 C10L1/18 C10L1/32 C10L5/00 C10L9/00 C10L9/02 (Advanced/Invention); C10L1/32 C10L5/00 (Advanced/Non-invention); B03B9/00 B03D1/00 C10G1/00 C10L1/32 C10L5/00 C10L9/00 (Core/Invention)

International (IPC 1-7): B01J C01G C08L95/00 C10G1/04 C10L1/12 C10L1/16 C10L1/18 C10L1/22 C10L1/28 C10L1/32 C10L5/00 C10L9/00 C10L9/10 C11D G01N

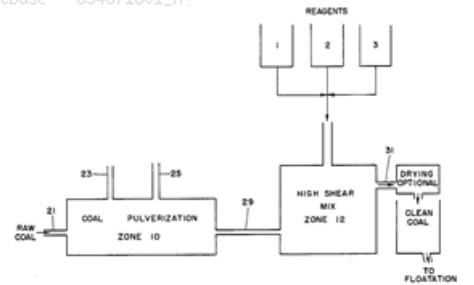
CPC: Y10S516/01 Y10S516/93 C10L1/324 B03D1/1456 B03B9/005 B03D1/02 C10G1/00 C10G1/04 C10L9/00 C10L1/326

European: B03B9/00B B03D1/02 C10G1/00 C10G1/04 C10L1/32B C10L1/32C C10L9/00

US: 106/273R 106/277 106/283 208/14 209/166 252/351 252/DIG.1 252/DigI 44/15R 44/280 44/281 44/282 44/51 44/51' 44/592 44/606

44/621 44/622 44/627 44/71 44/72 44/77 516/38 516/45 516/46 516/53 516/930 516/DIG.1

PatBase - US4671801_A



Family:

Publication number	Publication date	Application number	Application date
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AT19649 E	19860515	AT19820300449T	19820128
AT23186 E	19861115	AT19840105630T	19840517
AT33397 E	19880415	AT19830108876T	19830908
AT56037 E	19900915	AT19850104280T	19850409
AU198279475 A1	19820805	AU19820079475	19820113
AU198279476 A1	19820805	AU19820079476	19820113
AU198318646 A1	19850307	AU19830018646	19830902
AU198428343 A1	19841122	AU19840028343	19840517
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AU551442 B2	19860501	AU19820079476	19820113
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AU568309 B2	19871224	AU19830018646	19830902
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CA1260708 A1	19890926	CA19850477678	19850327
DE3270542 D1	19860522	DE19823270542	19820128
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DE3461103 D1	19861204	DE19843461103	19840517
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DK162654 C	19920413	DK19830004096	19830909
DK245084 A	19841119	DK19840002450	19840517
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DK409683 A	19840311	DK19830004096	19830909
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EP0057576 B1	19860416	EP19820300448	19820128
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EP0057577 A2	19820811	EP19820300449	19820128
EP0057577 A3	19831130	EP19820300449	19820128
EP0057577 B1	19860507	EP19820300449	19820128
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EP0106130 B1	19880406	EP19830108876	19830908
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FI78498 B	19890428	FI19840002009	19840518
FI78498 C	19890810	FI19840002009	19840518
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FI851405 A0	19850409	FI19850001405	19850409
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NO163626 C	19900627	NO19840001947	19840516
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ZA8200215 A	19821229	ZA19820000215	19820113
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ZA8403455 A	19841224	ZA19840003455	19840508
ZA8502482 A	19851127	ZA19850002482	19850402

Priority:

US19810230052 19810129	US19810230062 19810129	EP19820300448 19820128
EP19820300449 19820128	CA19820395218 19820129	CA19820395228 19820129
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Probable Assignee: STANDARD OIL CO

Assignee(s): (std): GULF AND WESTERN IND ; GULF AND WESTERN INDUSTRIES ; GULF AND WESTERN MFG CO ; SOHIO ALTERNA ENERGY DEV CO ; INC ; SOHIAO OORUTANEETO ENAJII DEV CO ; SOHIO ALTERNATE ENERGY DEV ; SOHIO ALTERNATE ENERGY DEV COM ; STANDARD OIL CO OHIO ; SOHIO ALTERNATE ENERGY DEV CO ; STANDARD OIL COMPANY THE ; STANDARD OIL CO THE ; SOHIO ALTERNATE ENERGY DEVELOPMENT COMPANY ; STANDARD OIL COMP THE ; SOHIO ALTERNATE ENERGY DEVELOPMENT CO ; THE STANDARD OIL COMPANY

