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(54) Title of the invention : DUAL FLUIDIZED BED CHEMICAL LOOPING GASIFICATION SYSTEM FOR HYDROGEN PRODUCTION AND PROCESS OF PRODUCTION OF HYDROGEN THEREIN

(51) International classification :C10J0003720000, F23C0010000000, F23C0010010000, C10L0009080000, C10J0003840000 (86) International Application No :NA Filing Date :NA (87) International Publication No : NA (61) Patent of Addition to Application Number :NA Filing Date :NA (62) Divisional to Application Number :NA Filing Date :NA	(71)Name of Applicant : 1)INDIAN INSTITUTE OF TECHNOLOGY (INDIAN SCHOOL OF MINES), DHANBAD Address of Applicant :Dhanbad - 826004, Jharkhand, India Dhanbad ----- Name of Applicant : NA Address of Applicant : NA (72)Name of Inventor : 1)ARUNKUMAR SAMANTA Address of Applicant :Department of Chemical Engineering, Indian Institute of Technology (Indian School of Mines), Dhanbad, Dhanbad – 826004, Jharkhand, India Dhanbad ----- ----- 2)SANDIPAN KUMAR DAS Address of Applicant :Department of Mechanical Engineering, Indian Institute of Technology (Indian School of Mines), Dhanbad, Dhanbad – 826004, Jharkhand, India Dhanbad ----- ----- 3)SOUMYAJIT SEN GUPTA Address of Applicant :Department of Chemical Engineering, Indian Institute of Technology (Indian School of Mines), Dhanbad, Dhanbad – 826004, Jharkhand, India Dhanbad ----- -----
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(57) Abstract :

The present invention relates to a dual fluidized bed chemical looping gasification system for hydrogen production, comprising a biomass torrefaction module, a gasification module and a downstream post-gasification gas purification and conditioning module. In the present invention, two interconnected fluidized bed reactors (101, 102) are used – fluidized bed reactor (101) is for the gasification of biomass and another reactor (102) is used for oxidation of reduced oxygen carriers. During the gasification process, the metal oxide oxygen carrier circulates (in a closed loop) between the two interconnected fluidized beds - the gasifier reactor (101) and air reactor (102). Chemical looping involves an innovative method to provide only oxygen to the biomass gasification process, excluding other gases, e.g., nitrogen. The invention serves a dual purpose as it produces hydrogen from biomass but also achieves inherent separation of CO₂.

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