ELECTRICAL POWER GENERATION SYSTEMS AND METHODS REGARDING SAME

CROSS-REFERENCES OF RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Application Nos. 62/004,883, filed May 29, 2014; 62/012,193, filed June 13, 2014; 62/016,540, filed June 24, 2014; 62/021,699, filed July 7, 2014; 62/023,586, filed July 11, 2014; 62/026,698, filed July 20, 2014; 62/037,152, filed August 14, 2014; 62/041,026, filed August 22, 2014; 62/058,844, filed October 2, 2014; 62/068,592, filed October 24, 2014; 62/083,029, filed November 24, 2014; 62/087,234, filed December 4, 2014; 62/092,230, filed December 15, 2014; 62/113,211, filed February 6, 2015; 62/141,079, filed March 31, 2015; 62/149,501, filed April 17, 2015; 62/159,230, filed May 9, 2015 and 62/165,340, filed May 22, 2015, all of which are incorporated herein by reference.

The present disclosure relates to the field of power generation and, in particular, to systems, devices, and methods for the generation of power. More specifically, embodiments of the present disclosure are directed to power generation devices and systems, as well as related methods, which produce optical power, plasma, and thermal power and produces electrical power via an optical to electric power converter, plasma to electric power converter, photon to electric power converter, or a thermal to electric power converter. In addition, embodiments of the present disclosure describe systems, devices, and methods that use the ignition of a water or water-based fuel source to generate optical power, mechanical power, electrical power, and/or thermal power using photovoltaic power converters. These and other related embodiments are described in detail in the present disclosure.

Power generation can take many forms, harnessing the power from plasma. Successful commercialization of plasma may depend on power generation systems capable of efficiently forming plasma and then capturing the power of the plasma produced.

Plasma may be formed during ignition of certain fuels. These fuels can include water or water-based fuel source. During ignition, a plasma cloud of electron-stripped atoms is formed, and high optical power may be released. The high optical power of the plasma can be harnessed by an electric converter of the present disclosure. The ions and excited state atoms can recombine and undergo electronic relaxation to emit optical power. The optical power can be converted to electricity with photovoltaics.

Summary

In an aspect, the present disclosure refers to a method comprising:

a) producing a voltage differential between a set of electrodes separated to form an open circuit;

b) injecting a conductive material and H2O between said electrodes to close said open circuit and form a current and voltage across said conductive material;

wherein said conductive material comprises metal and a metal oxide, and wherein the current and voltage in said closed circuit and conductive material is capable of initiating a plasma forming reaction when H2O is present as nascent molecules;

c) collecting the products of said plasma forming reaction, wherein a portion of the collecting comprising directing the products upon a light transparent baffle or a light transparent window to retard their trajectory following the plasma forming reaction;

d) regenerating said conductive material from said collected products; and

e) loading said regenerated conductive material between said electrodes.

In an aspect, the present disclosure refers to a method comprising:

a) producing a voltage differential between a set of electrodes separated to form an open circuit;

b) injecting a conductive material and H2O between said electrodes to close said open circuit and form a current and voltage across said conductive material;

wherein said conductive material comprises metal and a metal halide; and wherein the current and voltage in said closed circuit and conductive material is capable of initiating a plasma forming reaction when H2O is present as nascent molecules;

c) collecting the products of said plasma forming reaction, wherein a portion of the collecting comprising directing the products upon a light transparent baffle or a light transparent window to retard their trajectory following the plasma forming reaction;

d) regenerating said conductive material from said collected products; and

e) loading said regenerated conductive material between said electrodes.

Certain examples of the present disclosure are directed to a power generation system comprising: a plurality of electrodes configured to deliver power to a fuel to ignite the fuel and produce a plasma; a source of electrical power configured to deliver electrical energy to the plurality of electrodes; and at least one photovoltaic power converter positioned to receive at least a plurality of plasma photons.