

# HUMBERTO RUBIO & CIA.

## ABOGADOS

Cra. 7a # 74 - 64 Oficina 506  
Tel: (571) 3132408 - 3132423 - 3132410 - 3131759  
Fax: (571) 3131647 - 3132367  
E-mail: rubiolaw@cable.net.co  
Apartado Aereo 218  
Bogota, D.C. -Colombia

Señor

**SUPERINTENDENTE DE INDUSTRIA Y COMERCIO  
DIVISIÓN DE NUEVAS CREACIONES**

**E. S. D.**

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 08-117920- -00002-0000

Fecha: 2009-01-22 16:11:00 Dep. 2020 NUECREACION  
Tra. 11 PATENTE IYII Eva: 379 FASENACIONAL II  
Act. 329 CTOINFORMACION Folios: 227

Expediente No.:  
Patente de Invención:

**08-117.920**  
**"INSTALACIÓN DE GASIFICACIÓN A**  
**BAJA TEMPERATURA CON UN**  
**GASIFICADOR ORIENTADO**  
**HORIZONTALMENTE"**  
**PlascoEnergy IP Holdings, S.L., Bilba ,**  
**Schaffhausen Branch**

Titular:

### DESTINO: 09

**HUMBERTO RUBIO CAMACHO**, mayor de edad, domiciliado en Bogotá, D.C., identificado con la cédula de ciudadanía número 17.192.062 de Bogotá, abogado en ejercicio, portador de la Tarjeta Profesional No. 50.007 expedida por el Consejo Superior de la Judicatura, actuando en carácter de **APODERADO** de la Sociedad **PlascoEnergy IP Holdings, S.L., Bilbao, Schaffhausen Branch** domiciliada en Vordergasse 3, CH-8200 Schaffhausen, Suiza; me permito anexar:

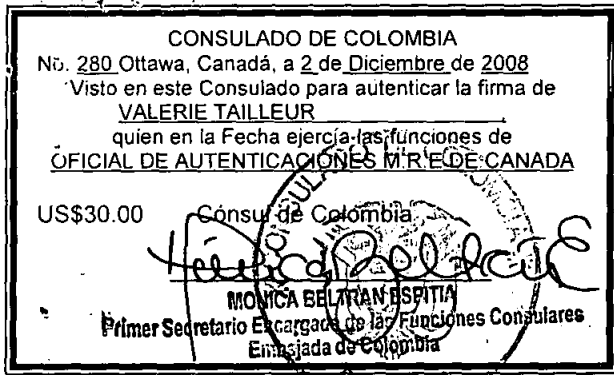
- 1.- Documentos de **cesión** otorgados por los inventores, debidamente legalizados por el Consulado de Colombia en Canadá; traducidos oficialmente del idioma Inglés al Español y reconocidos por el Ministerio de Relaciones Exteriores en Colombia; por medio de los cuales se ceden todos los derechos poseídos sobre la presente invención a favor de la Sociedad **Plasco Energy Group Inc.**
- 2.- Fotocopia auténtica del documento de **Traspaso** por medio del cual la sociedad **Plasco Energy Group Inc.**, traspasa los derechos de la solicitud en referencia, a la sociedad **PlascoEnergy IP Holdings, S.L., Bilbao, Schaffhausen Branch**. Documento que se encuentra debidamente notariado y legalizado por el Consulado de Colombia en Canadá, traducido oficialmente del idioma Inglés al Español y avalado por el Ministerio de Relaciones Exteriores de Colombia.
- 3.- Fotocopia auténtica del documento de **Poder** y Certificado Notarial que acredita la existencia y representación legal de mi representada la sociedad **PlascoEnergy IP Holdings, S.L., Bilbao, Schaffhausen Branch**, el cual se encuentra debidamente notariado y legalizado por el Consulado de Colombia en Canadá, traducido oficialmente del idioma Inglés al Español y avalado por el Ministerio de Relaciones Exteriores de Colombia.
- 4- Nuevo pliego de Dibujos

Teniendo en cuenta lo anterior solicito se continúe con el trámite correspondiente.

Atentamente,

**HUMBERTO RUBIO CAMACHO**  
**C.C. 17.192.062 de Bogotá**  
**T.P. 50.007 Consejo Superior**  
**de la Judicatura.**  
**COD. 4134**

08/2590/P000768  
Bap



MINISTERIO DE  
RELACIONES EXTERIORES

2009 ENE -9 A 8:52

JEFE DE LEGALIZACIONES  
BOGOTA D.C.

NO SE ASUME  
RESPONSABILIDAD  
DEL TEXTO

860071

Monica Beltran  
2009 ENE -9 A 8:52 EN EL  
DOCUMENTO DESEMPENA  
AS FUNCIONES INDICADAS

CANADA )

TO ALL TO WHOM THESE  
PRESENTS MAY

Province of Ontario )

COME, BE SEEN OR KNOWN

To Wit: )

I, Michelle Ai Ling Li, a Notary Public in and for the Province of Ontario, by Royal Authority duly appointed, and residing at the City of Ottawa, in the Province of Ontario, **DO CERTIFY AND ATTEST** that the paper hereto annexed is a true copy of a document produced and shown to me and being the notarized Assignment of Invention, effective May 5, 2007, the copy having been compared by me with the original notarized document, an act which, having been requested, I have granted under my notarial form and seal of office to serve as shall be required.

**IN TESTIMONY WHEREOF** I have hereto subscribed my name and affixed my Notarial Seal of Office at the City of Ottawa, this 20<sup>th</sup> day of November 2008.

(Seal)

*Michelle Li*  
A NOTARY PUBLIC IN AND FOR THE  
PROVINCE OF ONTARIO



## ASSIGNMENT OF INVENTION

This Assignment is effective the 5<sup>th</sup> day of May, 2007.

In consideration of One (\$1.00) Dollar and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, I,

**CHOTALIYA, Ashish**, whose full post office address is 1816 121 St SW, Edmonton, Alberta T6W 1T5, Canada;

agree and confirm that I have sold, assigned and transferred, and by these presents do hereby sell, assign and transfer to **Plasco Energy Group Inc.** (hereinafter the "Assignee"), whose full post office address is **1000 Innovation Drive, Suite 400, Kanata, Ontario K2K 3E7, Canada**, all my right, title and interest throughout the world in and to (1) my invention(s) relating to

**A Low Temperature Gasification Facility With A Horizontally Oriented Gasifier**, as described and/or claimed in the patent applications listed in Schedule A attached hereto;

(2) all improvements, including but not limited to modifications, additions, substitutions, derivatives, and deletions to said invention(s); (3) the above-identified applications in (1) and national phase applications thereof; (4) all other applications for Letters Patent in any country throughout the world for said invention(s) and improvements, including but not limited to all divisional, continuation, continuation-in-part, renewal, reissue, and substitute applications; (5) any Letters Patent which may issue from any of said applications as exemplified in (3) and (4) above in any country throughout the world; (6) all Convention or Treaty rights derived from any of said applications, including without limitation, all rights of priority throughout the world in and to said applications; and (7) the full and complete right to file applications for Letters Patent in the name of the Assignee, or in my name at the Assignee's election, on said invention(s) and improvements in all countries throughout the world.

For said consideration, I agree, upon the request and at the expense of the Assignee, its successors and assigns, to execute any and all divisional, continuation, continuation-in-part, reissue and substitute applications for said invention(s) and improvements, and acknowledge and agree that all rights therein shall vest in the Assignee, its successors and assigns, whereby said Letters Patent will be held and enjoyed by said Assignee, its successors and assigns, to the full end of the term for which said Letters Patent will be granted, as fully and entirely as the same would have been held and enjoyed by the undersigned if this assignment had not been made. In addition, I will, at the request of the Assignee, execute any and all documents required by the Assignee to fully and properly vest the aforementioned rights in the Assignee.

The undersigned hereby grants to the firm of **MBM Intellectual Property Law LLP** whose full post office address is 270 Albert Street, 14<sup>th</sup> Floor, Ottawa, Ontario, Canada, K1P 5G8, the power to insert on this assignment any further information and/or correct any clerical error in the information pertaining to the referenced application above, which may be necessary or desirable in order to comply with the patent legislation for recordation of this document.

[CONTINUED ON NEXT PAGE]

# SCHEDULE A

|                                                                               |                                                          |                          |
|-------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------|
| International (PCT)                                                           | International Application No. PCT/US07/68407             | Filed: May 7, 2007       |
| Argentina                                                                     | Argentina Application No. P-070101975                    | Filed: May 7, 2007       |
| Bahamas                                                                       | Bahamian Application No. 1982                            | Filed: May 25, 2007      |
| Chile                                                                         | Chile Application No. 1288-2007                          | Filed: May 7, 2007       |
| Jamaica                                                                       | Jamaica Application No. 18/1/4628                        | Filed: May 7, 2007       |
| Panama                                                                        | Panama Application No. PI/PA01/87255-01                  | Filed: May 7, 2007       |
| Taiwan                                                                        | Taiwan Application No. 96116178                          | Filed: May 7, 2007       |
| Venezuela                                                                     | Venezuela Application No. 07-0926                        | Filed: May 7, 2007       |
| Aruba                                                                         | Aruba Application No. OCT-02/071105                      | Filed: November 5, 2007  |
| Bangladesh                                                                    | Bangladesh Application No. 242/2007                      | Filed: November 4, 2007  |
| Burundi                                                                       | Burundi Application No. Not Yet Available                | Filed: November 5, 2007  |
| Bolivia                                                                       | Bolivia Application No. SP-270345                        | Filed: November 1, 2007  |
| Gulf Cooperation Council (Oman, Bahrain, Qatar, U.A.E., Saudi Arabia, Kuwait) | Gulf Cooperation Council Application No. GCC/P/2007/9412 | Filed: November 5, 2007  |
| Iran                                                                          | Iran Application No. 38609165                            | Filed: November 27, 2007 |
| Jordan                                                                        | Jordan Application No. 460/2007                          | Filed: November 4, 2007  |
| Lebanon                                                                       | Lebanon Application No. 6837                             | Filed: November 1, 2007  |
| Mauritius                                                                     | Mauritius Application No. MU/P/07/00083                  | Filed: November 5, 2007  |
| Nepal                                                                         | Nepal Application No. 925                                | Filed: November 2, 2007  |
| Peru                                                                          | Peru Application No. 001515-2007/OIN                     | Filed: November 5, 2007  |
| Pakistan                                                                      | Pakistan Application No. 1279/2007                       | Filed: November 2, 2007  |
| Paraguay                                                                      | Paraguay Application No. 37.569                          | Filed: November 2, 2007  |
| Thailand                                                                      | Thailand Application No. 0701005570                      | Filed: November 2, 2007  |
| Tonga                                                                         | Tonga Application No. TO/P/07/00007                      | Filed: November 2, 2007  |
| Uruguay                                                                       | Uruguay Application No. 30.688                           | Filed: November 5, 2007  |
| Yemen                                                                         | Yemen Application No. Not Yet Available                  | Filed: November 6, 2007  |

## EXECUTION OF ASSIGNMENT OF INVENTION

### Execution by Assignor

|                                                                                                                                                                                                                        |                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ASSIGNOR:</b><br>By: <u><i>Ashish Chotaliya</i></u><br>(Signature)<br><br><b>CHOTALIYA, Ashish</b><br><u>Nov 07, 2008</u><br>(Date Signed)<br><u>Edmonton, Canada</u><br>(City & Country Where Assignment Executed) | <b>WITNESS:</b><br>By: <u><i>Eileen Bouthillier</i></u><br>(Signature)<br><u>EILEEN BOUTHILLIER</u><br>(Name)<br><u>Nov. 7 / 08</u><br>(Date Signed) |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|

