



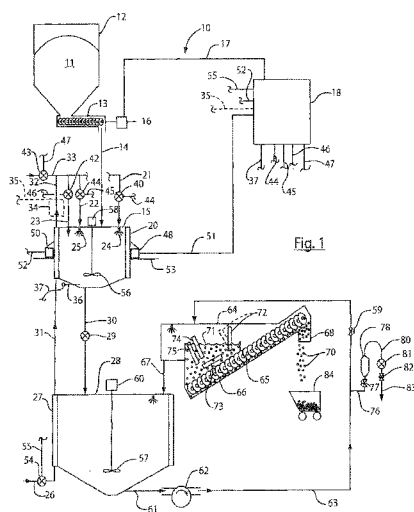
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- (81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM,

AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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- Published:**
- with international search report (Art. 21(3))
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- (88) **Date of publication of the international search report:**
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(54) **Title:** PROCESS AND APPARATUS FOR SLAKING LIME AND DISSOLVING SCALE



(57) **Abstract:** Process and apparatus is disclosed for providing a chemical reaction between calcium oxide containing grit particles to produce calcium hydroxide and heat, capturing the heat of hydration and using it to preheat water initially at ambient temperature, to rise to an elevated temperature to increase the amount of lime present in the water to a supersaturated lime suspension level, with the chemical reaction running to completion, followed by cooling. Heat from a water jacket may be used to raise the temperature in the lime slaker. A process and apparatus is also provided for dissolving scale on internal surfaces of a lime slaker, a lime aging tank, grit separation device and piping and dosing sub-systems, by adding acid into the system with rinse water. A pressurized delivery system that is substantially closed to atmosphere delivers treating dosing under sufficient pressure conditions to maintain a relatively constant back pressure, by means of valving.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/027109**A. CLASSIFICATION OF SUBJECT MATTER***C02F 11/14(2006.01)i, B01D 21/01(2006.01)i, C02F 1/52(2006.01)i*

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)

C02F 11/14; C04B 2/04; C01B 13/14; B01F 15/02; E01F 2/08; C02F 1/00

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

Korean utility models and applications for utility models
Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: lime , slaker , heat

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 04588559A A (EMMETT; ROBERT C.) 13 May 1986 See the whole document	1-44
A	US 6568842 B1 (MURRAY; RICHARD D.) 27 May 2003 See the whole document	1-44
A	US 05336481A A (MUZIK; CHARLES J. et al.) 09 August 1994 See the whole document	1-44
X	US 2006-0231511 A1 (PAUL CHRISTY et al.) 19 October 2006 See abstract, figures 1,2,6, [0029]-[0041]	44
A	See the whole document	1-43

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

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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"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

"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

"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

"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

"&" document member of the same patent family

Date of the actual completion of the international search

15 NOVEMBER 2011 (15.11.2011)

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/027109

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 04588559A A	13.05.1986	US 04482528A A	13.11.1984
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US 05336481A A	09.08.1994	US 05294408A A	15.03.1994
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