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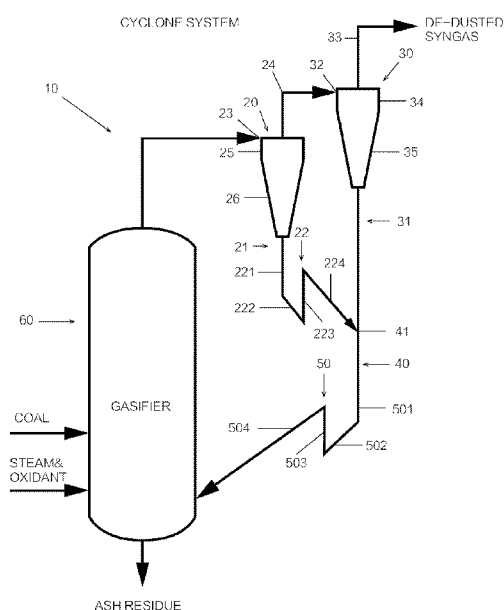
(54) **Title:** FINES CAPTURE AND RECYCLE SYSTEM AND USES THEREOF

Figure 1. Overall Arrangement of Gasifier, Cyclones and Diplegs

(57) **Abstract:** A cyclone system for a gasifier having two or more cyclones arranged in series. The cyclone system comprises a first stage cyclone, a first dipleg, and a first loopseal; a second stage cyclone, a second dipleg, a combined dipleg, and a combined loopseal. The first loopseal connects to the combined dipleg above the combined loopseal. The combined loop seal is connected to the combined dip leg for receiving a mixture of the first and second solid particle fractions, and to the gasifier for feeding the mixture of the first and second solid particle fractions back to the gasifier. Also disclosed is a method for capturing and recycling fines with the cyclone system.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 12/44094

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - C10J 3/00, C10J 3/46 (2012.01)

USPC - 48/197R; 48/202; 48/210; 48/77; 48/206, 48/63

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)

IPC (8) - C10J 3/00, C10J 3/46 (2012.01)

USPC - 48/197R; 48/202; 48/210; 48/77; 48/206, 48/63

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)

PubWEST (PGPB,USPT,USOC,EPAB,JPAB) Terms - loopseal loop seal cyclones cyclonic ash fines recycle recirculate volute dipleg downcomer

Google - (ash OR fines) (capture OR recycle) (dual OR two)-cyclones volute (downcomer OR dipleg) seal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 7,329,309 B2 (SMITH, ET AL.) 12 February 2008 (12.02.2008), col 7, ln 37-59; col 8, ln 4-53	1-16
Y	WO 2010/141930 A1 (LIU) 09 December 2010 (08.12.2010), paras [0026], [0028]	1-16
A	US 2011/0146152 A1 (VIMALCHAND, ET AL.) 23 June 2011 (23.06.2011), entire document	1-16
A	US 2010/0043683 A1 (MATSUZAWA, ET AL.) 25 February 2010 (25.02.1010), entire document	1-16
A	US 5,154,732 A (HAKULIN, ET AL.) 13 October 1992 (13.10.1992), entire document	1-16
A	US 4,969,930 A (ARPALAHTI) 13 November 1990 (13.11.1990), entire document	1-16

☐ Further documents are listed in the continuation of Box C.


* Special categories of cited documents:

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"E" earlier application or patent but published on or after the international filing date

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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

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