### Notarization of Witness to Signature of Assignor

|                                                                                                                                                                                                                                                      |                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| I, <u><i>Eileen Bouthillier</i></u> , of <u><i>Edmonton AB</i></u><br>(Witness name) (Witness address)                                                                                                                                               |                                                            |
| declare that I was personally present and did witness the abovementioned Assignor duly sign and execute the above Assignment.                                                                                                                        |                                                            |
| Sworn Before Me at <u>EDMONTON</u> ,<br>(City)<br><u>CANADA</u> on <u>NOV 7, 2008</u> .<br>(Country) (Date)<br><u>MOOSA Y. JIWAJI</u><br>Barrister and Solicitor<br>(Commissioner's Name)<br><u><i>[Signature]</i></u><br>(Commissioner's Signature) | <u><i>Eileen Bouthillier</i></u><br>(Signature of Witness) |
| A Commissioner for taking Oaths and Affidavits for the jurisdiction of <u>ALBERTA</u><br>(State, Province, etc)                                                                                                                                      |                                                            |

|                                                                                                      |                                                                                                       |
|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| <b>ASSIGNEE:</b>                                                                                     | <b>WITNESS:</b>                                                                                       |
| By: <br>(Signature) | By: <br>(Signature) |
| Name: ANDREAS TSANGARIS<br>Title: CHIEF SCIENTIST                                                    | Margaret Sumin<br>(Name)                                                                              |
| done 20, 2008<br>(Date Signed)                                                                       | November 20 2008<br>(Date Signed)                                                                     |
| KANATA, CANADA<br>(City & Country Where Assignment Executed)                                         |                                                                                                       |

I, Margaret Swain, of # 3807 1111 West Pender, Vancouver, BC  
(Witness name) (Witness address)

declare that I was personally present and did witness the abovementioned Assignee duly sign and execute the above Assignment.

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|                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sworn Before Me at <u>Ottawa (Karata)</u><br><small>(City)</small><br><u>Canada</u> on <u>Nov. 20, 2008</u> .<br><small>(Country)</small> <small>(Date)</small><br><br><br><small>(Commissioner's Name)</small><br><br>A Commissioner for taking Oaths and Affidavits for the<br>jurisdiction of <u>Ontario</u><br><small>(State, Province, etc)</small> | <div style="text-align: center; padding-top: 10px;">  </div> <small>(Signature of Witness)</small> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

CONSULADO DE COLOMBIA

No. 280 Ottawa, Canadá, el 2 de Diciembre de 2008

Visto en este Consulado para autenticar la firma de VALERIE TAILLEUR quien en esta fecha ejercía las funciones de OFICIAL DE AUTENTICACIONES M.R.E DE CANADÁ

Cónsul de Colombia

MINISTERIO DE RELACIONES EXTERIORES

9 DE ENERO DE 2009 – 860071

JEFE DE LEGALIZACIONES BOGOTÁ, D.C.

CANADÁ )

Provincia de Ontario ) A TODOS LOS QUE PUEDAN VER O CONOCER  
LOS PRESENTES

Consideración: )

Yo, Michelle Ai Ling Li, un Notario Público en y para la Provincia de Ontario, debidamente nombrado por la Autoridad Real y residente en la ciudad de Ottawa, en la Provincia de Ontario, CERTIFICO Y ATESTIGUO que el documento anexo es una copia fiel de un documento dirigido y presentado ante mí y corresponde a la Asignación de la invención con fecha de entrada en vigor el 5 de mayo de 2007; comparé la copia con el documento original, un acto que me fue solicitado, y he otorgado bajo mi firma y sello notarial de la oficina para servir de acuerdo como sea requerido.

Resolución  
6694/78  
Minjusticia

Clementina Parades Tejada  
TRADUCTURA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

MINISTERIO DE  
RELACIONES EXTERIORES

NO SE ASUME  
RESPONSABILIDAD  
DEL TEXTO

2009 ENE 21 A 9:58

*mol*  
JEFE DE LEGALIZACION  
BOGOTA D.C.

864944

*General*

*PAQUES*

CUYA FOLIA ATADORA EN EL  
DOCUMENTO DESEMPEÑA  
AS FUNCIONES INDICADAS

MINISTERIO DE RELACIONES EXTERIORES

RECIBO LEGALIZACION

No.

*9422152*

EN TESTIMONIO DE LO CUAL he suscrito mi nombre y fijado mi sello notarial de la  
Oficina en la ciudad de Ottawa, este día 20 de noviembre de 2008.

(Sello)

UN NOTARIO PÚBLICO EN Y PARA LA PROVINCIA DE ONTARIO

Certificado en el Departamento de Relaciones Exteriores y Comercio Internacional para la  
legalización de la firma anterior de  
Ministro de Relaciones Exteriores  
CANADÁ

Recepción  
6694/78  
Minjusticia

*Clementina Parales Tejeda*  
TRADUCTORA OFICIAL  
  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

## ASIGNACIÓN DE LA INVENCION

Esta asignación entra en vigor el 5 de mayo de 2007

En consideración de un (\$1.00) dólar y otras consideraciones buenas y valiosas, cuyo recibo y suficiencia se reconoce por medio del presente, yo

CHOTALIYA, Ashish, cuya dirección es 1816 121 St SW, Edmonton, Alberta T6w 1T5, Canadá;

Acuerdo y confirmo que he vendido, asignado y transferido y por medio del presente vendo, asigno y transfiero a Plasco Energy Group Inc. (de ahora en adelante el "Cesionario"), con oficinas ubicadas en 1000 Innovation Drive, Suite 400, Kanata, Ontario K2K 3E7, Canadá, todos mis derechos, títulos e intereses en todo el mundo en y sobre (1) mis invenciones relacionadas con

**Una instalación de gasificación de baja temperatura con un Gasificador orientado horizontalmente**, tal como se describe y/o reivindica en las solicitudes listadas en el Programa A anexo;

(2) todas las mejoras, incluyendo sin limitación las modificaciones, adiciones, sustituciones, derivaciones y eliminaciones de dicha invención; (3) las solicitudes antes identificadas en (1) y las solicitudes de la fase nacional; (4) todas las demás solicitudes para las Cartas de Patente en cualquier país del mundo para dichas invenciones y mejoras,

Resolución  
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Minjusticia



incluyendo sin limitación todas las solicitudes divisionales, continuaciones, continuaciones en parte, renovaciones, remisiones y solicitudes sustitutas; (5) todas las Cartas de Patente que se puedan expedir de cualquiera de dichas solicitudes tal como se ejemplifica en los numerales (3) y (4) anteriores en cualquier país del mundo; (6) todos los derechos de Convenciones o Tratados derivados de dichas solicitudes, incluyendo sin limitación, todos los derechos de propiedad en todo el mundo en y sobre dichas solicitudes y (7) el derecho total y completo para radicar las solicitudes por Cartas de Patente a nombre de Cesionario, o en mi nombre a elección del Cesionario, sobre dichas invenciones y mejoras en todos los países del mundo.

Por dicha consideración, acuerdo, a solicitud y por cuenta del Cesionario, sus sucesores y asignados, ejecutar cualquiera y todas las solicitudes divisionales, continuaciones, continuaciones en parte, remisiones y solicitudes sustitutas para dichas invenciones y mejoras y reconozco y acuerdo que todos los derechos serán investidos en el Cesionario, sus sucesores y asignados, hasta el final del término por el cual se otorgarán dichas Cartas de Patente, tan completamente y totalmente como hubieran sido mantenidas y disfrutadas por el suscritos si no se hiciera esta asignación. Además, a solicitud del Cesionario, ejecutar cualquiera y todos los documentos requeridos por el Cesionario para invertir completamente y apropiadamente los derechos antes mencionados en el Cesionario.

El suscrito por medio del presente le otorga a la firma **MBM Intellectual Property Law LLP**, con oficinas ubicadas en 270 Alvert Street 14 Floor, Ottawa, Ontario, Canadá K1P 5G8, el poder para insertar en esta asignación cualquier información adicional y/o corregir

Resolución  
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Minjusticia

*Clemente Parades Tejada*  
TRADUCCIONES OFICIALES  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANCAIS - ESPAGNOL

errores de oficina en la información pertinente a la solicitud referenciada anteriormente, lo cual puede ser necesario o deseable para la recordación de este documento.

Resolución  
6694/78  
Minjusticia



PROGRAMA A

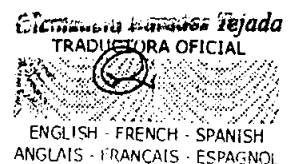
|                                                                  |                                                                          |                                  |
|------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------------|
| International<br>(PCT)                                           | Solicitud internacional<br>No. PCT/US07/68407 <sup>3</sup>               | Radicado: 7 de mayo de 2007      |
| Argentina                                                        | Solicitud Argentina No. P-<br>070101975                                  | Radicado: 7 de mayo de 2007      |
| Bahamas                                                          | Solicitud Bahamas No. 1982                                               | Radicado: 25 de mayo de 2007     |
| Chile                                                            | Solicitud Chile No. 1288-2007                                            | Radicado: 7 de mayo de 2007      |
| Jamaica                                                          | Solicitud Jamaica No. 18/1/4628                                          | Radicado: 7 de mayo de 2007      |
| Panamá                                                           | Solicitud Panamá No.<br>PI/PA01/87255-01                                 | Radicado: 7 de mayo de 2007      |
| Taiwán                                                           | Solicitud Taiwán No. 96116178                                            | Radicado: 7 de mayo de 2007      |
| Venezuela                                                        | Solicitud Venezuela No.<br>PI/PA01/87255-01                              | Radicado: 7 de mayo de 2007      |
| Aruba                                                            | Solicitud Aruba No. OCT-<br>02/071105                                    | Radicado: 5 de noviembre de 2007 |
| Bangladesh                                                       | Solicitud Bangladesh No. 242/2007                                        | Radicado: 4 de noviembre de 2007 |
| Burundi                                                          | Solicitud Burundi No. Aún no<br>disponible                               | Radicado: 5 de noviembre de 2007 |
| Bolivia                                                          | Solicitud Bolivia No. SP-270345                                          | Radicado: 1 de noviembre de 2007 |
| Concejo de<br>cooperación del<br>golfo (Omán,<br>Bahréin, Qatar, | Solicitud del Concejo de<br>cooperación del golfo No.<br>GCC/P/2007/9412 | Radicado: 5 de noviembre de 2007 |

Resolución  
6694/78  
Minjusticia

*Clemencia Farvades Tejeda*  
TRADUCTORA OFICIAL  
  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

|                                  |                                         |                                   |
|----------------------------------|-----------------------------------------|-----------------------------------|
| U.A.E., Arabia<br>Saudi, Kuwait) |                                         |                                   |
| Irán                             | Solicitud Irán No. 38609165             | Radicado: 27 de noviembre de 2007 |
| Jordania                         | Solicitud Jordania No. 460/2007         | Radicado: 4 de noviembre de 2007  |
| Líbano                           | Solicitud Líbano No. 6837               | Radicado: 1 de noviembre de 2007  |
| Mauricio                         | Solicitud Mauricio No.<br>MU/P/07/00083 | Radicado: 5 de noviembre de 2007  |
| Nepal                            | Solicitud Nepal No. 925                 | Radicado: 2 de noviembre de 2007  |
| Perú                             | Solicitud Perú No. 001515-<br>2007/OIN  | Radicado: 5 de noviembre de 2007  |
| Pakistán                         | Solicitud Pakistán No. 1279/2007        | Radicado: 2 de noviembre de 2007  |
| Paraguay                         | Solicitud Paraguay No. 37.569           | Radicado: 2 de noviembre de 2007  |
| Tailandia                        | Solicitud Tailandia No.<br>0701005570   | Radicado: 2 de noviembre de 2007  |
| Tonga                            | Solicitud Tonga No.<br>TO/P/07/00007    | Radicado: 2 de noviembre de 2007  |
| Uruguay                          | Solicitud Uruguay No. 30-688            | Radicado: 5 de noviembre de 2007  |
| Yemen                            | Solicitud Yemen: aún no disponible      | Radicado: 6 de noviembre de 2007  |

Resolución  
6694/78  
Minjusticia



## EJECUCIÓN DE LA ASIGNACIÓN DE LA INVENCION

Ejecución por parte del Cedente

CEDENTE

TESTIGO:

Por

Por

CHOTALIYA, Ashish

EILEEN BOTHILLIER

7 de noviembre de 2008

7 de noviembre de 2008

EDMONTON, CANADÁ

(Ciudad y país en donde se ejecuta la asignación)

Autenticación de la firma del testigo del Cedente

Yo, EILEEN BOTHILLIER, de EDMONTON, AB declaro que estuve personalmente y fui el testigo del Cedente antes mencionado quien firmó y ejecutó debidamente la Asignación anterior.

