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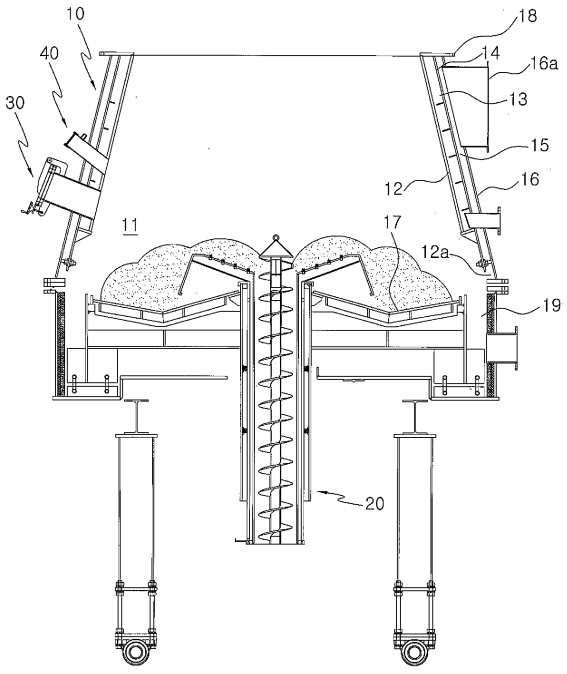
(54) Combustion apparatus with improved combustion efficiency

(57) Provided is a combustion apparatus with improved thermal efficiency having a combustion vessel that receives an air supply from the outside to thus burn a fuel that is supplied from a fuel supply unit, which including: a cylindrical combustion chamber (11) that is surrounded by an inner wall (12) of the combustion vessel (10) to thus burn a fuel; a cooling chamber (13) that comprises an intermediate wall (14) that is formed to be spaced apart from an outer side of the inner wall (12) of the combustion vessel (10), in which a cooling water inlet and a cooling water outlet through which cooling water flows in and out, respectively, are formed at lower and upper sides of the intermediate wall (14), and that is formed at an outer circumference of the combustion chamber (11), to thereby cool the inner wall (12) of the combustion chamber (11) by the cooling water that flows into a space formed between the inner and intermediate walls (12, 14) of the cooling chamber (13) through the cooling water inlet; a lateral combustion air supply chamber (15) that comprises an outer wall (16) that is formed to be spaced apart from an outer side of the intermediate wall (14) of the cooling chamber (13), in which a combustion air supply inlet (16a) through which air necessary for combustion is supplied from the outside is formed at an upper side of the outer wall (16), and that is formed at an outer circumference of the cooling chamber (13), to thereby make the air supplied through the combustion air supply inlet (16a) that is formed in a tangential direction with respect to the cylindrical outer wall (16) turn and fall in a space formed between the intermediate wall (14) of the cooling chamber (13) and the outer wall (16) of the lateral combustion air supply chamber (15), so that the combustion air is supplied to the combustion chamber (11) via an opened lower portion of the lateral combustion air supply chamber (15) (Fig. 2).

FIG. 2



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EUROPEAN SEARCH REPORT

Application Number
EP 12 17 4643

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	KR 200 445 277 Y1 (SANG KWON K) 16 July 2009 (2009-07-16) * figures 2,4 * -----	1-10	INV. F23B30/04 F23B40/04 F23M5/08
A	US 2009/126607 A1 (KIM HONG JIN [KR]) 21 May 2009 (2009-05-21) * figures 1,5 * -----	1-10	

TECHNICAL FIELDS SEARCHED (IPC)

F23B
F23M

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	24 March 2015	Christen, Jérôme

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 200445277 Y1	16-07-2009	NONE	
US 2009126607 A1	21-05-2009	KR 100821124 B1	14-04-2008
		US 2009126607 A1	21-05-2009

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