

106
116

JOSE JOAQUIN PEREZ & CIA.
ABOGADOS

Señora Jefe
División Nuevas Creaciones
Dra. Alix Carmenza Cespedes de Vergel
Superintendencia de Industria y Comercio

RADICACION 07.086.901

TRAMITE 011

EVENTO 379

ACTUACION 430

Con Anexos

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 07-086901- -00003-0000

Fecha: 2008-09-12 14:50:03 Dep. 2020 NULCREACIONI
Tra. 11 PATENTEIYII Eve: 378 FASENACIONALI
Act. 538 PETICION Folios: 2

**Ref: Expediente No 07.086.901 Solicitud de Registro de Patente de Invención
"CALDERA DE OXIGENO Y COMBUSTIBLE BASADA EN MODULOS" a nombre
de la sociedad JUPITER OXYGEN CORPORATION**

EL suscrito vecino de Bogotá D. C., abogado titulado, identificado como aparece al pie de mi firma, actuando como apoderado en este asunto, de acuerdo con lo establecido en el artículo 44 de la Decisión 486, para poder continuar con el trámite de la solicitud en referencia luego de la publicación en la Gazeta No 591, me permito adjuntar los comprobante de pago No 08-72,195 del 10 de septiembre de 2008, correspondiente a los derechos de la solicitud de examen de patentabilidad de la invención en referencia por la suma de \$ 420.000.00.

Agradezco se agregue este escrito al expediente de la referencia, para que se continúe con su tramitación normal.

De la señora Jefe

Fernando Pérez Caballero

C.C. 17.173.340

T.P. 18.531

Bogotá, D.C. 12 de Septiembre 2008

103
107

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 900176089-2

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

RECIBO OFICIAL DE CAJA : 08 - 72,195
FECHA : SEPTIEMBRE 10 DE 2008



No. 07-086901- -00003-0000

Fecha: 2008-09-12 14:50:03 Dep. 2020 NUECREACION
Tra. 11 PATENTEIYII Eve: 378 FASENACIONALI
Act. 538 PETICION Folios: 2

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PAGO	Vr. PAGO
FERNANDO PEREZ	CONSIGNACION	BANCO DE BOGOTA	062754387	928093	10/09/2008	716,000.00

***** CONCEPTO *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO	
1	50005-01-01	SOLICITUDES	85 EXAMEN DE PATENTABILIDAD DE INVEN	420,000.00
			TOTAL :	\$ 420,000.

SON: CUATROCIENTOS VEINTE MIL PESOS

RESPONSABLE : _____

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

108
109

DIVISIÓN DE NUEVAS CREACIONES

RADICACIÓN EXPEDIENTE No. 07-86901

EL EXTRACTO DE LA PRESENTE SOLICITUD DE **PATENTE DE INVENCION**

FUE PUBLICADO EN LA GACETA DE PROPIEDAD INDUSTRIAL No **591** DE

FECHA **30 DE ABRIL DE 2008** EL TÉRMINO HÁBIL SEÑALADO POR LA LEY

EXPIRA EL **30 DE JULIO DE 2008**

NOTA: Dentro del plazo de los seis (6) meses siguientes a partir de la fecha de publicación en la gaceta de Propiedad Industrial, deberá solicitar y cancelar el examen de patentabilidad so pena de que la solicitud caiga en abandono, de acuerdo con lo establecido en el Artículo 44 de la Decisión 486/2000.

SE PRESENTARON OPOSICIONES POR PARTE DE TERCEROS.

