

(21) Application No 0206915.1

(22) Date of Filing 23.03.2002

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(51) INT CL<sup>7</sup>  
**C25B 1/04**

(52) UK CL (Edition V )  
**C7B BCAX BDAF B146 B264 B280 B758 B759**

(56) Documents Cited  
**CA 002209237 A**                      **US 6332434 A**  
**US 5513600 A**                         **US 4361474 A**  
**US 3999089 A**

(58) Field of Search  
UK CL (Edition T ) **C7B BCAX BDAF BDAJ BDAL**  
INT CL<sup>7</sup> **C25B 1/00 1/02 1/04 1/06**  
Other: **Online: OPAJ, WPI and EPODOC**

(54) Abstract Title  
**Gaseous Fuel Generator**

(57) A gaseous fuel generator has a controller 10 for supplying and adjusting power, and a gas generating assembly 20 which is driven by the power supplied by the controller 10 to electrolyse water into a mixed gas fuel of hydrogen and oxygen. A tube 30, which has an end in communication with the gas generating assembly 20 and which can transport the mixed gas, and an adjusting valve 40, which is disposed on the tube 30 for controlling the flow of the mixed gas in the tube 30, are also supplied. A pressure sensor 50 is disposed on the tube 30 for detecting the pressure of the mixed gas in the tube 30 and for sending detection signals to the controller 10 so that the gas generating assembly 20 adjusts the rate of electrolysis. A burner 60 communicates with the tube 30 to receive and burn the mixed gas. A temperature sensor may also be included.

