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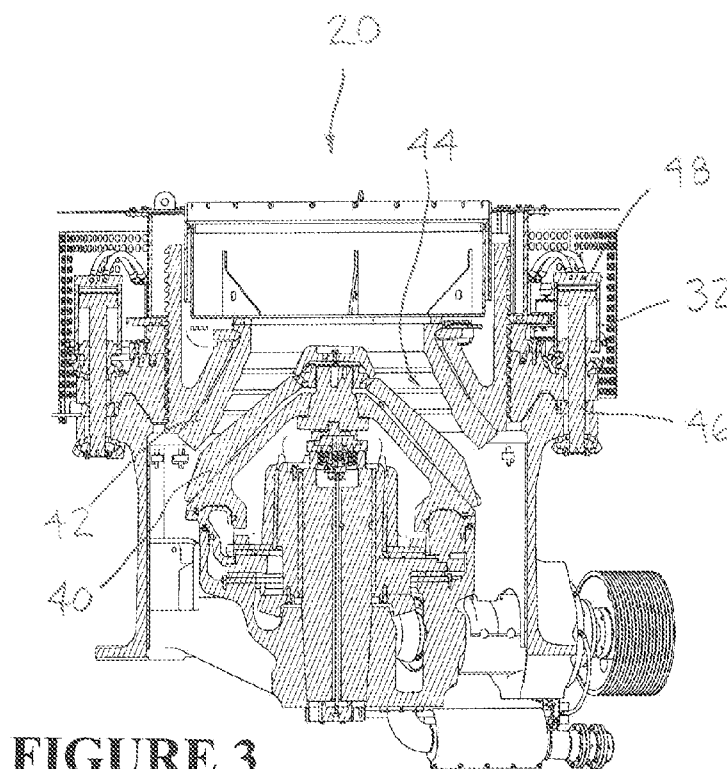
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[Continued on next page]

(54) Title: APPARATUS AND METHOD FOR A CRUSHER WITH AN INVERTED CYLINDER



(57) Abstract: A crusher adapted to crush feed materials comprising a main frame, a secondary frame disposed adjacent to the main frame, a crushing chamber adapted to receive feed materials, and a tramp iron relief system comprising a cylinder. The tramp iron relief system is adapted to allow a portion of the secondary frame to move away from the main frame. The cylinder is disposed substantially adjacent to the secondary frame. A method for installing a cylinder on a crusher and a method for removing a cylinder from a crusher wherein a lifting device remains attached to the cylinder continuously during each operation.



TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

— *of inventorship (Rule 4.17(iv))*

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2013/046347

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - B02C 2/00 (2013.01)

USPC - 241/207

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) - B02C 2/00, 2/02, 2/04 (2013.01)

USPC - 241/198.1, 201, 203, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 286

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

CPC - B02C 2/045, 2/047 (2013.01)

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

PatBase, Google Scholar

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2011/091403 A1 (SOLOMON et al) 28 July 2011 (28.07.2011) entire document	1-21
Y	US 4,717,084 A (VENDELIN et al) 05 January 1988 (05.01.1988) entire document	1-21

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

* Special categories of cited documents:

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

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

"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)

"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

17 November 2013

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