Juramentado ante mí en EDMONTON

Canadá, el 7 de Noviembre de 2008

Nombre del Comisionado

Firma del Comisionado

Un Comisionado para tomar juramentos y declaraciones para la jurisdicción de Alberta.

Resolución  
6694/78  
Minjusticia



### **Ejecución por parte del Cesionario**

Cesionario

Testigo

Por

Por

Nombre: ANDREAS TSANGARIS

MARGARET SWAIN

Cargo: CIENTÍFICO JEFE

Nombre: 20 de noviembre 2008

Nombre: 20 de noviembre 2008

KANATA, CANADÁ

(Ciudad y país en donde se ejecuta la asignación)

### **Autenticación de la firma del testigo del Cesionario**

Yo, MARGARET SWAIN de 3807 111 WEST PENDER, VANCOWER, BC declaro que estuve personalmente y fui el testigo del Cesionario antes mencionado quien firmó y ejecutó debidamente la Asignación anterior.

Juramentado ante mí en Ottawa (Kanata)

Canadá, el 20 de noviembre de 2008

A. ATHANASSIADIS

Nombre del Comisionado

Firma del Comisionado

Un Comisionado para tomar juramentos y declaraciones para la jurisdicción de Ontario.

Recepción  
6694/78  
Minjusticia

Estimada Señora Alejandra  
TRADUCCIONES OFICIALES  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

CONSULADO DE COLOMBIA  
 No. 282 Ottawa, Canadá, a 2 de Diciembre de 2008  
 Visto en este Consulado para autenticar la firma de  
VALERIE TAILLEUR  
 quien en la Fecha ejercía las funciones de  
OFICIAL DE AUTENTICACIONES M.R.E DE CANADA  
 US\$30.00 Consulado de Colombia  
 MONICA BELTRAN ESPINA  
 Primer Secretario Encargado de las Funciones Consulares  
 Embajada de Colombia  
 OTTAWA

MINISTERIO DE  
 RELACIONES EXTERIORES

2009 ENE -9 A 8:53

JEFE DE LEGALIZACIONES  
 BOGOTA D.C.

NO SE ASUME  
 RESPONSABILIDAD  
 DEL TEXTO

860074  
 Monica Beltran  
 SOY A FIRMAR ADELANTE EN EL  
 DOCUMENTO DESFRENDA  
 AS FUNCIONES INDICADAS

CANADA )

TO ALL TO WHOM THESE  
 PRESENTS MAY

Province of Ontario )

COME, BE SEEN OR KNOWN

To Wit: )

I, Diana Mansour, a Notary Public in and for the Province of Ontario, by Royal Authority duly appointed, and residing at the City of Ottawa, in the Province of Ontario, **DO CERTIFY AND ATTEST** that the paper hereto annexed is a true copy of a document produced and shown to me and being the notarized Assignment of Invention, effective May 5, 2007, the copy having been compared by me with the original notarized document, an act which, having been requested, I have granted under my notarial form and seal of office to serve as shall be required.

**IN TESTIMONY WHEREOF** I have hereto subscribed my name and affixed my Notarial Seal of Office at the City of Ottawa, this 10<sup>th</sup> day of November, 2008.

(Seal)

A NOTARY PUBLIC IN AND FOR THE  
 PROVINCE OF ONTARIO

Certified at the Department of Foreign Affairs and  
 International Trade for Legalization of the  
 Foregoing Signature of  
 Certifié au Ministère des Affaires étrangères et  
 du Commerce international aux fins de légaliser  
 la signature ci-dessous de  
 Deputy Minister of  
 Foreign Affairs  
 Sous-ministre des  
 Affaires étrangères  
 CANADA

## ASSIGNMENT OF INVENTION

This Assignment is effective the 5<sup>th</sup> day of May, 2007.

In consideration of One (\$1.00) Dollar and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, we,

- (a) **BASHAM**, Scott Douglas, whose full post office address is 87 Cedar Valley Dr, Ottawa, Ontario, K2M 3A3, Canada;
- (b) **CAMPBELL**, Kenneth Craig, whose full post office address is 69 Meadow Cres, Kitchener, Ontario N2M 4E9, Canada;
- (c) **CUI**, Mao Pei, whose full post office address is 18 Gardengate Way, Ontario K2G 5Z2, Canada;
- (d) **DOBBS**, Geoffrey, whose full post office address is 201 Deerwood Drive, RR #2, Kinburn, Ontario K0A 2H0, Canada;
- (e) **FEASBY**, Douglas Michael, whose full post office address is 175 Woodbine Place, Unit 204, Ottawa, Ontario K1S 5M8, Canada;
- (f) **MARCEAU**, Pascale Bonnie, whose full post office address is 13 Kettleby, Kanata, Ontario K2K 3C4, Canada;
- (g) **MCLEAN**, Alisdair Alan, whose full post office address is 41 Iona St, Ottawa, Ontario K1Y 3L6, Canada;
- (h) **SHEN**, Zhiyuan, whose full post office address is 1480 Bradshaw Cr, Ottawa, Ontario K1B 5G2, Canada;
- (i) **WAGLER**, Thomas Edward, whose full post office address is 625 Kerwin Rd, Dunrobin, Ontario K0A 1T0, Canada;

agree and confirm that we have sold, assigned and transferred, and by these presents do hereby sell, assign and transfer to **Plasco Energy Group Inc.** (hereinafter the "Assignee"), whose full post office address is **1145 Innovation Drive, Suite 100, Kanata, Ontario K2K 3G8, Canada**, all our right, title and interest throughout the world in and to (1) our invention(s) relating to

**A Low Temperature Gasification Facility With A Horizontally Oriented Gasifier**, as described and/or claimed in the patent applications listed in Schedule A attached hereto,

(2) all improvements, including but not limited to modifications, additions, substitutions, derivatives, and deletions to said invention(s); (3) the above-identified applications in (1) and national phase applications thereof; (4) all other applications for Letters Patent in any country throughout the world for said invention(s) and improvements, including but not limited to all divisional, continuation, continuation-in-part, renewal, reissue, and substitute applications; (5)

any Letters Patent which may issue from any of said applications as exemplified in (3) and (4) above in any country throughout the world; (6) all Convention or Treaty rights derived from any of said applications, including without limitation, all rights of priority throughout the world in and to said applications; and (7) the full and complete right to file applications for Letters Patent in the name of the Assignee, or in our names at the Assignee's election, on said invention(s) and improvements in all countries throughout the world.

For said consideration, we agree, upon the request and at the expense of the Assignee, its successors and assigns, to execute any and all divisional, continuation, continuation-in-part, reissue and substitute applications for said invention(s) and improvements, and acknowledge and agree that all rights therein shall vest in the Assignee, its successors and assigns, whereby said Letters Patent will be held and enjoyed by said Assignee, its successors and assigns, to the full end of the term for which said Letters Patent will be granted, as fully and entirely as the same would have been held and enjoyed by the undersigned if this assignment had not been made. In addition, we will, at the request of the Assignee, execute any and all documents required by the Assignee to fully and properly vest the aforementioned rights in the Assignee.

The undersigned hereby grants to the firm of **MBM Intellectual Property Law LLP** whose full post office address is 270 Albert Street, 14<sup>th</sup> Floor, Ottawa, Ontario, Canada, K1P 5G8, the power to insert on this assignment any further information and/or correct any clerical error in the information pertaining to the referenced application above, which may be necessary or desirable in order to comply with the patent legislation for recordation of this document.

**[CONTINUED ON NEXT PAGE]**

## SCHEDULE A

|                                                                               |                                                          |                          |
|-------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------|
| International (PCT)                                                           | International Application No. PCT/US07/68407             | Filed: May 7, 2007       |
| Argentina                                                                     | Argentina Application No. P-070101975                    | Filed: May 7, 2007       |
| Bahamas                                                                       | Bahamian Application No. 1982                            | Filed: May 25, 2007      |
| Chile                                                                         | Chile Application No. 1288-2007                          | Filed: May 7, 2007       |
| Jamaica                                                                       | Jamaica Application No. 18/1/4628                        | Filed: May 7, 2007       |
| Panama                                                                        | Panama Application No. PI/PA01/87255-01                  | Filed: May 7, 2007       |
| Taiwan                                                                        | Taiwan Application No. 96116178                          | Filed: May 7, 2007       |
| Venezuela                                                                     | Venezuela Application No. 07-0926                        | Filed: May 7, 2007       |
| Aruba                                                                         | Aruba Application No. OCT-02/071105                      | Filed: November 5, 2007  |
| Bangladesh                                                                    | Bangladesh Application No. 242/2007                      | Filed: November 4, 2007  |
| Burundi                                                                       | Burundi Application No. Not Yet Available                | Filed: November 5, 2007  |
| Bolivia                                                                       | Bolivia Application No. SP-270345                        | Filed: November 1, 2007  |
| Gulf Cooperation Council (Oman, Bahrain, Qatar, U.A.E., Saudi Arabia, Kuwait) | Gulf Cooperation Council Application No. GCC/P/2007/9412 | Filed: November 5, 2007  |
| Iran                                                                          | Iran Application No. 38609165                            | Filed: November 27, 2007 |
| Jordan                                                                        | Jordan Application No. 460/2007                          | Filed: November 4, 2007  |
| Lebanon                                                                       | Lebanon Application No. 6837                             | Filed: November 1, 2007  |
| Mauritius                                                                     | Mauritius Application No. MU/P/07/00083                  | Filed: November 5, 2007  |
| Nepal                                                                         | Nepal Application No. 925                                | Filed: November 2, 2007  |
| Peru                                                                          | Peru Application No. 001515-2007/OIN                     | Filed: November 5, 2007  |
| Pakistan                                                                      | Pakistan Application No. 1279/2007                       | Filed: November 2, 2007  |
| Paraguay                                                                      | Paraguay Application No. 37.569                          | Filed: November 2, 2007  |
| Thailand                                                                      | Thailand Application No. 0701005570                      | Filed: November 2, 2007  |
| Tonga                                                                         | Tonga Application No. TO/P/07/00007                      | Filed: November 2, 2007  |
| Uruguay                                                                       | Uruguay Application No. 30.688                           | Filed: November 5, 2007  |
| Yemen                                                                         | Yemen Application No. Not Yet Available                  | Filed: November 6, 2007  |

***Execution by Assignor #1***

***Notarization of Witness to Signature of Assignor #1***

Page 4 of 13

**Execution by Assignor #2**

|                                                                                                                                                                                                           |                                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <b>ASSIGNOR #2:</b><br>By: <u>K Campbell</u><br>(Signature)<br><b>CAMPBELL, Kenneth Craig</b><br><u>Oct 23/08</u><br>(Date Signed)<br><u>Ottawa, Canada</u><br>(City & Country Where Assignment Executed) | <b>WITNESS:</b><br>By: <u>R Genest</u><br>(Signature)<br><u>Rosemary Genest</u><br>(Name)<br><u>October 23, 2008</u><br>(Date Signed) |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|