SI _____

NO X



US006436337B1

(12) **United States Patent**
Gross

(10) **Patent No.:** **US 6,436,337 B1**
(45) **Date of Patent:** **Aug. 20, 2002**

(54) **OXY-FUEL COMBUSTION SYSTEM AND
USES THEREFOR**

(75) **Inventor:** **Dietrich M. Gross, Wilmette, IL (US)**

(73) **Assignee:** **Jupiter Oxygen Corporation, Schiller
Park, IL (US)**

(*) **Notice:** Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

(21) **Appl. No.:** **09/843,679**

(22) **Filed:** **Apr. 27, 2001**

(51) **Int. Cl.:** **C22B 8/00**

(52) **U.S. Cl.:** **266/242; 266/200; 266/900;
266/901**

(58) **Field of Search:** **266/200, 216,
266/217, 242, 280, 286, 900, 901**

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,547,624 A 12/1970 Gray
3,734,719 A 5/1973 Estes et al.
3,904,180 A 9/1975 Bass et al.
3,955,970 A 5/1976 Claxton et al.
4,169,584 A 10/1979 Mangalick
4,730,336 A 3/1988 Hermeisen et al.
4,989,841 A 2/1991 Tokumasu et al.

5,871,343 A 2/1999 Baukal, Jr. et al.
5,883,918 A 3/1999 Gubb et al.
5,954,498 A 9/1999 Joshi et al.
6,190,160 B1 2/2001 Hibon et al.

FOREIGN PATENT DOCUMENTS

EP 0962540 A1 * 8/1999

* cited by examiner

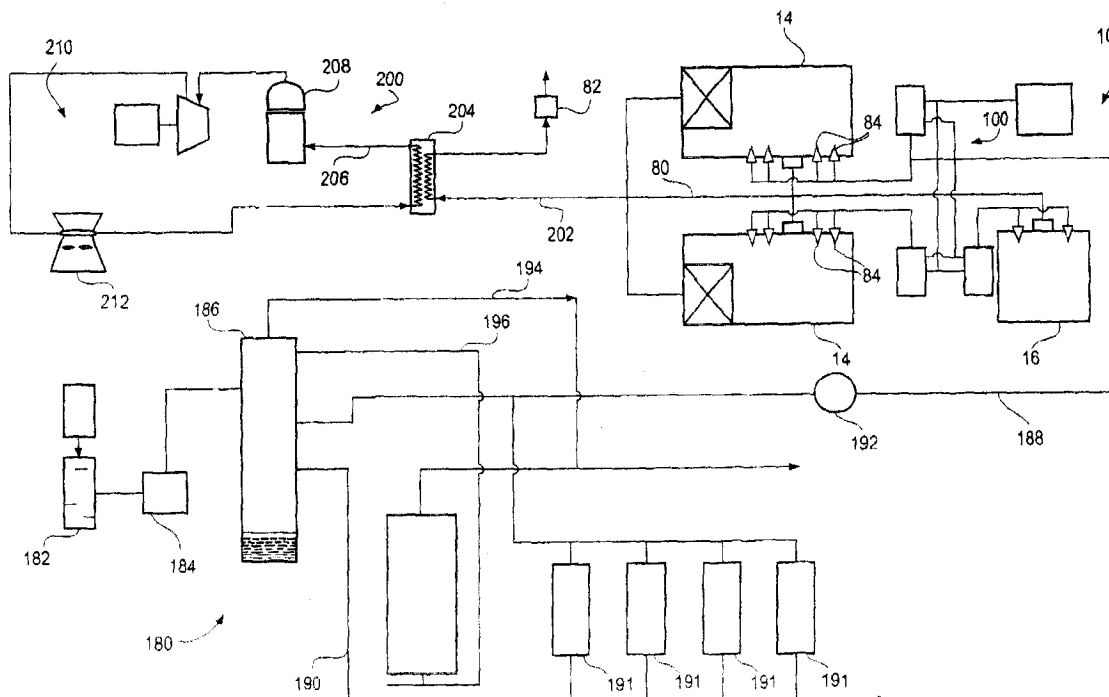
Primary Examiner—Scott Kastler

(74) **Attorney, Agent, or Firm**—Welsh & Katz, Ltd.

(57) **ABSTRACT**

An oxygen fueled combustion system includes a furnace having at least one burner, an oxygen supply for supplying oxygen having a predetermined purity, and a carbon based fuel supply for supplying a carbon based fuel. The oxygen and the carbon based fuel are fed into the furnace in a stoichiometric proportion to one another to limit an excess of either the oxygen or the carbon based fuel to less than 5 percent over the stoichiometric proportion. The combustion of the carbon based fuel provides a flame temperature in excess of 4500° F. The exhaust gas stream from the furnace has substantially zero nitrogen-containing combustion produced gaseous compounds from the oxidizing agent and reduced green-house gases. Substantially less carbon based fuel is required than conventional combustion systems without a loss of energy output.