Assignee(s): SOHIO ALTERNATE ENERGY DEVELOPMENT CO CLEVELAND OHIO US ; SOHIO ALTERNATE ENERGY DEVELOPMENT COMPANYO A CORP OF DE ; STANDARD OIL COMP ; BURGESS LESTER E ; GARUFU ANDO UESUTAN INC ; WICKES MFG CO ; STANDARD OIL CO ; WICKES MFG ; THE STANDARD OIL CO ; SOHIO ALTERNATE ENERGY DEVELOPMENT ; GULF AND WESTERN INDUSTRIES INC ; GULF AND WESTERN MANUFACTURING COMPANY ; GULF AND WESTERN MFG CO A DE CORP ; MARK SEYMOUR ; MCGARRY PHILLIP E ; HERMAN DAVID E ; HAGSTROM ROBERT G ; GULF AND WESTERN MFG CO A CORP OF DELAWARE ; GULF AND WESTERN MFG ; GULF AND WESTERN MANUFACTURING CO ; GULF AND WESTERN IND INC ; GULF AND WESTERN IND INC 1 GULF AND WESTERN PLAZA ; GULF AND WESTERN IND INC 1 GULF AND WESTERN PLAZA NEW YORK NY 10023 A CORP OF DEL

Inventor(s): (std): BURGESS LESTER E ; DAVID E HERMAN ; DEBITSUDO II HAAMAN ; FUIRITSUPU II MATSUKUGIYARII ; HAGSTROM ROBERT G ; HERMAN DAVID E ; LESTER E BURGESS ; MCGARRY PHILIP E ; MCGARRY PHILLIP E ; PHILIP E MCGARRY ; RESUTAA II BAAJISU ; ROBAATO JII HAGUSUTOROOMU ; ROBERT G HAGSTROM ; SEIMOORU MAAKU ; SEYMOUR MARK ; SHIIMOO MAAKU ; MARK SEYMOUR ; MARK SEYMOR ; FUIRITSUPU II MATSUKUGIYARII

Inventor(s): SEYMOUR MARK WAYNE PENNSYLVANIA 19087 US ; SEIMOA MAAKU

Agent(s): SPRUSON AND FERGUSON; ASPEN PHARMA PTY LTD; MACRAE AND CO; MCFADDEN FINCHAM; OSLER HOSKIN AND HARCOURT LLP

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

Title: METHOD FOR THE FROTH FLOTATION OF COAL

Abstract: The present invention relates to the beneficiation of coal by the process of froth flotation and specifically relates to a process for the froth flotation of coal using a collector consisting essentially of a fatty acid monoester of a polyol, a fatty acid diester of a polyol, or a mixture thereof.

Classifications:

International (IPC 8-9): B03D B03D1/008 B03D1/01 B03D1/016 B03D1/02 B03D101/02 B03D103/08 (Advanced/Invention);

B03D101/02 B03D103/08 (Advanced/Non-invention);

B03D1/00 B03D1/004 (Core/Invention);

B03D (Subclass/Invention)

CPC: B03D1/008 B03D2201/02 B03D2203/08

European: B03D1/008

US: 209/166

Family:

Publication number	Publication date	Application number	Application date
AU2009210639 AA	20090813	AU20090210639	20090115
AU2009210639 BB	20120621	AU20090210639	20090115
AU2010101008 AD	20101014	AU20100101008	20100914
CA2713136 AA	20090813	CA20092713136	20090115
CA2713136 C	20160913	CA20092713136	20090115
US2009194466 AA	20090806	US20090353998	20090115
US8875898 BB	20141104	US20090353998	20090115
WO09099731 A1	20090813	WO2009US31036	20090115
ZA201005129 A	20110928	ZA20100005129	20100719

Priority:

US20080026316P 20080205 AU20090210639 20090115 US20090353998 20090115
 WO2009US31036 20090115 AU20100101008 20100914

Probable Assignee: INGEVITY SOUTH CAROLINA LLC

Assignee(s): (std): GEORGIA PACIFIC CHEMICALS LLC ; HINES JOHN B ; HURD PHILLIP W ; KENNEDY DENNIS

Assignee(s): WELLS FARGO BANK NA ADMINISTRATIVE AGENT AS ; INGEVITY SOUTH CAROLINA LLC

Inventor(s): (std): HINES JOHN B ; HURD PHILLIP W ; KENNEDY DENNIS

Inventor(s): PHILLIP W HURD ; JOHN B HINES ; DENNIS KENNEDY

Agent(s): PHILLIPS ORMONDE FITZPATRICK; BLAKE CASSELS AND GRAYDON LLP; PATENT GROUP GA030-43,GEORGIA-PACIFIC LLC; PATENT GROUP GA030 43 GEORGIA PACIFIC LLC; RAM W; KERNS MICHAEL

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

Title: FUEL OIL COMPOSITIONS AND PROCESSES

Abstract: This document relates to a fuel oil composition comprising: (i) a solid hydrocarbonaceous and/or solid carbonaceous material, wherein the material is in particulate form, and wherein at least about 90 percent by volume (percent v) of the particles are no greater than about 20 microns in diameter; and (ii) a liquid fuel oil; wherein the solid hydrocarbonaceous and/or solid carbonaceous material is present in an amount of at most about 30 by mass (percent m) based on the total mass of the fuel oil composition. The invention further relates a process for the preparation of this fuel oil composition, a method of changing a grade of a liquid fuel oil, and a method for adjusting the flash point of a liquid fuel oil.

