(19) KIPI Kenya Industrial Property Institute

(11) **Utility model Number:** 172

(24) **Registration date:** 04/10/2017

(12) UTILITY MODEL

(21) **Application Number:** 2016/684

(22) **Filing Date:** 07/09/2016

(73) **Owner:**
JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY(JKUAT) of P.O. BOX 62000-00200, NAIROBI, Kenya

(72) **Inventor:**
PAUL M.NJOGU, P.O. BOX 62000-00200, NAIROBI, KENYA

(74) **Agent/address for correspondence:**
JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY(JKUAT), P.O. BOX 62000-00200, NAIROBI, KENYA

(51) Int.Cl.2016.01: C 08J 11/00, 11/10

(54) **Title:** SYSTEM AND PROCESS FOR PRODUCTION OF FUEL GASES AND ULTRAFINE CARBON FROM LOW POLYETHLENE WASTES

(57) **Abstract:** The present invention discloses a system for production of fuel gases and carbon from Polyethylene Films and Shopping Bags (PFSBs) wastes. The system comprises a thermochemical catalytic reactor comprising chimney with a cap (1), reaction chamber (12), an in-feed section (4) control valve and furnace cover reactor (10). Between 150 - 250^0 C, PFSBs are converted to combustible gases weighing 88-90 wt. % and carbon weighing 10 - 12 wt. % with Manganese Dioxide (Mn02) catalyst. The system reaction chamber (12) is a conical shaped fixed bed as shown in Figure 1 below. The invention further discloses a process for producing combustible gases involving steps of thermal decomposition of NaHC03 at temperatures 100 - 250^0 C to generate carbon dioxide gas which drives off oxygen. The process reduces reaction time by 10 - 12% and energy consumption by 45 - 60%, and recovers Carbon from the reactor after reaction.