22 Claims, 5 Drawing Sheets



5

heavily dross-laden product is pressed in a mechanical press to separate the aluminum from the heavily dross-laden product to produce a concentrated heavily dross-laden product. The method can include the step of returning the concentrated heavily dross-laden product to the furnace. Introduction of the dross-laden aluminum into the furnace is carried out in near direct flame impingement to release the oxides from the dross.

These and other features and advantages of the present invention will be apparent from the following detailed description, in conjunction with the appended claims.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

The benefits and advantages of the present invention will become more readily apparent to those of ordinary skill in the relevant art after reviewing the following detailed description and accompanying drawings, wherein:

FIG. 1 is an overall flow scheme of an exemplary aluminum scrap recovery process having a melting furnace with an oxygen fueled combustion system, in which green-house gas production and fuel consumption are reduced, embodying the principles of the present invention;

FIG. 2 is an overall flow scheme of a dross processing operation continued from FIG. 1 having a recovery furnace having an oxygen fueled combustion system embodying the principles of the present invention;

FIG. 3 is an exemplary natural gas supply train and oxygen supply train for use with the oxygen fueled combustion system;

FIG. 4 is an overall plant scheme showing the oxygen supply, from a cryogenic plant, and flow to the furnaces, and further illustrating an exemplary waste heat recovery plant;

FIG. 5 is a schematic illustration of an aluminum melting furnace for use with an oxygen fueled combustion system in accordance with the principles of the present invention;

FIG. 6 is a side view of the furnace of FIG. 5;

FIG. 7 is a front view of the melting furnace of FIG. 6;

FIGS. 8 and 9 are partial cross-sectional illustrations of a side wall and the floor of the furnace, respectively;

FIG. 10 illustrates a burner assembly for use with the oxygen fueled combustion system;

FIG. 11 is a schematic illustrations of an exemplary control system for use with an oxygen fueled combustion system of the present invention

FIG. 12 is a schematic view of an exemplary power boiler or furnace front wall illustrating a burner and an air feed arrangement, and showing the incorporation of an oxy fuel combustion system therein embodying the principles of the present invention; and

FIG. 13 is a schematic illustration of a waste incinerator showing the incorporation therein of an oxy fuel combustion system embodying the principles of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

While the present invention is susceptible of embodiment in various forms, there is shown in the drawings and will hereinafter be described a presently preferred embodiment with the understanding that the present disclosure is to be considered an exemplification of the invention and is not intended to limit the invention to the specific embodiment illustrated. It should be further understood that the title of this section of this specification, namely, "Detailed Description

6

Of The Invention", relates to a requirement of the United States Patent Office, and does not imply, nor should be inferred to limit the subject matter disclosed herein.

An oxy-fuel combustion system uses essentially pure oxygen, in combination with a fuel source to produce heat, by flame production (i.e., combustion), in an efficient, environmentally non-adverse manner. Oxygen, which is supplied by an oxidizing agent, in concentrations of about 85 percent to about 99+ percent can be used, however, it is preferable to have oxygen concentration (i.e., oxygen supply purity) as high as possible. In such a system, high-purity oxygen is fed, along with the fuel source in stoichiometric proportions, into a burner in a furnace. The oxygen and fuel is ignited to release the energy stored in the fuel. For purposes of the present disclosure, reference to furnace is to be broadly interpreted to include any industrial or commercial heat generator that combusts fossil (carbon-based) fuels. In a preferred system, oxygen concentration or purity is as high as practicable to reduce green-house gas production.

It is contemplated that essentially any fuel source can be used. For example, in a present application, as will be described in more detail below, oxygen is fed along with natural gas, for combustion in a furnace. Other fuel sources contemplated include oils including refined as well as waste oils, wood, coal, coal dust, refuse (garbage waste) and the like. Those skilled in the art will recognize the myriad fuel sources that can be used with the present oxy-fuel system.

