



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
06.11.2013 Bulletin 2013/45

(51) Int Cl.:
F28D 19/04 ^(2006.01) **F28F 27/00** ^(2006.01)
F28F 27/02 ^(2006.01)

(43) Date of publication A2:
14.12.2011 Bulletin 2011/50

(21) Application number: **11167189.7**

(22) Date of filing: **23.05.2011**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(72) Inventors:
• **Birmingham, James William**
Wellsville, NY 14895 (US)
• **Seebald, James David**
Wellsville, NY 14895 (US)

(30) Priority: **14.06.2010 US 814812**

(74) Representative: **Pesce, Michele**
ALSTOM Technology Ltd
CHTI Intellectual Property
Brown Boveri Str. 7/664/2
5401 Baden (CH)

(71) Applicant: **Alstom Technology Ltd**
5400 Baden (CH)

(54) **Regenerative air preheater design to reduce cold end fouling**

(57) An air preheater 100 is described having an air damper assembly 162 that partially restricts an air inlet 130 and a flue gas damper assembly 152 that partially restricts flue gas inlet 124 during periods of reduced boiler load. Restricting the flue gas inlet 124 reduces the effective surface area of the preheater causing more heat to pass to the cold end of the air preheater 100, reducing

acid condensation and fouling. Restricting the gas inlet 124, increases gas velocity, thereby eroding accumulations in the air preheater 100, also reducing fouling. Restricting the air inlet 130 reduces the effective heat transfer surface area of the air preheater, which raises the gas temperature in the cold end of the air preheater and thereby reduces acid condensation and fouling.

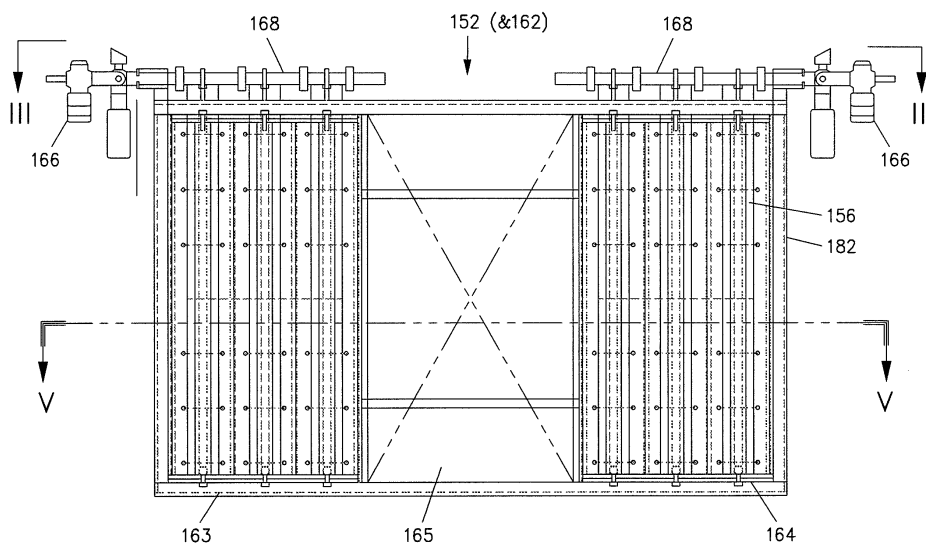


Figure 3



EUROPEAN SEARCH REPORT

Application Number
EP 11 16 7189

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	GB 1 209 876 A (HERBERT BRANDT & ARTHUR KRITZL [DE]) 21 October 1970 (1970-10-21)	1,2,4-9	INV. F28D19/04
Y	* page 1, line 12 - line 22; figures 1,2 * * page 2, line 17 - line 29; figures 1,2 * * page 2, line 7 - line 16; figures 1,2 * * page 1, line 23 - line 30; figures 1,2 * * page 1, line 12 - line 30; figures 1,2 * * sentence 17 - sentence 29; figures 1,2 * * page 2, line 15 - line 16; figures 1,2 * * sentence 7 - sentence 16; figures 1,2 *	3,10,11	F28F27/00 F28F27/02
Y	EP 0 011 118 A1 (LUMMUS TECH FRANCE [FR]) 28 May 1980 (1980-05-28) * page 5, line 16 - line 26; figure 1 *	3	
Y	US 2 692 761 A (JOSEPH WAITKNS) 26 October 1954 (1954-10-26) * column 3, line 12 - line 47; figures 3-6 *	10,11	
A	US 2 499 358 A (COOPER ROLAND S ET AL) 7 March 1950 (1950-03-07) * column 3, line 14 - line 38; figure 1 *	2	TECHNICAL FIELDS SEARCHED (IPC)
A	US 2 989 952 A (RICHL FREDERICK W) 27 June 1961 (1961-06-27) * column 6, line 51 - line 60; figure 3 *	4	F28F F28D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 25 September 2013	Examiner Mendão, João
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

 1
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 11 16 7189

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

25-09-2013

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
GB 1209876	A	21-10-1970	FR GB	2008317 A1 1209876 A	16-01-1970 21-10-1970

EP 0011118	A1	28-05-1980	AU CA EP JP US	5278879 A 1128823 A1 0011118 A1 S5568523 A 4205630 A	22-05-1980 03-08-1982 28-05-1980 23-05-1980 03-06-1980

US 2692761	A	26-10-1954	NONE		

US 2499358	A	07-03-1950	NONE		

US 2989952	A	27-06-1961	NONE		