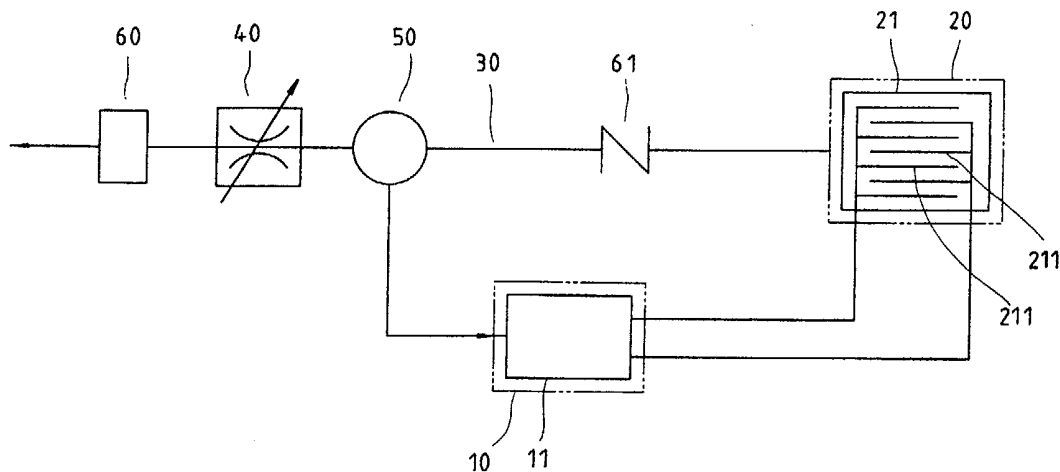


FIG. 1

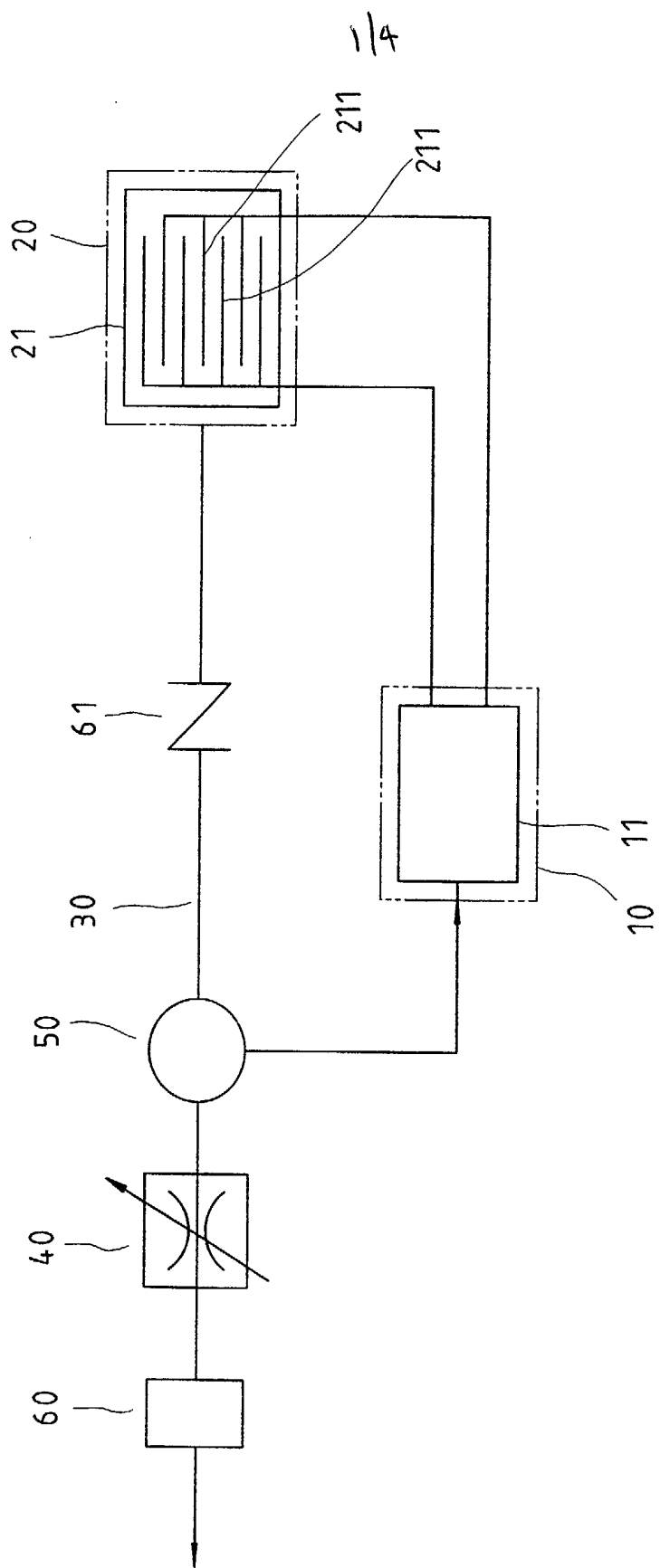


FIG. 1

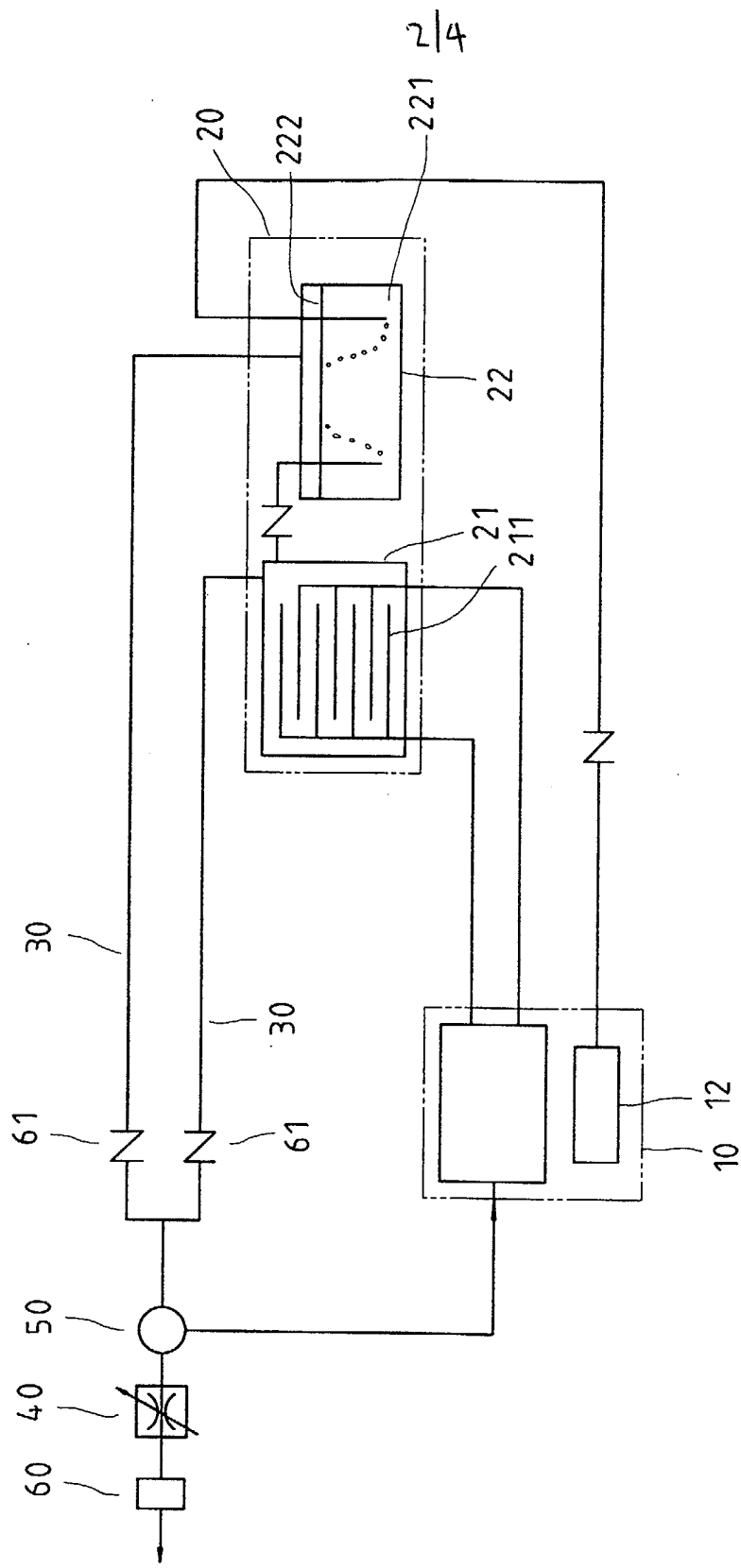


FIG. 2

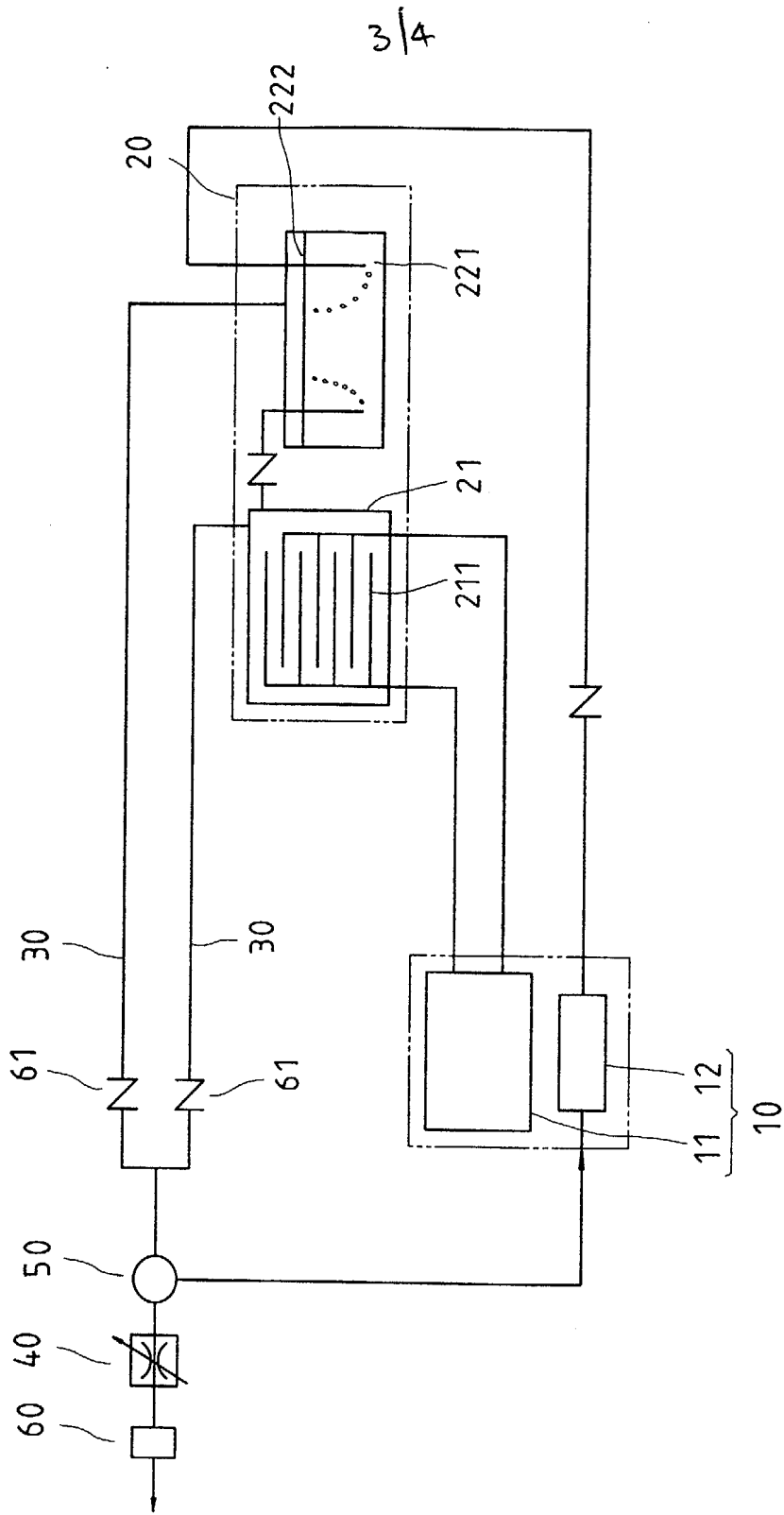


FIG. 3

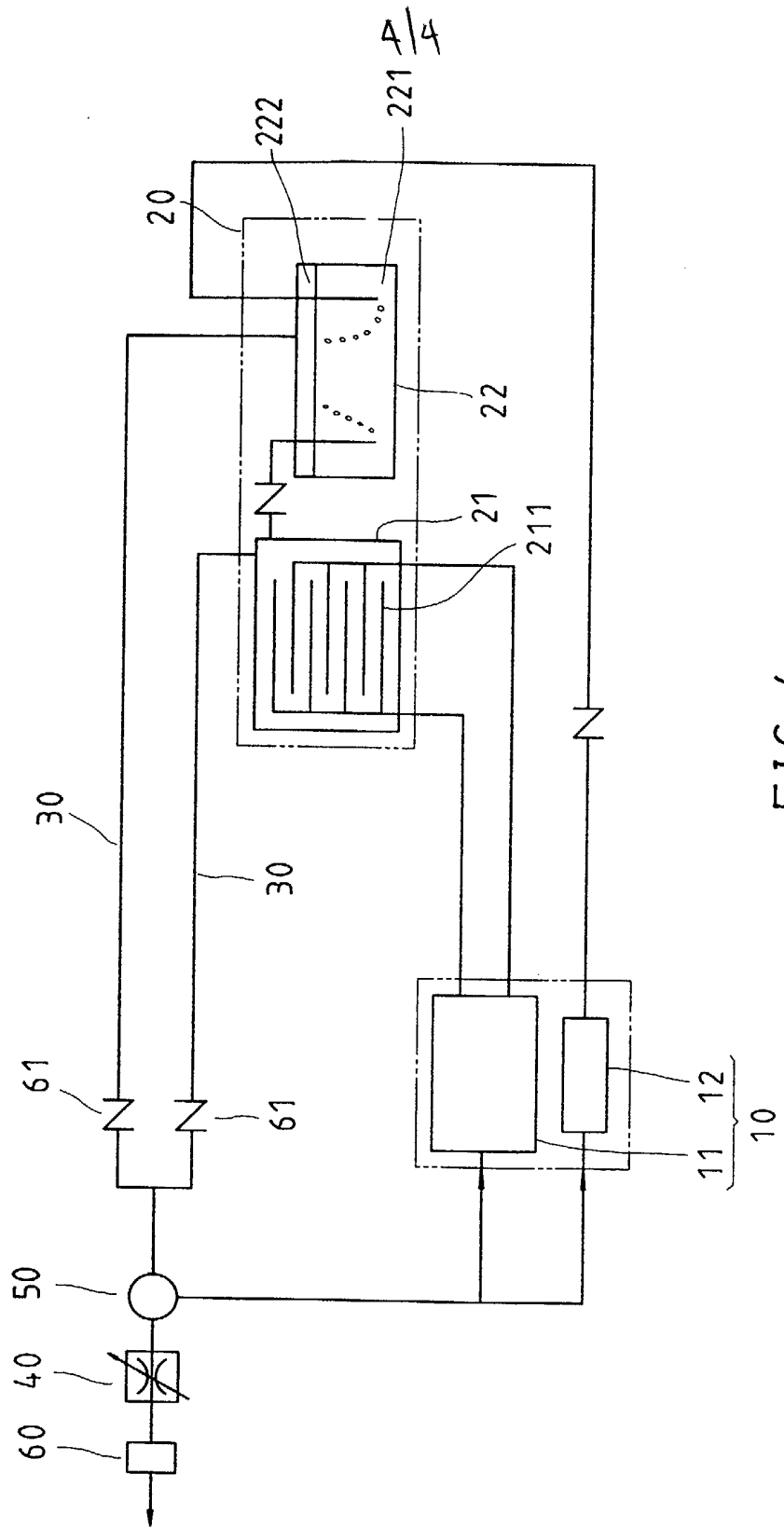


FIG. 4

## GASEOUS FUEL GENERATOR

## FIELD OF THE INVENTION

The present invention related to a fuel generator, and more particularly to a gaseous fuel generator, which can provide a steady supplying rate of the fuel.

## BACKGROUND OF THE INVENTION

In the prior art, a conventional gaseous fuel generator provides an electric power controller to control an electrolytic cell, which can electrolyze water into a mixed gas of hydrogen and oxygen. A valve is provided to control the flow of the mixed gas and sent it to a burner. The burner is to burn the mixed gas and the electric power controller is to provide the essential power for the electrolytic cell to electrolyze water.