The present system departs from conventional processes in two principal areas. First, conventional combustion processes use air (as an oxidizing agent to supply oxygen), rather than essentially pure oxygen, for combustion. The oxygen component of air (about 21 percent) is used in combustion, while the remaining components (essentially nitrogen) are heated in and exhausted from the furnace. Second, the present process uses oxygen in a stoichiometric proportion to the fuel. That is, only enough oxygen is fed in proportion to the fuel to assure complete combustion of the fuel. Thus, no "excess" oxygen is fed into the combustion system.

Many advantages and benefits are achieved using the present combustion system. It has been observed, as will be described below, that fuel consumption, to produce an equivalent amount of power or heat is reduced, in certain applications, by as much as 70 percent. Significantly, this can provide for a tremendous reduction in the amount of pollution that results. Again, in certain applications, the emission of NOx can be reduced to essentially zero, and the emission of other green-house gases reduced by as much as about 70 percent over conventional air-fueled combustion systems.

An Exemplary Scrap Aluminum Recovery Process

In one specific use, the oxygen fueled combustion system (also referred to as oxy-fuel or oxy-fueled) is used in a scrap aluminum recovery plant 10. A flow process for an exemplary plant is illustrated in FIGS. 1-2. Scrap aluminum, generally indicated at 12 is fed into a melting furnace 14, and is liquefied. The plant 10 can include multiple furnaces operated in parallel 14, one of which is illustrated. The liquefied or molten aluminum is drawn from the melting furnace 14 and is fed into a smaller holding furnace or holder 16. The holding furnace 16 is also an oxy-fueled furnace. The molten aluminum is drawn from the melting furnace 14 as necessary, to maintain a certain, predetermined level in the holding furnace 16. This can result in continuously drawing down from the melting furnace 14 or drawing down in "batches" as required.

In the holding furnace 16, chlorine and nitrogen (as gas), as indicated at 18 and 20, respectively, are fed into the

[54] **POWER GENERATION SYSTEM**

[75] Inventors: **Paul Vincent Guido**, Cedar Grove;
Robert Lenox Criswell, Florham
Park; **Albert John Zipay**, Clifton, all
of N.J.

[73] Assignee: **Foster Wheeler Energy Corporation**,
Livingston, N.J.

[21] Appl. No.: **659,300**

[22] Filed: **Feb. 19, 1976**

[51] Int. Cl.² **F01K 13/00**

[52] U.S. Cl. **60/676; 60/679**

[58] Field of Search **60/660-667,**
60/679, 680, 677, 678, 676, 646

[56] **References Cited**

U.S. PATENT DOCUMENTS

2,676,574	4/1954	Wenzel	60/676 X
3,140,588	7/1964	Brown	60/680 X
3,163,991	1/1965	Capitaine	60/679 X
3,358,450	12/1967	Schroedter	60/646
3,359,732	12/1967	Schuetzenduebel	60/646