**Notarization of Witness to Signature of Assignor #2**

|                                                                                                                                                                                                                        |                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| I, <u>Rosemary Genest</u> , of <u>1024 Taffy Lane, Ottawa, Ontario K1C1V5</u><br>(Witness name) (Witness address)                                                                                                      |                                           |
| declare that I was personally present and did witness the abovementioned Assignor #2 duly sign and execute the above Assignment.                                                                                       |                                           |
| Sworn Before Me at <u>Ottawa</u><br>(City)<br><u>Canada</u> on <u>October 23, 2008</u> .<br>(Country) (Date)<br><u>A. ATHANASSIADIS</u><br>(Commissioner's Name)<br><u>A Athanassiad</u><br>(Commissioner's Signature) | <u>R Genest</u><br>(Signature of Witness) |
| A Commissioner for taking Oaths and Affidavits for the jurisdiction of <u>Ontario</u><br>(State, Province, etc)                                                                                                        |                                           |

**Execution by Assignor #3**

|                                                                                                                                                                                                                                                                          |                                                                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>ASSIGNOR #3:</b></p> <p>By: <u><i>Mao Pei Cui</i></u><br/>         (Signature)</p> <p><b>CUI, Mao Pei</b></p> <p><u>Oct 23rd, 2008</u><br/>         (Date Signed)</p> <p><u>Karata, ON, Canada</u><br/>         (City &amp; Country Where Assignment Executed)</p> | <p><b>WITNESS:</b></p> <p>By: <u><i>R Genest</i></u><br/>         (Signature)</p> <p><b>Rosemary Genest</b><br/>         (Name)</p> <p><u>October 23, 2008</u><br/>         (Date Signed)</p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Notarization of Witness to Signature of Assignor #3**

I, Rosemary Genest, of 1094 Taffy Lane, Ottawa, Ontario, K1C1Y5  
 (Witness name) (Witness address)

declare that I was personally present and did witness the abovementioned Assignor #3 duly sign and execute the above Assignment.

|                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| <p>Sworn Before Me at <u>Karata (Ottawa)</u><br/>         (City)</p> <p><u>Canada</u> on <u>October 23, 2008</u><br/>         (Country) (Date)</p> <p><u>A. ATHANASSIOU</u><br/>         (Commissioner's Name)</p> <p><u><i>A. Athanassiou</i></u><br/>         (Commissioner's Signature)</p> <p>A Commissioner for taking Oaths and Affidavits for the jurisdiction of <u>Ontario</u><br/>         (State, Province, etc)</p> | <p><u><i>R Genest</i></u><br/>         (Signature of Witness)</p> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|

**Execution by Assignor #4**

|                                                                                                                                                                                                    |                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ASSIGNOR #4:</b><br>By: <u>[Signature]</u><br>(Signature)<br><b>DOBBS, Geoffrey</b><br><u>2008-10-27</u><br>(Date Signed)<br><u>OTTAWA CANADA</u><br>(City & Country Where Assignment Executed) | <b>WITNESS:</b><br>By: <u>Maria de Fatima Machado</u><br>(Signature)<br><u>MARIA DE FATIMA MACHADO</u><br>(Name)<br><u>Oct. 27, 2008</u><br>(Date Signed) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|

**Notarization of Witness to Signature of Assignor #4**

|                                                                                                                                                                                                                    |                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <u>MARIA DE FATIMA MACHADO</u> of <u>103 COHEN AVE, KANATA ON, K2L4G4</u><br>(Witness name) (Witness address) CANADA                                                                                               |                                                                                                                      |
| declare that I was personally present and did witness the abovementioned Assignor #4 duly sign and execute the above Assignment.                                                                                   |                                                                                                                      |
| Sworn Before Me at <u>Ottawa</u><br>(City)<br><u>Canada</u> on <u>October 27, 2008</u><br>(Country) (Date)<br><u>A. ATHANASSIADIS</u><br>(Commissioner's Name)<br><u>[Signature]</u><br>(Commissioner's Signature) | )<br>)<br>)<br>)<br>)<br>)<br>)<br>)<br>)<br>)<br>)<br>)<br><u>Maria de Fatima Machado</u><br>(Signature of Witness) |
| A Commissioner for taking Oaths and Affidavits for the jurisdiction of <u>Ontario</u><br>(State, Province, etc)                                                                                                    |                                                                                                                      |

***Execution by Assignor #5***

ASSIGNOR #5:

By: D. Feasby  
(Signature)

FEASBY, Douglas Michael

23/10/08  
(Date Signed)

KANATA, CANADA  
(City & Country Where Assignment Executed)

WITNESS:

By: Rosemary Genest  
(Signature)

Rosemary Genest  
(Name)

October 23, 2008  
(Date Signed)

***Notarization of Witness to Signature of Assignor #5***

I, Rosemary Genest, of 1094 Taffy Lane, Ottawa, Ontario, K1C 1Y5  
(Witness name) (Witness address)

declare that I was personally present and did witness the abovementioned Assignor #5 duly sign and execute the above Assignment.

Sworn Before Me at Kanata (Ottawa),  
(City)  
Canada on October 23, 2008.  
(Country) (Date)

A. ATHANASSIADIS  
(Commissioner's Name)  
A Athanassiadis  
(Commissioner's Signature)

A Commissioner for taking Oaths and Affidavits for the jurisdiction of Ontario  
(State, Province, etc)

R Genest  
(Signature of Witness)

**Execution by Assignor #6**

|                                                                                                                                                                                                                           |                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| <b>ASSIGNOR #6:</b><br>By: <u>Pascale Marceau</u><br>(Signature)<br><b>MARCEAU, Pascale Bonnie</b><br><u>Oct 23 2008</u><br>(Date Signed)<br><u>Kanata, Ontario, Canada</u><br>(City & Country Where Assignment Executed) | <b>WITNESS:</b><br>By: <u>R Genest</u><br>(Signature)<br><u>Rosemary Genest</u><br>(Name)<br><u>October 23, 2008</u><br>(Date Signed) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|

**Notarization of Witness to Signature of Assignor #6**

|                                                                                                                                  |                                           |
|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| I, <u>Rosemary Genest</u> , of <u>1094 Taffy Lane, Ottawa, Ontario K1C1Y5</u><br>(Witness name) (Witness address)                |                                           |
| declare that I was personally present and did witness the abovementioned Assignor #6 duly sign and execute the above Assignment. |                                           |
| Sworn Before Me at <u>Kanata (Ottawa)</u><br>(City)<br><u>Canada</u> on <u>October 23, 2008</u><br>(Country) (Date)              | <u>R Genest</u><br>(Signature of Witness) |
| <u>A. ATHANASSIADIS</u><br>(Commissioner's Name)                                                                                 |                                           |
| <u>A Athanassiadis</u><br>(Commissioner's Signature)                                                                             |                                           |
| A Commissioner for taking Oaths and Affidavits for the jurisdiction of <u>Ontario</u><br>(State, Province, etc)                  |                                           |

***Execution by Assignor #7***

ASSIGNOR #7:  
By: Alisdair McLean  
(Signature)  
MCLEAN, Alisdair Alan  
OCT 23 2008  
(Date Signed)  
OTTAWA CANADA  
(City & Country Where Assignment Executed)

***Notarization of Witness to Signature of Assignor #7***

I, Rosemary Genest, of 1094 Taffy Lane, Ottawa, Ont K1C 1Y8  
(Witness name) (Witness address)

declare that I was personally present and did witness the abovementioned Assignor #7 duly sign and execute the above Assignment.

Sworn Before Me at Ottawa,  
(City)  
Canada on October 23, 2008.  
(Country) (Date)

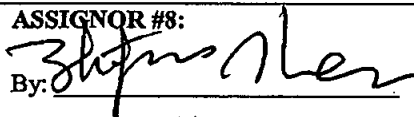
A. ATHANASSIOU  
(Commissioner's Name)

A. Athanassiou  
(Commissioner's Signature)

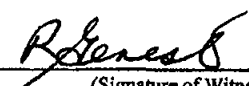
A Commissioner for taking Oaths and Affidavits for the jurisdiction of Ontario  
(State, Province, etc)

R. Genest  
(Signature of Witness)

**Execution by Assignor #8**

|                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ASSIGNOR #8:</b><br>By: <u></u><br>(Signature)<br><b>SHEN, Zhiyuan</b><br><u>Oct. 28, 2008</u><br>(Date Signed)<br><u>Ottawa, Canada</u><br>(City & Country Where Assignment Executed) | <b>WITNESS:</b><br>By: <u></u><br>(Signature)<br><u>Rosemary Genest</u><br>(Name)<br><u>October 28, 2008</u><br>(Date Signed) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Notarization of Witness to Signature of Assignor #8**

|                                                                                                                                  |                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| I, <u>Rosemary Genest</u> , of <u>1094 Taffy Lane, Ottawa, Ontario, K1C1Y5</u><br>(Witness name) (Witness address)               |                                                                                                                        |
| declare that I was personally present and did witness the abovementioned Assignor #8 duly sign and execute the above Assignment. |                                                                                                                        |
| Sworn Before Me at <u>Ottawa</u><br>(City)<br><u>Canada</u> on <u>Oct. 28, 2008</u><br>(Country) (Date)                          | <u></u><br>(Signature of Witness) |
| <u>Jonathan Roch</u><br>(Commissioner's Name)                                                                                    |                                                                                                                        |
| <u></u><br>(Commissioner's Signature)         |                                                                                                                        |
| A Commissioner for taking Oaths and Affidavits for the jurisdiction of <u>ONTARIO</u><br>(State, Province, etc)                  |                                                                                                                        |

**Execution by Assignor #9**

|                                                                                                                                                                                                                              |                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ASSIGNOR #9:</b><br><br>By: <u>Tom Wagler</u><br>(Signature)<br><b>WAGLER, Thomas Edward</b><br><br><u>Oct. 23, 2008</u><br>(Date Signed)<br><u>Kanata, Ontario, Canada</u><br>(City & Country Where Assignment Executed) | <b>WITNESS:</b><br><br>By: <u>R. Genest</u><br>(Signature)<br><u>Rosemary Genest</u><br>(Name)<br><br><u>October 23, 2008</u><br>(Date Signed) |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|

**Notarization of Witness to Signature of Assignor #9**

|                                                                                                                                  |                                            |
|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| I, <u>Rosemary Genest</u> , of <u>1094 Toffy Lane, Ottawa, Ontario, K1C 1V5</u><br>(Witness name) (Witness address)              |                                            |
| declare that I was personally present and did witness the abovementioned Assignor #9 duly sign and execute the above Assignment. |                                            |
| Sworn Before Me at <u>Kanata (Ottawa)</u><br>(City)<br><u>Canada</u> on <u>October 23, 2008</u><br>(Country) (Date)              | <u>R. Genest</u><br>(Signature of Witness) |
| <u>A. ATHANASSIADIS</u><br>(Commissioner's Name)<br><u>A. Athanassiadis</u><br>(Commissioner's Signature)                        |                                            |
| A Commissioner for taking Oaths and Affidavits for the jurisdiction of <u>Ontario</u><br>(State, Province, etc)                  |                                            |