In operating, operator first has to start the electric power controller to drive the electrolytic cell to generate the mixed gas of hydrogen and oxygen. Then, operator must control both of the electric power controller and the valve to have predetermined rate of the mixed gas sending to the

burner. But the factors of affecting the electrolytic reaction are very complex, such as temperature, precipitation of reaction and the efficiency of electrolyzing etc. The operator is hardly to control an equal quantity and a steady rate of generating the mixed gas in every moment of the period of burning. This will make the flames of the burner unsteady. The manual control procedure does not meet the request of automatic control in modern industry and it can not have a precise control. Furthermore, it takes a lot electric power but a little mixed gas is generated, some power is wasted in the adjusting.

There were relative inventions of the inventor had provided to fix the problems described above, such as Taiwan patent No. 113039, Taiwan patent No. 115306, Taiwan patent No. 123279 and Taiwan patent published No. 409828.

## SUMMARY OF THE INVENTION

The primary objective of the present invention is to provide a gaseous fuel generator, which can steadily provide mixed gas of hydrogen and oxygen in the period of burning.

According to the objective of the present invention, a gaseous fuel generator comprises a controller for supplying and adjusting power. A gas generating assembly is driven by the power supplied by the controller to generate gaseous fuel. A tube has an end communicating with the gas

generating assembly for transporting the gaseous fuel. An adjusting valve is disposed on the tube for controlling the flow of the gaseous fuel in the tube. A pressure sensor is disposed on the tube for detecting the pressure of the gaseous fuel in the tube and sending signals of detecting to the controller to make the gas generating assembly adjusting the rate of generating the gaseous fuel, and a burner communicates with the other end of the tube to receive the gaseous fuel and burn the gaseous fuel.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram of a first prefer embodiment of the present invention;

FIG. 2 is a block diagram of a second prefer embodiment of the present invention;

FIG. 3 is a block diagram of a third prefer embodiment of the present invention, and

FIG. 4 is a block diagram of a fourth prefer embodiment of the present invention.

## DETAIL DESCRIPTION OF THE INVENTION



Please refer to FIG. 1, a gaseous fuel generator of the first preferred embodiment of the present invention comprises a controller 10, a gas generating assembly 20, a tube 30, an adjusting valve 40, a pressure sensor 50 and a burner 60, wherein

The controller 10 is an electric power controller 11 in the present embodiment, which provides essential electric power to the gas generating assembly 20.

The gas generating assembly 20 has an electrolytic cell 21 and two electric poles 211 in the electrolytic cell 21. The gas generating assembly 20 is to electrolyze water into mixed gas of hydrogen and oxygen and transports the mixed gas by the tube 30. The quantity and rate of generating the mixed gas depends on the direct current provided from the controller 10.