Classifications:

International (IPC 8-9): C10L1/04 C10L1/32 (Advanced/Invention)

CPC: C10L1/322 C10L2200/0438 C10L2250/06 C10L2290/24
C10L2290/34 C10L2290/28 C10L2200/043 C10L2230/14 C10L2290/08
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US: 44/282

PatBase - US2017022437_AA

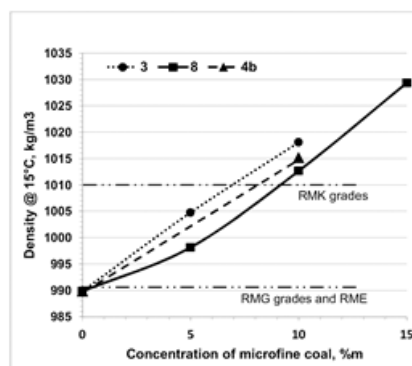


Figure 1

Family:

Publication number	Publication date	Application number	Application date
CN107267227 A	20171020	CN201611044116	20161123
GB201607557 A0	20160615	GB20160007557	20160429
US2017022437 AA	20170126	US20160284995	20161004
US9777235 BB	20171003	US20160284995	20161004
WO17174972 A1	20171012	WO2017GB50938	20170404

Priority:

GB20160005768 20160404 GB20160007557 20160429 US20160284995 20161004
CN201611044116 20161123

Probable Assignee: HENDRICKS TECHNOLOGIES LTD

Assignee(s): (std): ALLARD SERVICES LTD

Assignee(s): ARQ IP LTD ; HENDRICKS TECHNOLOGIES LTD

Inventor(s): (std): JOHN FRANCIS UNSWORTH ; PAUL SNAITH ; SNAITH PAUL ; UNSWORTH JOHN FRANCIS

Agent(s): DINSMORE AND SHOHL LLP; CALDWELL JUDITH 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 DJ 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 KH KM KN KP KR KW 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

Title: PROCESS FOR PRODUCING HIGH CALORIFIC VALUE WATER-COAL SLURRY BY UTILIZING COAL OR COAL GANGUE AND COAL GASIFICATION PROCESS ADOPTING PROCESS

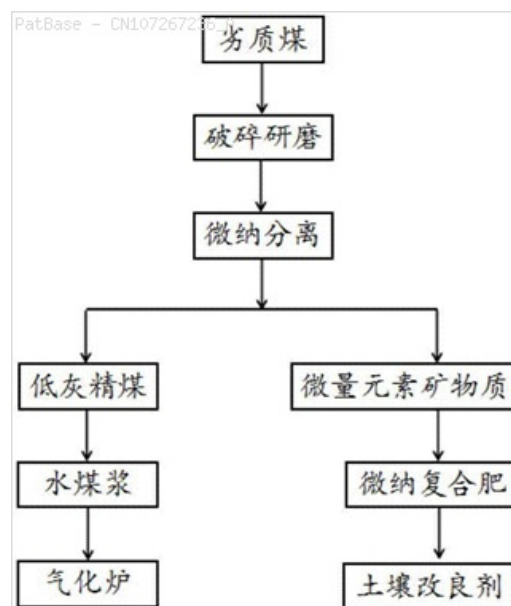
Abstract: The invention discloses a process for producing high calorific value water-coal slurry by utilizing coal or coal gangue. The coal or the coal gangue comprises incombustible minerals and combustible containing carbon-hydrogen. The process comprises the following steps: A, wet grinding coal or coal gangue in water until an average particle size of particles is smaller than 500 micrometers, adding additives in a continuous wet grinding process, uniformly dispersing the additives, and obtaining micro-nano water-coal slurry; B, introducing micro-bubbles with a diameter smaller than 200 micrometers into the micro-nano water-coal slurry, wherein the mineral particles bonded with the additives are agglomerated and sunken as a bottom stream, wherein the combustible particles containing the carbon-hydrogen floats along with the bubbles to be a floating stream, so that the separation of the mineral particles and the combustible particles can be realized; and C, separating the combustible particles containing the carbon-hydrogen from the floating stream, and preparing the high calorific value water-coal slurry with a calorific value higher than 4000kcal/kg by virtue of press filtering. The invention also discloses a coal gasification process comprising the high calorific value water-coal slurry preparation process, so that inferior coal can be used for gasifying the water-coal slurry at first.

Classifications:

International (IPC 8-9): C05G1/00 C10J3/46

C10L1/32 (Advanced/Invention)

CPC: C10L1/326 C05G1/00 C10J3/46



Family:

Publication number	Publication date	Application number	Application date
■ CN107267236 A	20171020	CN201710502714	20170627

Priority:

CN201710502714 20170627

Probable Assignee: SHENZHEN RUIKE TIANQI TECH CO LTD

Assignee(s): (std): SHENZHEN RUIKE TIANQI TECH CO LTD

Assignee(s): SHENZHEN RUIKE TIANQI TECHNOLOGY CO

Inventor(s): (std): LIU KE ; WENG LI ; WU CHANGNING