**Execution by Assignee:**

|                                                                     |                                       |
|---------------------------------------------------------------------|---------------------------------------|
| <b>ASSIGNEE:</b>                                                    | <b>WITNESS:</b>                       |
| By: <u>[Signature]</u><br>(Signature)                               | By: <u>[Signature]</u><br>(Signature) |
| Name: <u>Tim SAUNDERS</u><br>Title: <u>VP Finance ECFO</u>          | <u>LISA SOULIERE</u><br>(Name)        |
| <u>10/31/08</u><br>(Date Signed)                                    | <u>10/31/08</u><br>(Date Signed)      |
| <u>OTTAWA, CANADA</u><br>(City & Country Where Assignment Executed) |                                       |

**Notarization of Witness to Signature of Assignee:**

|                                                                                                                               |                                              |
|-------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| I, <u>LISA SOULIERE</u> , of <u>13 LOUG GATE COURT NEPEAN ONT.</u><br>(Witness name) (Witness address)                        |                                              |
| declare that I was personally present and did witness the abovementioned Assignee duly sign and execute the above Assignment. |                                              |
| Sworn Before Me at <u>Ottawa</u><br>(City)<br><u>Canada</u> on <u>Oct. 31, 2008</u><br>(Country) (Date)                       | <u>[Signature]</u><br>(Signature of Witness) |
| <u>[Signature]</u><br>(Commissioner's Name) <u>A. ATHANASSIOU</u>                                                             |                                              |
| A Commissioner for taking Oaths and Affidavits for the jurisdiction of <u>Ontario</u><br>(State, Province, etc)               |                                              |

CONSULADO DE COLOMBIA

No. 282 Ottawa, Canadá, el 2 de Diciembre de 2008

Visto en este Consulado para autenticar la firma de VALERIE TAILLEUR quien en esta fecha ejercía las funciones de OFICIAL DE AUTENTICACIONES M.R.E DE CANADÁ

Cónsul de Colombia

MINISTERIO DE RELACIONES EXTERIORES

9 DE ENERO DE 2009 – 860074

JEFE DE LEGALIZACIONES BOGOTÁ, D.C.

CANADÁ )

Provincia de Ontario ) A TODOS LOS QUE PUEDAN VER O CONOCER  
LOS PRESENTES

Consideración: )

Yo, Diana Mansour, un Notario Público en y para la Provincia de Ontario, debidamente nombrado por la Autoridad Real y residente en la ciudad de Ottawa, en la Provincia de Ontario, CERTIFICO Y ATESTIGUO que el documento anexo es una copia fiel de un documento dirigido y presentado ante mí y corresponde a la Asignación de la invención notariada con fecha efectiva 4 de mayo de 2007; comparé la copia con el documento original, un acto que me fue solicitado, y he otorgado bajo mi firma y sello notarial de la oficina para servir de acuerdo como sea requerido.

Resolución  
6694/78  
Minjusticia

*Clomansa Mansour Mansour*  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

MINISTERIO DE  
RELACIONES EXTERIORES

2009 ENE 21 A 9:57

*MSL*  
JEFE DE LEGALIZACIONES  
BOGOTA D.C.

NO SE ASUME  
RESPONSABILIDAD  
DEL TEXTO

864942

*C. GARCIA*

*PARCERES*

NOVA FISCIA ASERDE EN EL  
DOCUMENTO DESEMPENA  
AS FUNCIONES INDICADAS

MINISTERIO DE RELACIONES EXTERIORES  
RECIBO LEGALIZACION  
*00422052*  
No. \_\_\_\_\_

EN TESTIMONIO DE LO CUAL he suscrito mi nombre y fijado mi sello notarial de la  
Oficina en la ciudad de Ottawa, este día 10 de noviembre de 2008.

(Sello)

UN NOTARIO PÚBLICO EN Y PARA LA PROVINCIA DE ONTARIO

Certificado en el Departamento de Relaciones Exteriores y Comercio Internacional para la  
legalización de la firma anterior de

Ministro de Relaciones Exteriores

CANADÁ

Resolución  
6694/78  
Minjusticia

**Clemente Pineda Tejeda**  
TRADUCTURA OFICIAL  
  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

## ASIGNACIÓN DE LA INVENCION

Esta asignación entra en vigor el 5 de mayo de 2007.

En consideración de un (\$1.00) dólar y otras consideraciones buenas y valiosas, cuyo recibo y suficiencia se reconoce por medio del presente, nosotros,

(a) **BASHAM**, Scott Douglas, cuya dirección es 87 Cedar Valley Dr, Ottawa, Ontario, K2M 3A3, Canadá;

(b) **CAMPBELL**, Kenneth Craig, cuya dirección es 69 Meadow Cres, Kitchener, Ontario N2M 4E9, Canadá;

(c) **CUI**, Mao Pei, cuya dirección es 18 Gardengate Way, Ontario K2G 5Z2, Canadá;

(d) **DOBBS**, Geoffrey, cuya dirección es 201 Deerwood Drive, RR #2 Kinburn, Ontario K0A 2H0, Canadá;

(e) **FEASBY**, Douglas Michael, cuya dirección es 175 Woodbine Place, Unit 204, Ottawa, Ontario K1S 5M8, Canadá;

(f) **MARCEAU**, Pascale Bonnie, cuya dirección es 13 Kettleby, Kanata, Ontario K2K 3C4, Canadá;

Resolución  
6694/78  
Minjusticia

*Clementina Parades y Jada*  
TRADUCTURA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

32

(g) **MCLEAN**, Alisdair Alan, cuya dirección es 41 Iona St, Ottawa, Ontario K1Y 3L6, Canadá;

(h) **SHEN**, Zhiyuan, cuya dirección es 1480 Bradsbaw Cr, Ottawa, Ontario K1B 502, Canadá;

(i) **WAGLER**, Thomas Edward, cuya dirección es 625 Kerwin Rd, Dunrobin, Ontario KOA 1T0 Canadá;

Acordamos y confirmamos que hemos vendido, asignado y transferido, y por medio de los presentes vendemos, asignamos y transferimos a **Plasco Energy Group Inc.**, (de ahora en adelante el Cesionario), con oficinas ubicadas en 1145 Innovation Drive, Suite 100, Kanata, Ontario K2K 3G8, Canadá, todos nuestros derechos, título en interés en todo el mundo en y sobre (1) nuestras invenciones relacionadas con :

**Una instalación de gasificación de baja temperatura con un Gasificador orientado horizontalmente**, tal como se describe y/o reivindica en las solicitudes de patentes listadas en el Programa A anexo a este documento, y

(2) todas las mejoras, incluyendo sin limitación las modificaciones, adiciones, sustituciones, derivaciones y eliminaciones de dicha invención; (3) las solicitudes antes identificadas en (1) y las solicitudes de la fase nacional; (4) todas las demás solicitudes para las Cartas de Patente en cualquier país del mundo para dichas invenciones y mejoras,

Resolución  
6694/78  
Minjusticia

**Clementina Parades Tejeda**  
TRADUCTORA OFICIAL  
  
ENGLISH · FRENCH · SPANISH  
ANGLAIS · FRANÇAIS · ESPAGNOL

incluyendo sin limitación todas las solicitudes divisionales, continuaciones, continuaciones en parte, renovaciones, remisiones y solicitudes sustitutas; (5) todas las Cartas de Patente que se puedan expedir de cualquiera de dichas solicitudes tal como se ejemplifica en los numerales (3) y (4) anteriores en cualquier país del mundo; (6) todos los derechos de Convenciones o Tratados derivados de dichas solicitudes, incluyendo sin limitación, todos los derechos de propiedad en todo el mundo en y sobre dichas solicitudes y (7) el derecho total y completo para radicar las solicitudes por Cartas de Patente a nombre de Cesionario, o en nuestros nombres, a elección del Cesionario, sobre dichas invenciones y mejoras en todos los países del mundo.

Por dicha consideración, acordamos, a solicitud y por cuenta del Cesionario, sus sucesores y asignados, ejecutar cualquiera y todas las solicitudes divisionales, continuaciones, continuaciones en parte, remisiones y sustitutas para dichas invenciones y mejoras y reconocemos y acordamos que todos los derechos serán investidos en el Cesionario, sus sucesores y asignados, hasta el final del término por el cual se otorgarán dichas Cartas de Patente, tan completamente y totalmente como hubieran sido mantenidas y disfrutadas por los suscritos si no se hiciera esta asignación. Además, a solicitud del Cesionario, ejecutaremos cualquiera y todos los documentos requeridos por el Cesionario para invertir completamente y apropiadamente los derechos antes mencionados en el Cesionario.

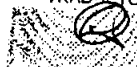
Los suscritos por medio del presente le otorgamos a la firma **MBM Intellectual Property Law LLP** con oficinas ubicadas en 270 Albert Street, 14 Floor, Ottawa, Ontario, Canadá, K1P 5G8, el poder para insertar en esta asignación cualquier información adicional y/o

Regulación  
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*Traducción*  
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corregir errores de oficina en la información pertinentes a la solicitud referenciada anteriormente, lo cual puede ser necesario o deseable para la recordación de este documento.

Resolución  
6694/78  
Minjusticia

*Clemencia Parades Yajeda*  
TRADUCTORA OFICIAL  
  
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# PROGRAMA A

|                                                                  |                                                                          |                                  |
|------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------------|
| International<br>(PCT)                                           | Solicitud internacional<br>No. PCT/US07/68407                            | Radicado: 7 de mayo de 2007      |
| Argentina                                                        | Solicitud Argentina No. P-<br>070101975                                  | Radicado: 7 de mayo de 2007      |
| Bahamas                                                          | Solicitud Bahamas No. 1982                                               | Radicado: 25 de mayo de 2007     |
| Chile                                                            | Solicitud Chile No. 1288-2007                                            | Radicado: 7 de mayo de 2007      |
| Jamaica                                                          | Solicitud Jamaica No. 18/1/4628                                          | Radicado: 7 de mayo de 2007      |
| Panamá                                                           | Solicitud Panamá No.<br>PI/PA01/87255-01                                 | Radicado: 7 de mayo de 2007      |
| Taiwán                                                           | Solicitud Taiwán No. 96116178                                            | Radicado: 7 de mayo de 2007      |
| Venezuela                                                        | Solicitud Venezuela No.<br>PI/PA01/87255-01                              | Radicado: 7 de mayo de 2007      |
| Aruba                                                            | Solicitud Aruba No. OCT-<br>02/071105                                    | Radicado: 5 de noviembre de 2007 |
| Bangladesh                                                       | Solicitud Bangladesh No. 242/2007                                        | Radicado: 4 de noviembre de 2007 |
| Burundi                                                          | Solicitud Burundi No. Aún no<br>disponible                               | Radicado: 5 de noviembre de 2007 |
| Bolivia                                                          | Solicitud Bolivia No. SP-270345                                          | Radicado: 1 de noviembre de 2007 |
| Concejo de<br>cooperación del<br>golfo (Omán,<br>Bahréin, Qatar, | Solicitud del Concejo de<br>cooperación del golfo No.<br>GCC/P/2007/9412 | Radicado: 5 de noviembre de 2007 |

Resolución  
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|                                  |                                         |                                   |
|----------------------------------|-----------------------------------------|-----------------------------------|
| U.A.E., Arabia<br>Saudí, Kuwait) |                                         |                                   |
| Irán                             | Solicitud Irán No. 38609165             | Radicado: 27 de noviembre de 2007 |
| Jordania                         | Solicitud Jordania No. 460/2007         | Radicado: 4 de noviembre de 2007  |
| Líbano                           | Solicitud Líbano No. 6837               | Radicado: 1 de noviembre de 2007  |
| Mauricio                         | Solicitud Mauricio No.<br>MU/P/07/00083 | Radicado: 5 de noviembre de 2007  |
| Nepal                            | Solicitud Nepal No. 925                 | Radicado: 2 de noviembre de 2007  |
| Perú                             | Solicitud Perú No. 001515-<br>2007/OIN  | Radicado: 5 de noviembre de 2007  |
| Pakistán                         | Solicitud Pakistán No. 1279/2007        | Radicado: 2 de noviembre de 2007  |
| Paraguay                         | Solicitud Paraguay No. 37.569           | Radicado: 2 de noviembre de 2007  |
| Tailandia                        | Solicitud Tailandia No.<br>0701005570   | Radicado: 2 de noviembre de 2007  |
| Tonga                            | Solicitud Tonga No.<br>TO/P/07/00007    | Radicado: 2 de noviembre de 2007  |
| Uruguay                          | Solicitud Uruguay No. 30-688            | Radicado: 5 de noviembre de 2007  |
| Yemen                            | Solicitud Yemen: aún no disponible      | Radicado: 6 de noviembre de 2007  |

Recepción  
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**Clemencia Paredes Tejada**  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
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## EJECUCIÓN DE LA ASIGNACIÓN DE LA INVENCION

Ejecución por parte del Cedente #1

CEDENTE #1

TESTIGO:

Por

Por

BASHAM, Scott Douglas

Rosemary Genest

10/23/08

23 de octubre de 2008

KANATA (OTTAWA), CANADÁ

(Ciudad y país en donde se ejecuta la asignación)

Autenticación de la firma del testigo del Cedente #1

Yo, ROSEMARY GENEST, de 1094 Taffy Lane, Ottawa, Ontario K1C1Y5 declaro que estuve personalmente y fui el testigo del Cedente #1 antes mencionado quien firmó y ejecutó debidamente la Asignación anterior.

