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(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)Sandipan Kumar Das

Address of Applicant :Department of Mechanical Engineering,
Indian Institute of Technology (Indian School of Mines),
Dhanbad, Dhanbad – 826004, Jharkhand, India Dhanbad -----

2)Arunkumar Samanta

Address of Applicant :Department of Chemical Engineering,
Indian Institute of Technology (Indian School of Mines),
Dhanbad, Dhanbad – 826004, Jharkhand, India Dhanbad -----

3)Siddhartha Sengupta

Address of Applicant :Department of Chemical Engineering,
Indian Institute of Technology (Indian School of Mines),
Dhanbad, Dhanbad – 826004, Jharkhand, India Dhanbad -----

4)Soumyajit Sen Gupta

Address of Applicant :Department of Chemical Engineering,
Indian Institute of Technology (Indian School of Mines),
Dhanbad, Dhanbad – 826004, Jharkhand, India Dhanbad -----

(57) Abstract :

The invention relates to an integrated fluidized bed reactor system for ammonia combustion by first containing hydrogen and then combusting it to generate power. The invention essentially consists of a combustion reactor (2) within a fluidized bed reactor (1), with the outlet of the fluidized bed reactor entering into a separator (3), one of the two outlets of which enters the combustor (2) within the fluidized bed reactor carrying hydrogen from the separator. Ammonia enters the fluidized bed reactor at a temperature of 250C or higher. The reactor is heated to a temperature of around 450oC or even higher. The fluidized bed reactor (1) thermally cracks ammonia into nitrogen and hydrogen in the presence of catalysts. This resultant gases nitrogen and hydrogen from ammonia decomposition are passed into a separator (3) where they are separated into two different streams. According to the invention this ammonia combustion avoids the drawbacks of high ignition temperature, low flame speed and slow kinetics generally associated with ammonia combustion.

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