3,488,961	1/1970	Gerber	60/662 X
3,882,680	5/1975	Durrant	60/646

FOREIGN PATENT DOCUMENTS

1,253,461	1/1961	France	60/679
-----------	--------	--------	--------

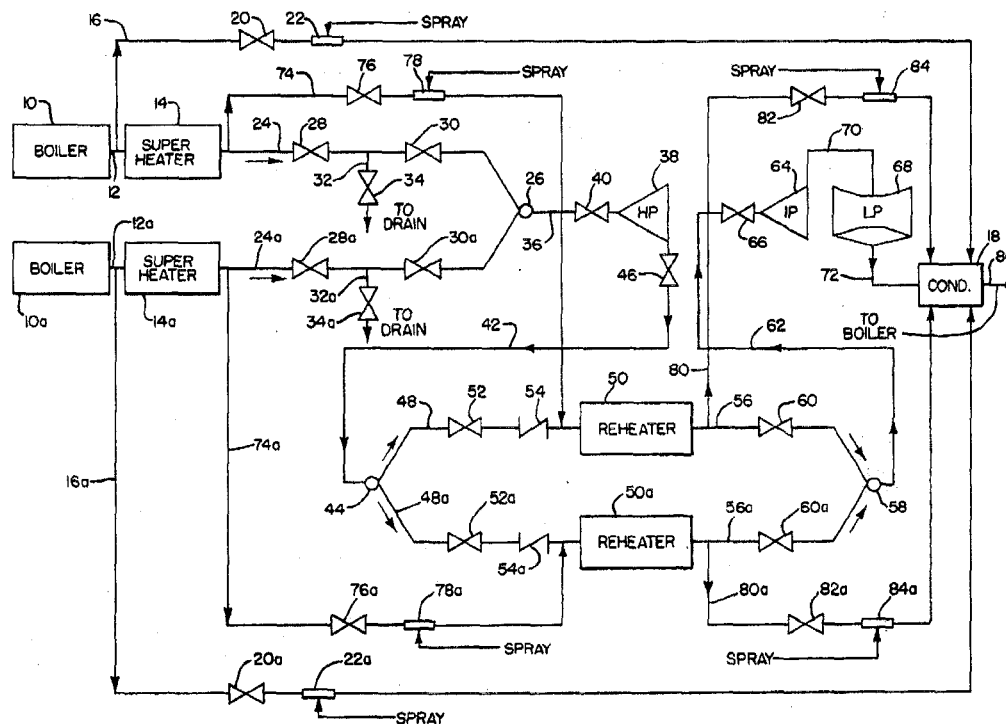
Primary Examiner—Allen M. Ostrager
Attorney, Agent, or Firm—Marvin A. Naigur; John E.
Wilson

[57]

ABSTRACT

A power generation system in which one or more vapor generators are provided for driving a turbine having a relatively high pressure section and at least one relatively low pressure section. A reheater is disposed between the high pressure turbine section and the low pressure turbine section and its outlet is connected to the latter section. The steam outlet of the vapor generator is connected directly to the high pressure turbine section and directly to the reheater, and the outlet of the reheater is connected directly to the low pressure turbine section and directly to the condenser.

13 Claims, 1 Drawing Figure



POWER GENERATION SYSTEM

BACKGROUND OF THE INVENTION

This invention relates to a power generation system and, more particularly, to such a system in which the condition of the vapor output from one or more vapor generators is precisely controlled before being passed to a turbine for driving same.

In the design of power generation systems, it is often necessary to carefully control the critical parameters, such as temperature and pressure, of steam from a vapor generator before it is passed to a turbine. For example, power generation systems may utilize two vapor generators which operate to drive a single turbine. In this manner, the vapor generators can be designed to operate at approximately half the load of the turbine so that, upon failure of one of the generators, the turbine still will be driven by the other generator to avoid a complete stoppage of the turbine. However, in systems of this type, when one of the vapor generators is started up after being shut down for any reason, the temperature and pressure conditions of the vapor generated by the starting up vapor generator must be carefully regulated so that it will match the temperature and pressure conditions of the vapor generated by the other vapor generator that is in operation since, otherwise, the turbine may be severely damaged.

SUMMARY OF THE INVENTION

It is, therefore, an object of the present invention to provide a power generation system of the above type which enables the temperature and pressure conditions of steam generated by a vapor generator to be carefully controlled.

It is a further object of the present invention to provide a power generating system of the above type in which two vapor generators are provided for driving a turbine and in which the temperature and pressure conditions of the steam generated by each generator is precisely controlled to effect optimum matching of the two supplies of steam before they are passed to the turbine.

It is a still further object of the present invention to provide a power generation system of the above type in which the steam output from either of the vapor generators is selectively directed to various other stages of the system in order to selectively control its pressure and temperature conditions.

Toward the fulfillment of these and other objects, the power generation system of the present invention comprises at least one vapor generating means, a relatively high pressure turbine section and at least one relatively low pressure turbine section, a reheater, a condenser, fluid transfer means connecting said vapor generating means directly to said high pressure turbine section and directly to said reheater, and fluid transfer means connecting said reheater directly to said low pressure turbine section and directly to said condenser.