Juramentado ante mí en Kanata (Ottawa)

Canadá, el 23 de octubre de 2008

A. ATHANASSIADIS

Nombre del Comisionado

Firma del Comisionado

Un Comisionado para tomar juramentos y declaraciones para la jurisdicción de Ontario.

Ejecución por parte del Cedente #2

Resolución  
6694/78  
Minjusticia

*Clemente Paredes Tejada*  
TRADUCTORA OFICIAL  
  
ENGLISH · FRENCH · SPANISH  
ANGLAIS · FRANÇAIS · ESPAGNOL

Ejecución por parte del Cedente #2

CEDENTE #2

TESTIGO:

Por

Por

CAMBELL, Kenneth Craig

Rosemary Genest

23 de octubre de 2008

23 de octubre de 2008

OTTAWA, CANADÁ

(Ciudad y país en donde se ejecuta la asignación)

Autenticación de la firma del testigo del Cedente #2

Yo, ROSEMARY GENEST, de 1094 Taffy Lane, Ottawa, Ontario K1C1Y5 declaro que estuve personalmente y fui el testigo del Cedente #2 antes mencionado quien firmó y ejecutó debidamente la Asignación anterior.

Juramentado ante mí en Kanata (Ottawa)

Canadá, el 23 de octubre de 2008

A. ATHANASSIADIS

Nombre del Comisionado

Firma del Comisionado

Un Comisionado para tomar juramentos y declaraciones para la jurisdicción de Ontario.

Recepción  
6694/78  
Minjusticia

Clemencia Barrios Tejada  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

Ejecución por parte del Cedente #3

CEDENTE #3

TESTIGO:

Por

Por

CUI, Mao Pei

Rosemary Genest

23 de octubre de 2008

23 de octubre de 2008

Fecha de firmado

KANATA, OTTAWA, CANADÁ

(Ciudad y país en donde se ejecuta la asignación)

Autenticación de la firma del testigo del Cedente #3

Yo, ROSEMARY GENEST, de 1094 Taffy Lane, Ottawa, Ontario K1C1Y5 declaro que estuve personalmente y fui el testigo del Cedente #3 antes mencionado quien firmó y ejecutó debidamente la Asignación anterior.

Juramentado ante mí en Kanata (Ottawa)

Canadá, el 23 de octubre de 2008

A. ATHANASSIADIS

Nombre del Comisionado

Firma del Comisionado

Un Comisionado para tomar juramentos y declaraciones para la jurisdicción de Ontario.

Recepción  
6694/78  
Minjusticia

*Eleonora Barrios Tejada*  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

Ejecución por parte del Cedente #4

CEDENTE #34

Por

DOBBS, Geoffrey

27 de octubre de 2008

TESTIGO:

Por

Maria de Fátima MACHADO

27 de octubre de 2008

OTTAWA, CANADÁ

(Ciudad y país en donde se ejecuta la asignación)

Autenticación de la firma del testigo del Cedente #4

Yo, MARIA DE FATIMA MACHADDOFF, de 103 COHEN AVE, KANATA/ON  
K21464 CANADÁ declaro que estuve personalmente y fui el testigo del Cedente #4 antes  
mencionado quien firmó y ejecutó debidamente la Asignación anterior.

Juramentado ante mí en Ottawa

Canadá, el 27 de octubre de 2008

A. ATHANASSIADIS

Nombre del Comisionado

Firma del Comisionado

Un Comisionado para tomar juramentos y declaraciones para la jurisdicción de Ontario.

Resolución  
6694/78  
Minjusticia

*Glennice Pardo Tejada*  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

Ejecución por parte del Cedente #5

CEDENTE #5

Por

FEASBY, Douglas Michael

23 de octubre de 2008

TESTIGO:

Por

Rosemary Genest

23 de octubre de 2008

KANATA, OTTAWA, CANADÁ

(Ciudad y país en donde se ejecuta la asignación)

Autenticación de la firma del testigo del Cedente #5

Yo, ROSEMARY GENEST, de 1094 Taffy Lane, Ottawa, Ontario K1C1Y5 declaro que estuve personalmente y fui el testigo del Cedente #5 antes mencionado quien firmó y ejecutó debidamente la Asignación anterior.

Juramentado ante mí en Kanata (Ottawa)

Canadá, el 23 de octubre de 2008

A. ATHANASSIADIS

Nombre del Comisionado

Firma del Comisionado

Un Comisionado para tomar juramentos y declaraciones para la jurisdicción de Ontario.

Resolución  
6694/78  
Minjusticia

**Eleonora Haredes Tejada**  
TRADUCTORA OFICIAL  
  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

Ejecución por parte del Cedente #6

CEDENTE #6

Por

MARCEAU, Pascale Bonnie

23 de octubre de 2008

TESTIGO:

Por

Rosemary Genest

23 de octubre de 2008

KANATA, OTTAWA, CANADÁ

(Ciudad y país en donde se ejecuta la asignación)

Autenticación de la firma del testigo del Cedente #6

Yo, ROSEMARY GENEST, de 1094 Taffy Lane, Ottawa, Ontario K1C1Y5 declaro que estuve personalmente y fui el testigo del Cedente #6 antes mencionado quien firmó y ejecutó debidamente la Asignación anterior.

Juramentado ante mí en Kanata (Ottawa)

Canadá, el 23 de octubre de 2008

A. ATHANASSIADIS

Nombre del Comisionado

Firma del Comisionado

Un Comisionado para tomar juramentos y declaraciones para la jurisdicción de Ontario.

Resolución  
6694/78  
Minjusticia

**Gloria Pineda Tejada**  
TRADUCTORA OFICIAL  
  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

Ejecución por parte del Cedente #7

CEDENTE #7

TESTIGO:

Por

Por

MCLEAN, Alisdair Alan

Rosemary Genest

23 de octubre de 2008

23 de octubre de 2008

KANATA, OTTAWA, CANADÁ

(Ciudad y país en donde se ejecuta la asignación)

Autenticación de la firma del testigo del Cedente #7

Yo, ROSEMARY GENEST, de 1094 Taffy Lane, Ottawa, Ontario K1C1Y5 declaro que estuve personalmente y fui el testigo del Cedente #7 antes mencionado quien firmó y ejecutó debidamente la Asignación anterior.

Juramentado ante mí en Kanata (Ottawa)

Canadá, el 23 de octubre de 2008

A. ATHANASSIADIS

Nombre del Comisionado

Firma del Comisionado

Un Comisionado para tomar juramentos y declaraciones para la jurisdicción de Ontario.

Recepción  
6694/78  
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Estimada Karol Tejada  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

44

Ejecución por parte del Cedente #8

CEDENTE #8

Por

SHEN, Zhiyuan

28 de octubre de 2008

TESTIGO:

Por

Rosemary Genest

28 de octubre de 2008

KANATA, OTTAWA, CANADÁ

(Ciudad y país en donde se ejecuta la asignación)

Autenticación de la firma del testigo del Cedente #8

Yo, ROSEMARY GENEST, de 1094 Taffy Lane, Ottawa, Ontario K1C1Y5 declaro que estuve personalmente y fui el testigo del Cedente #8 antes mencionado quien firmó y ejecutó debidamente la Asignación anterior.

Juramentado ante mí en Kanata (Ottawa)

Canadá, el 28 de octubre de 2008

Jonathan Rod

Nombre del Comisionado

Firma del Comisionado

Un Comisionado para tomar juramentos y declaraciones para la jurisdicción de Ontario.

Rogelusión  
6694/78  
Minjusticia

**Gloria Rodas Tejeda**  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

45

Ejecución por parte del Cedente #9

CEDENTE #9

TESTIGO:

Por

Por

WAGLER, Thomas Edward

Rosemary Genest

23 de octubre de 2008

23 de octubre de 2008

Fecha de firmado

KANATA, OTTAWA, CANADÁ

(Ciudad y país en donde se ejecuta la asignación)

Autenticación de la firma del testigo del Cedente #9

Yo, ROSEMARY GENEST, de 1094 Taffy Lane, Ottawa, Ontario K1C1Y5 declaro que estuve personalmente y fui el testigo del Cedente #9 antes mencionado quien firmó y ejecutó debidamente la Asignación anterior.

Juramentado ante mí en Kanata (Ottawa)

Canadá, el 23 de octubre de 2008

A. ATHANASSIADIS

Nombre del Comisionado

Firma del Comisionado

Un Comisionado para tomar juramentos y declaraciones para la jurisdicción de Ontario.

Resolución  
6694/78  
Minjusticia

Elisavinda Barrios Tejada  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

Ejecución por parte del Cesionario

Cesionario

Testigo

Por

Por

Nombre TIM SAUNAAVRS

LISA SOULIERE

Cargo: VP Finanzas y CFO

10/31/08

10/31/08

OTTAWA, CANADÁ

(Ciudad y país en donde se ejecuta la asignación)

Autenticación de la firma del testigo del Cesionario

Yo, LISA SOULIERE, de 13 LONE GATE COURT NEPEAU ONT declaro que estuve personalmente y fui el testigo del Cesionario antes mencionado quien firmó y ejecutó debidamente la Asignación anterior.

Juramentado ante mí en Ottawa

Canadá, el 31 de octubre de 2008

A. ATHANASSIADIS

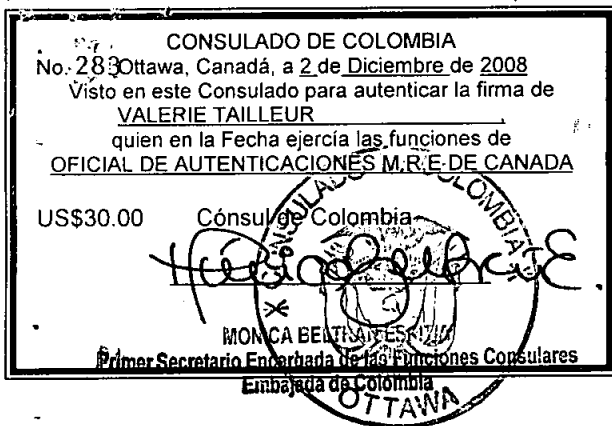
Nombre del Comisionado

Firma del Comisionado

Un Comisionado para tomar juramentos y declaraciones para la jurisdicción de Ontario.