The adjusting valve 40 is to control the flow of the mixed gas in the tube 30.

The pressure sensor 50 is to detect the pressure of the mixed gas in the tube 30. The detected data is comparing to the last time's detected data to be converted to an electric signal feedback to the electric power controller 11 of the controller 10. The electric power controller 11 can adjust the current of the electric power supplied to the electrolytic cell 20 according to the signal provided by the pressure sensor 50. Thus, the quantity and the rate of generating the mixed gas of hydrogen and oxygen

in the electrolytic cell 20 can be controlled automatically and precisely in a steady status. The pressure sensor 50 can be an electronic sensor or a mechanic sensor.

The burner 60 can be a welding device, a heater, a motor-driven device of the stove, a baker or a heating stove etc. to communicate with the tube 30 to get the mixed gas of hydrogen and oxygen. The burner 60 has a one-way valve 61 between the inlet of the burner 60 and the tube 30 to prevent the mixed gas flowing back to the tube 30.

The gaseous fuel generator of the present invention can precisely control the quantity and the rate of generating the mixed gas of hydrogen and oxygen by means of the pressure sensor 50 can provide electric signals of voltage or resistant according to the variation of the pressure of the mixed gas in the tube 30. These signals are sent to the electric power controller 11 to make the electric power controller 11 to adjust the current of electric power supplied to the electrolytic cell 20. In the other words, if the pressure in the tube 30 is set to 1 atm but the value detected by the pressure sensor 50 is 0.9 atm, the electric power controller will increase the current of electric power supplied to the electrolytic cell 20 to make the electrolytic cell 20 can generate the mixed gas in a higher rate. That will make supplying rate of the mixed gas of the gaseous fuel generator keeping steady and make the burner 60 to have a steady burning status to reduce the precipitation of the electrolytic reaction, the aging of the electric poles and the variation of the temperature.

FIG. 2 shows a gaseous fuel generator of the second preferred embodiment of the present invention, which is similar to the first preferred embodiment, except that further has a mixing chamber 22 disposed in a gas generating assembly 20, which has hydrocarbon solution 221 and hydrocarbon gas 222 (formed from evaporating the solution 221) therein. A tube communicates the electrolytic cell 21 with the mixing chamber 22 and has the end opening in the hydrocarbon solution 221 to increase the rate of evaporating the solution 221 to the gas 222. The controller 10 has an electric power controller 11 and a pump 12 for pumping air, which has 1/5 oxygen component, from outside to the hydrocarbon solution 221 in the mixing chamber 22 to increase the rate of evaporating the solution 221 to the gas 222. The rate of the hydrocarbon solution 221 evaporated to gas 222 is according to the quantity of the pump 12 pumping air to the mixing chamber 22. More air is pumped to the mixing chamber 22 will make a higher rate of the hydrocarbon solution 221 being evaporated to gas 222. On the contrary, less air is pumped to the mixing chamber 22 will make a lower rate of the hydrocarbon solution 221 being evaporated to gas 222. A pressure sensor 50 is to detect the pressure in the tube 30 and send a signal to the electric power controller 11.

FIG. 3 shows a gaseous fuel generator of the third preferred embodiment of the present invention, which is similar to the second preferred embodiment, except that the pressure sensor 50 sends the signals to the pump 12 to change the quantity of air pumped to the mixing chamber 22 for balance the request and the supply of the mixed gas.

FIG. 4 shows a gaseous fuel generator of the fourth preferred embodiment of the present invention, which is similar to the second preferred embodiment, except that the pressure sensor 50 sends the signals to both of the electric power controller 11 and the pump 12 to change the generating rate of the mixed gas of hydrogen and the oxygen and the evaporating rate of the hydrocarbon solution 221 both.

In brief, the present invention provides the pressure sensor 50 to detect the gas pressure in the tube 30 for providing a signal feedback to the controller 10 for precisely controlling the supplying rate of the mixed gas of hydrogen and oxygen of the gaseous fuel generator of the present invention keeping steady.

It is to be noted that the aforesaid embodiment of the present invention uses the pressure sensor 50 as a detector of the feedback control system. However, a temperature sensor can be used in stead of the temperature sensor to detect the temperature of the gas generating assembly 20 for providing a signal feedback to the controller 10 for controlling the supplying rate of the gaseous fuel generator. In addition, the pressure sensor and the temperature sensor can also be used simultaneously for precise controlling.