BRIEF DESCRIPTION OF THE DRAWINGS

The drawing is a schematic representation of the fluid circuit of the power generation system of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring specifically to the drawing, the reference numeral 10 refers in general to a boiler which is connected via a line 12 to a superheater 14. For the purposes of this application, it is to be understood that the term "line" is meant to cover all possible fluid transfer systems, such as tubes, conduits, downcomers, and the like, which are normally associated with this type of equipment. As an example, the line 12 could be in the form of tubes connecting one section of a finned tube wall forming the furnace section of the boiler, with another section thereof.

A line 16 extends from the line 12 and is connected to a condenser 18 for supplying fluid from the boiler 10 directly to the condenser without passing through the superheater 14. A flow control valve 20 and a desuperheating unit 22 are provided in the line 16 for reasons that will be indicated in detail later. The outlet of the superheater 14 is connected, via a line 24, to a (Y) junction header 26 with stop-check valve 28 and stop valve 30 being imposed in line 24. Also, a line 32 extends from the line 24 at a point between the stop-check valve 28 and stop valve 30 for connecting the line 24 to drain, with a flow control valve 34 being disposed in the line 32 for the purpose of checking the tightness of valves 28 and 30.

The outlet of the (Y) junction header 26 is connected, via a line 36, to the high pressure section 38 of a turbine, and a flow control valve 40 is disposed in the line 36 for controlling the flow of fluid to the latter section. A line 42 connects the outlet of the high pressure turbine section 38 to a (Y) junction header 44 and a stop-check valve 46 is disposed in the line 42. The outlet of the (Y) junction header 44 is connected, via a line 48, to a reheater 50. A flow control valve 52 and a check valve 54 are disposed in the line 48.

A line 56 connects the outlet of the reheater 50 to a (y) junction header 58 with a stop-check valve 60 being disposed in the line 56. The outlet of the (Y) junction header 58 is connected, via a line 62, to the intermediate pressure section 64 of the above-mentioned turbine and a flow control valve 66 being disposed in the line 62. The intermediate pressure section 64 of the turbine is connected to a low pressure section 68 by a line 70, with the output of the low pressure section being connected to the condenser 18 by a line 72.

A bypass line 74 connects with the line 24 at a point between the superheater 14 and the valve 28, and with the line 48 at a point between the check valve 54 and the reheater 50. A pressure reducing valve 76 and a desuperheating unit 78 are disposed in the line 74.

A bypass line 80 connects with the line 56 at a point between the reheater 50 and the valve 60, and connects the latter line directly to the condenser 18, with a pressure regulating valve 82 and a desuperheating unit 84 being disposed in the line 80.

It should be noted that the basic fluid flow circuit would extend through the appropriate lines just mentioned from the boiler 10 through the superheater 14 and the (Y) junction header 26, and to the high pressure turbine section 38. From the latter turbine section the fluid would flow through the (Y) junction header 44, the reheater 50 and into the (Y) junction header 58, from which it passes to the intermediate pressure turbine section 64. From the latter turbine section, the fluid would then pass into the low pressure turbine section 68

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIRECCIÓN DE NUEVAS CREACIONES

2020
Bogotá, D.C.,

Abogado
FERNANDO PEREZ CABALLERO

ASUNTO	Radicación	07-086901
	Trámite	011
	Evento	001
	Actuación	430
	Oficio	008
	Folios	008

Patente de Invención	☒	Patente de Modelo de Utilidad	☐
Vía Nacional	☐		
Vía PCT (fase nacional)	☒	Cap. I	☒
		Cap. II	☐
No. Sol. Internacional	PCT / US2006/ 007568		
Fecha de Presentación Internal.	2006-03-01		

Como resultado del examen de fondo, realizado con fundamento en el artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le comunica:

1. Documentos estudiados

- 1.1. Descripción: Folios: 09 a 35 como se radicó inicialmente.
- 1.2. Reivindicaciones: Folios: 36 a 42 como se radicó inicialmente.
- 1.3. Dibujos: Folios: 43 a 48 como se radicó inicialmente.
- 1.4. Prioridad: 2005-03-01, US 11/070,177

2. Objeto de la invención

Título de la solicitud: "Caldera de oxígeno y combustible basada en módulos".

