

(12) **United States Patent**
Zhang et al.

(10) **Patent No.:** **US 9,409,775 B2**
(45) **Date of Patent:** ***Aug. 9, 2016**

(54) **METHOD OF PURIFICATION OF BIOMASS SYNGAS UNDER NEGATIVE PRESSURE**

(71) Applicant: **WUHAN KAIDI GENERAL RESEARCH INSTITUTE OF ENGINEERING & TECHNOLOGY CO., LTD.**, Wuhan (CN)

(72) Inventors: **Yanfeng Zhang**, Wuhan (CN); **Hongtao Nie**, Wuhan (CN); **Minggui Xia**, Wuhan (CN); **Wenyan Liu**, Wuhan (CN); **Liang Zhang**, Wuhan (CN)

(73) Assignee: **WUHAN KAIDI ENGINEERING TECHNOLOGY RESEARCH INSTITUTE CO., LTD.**, Wuhan (CN)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **14/314,011**

(22) Filed: **Jun. 24, 2014**

(65) **Prior Publication Data**
US 2015/0041720 A1 Feb. 12, 2015

Related U.S. Application Data

(63) Continuation-in-part of application No. PCT/CN2012/083536, filed on Oct. 26, 2012.

(30) **Foreign Application Priority Data**

Dec. 29, 2011 (CN) 2011 1 0449373

(51) **Int. Cl.**
C01B 3/50 (2006.01)
C10K 1/02 (2006.01)

(Continued)

(52) **U.S. Cl.**
CPC . **C01B 3/506** (2013.01); **C10K 1/02** (2013.01);
C10K 1/046 (2013.01); **C10K 1/06** (2013.01);
C10K 1/101 (2013.01);

(Continued)

(58) **Field of Classification Search**
CPC C01B 3/02
USPC 252/373
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2007/0051044 A1* 3/2007 Holle et al. 48/210
2009/0277089 A1* 11/2009 Neathery 48/76

(Continued)

FOREIGN PATENT DOCUMENTS

CN 2680671 * 2/2005
JP 11-21565 * 1/1999

Primary Examiner — Melvin C Mayes

Assistant Examiner — Kenneth Vaden

(74) *Attorney, Agent, or Firm* — Matthias Scholl P.C.; Matthias Scholl

(57) **ABSTRACT**

A method for purifying biomass syngas, including: a) introducing syngas out of a gasifier, through a water-cooling flue to a water-cooling quench tower; b) introducing the syngas from the water-cooling quench tower to a waste heat boiler of a water-tube type and a waste heat boiler of a heat-tube type; c) washing the syngas from the waste heat boiler of the heat-tube type in a Venturi scrubber in the absence of a filler to remove dust; d) introducing the syngas from the Venturi scrubber to a wet electrical dust precipitator for conducting dust removal and tar mist removal; and e) extracting the syngas by a coal gas draft fan, and transporting the syngas to a wet gas tank for storage or to a downstream process for use.

6 Claims, 1 Drawing Sheet