WHAT IS CLAIMED IS:

1. A gaseous fuel generator, comprising:

a controller for supplying and adjusting power;

a gas generating assembly being driven by the power supplied by said controller to generate gaseous fuel;

a tube having an end communicating with said gas generating assembly for transporting the gaseous fuel;

an adjusting valve disposed on said tube for controlling the flow of the gaseous fuel in said tube;

a pressure sensor disposed on said tube for detecting the pressure of the gaseous fuel in said tube and sending signals of detecting to said controller to make said gas generating assembly adjusting the rate of generating the gaseous fuel, and

a burner communicating with said tube at the other end thereof to receive the gaseous fuel and burn the gaseous fuel.

2. The gaseous fuel generator as defined in claim 1, wherein said gas generating assembly is an electrolytic cell for electrolyzing water into

mixed gas of hydrogen and oxygen and said controller is an electric power controller for supplying said electrolytic cell electric power.

3. The gaseous fuel generator as defined in claim 1, wherein said tube disposes an one-way valve thereon for preventing the gaseous fuel flowing back from said burner.

4. The gaseous fuel generator as defined in claim 2, wherein said pressure sensor sends the signals to said electric power controller.

5. The gaseous fuel generator as defined in claim 2, wherein said gas generating assembly further comprises a mixing chamber having hydrocarbon solution and hydrocarbon gas, which is the evaporation of said hydrocarbon solution, therein and a tube communicating electrolytic cell to said mixing chamber, said controller further comprises a pump for pumping air to said mixing chamber.

6. The gaseous fuel generator as defined in claim 5, wherein said pressure sensor sends the signals to said electric power controller.

7. The gaseous fuel generator as defined in claim 5, wherein said pressure sensor sends the signals to said pump.

8. The gaseous fuel generator as defined in claim 5, wherein said pressure sensor sends the signals to said electric power controller and said pump.

9. The gaseous fuel generator as defined in claim 1 further comprising a temperature sensor disposed in said gas generating assembly for detecting the temperature and sending signals of detecting to said controller to make said gas generating assembly adjusting the rate of generating the gaseous fuel.

10. A gaseous fuel generator, comprising:

a controller for supplying and adjusting power;

a gas generating assembly being driven by the power supplied by said controller to generate gaseous fuel;

a tube having an end communicating with said gas generating assembly for transporting the gaseous fuel;

an adjusting valve disposed on said tube for controlling the flow of the gaseous fuel in said tube;

a temperature sensor disposed in said gas generating assembly for detecting the temperature and sending signals of detecting to said controller to make said gas generating assembly adjusting the rate of generating the gaseous fuel, and

a burner communicating with said tube at the other end thereof to

receive the gaseous fuel and burn the gaseous fuel.

11. A gaseous fuel generator substantially as hereinbefore described with reference to Figure 1, Figure 2, Figure 3 or Figure 4 of the accompanying drawings.





INVESTOR IN PEOPLE

Application No: GB 0206915.1  
Claims searched: 1-11

Examiner: Marian Challis  
Date of search: 6 December 2002

### Patents Act 1977 : Search Report under Section 17

#### Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-11	US 6332434 (DE SOUZA) Figures 1-4, Columns 3-12
X	1-11	CA 2209237 (DE SOUZA) Figures 1-4, Pages 4-19
X	1-11	US 4361474 (SHOAF) Figures 1-11, Columns 2-4
X	1-8	US 3999089 (BARROS) Figures 1-7, Columns 2-4
X	1-8	US 5513600 (TEVES) Figures 1-8, Columns 3-6

#### Categories:

X Document indicating lack of novelty or inventive step	A Document indicating technological background and/or state of the art.
Y Document indicating lack of inventive step if combined with one or more other documents of same category.	P Document published on or after the declared priority date but before the filing date of this invention.
& Member of the same patent family	E Patent document published on or after, but with priority date earlier than, the filing date of this application.

#### Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC<sup>T</sup>:

C7B

Worldwide search of patent documents classified in the following areas of the IPC<sup>T</sup>:

C25B

The following online and other databases have been used in the preparation of this search report:

PAJ, WPI and EPODOC