Resolución  
6694/78  
Minjusticia

*Ekmanita Harrobes Tejada*  
TRADUCTORA OFICIAL  
  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL



MINISTERIO DE  
RELACIONES EXTERIORES

2009 ENE -9 A 8:53

JEFE DE LEGALIZACIONES  
BOGOTA D.C.

NO SE ASUME  
RESPONSABILIDAD  
DEL TEXTO

860072

Monica Bertran  
Cuya Firma aparece en el  
DOCUMENTO DESEMPENA  
AS FUNCIONES INDICADAS

CANADA

)

TO ALL TO WHOM THESE  
PRESENTS MAY

)

Province of Ontario

)

COME, BE SEEN OR KNOWN

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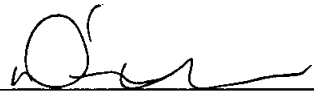
To Wit:

)

I, Diana Mansour, a Notary Public in and for the Province of Ontario, by Royal Authority duly appointed, and residing at the City of Ottawa, in the Province of Ontario, **DO CERTIFY AND ATTEST** that the paper hereto annexed is a true copy of a document produced and shown to me and being the notarized Assignment of Invention, executed on the 27<sup>th</sup> day of October 2008, the copy having been compared by me with the original notarized document, an act which, having been requested, I have granted under my notarial form and seal of office to serve as shall be required.

**IN TESTIMONY WHEREOF** I have hereto subscribed my name and affixed my Notarial Seal of Office at the City of Ottawa, this 7<sup>th</sup> day of November, 2008.

(Seal)

  
A NOTARY PUBLIC IN AND FOR THE  
PROVINCE OF ONTARIO



## ASSIGNMENT OF INVENTION

This Assignment is effective the 5<sup>th</sup> day of May, 2007.

In consideration of One (\$1.00) Dollar and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, I,

**ZOU, Xiaoping**, whose full post office address is 145 Moresby Dr, Ottawa, Ontario K2M 2E4, Canada;

agree and confirm that I have sold, assigned and transferred, and by these presents do hereby sell, assign and transfer to **Plasco Energy Group Inc.** (hereinafter the "Assignee"), whose full post office address is 1000 Innovation Drive, Suite 400, Kanata, Ontario K2K 3E7, Canada, all my right, title and interest throughout the world in and to (1) my invention(s) relating to

**A Low Temperature Gasification Facility With A Horizontally Oriented Gasifier**, as described and/or claimed in the patent applications listed in Schedule A attached hereto,

(2) all improvements, including but not limited to modifications, additions, substitutions, derivatives, and deletions to said invention(s); (3) the above-identified applications in (1) and national phase applications thereof; (4) all other applications for Letters Patent in any country throughout the world for said invention(s) and improvements, including but not limited to all divisional, continuation, continuation-in-part, renewal, reissue, and substitute applications; (5) any Letters Patent which may issue from any of said applications as exemplified in (3) and (4) above in any country throughout the world; (6) all Convention or Treaty rights derived from any of said applications, including without limitation, all rights of priority throughout the world in and to said applications; and (7) the full and complete right to file applications for Letters Patent in the name of the Assignee, or in my name at the Assignee's election, on said invention(s) and improvements in all countries throughout the world.

For said consideration, I agree, upon the request and at the expense of the Assignee, its successors and assigns, to execute any and all divisional, continuation, continuation-in-part, reissue and substitute applications for said invention(s) and improvements, and acknowledge and agree that all rights therein shall vest in the Assignee, its successors and assigns, whereby said Letters Patent will be held and enjoyed by said Assignee, its successors and assigns, to the full end of the term for which said Letters Patent will be granted, as fully and entirely as the same would have been held and enjoyed by the undersigned if this assignment had not been made. In addition, I will, at the request of the Assignee, execute any and all documents required by the Assignee to fully and properly vest the aforementioned rights in the Assignee.

The undersigned hereby grants to the firm of **MBM Intellectual Property Law LLP** whose full post office address is 270 Albert Street, 14<sup>th</sup> Floor, Ottawa, Ontario, Canada, K1P 5G8, the power to insert on this assignment any further information and/or correct any clerical error in the information pertaining to the referenced application above, which may be necessary or desirable in order to comply with the patent legislation for recordation of this document.

# SCHEDULE A

|                                                                               |                                                          |                          |
|-------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------|
| International (PCT)                                                           | International Application No. PCT/US07/68407             | Filed: May 7, 2007       |
| Argentina                                                                     | Argentina Application No. P-070101975                    | Filed: May 7, 2007       |
| Bahamas                                                                       | Bahamian Application No. 1982                            | Filed: May 25, 2007      |
| Chile                                                                         | Chile Application No. 1288-2007                          | Filed: May 7, 2007       |
| Jamaica                                                                       | Jamaica Application No. 18/1/4628                        | Filed: May 7, 2007       |
| Panama                                                                        | Panama Application No. PI/PA01/87255-01                  | Filed: May 7, 2007       |
| Taiwan                                                                        | Taiwan Application No. 96116178                          | Filed: May 7, 2007       |
| Venezuela                                                                     | Venezuela Application No. 07-0926                        | Filed: May 7, 2007       |
| Aruba                                                                         | Aruba Application No. OCT-02/071105                      | Filed: November 5, 2007  |
| Bangladesh                                                                    | Bangladesh Application No. 242/2007                      | Filed: November 4, 2007  |
| Burundi                                                                       | Burundi Application No. Not Yet Available                | Filed: November 5, 2007  |
| Bolivia                                                                       | Bolivia Application No. SP-270345                        | Filed: November 1, 2007  |
| Gulf Cooperation Council (Oman, Bahrain, Qatar, U.A.E., Saudi Arabia, Kuwait) | Gulf Cooperation Council Application No. GCC/P/2007/9412 | Filed: November 5, 2007  |
| Iran                                                                          | Iran Application No. 38609165                            | Filed: November 27, 2007 |
| Jordan                                                                        | Jordan Application No. 460/2007                          | Filed: November 4, 2007  |
| Lebanon                                                                       | Lebanon Application No. 6837                             | Filed: November 1, 2007  |
| Mauritius                                                                     | Mauritius Application No. MU/P/07/00083                  | Filed: November 5, 2007  |
| Nepal                                                                         | Nepal Application No. 925                                | Filed: November 2, 2007  |
| Peru                                                                          | Peru Application No. 001515-2007/OIN                     | Filed: November 5, 2007  |
| Pakistan                                                                      | Pakistan Application No. 1279/2007                       | Filed: November 2, 2007  |
| Paraguay                                                                      | Paraguay Application No. 37.569                          | Filed: November 2, 2007  |
| Thailand                                                                      | Thailand Application No. 0701005570                      | Filed: November 2, 2007  |
| Tonga                                                                         | Tonga Application No. TO/P/07/00007                      | Filed: November 2, 2007  |
| Uruguay                                                                       | Uruguay Application No. 30.688                           | Filed: November 5, 2007  |
| Yemen                                                                         | Yemen Application No. Not Yet Available                  | Filed: November 6, 2007  |

### *Execution by Assignor*

ASSIGNOR:  
By: Xiaoping Zou  
(Signature)  
  
ZOU, Xiaoping  
Oct 27, 2008  
(Date Signed) ☒  
Ottawa, Canada  
(City & Country Where Assignment Executed)

WITNESS:  
By: Maria de Fatima Machado  
(Signature)  
MARIA DE FATIMA MACHADO  
(Name)  
Oct. 27, 2008  
(Date Signed)

***Notarization of Witness to Signature of Assignor***

MARIA DE FATIMA MACHADO, of 103 COHEN AVE, KANATA / ON, K2L 4G4 CANADA  
(Witness name) (Witness address)

declare that I was personally present and did witness the abovementioned Assignor duly sign and execute the above Assignment.

Sworn Before Me at Ottawa  
(City)  
Canada on October 27, 2008.  
(Country) (Date)

A. ATHANASSIADIS  
(Commissioner's Name)  
A. Athanassiades  
(Commissioner's Signature)

A Commissioner for taking Oaths and Affidavits for the  
jurisdiction of Ontario  
(State, Province, etc)

Maria de Fatima Machado  
(Signature of Witness)

**Execution by Assignee:**

|                                                                     |                                                   |
|---------------------------------------------------------------------|---------------------------------------------------|
| <b>ASSIGNEE:</b>                                                    | <b>WITNESS:</b>                                   |
| By: <u>[Signature]</u><br>(Signature)                               | By: <u>Maria de Fatima Machado</u><br>(Signature) |
| Name: <u>ANDREAS TSANGARU</u><br>Title: <u>CHIEF SCIENTIST</u>      | <u>MARIA DE FATIMA MACHADO</u><br>(Name)          |
| <u>OCT 27, 2008</u><br>(Date Signed)                                | <u>OCT. 27, 2008</u><br>(Date Signed)             |
| <u>KANATA, CANADA</u><br>(City & Country Where Assignment Executed) |                                                   |

**Notarization of Witness to Signature of Assignee:**

|                                                                                                                                                                   |                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| I, <u>MARIA DE FATIMA MACHADO</u> <u>103 COHEN AVE. KANATA/ON, K2L4G4</u><br><small>(Witness name)</small> <small>(Witness address)</small> <small>CANADA</small> |                                                             |
| declare that I was personally present and did witness the abovementioned Assignee duly sign and execute the above Assignment.                                     |                                                             |
| Sworn Before Me at <u>Ottawa (Kanata)</u><br><small>(City)</small><br><u>Canada</u> on <u>October 27, 2008</u><br><small>(Country)</small> <small>(Date)</small>  | <u>[Signature]</u><br><small>(Signature of Witness)</small> |
| <u>[Signature]</u><br><small>(Commissioner's Name)</small> <u>A. ANTONIO SILVA</u>                                                                                |                                                             |
| A Commissioner for taking Oaths and Affidavits for the jurisdiction of <u>Ontario</u><br><small>(State, Province, etc)</small>                                    |                                                             |

CONSULADO DE COLOMBIA

No. 283 Ottawa, Canadá, el 2 de Diciembre de 2008

Visto en este Consulado para autenticar la firma de VALERIE TAILLEUR quien en esta fecha ejercía las funciones de OFICIAL DE AUTENTICACIONES M.R.E DE CANADÁ

Cónsul de Colombia

MINISTERIO DE RELACIONES EXTERIORES

9 DE ENERO DE 2009 – 860072

JEFE DE LEGALIZACIONES BOGOTÁ, D.C.

CANADÁ )

Provincia de Ontario ) A TODOS LOS QUE PUEDAN VER O CONOCER  
LOS PRESENTES

Consideración: )

Yo, Diana Mansour, un Notario Público en y para la Provincia de Ontario, debidamente nombrado por la Autoridad Real y residente en la ciudad de Ottawa, en la Provincia de Ontario, CERTIFICO Y ATESTIGUO que el documento anexo es una copia fiel de un documento dirigido y presentado ante mí y corresponde a la Asignación de la invención ejecutada el 27 de octubre de 2008; comparé la copia con el documento original, un acto que me fue solicitado, y he otorgado bajo mi firma y sello notarial de la oficina para servir de acuerdo como sea requerido.

Resolución  
6694/78  
Minjusticia

*Clementina Domínguez Rojas*  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

MINISTERIO DE  
RELACIONES EXTERIORES

2009 ENE 21 A 9:57

*MSR*  
JEFE DE LEGALIZACIONES  
BOGOTA D.C.

NO SE ASUME  
RESPONSABILIDAD  
DEL TEXTO

864943

*Cleravacca PAREDES*

COPIA FIRMADA POR EL  
DOCUMENTO DESEMPENA  
AS FUNCIONES INDICADAS

MINISTERIO DE RELACIONES EXTERIORES

RECIBO LEGALIZACION

No.

