

(12) **United States Patent**  
**Petty**

(10) **Patent No.:** **US 9,186,625 B2**  
(45) **Date of Patent:** **Nov. 17, 2015**

(54) **METHOD AND APPARATUS FOR PRE-HEATING RECIRCULATED FLUE GAS TO A DRY SCRUBBER DURING PERIODS OF LOW TEMPERATURE**

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(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 317 days.

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(21) Appl. No.: **14/016,669**  
(22) Filed: **Sep. 3, 2013**  
(65) **Prior Publication Data**  
US 2014/0086797 A1 Mar. 27, 2014

(Continued)

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**Related U.S. Application Data**  
(60) Provisional application No. 61/704,073, filed on Sep. 21, 2012.  
(51) **Int. Cl.**  
**B01D 53/34** (2006.01)  
**B01D 53/40** (2006.01)  
**B01D 53/50** (2006.01)  
**B01D 53/83** (2006.01)  
(52) **U.S. Cl.**  
CPC ..... **B01D 53/346** (2013.01); **B01D 53/40** (2013.01); **B01D 53/508** (2013.01); **B01D 53/83** (2013.01)  
(58) **Field of Classification Search**  
CPC .... B01D 53/346; B01D 53/40; B01D 53/508; B01D 53/83  
See application file for complete search history.

(57) **ABSTRACT**  
A method and system for preventing exclusions in an air quality control system (AQCS) of a type having a scrubber, either a circulating fluidized bed (CFB), transport reactor (TR) or spray-dryer absorber SDA, and in all three cases with a flue gas recirculation FGR system. The invention automatically pre-heats flue gas recirculated to the input of the CFB/TR/SDA scrubber during periods of low temperature operation. The system supplements the “traditional” gas recirculation scheme with heater(s) that are used during periods of low temperature. During periods of low load conditions, the system monitors the SDA/TR/CFB inlet temperature and, when it falls below a setpoint, the control system increases the heat input of the pre-heater(s) in the FGR system in order to maintain a minimum inlet temperature. This satisfies the need for the inlet temperature to be above a certain level, thereby ensuring that the temperature is high enough so that when process water is added for promotion of the acid gas reactions with lime the scrubber exit temperature is maintained above the minimum required for proper system operation. The temperature sensor may be a conventional dry bulb temperature sensor or its functional equivalent installed at or near the CFB, TR or SDA scrubber FGR inlet.

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**30 Claims, 3 Drawing Sheets**

