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(12) UTILITY MODEL

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(54) Title: SYSTEM AND PROCESS FOR PURIFICATION OF BIOGAS TO HIGH GRADE FUEL BIOMETHANE USING LOCAL MATERIAL

(57) Abstract: The present invention discloses a system for purification of high grade Biomethane fuel from Water hyacinth (*Ecchnoria crassipes*), an invasive weed that grows in polluted environments. The system comprises a bioreactor, water trap, hydrogen sulphide scrubber, dehydration unit, carbon dioxide scrubber, compressor and Biomethane fuel tank. The bioreactor operates within a range of 22 - 35 °C in a polyethene cover. Also disclosed is production of high quality bio- fertilizer from *E. crassipes*. The gas initially produced in biogas is a mixture of Carbon dioxide 30-40%, methane 45-50%, nitrogen 5-6%, hydrogen sulphide 0.001% and other traces. The biogas is upgraded to 95% Biomethane. The invention discloses a process for removal of CO₂, H₂S and H₂O with an efficiency of 95-99%, 100%, and 100% respectively using local materials. The removal of H₂S protects the metallic parts from corrosion by the acid gas.