El objeto de la presente solicitud de patente de invención se refiere a una caldera alimentada por oxígeno y combustible, que tiene un diseño basado en módulos.

El problema planteado en esta solicitud se relaciona con la necesidad de una caldera que utilice un sistema de combustión de oxígeno y combustible para reducir la contaminación ambiental.

Para solucionar este problema técnico, la solicitud en estudio proporciona un sistema de caldera basado en módulos, usando una pluralidad de calderas independientes

que operan en serie y utilizan oxígeno y combustible para producir vapor a partir de agua. Las calderas están configuradas para llevar a cabo funciones diferentes de transferencia de calor, unas respecto a las otras.

El objeto de la invención definido anteriormente se clasificó de acuerdo con el IPC así: B29K 25/00; C08F 290/04; B29C 45/00.

3. De la solicitud de Patente

3.1. Reivindicaciones (artículo 30 D 486)

Esta oficina se permite señalar que dentro de las reivindicaciones se encontró falta de claridad y concisión.

3.1.1. Claridad y concisión.

Estudiado el capítulo reivindicatorio que obra en los folios 36 a 42, se observó que el objeto de la solicitud no se encuentra bien definido.

Se observa que en la reivindicación 1 el sistema de caldera de oxígeno y combustible basado en módulos para producir vapor a partir de agua, se define por contener una primera caldera que tiene una entrada de agua de alimentación, un suministro de oxígeno, un suministro de combustión, por lo menos un sistema de quemador de oxígeno y combustible. Por otra parte, se está reivindicando el objeto de la solicitud por características funcionales que no definen el objeto de la invención, como es el reivindicar que el suministro de gas se caracteriza por *suministrar oxígeno de una pureza mayor de 21 por ciento*, o reivindicar que el suministro de gas se caracteriza por *ser basado en carbono para suministrar combustible basado en carbono*.

También se esta reivindicando el sistema quemador de oxígeno y combustible por características funcionales que no revelan cómo es lo estructural o la conformación de los elementos del sistema de caldera reivindicado.

Se observa que el objeto de la solicitud no se reivindica por la forma estructural y de los elementos que conforman el sistema, por medio de los cuales se logran los resultados funcionales que se enseñan en la reivindicación 1.

De igual manera, en la misma reivindicación 1 se define una segunda caldera conectada en serie a la primera caldera, definiéndose de la segunda caldera características funcionales y no por los elementos estructurales y por los elementos que conforman dicha caldera y cómo se disponen estos elementos para lograr el resultado y la función definidos.

Por otra parte se observa que las reivindicaciones 1, 23, y sus respectivas dependientes se relacionan al mismo objeto, y las diferencias entre una y otras se limitan a la definición de la materia que se trata de proteger, por esta razón el pliego no es conciso, por lo que se podría omitir la reivindicación 23, agrupando en la reivindicación 1 todas las características técnicas que se considere hacen novedosa la invención.

Se sugiere presentar un nuevo capítulo reivindicatorio, evitando múltiples reivindicaciones independientes por categoría y definir la materia a proteger mediante una sola reivindicación independiente.

Por otra parte, se sugiere separar en forma clara el preámbulo de la parte característica de la invención. De acuerdo a esto, se sugiere utilizar en la

reivindicación principal y las reivindicaciones dependientes, el término “*caracterizado porque*” para efectos de mayor claridad y definición de las características novedosas de la invención.

La presente solicitud no cumple con los requisitos de concisión y claridad de acuerdo al art. 30 de la Decisión 486.

4. Determinación del Estado de la Técnica

La fecha que se ha tenido en cuenta para determinar el Estado de la Técnica es:

Fecha de presentación de la solicitud prioritaria, 2005-03-01.

