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[Continued on next page]

(54) Title: RECOVERING VALUABLE MINED MATERIALS FROM AQUEOUS WASTES



FIG. 1

(57) Abstract: Disclosed herein are systems and methods for recovering a target material from an aqueous stream. The target material can be a natively hydrophobic target material, such as a hydrocarbon material, such as coal. The target material can also have a surface modification that renders it hydrophobic. Systems for recovering the target material can comprise an extractant formulation comprising a light hydrocarbon solvent and a high molecular weight hydrophobic polymer, wherein the extractant formulation is mixable with the aqueous stream in a mixer to form an admixed solution having a hydrophobic portion and an aqueous portion, with the target material partitioning to the hydrophobic portion; a separator for isolating the hydrophobic portion from the aqueous portion; and a collector to which the hydrophobic portion is directed, wherein the target material is recovered from the hydrophobic portion.



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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - B01D 21/00 (2012.01)

USPC - 44/282

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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USPC - 44/51, 280, 281, 282, 624, 626, 627; 209/5, 10, 17, 269; 210/638; 423/26, 27

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PatBase, Google Patents, Google

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,236,596 A (GREENWALD, SR.) 17 August 1993 (17.08.1993) entire document	1-7, 9-23, 25-29
Y	US 6,855,260 B1 (YOON) 15 February 2005 (15.02.2005) entire document	1-7, 9-23, 25-29
Y	US 2011/0017676 A1 (FRANKS et al) 27 January 2011 (27.01.2011) entire document	1-7, 9-23, 25-29
Y	US 2010/0000734 A1 (HUANG et al) 07 January 2010 (07.01.2010) entire document	18
A	US 2003/0146167 A1 (MILLER) 07 August 2003 (07.08.2003) entire document	1-29
A	US 4,544,490 A (ERICKSON et al) 01 October 1985 (01.10.1985) entire document	1-29

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