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(54) Title: METHODS OF USING NATURAL PRODUCTS AS DEWATERING AIDS FOR FINE PARTICLES

(57) Abstract: A new method of improving the process of dewatering fine particulate materials is disclosed. In this method, an aqueous slurry of fine particles is treated with appropriate hydrophobizing reagents so that the particulate material becomes moderately hydrophobic. A lipid of vegetable or animal origin is then added to the slurry in solutions of light hydrocarbon oils and short-chain alcohols, so that the hydrophobic lipid molecules adsorb on the moderately hydrophobic surface and, thereby, greatly enhance its hydrophobicity. By virtue of the enhanced hydrophobicity, the water molecules adhering to the surface are destabilized and more readily removed during the process of mechanical dewatering. The moisture reduction can be further improved using appropriate electrolytes in conjunction with the lipids, spraying surface tension lowering reagents onto the filter cake, subjecting the cake to a suitable vibratory means, and using combinations thereof.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/26925

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : B01D 37/02
US CL : 210/705

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)

U.S. : 210/705, 725, 727, 728, 729, 730, 748, 770, 772, 777, 778; 44/626; 209/5

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
NONE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,670,056 A (YOON et al.) 23 September 1997, see col. 2 line 21 through col. 6 line 44	1-37
Y	US 4,210,531 A (WANG et al.) 01 July 1980, see col. 2 line 3 through col. 4 line 34	1-37
Y	US 4,278,208 A (FALCON-STEWARD) 14 July 1981, see col. 3 line 17 through col. 5 line 52	5, 17-23, 34-37
Y	US 4,207,186 A (WANG et al.) 10 June 1980, see col. 2 line 19 through col. 3 line 43	11
Y	US 5,814,210 A (YOON et al.) 29 September 1998, see col. 17 lines 20-49	14

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents.	"T" Later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US00/26925

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4,561,953 A (MURALIDHARA et al.) 31 December 1985, see col. 3 line 7 through col. 4 line 48	24-28, 34-37
Y	US 5,346,630 A (KENNEY) 13 September 1994, see col. 3 line 49 through col. 4 line 61	29-37