Teniendo en cuenta la fecha indicada se realizó la búsqueda en el estado de la técnica de documentos relacionados con la solicitud, encontrándose los siguientes documentos más relevantes:

Nº	Documento	Título	Fecha de publicación*
D1	US 6436337	"Oxy-fuel combustion system and uses therefor"	2002-08-20
D2	US 4060990	"Power generation system"	1977-12-06

D1 enseña un sistema de combustión que incluye un horno y un suministro de oxígeno con una pureza determinada, en donde el oxígeno y el combustible son alimentados en el horno en una proporción estequiométrica. *Ver de D1, la columna 6, líneas 4-38, en el folio 110.*

D2 enseña un sistema de generación de potencia, en el cual, dos generadores de vapor son dispuestos para operar una turbina, controlando con precisión las condiciones de temperatura y presión del vapor en cada generador antes de hacer pasar el vapor a la turbina. *Ver de D2, el resumen y la columna 1, líneas 39-46, en folios 111, 112.*

5. Análisis de patentabilidad (artículo 14 D486)

5.1. Nivel inventivo (artículo 18 D486)

5.1.1. Respecto a la solicitud en estudio:

La reivindicación independiente número 1 enseña:

*"Un sistema de caldera de oxígeno y combustible basado en módulos para producir vapor a partir de agua, el cual comprende:
una primera caldera que tiene una entrada de agua de alimentación en comunicación de flujo con una pluralidad de tubos para (...) (...)".* Ver folio 36.

5.1.2. Respecto al estado de la Técnica:

El documento US 6436337, nombrado como **D1**, revela un sistema de combustión oxígeno combustible, que comprende dos hornos (14), utilizando una proporción estequiométrica y una concentración de oxígeno que está en el rango de lo reivindicado en la presente solicitud. *Ver la columna 6, líneas 4-38, en el folio 110.*

116
El calor generado en los hornos (14) es usado para generar vapor en el vaporizador (208) del intercambiador de calor (204) y hacer funcionar una turbina de vapor.

El documento **D1**, no revela dos calderas separadas calentadas directamente por los hornos (14).

El documento US 4060990, nombrado como **D2**, revela el concepto de usar dos hornos (12), (12a), para calentar las calderas 10, 10a, y los sobrecalentadores 14, 14a, generar vapor y operar la turbina de alta presión 38, una turbina 64 de presión media, y la turbina de baja presión 68. *Ver de D2, el resumen y la columna 1, líneas 39-46, en folios 111, 112.*

Podría ser obvio para una persona del oficio versada en la materia técnica correspondiente, en el momento de realizada la presente invención, modificar el sistema enseñado en **D1** y utilizar los hornos (14) revelados en dicho documento para calentar múltiples calderas, incluyendo un sobrecalentador y un recalentador, logrando operar un turbina de vapor de tres etapas tal como se revela en **D2**, con el objetivo de generar mayor energía con transferencia de calor directa.

5.1.3. Las reivindicaciones 1, 23, de la solicitud en estudio, se pueden ver afectadas por falta de nivel inventivo.

5. Conclusión:

Los requisitos de patentabilidad de la presente solicitud se encuentran afectados así:

Nº	Documento Nº	Reivindicaciones afectadas	Requisito que afecta
D1	US 6436337	1, 23	Nivel inventivo
D2	US 4060990	1, 23	Nivel inventivo

En cumplimiento del artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le indica que debe dar respuesta dentro del término de sesenta días contados a partir de la fecha de notificación de la presente comunicación. En caso de no dar respuesta al presente requerimiento, o si a pesar de la respuesta subsistieran los impedimentos para la concesión, se denegará la patente.

Notifíquese el presente oficio conforme a lo dispuesto en el numeral 5.2, literal e), del capítulo quinto del título primero de la Circular Única N° 10 de 2001.


JOSÉ LUIS SALAZAR LÓPEZ
Director de Nuevas Creaciones (E)

El anterior requerimiento fue notificado por fijación en lista, de fecha

7 / 10E 001

CONCEPTO TÉCNICO No. 4389	EXAMINADOR TÉCNICO Código No. 202065
-------------------------------------	--

RECIBIDO
18-04-11