*9422652*

EN TESTIMONIO DE LO CUAL he suscrito mi nombre y fijado mi sello notarial de la  
Oficina en la ciudad de Ottawa, este día 7 de noviembre de 2008.

(Sello)

UN NOTARIO PÚBLICO EN Y PARA LA PROVINCIA DE ONTARIO

Certificado en el Departamento de Relaciones Exteriores y Comercio Internacional para la  
legalización de la firma anterior de

Ministro de Relaciones Exteriores

CANADÁ

Resolución  
6694/78  
Minjusticia

*Clemente Parades Tejeda*  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

## ASIGNACIÓN DE LA INVENCION

Esta asignación entra en vigor el 5 de mayo de 2007

En consideración de un (\$1.00) dólar y otras consideraciones buenas y valiosas, cuyo recibo y suficiencia se reconoce por medio del presente, yo

ZOU, Xiaoping, cuya dirección es 145 Moresby Dr, Ottawa, Ontario K2M 2E4, Canadá;

Acuerdo y confirmo que he vendido, asignado y transferido y por medio del presente vendo, asigno y transfiero a Plasco Energy Group Inc. (de ahora en adelante el "Cesionario"), con oficinas ubicadas en 1000 Innovation Drive, Suite 400, Kanata, Ontario K2K 3E7, Canadá, todos mis derechos, título e intereses en todo el mundo en y sobre (1) mis invenciones relacionadas con

**Una instalación de gasificación de baja temperatura con un Gasificador orientado horizontalmente**, tal como se describe y/o reivindica en las solicitudes listadas en el Programa A anexo;

(2) todas las mejoras, incluyendo sin limitación las modificaciones, adiciones, sustituciones, derivaciones y eliminaciones de dicha invención; (3) las solicitudes antes identificadas en (1) y las solicitudes de la fase nacional; (4) todas las demás solicitudes para las Cartas de Patente en cualquier país del mundo para dichas invenciones y mejoras, incluyendo sin limitación todas las solicitudes divisionales, continuaciones, continuaciones

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0004/78  
Ministerio

**Clemencia Paredes Tejada**  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

5A

en parte, renovaciones, remisiones y solicitudes sustitutas; (5) todas las Cartas de Patente que se puedan expedir de cualquiera de dichas solicitudes tal como se ejemplifica en los numerales (3) y (4) anteriores en cualquier país del mundo; (6) todos los derechos de Convenciones o Tratados derivados de dichas solicitudes, incluyendo sin limitación, todos los derechos de propiedad en todo el mundo en y sobre dichas solicitudes y (7) el derecho total y completo para radicar las solicitudes por Cartas de Patente a nombre de Cesionario, o en mi nombre a elección del Cesionario, sobre dichas invenciones y mejoras en todos los países del mundo.

Por dicha consideración, acuerdo, a solicitud y por cuenta del Cesionario, sus sucesores y asignados, ejecutar cualquiera y todas las solicitudes divisionales, continuaciones, continuaciones en parte, remisiones y solicitudes sustitutas para dichas invenciones y mejoras y reconozco y acuerdo que todos los derechos serán investidos en el Cesionario, sus sucesores y asignados, hasta el final del término por el cual se otorgarán dichas Cartas de Patente, tan completamente y totalmente como hubieran sido mantenidas y disfrutadas por el suscritos si no se hiciera esta asignación. Además, a solicitud del Cesionario, ejecutar cualquiera y todos los documentos requeridos por el Cesionario para investir completamente y apropiadamente los derechos antes mencionados en el Cesionario.

El suscrito por medio del presente le otorga a la firma **MBM Intellectual Property Law LLP**, con oficinas ubicadas en 270 Alvert Street 14 Floor, Ottawa, Ontario, Canadá K1P 5G8, el poder para insertar en esta asignación cualquier información adicional y/o corregir

Resolución  
6694/78  
Minjusticia

*Clemente Parales Tejada*  
TRADUCTURA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

errores de oficina en la información pertinente a la solicitud referenciada anteriormente, lo cual puede ser necesario o deseable para la recordación de este documento.

Resolución  
6694/78  
Minjusticia

*Clemencia Parada Tejada*  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

PROGRAMA A

|                                                                  |                                                                          |                                  |
|------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------------|
| International<br>(PCT)                                           | Solicitud internacional<br>No.PCT/US07/68407                             | Radicado: 7 de mayo de 2007      |
| Argentina                                                        | Solicitud Argentina No. P-<br>070101975                                  | Radicado: 7 de mayo de 2007      |
| Bahamas                                                          | Solicitud Bahamas No. 1982                                               | Radicado: 25 de mayo de 2007     |
| Chile                                                            | Solicitud Chile No. 1288-2007                                            | Radicado: 7 de mayo de 2007      |
| Jamaica                                                          | Solicitud Jamaica No. 18/1/4628                                          | Radicado: 7 de mayo de 2007      |
| Panamá                                                           | Solicitud Panamá No.<br>PI/PA01/87255-01                                 | Radicado: 7 de mayo de 2007      |
| Taiwán                                                           | Solicitud Taiwán No. 96116178                                            | Radicado: 7 de mayo de 2007      |
| Venezuela                                                        | Solicitud Venezuela No.<br>PI/PA01/87255-01                              | Radicado: 7 de mayo de 2007      |
| Aruba                                                            | Solicitud Aruba No. OCT-<br>02/071105                                    | Radicado: 5 de noviembre de 2007 |
| Bangladesh                                                       | Solicitud Bangladesh No. 242/2007                                        | Radicado: 4 de noviembre de 2007 |
| Burundi                                                          | Solicitud Burundi No. Aún no<br>disponible                               | Radicado: 5 de noviembre de 2007 |
| Bolivia                                                          | Solicitud Bolivia No. SP-270345                                          | Radicado: 1 de noviembre de 2007 |
| Concejo de<br>cooperación del<br>golfo (Omán,<br>Bahréin, Qatar, | Solicitud del Concejo de<br>cooperación del golfo No.<br>GCC/P/2007/9412 | Radicado: 5 de noviembre de 2007 |

Resolución  
6694/78  
Minjusticia

*Clemencia Paredes Tejeda*  
TRACEDURA OFICIAL  
  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

|                                  |                                         |                                   |
|----------------------------------|-----------------------------------------|-----------------------------------|
| U.A.E., Arabia<br>Saudí, Kuwait) |                                         |                                   |
| Irán                             | Solicitud Irán No. 38609165             | Radicado: 27 de noviembre de 2007 |
| Jordania                         | Solicitud Jordania No. 460/2007         | Radicado: 4 de noviembre de 2007  |
| Líbano                           | Solicitud Líbano No. 6837               | Radicado: 1 de noviembre de 2007  |
| Mauricio                         | Solicitud Mauricio No.<br>MU/P/07/00083 | Radicado: 5 de noviembre de 2007  |
| Nepal                            | Solicitud Nepal No. 925                 | Radicado: 2 de noviembre de 2007  |
| Perú                             | Solicitud Perú No. 001515-<br>2007/OIN  | Radicado: 5 de noviembre de 2007  |
| Pakistán                         | Solicitud Pakistán No. 1279/2007        | Radicado: 2 de noviembre de 2007  |
| Paraguay                         | Solicitud Paraguay No. 37.569           | Radicado: 2 de noviembre de 2007  |
| Tailandia                        | Solicitud Tailandia No.<br>0701005570   | Radicado: 2 de noviembre de 2007  |
| Tonga                            | Solicitud Tonga No.<br>TO/P/07/00007    | Radicado: 2 de noviembre de 2007  |
| Uruguay                          | Solicitud Uruguay No. 30-688            | Radicado: 5 de noviembre de 2007  |
| Yemen                            | Solicitud Yemen: aún no disponible      | Radicado: 6 de noviembre de 2007  |

## EJECUCIÓN DE LA ASIGNACIÓN DE LA INVENCION

Ejecución por parte del Cedente

CEDENTE

TESTIGO:

Por

Por

ZOU, Xiaoping

MARIA DE FATIMA MACHADO

27 de octubre de 2008

27 de octubre de 2008

OTTAWA, CANADÁ

(Ciudad y país en donde se ejecuta la asignación)

Autenticación de la firma del testigo del Cedente

Yo, MARIA DE FÁTIMA MACHADO, de 103 COHEN AVE, KANATALON, K26464, CANADÁ declaro que estuve personalmente y fui el testigo del Cedente antes mencionado quien firmó y ejecutó debidamente la Asignación anterior.

Juramentado ante mí en Ottawa

Canadá, el 27 de octubre de 2008

A. ATHANASSIADIS

Nombre del Comisionado

Firma del Comisionado

Un Comisionado para tomar juramentos y declaraciones para la jurisdicción de Ontario.

Recepción  
6694/78  
Minjusticia

Clementine Paré-Jada  
TRADUCTURA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

**Ejecución por parte del Cesionario**

Cesionario

Testigo

Por

Por

Nombre: ANDREAS TSANGARIS

MARIA DE FÁTIMA MACHADO

Cargo: CIENTÍFICO JEFE

27 de octubre de 2008

27 de octubre de 2008

OTTAWA, CANADÁ

(Ciudad y país en donde se ejecuta la asignación)

**Autenticación de la firma del testigo del Cesionario**

Yo, MARIA DE FÁTIMA MACHADO, de 103 COHEN AVE, KANATALON, K26464, CANADÁ declaro que estuve personalmente y fui el testigo del Cesionario antes mencionado quien firmó y ejecutó debidamente la Asignación anterior.

Juramentado ante mí en Ottawa

Canadá, el 27 de octubre de 2008

**A. ATHANASSIADIS**

Nombre del Comisionado

Firma del Comisionado

Un Comisionado para tomar juramentos y declaraciones para la jurisdicción de Ontario.

Resolución  
6694/78  
Minjusticia

**Clementina Parades Tejada**  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

60



MINISTERIO DE  
RELACIONES EXTERIORES

2009 ENE -9 A 8:53

*OLIVERO*  
JEFE DE LEGALIZACIONES  
BOGOTA D.C.

NO SE ASUME  
RESPONSABILIDAD  
DEL TEXTO

860073

*Monica Beltran*  
COPIA DEL ORIGINAL EN EL  
DOCUMENTO REEMPLAZA  
LAS FUNCIONES INDICADAS

CANADA )

TO ALL TO WHOM THESE  
PRESENTS MAY

Province of Ontario )

COME, BE SEEN OR KNOWN

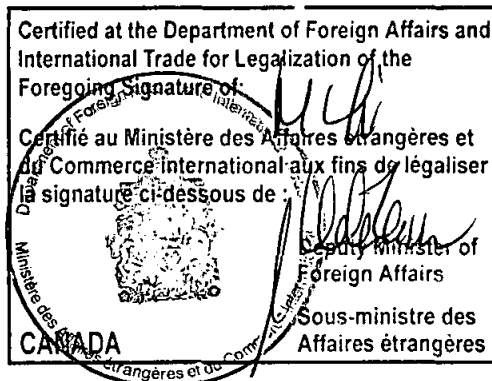
To Wit: )

I, Michelle Ai Ling Li, a Notary Public in and for the Province of Ontario, by Royal Authority duly appointed, and residing at the City of Ottawa, in the Province of Ontario, **DO CERTIFY AND ATTEST** that the paper hereto annexed is a true copy of a document produced and shown to me and being the notarized Assignment of Invention, effective May 5, 2007, the copy having been compared by me with the original notarized document, an act which, having been requested, I have granted under my notarial form and seal of office to serve as shall be required.

**IN TESTIMONY WHEREOF** I have hereto subscribed my name and affixed my Notarial Seal of Office at the City of Ottawa, this 12<sup>th</sup> day of November, 2008.

(Seal)

*Michelle Li*  
A NOTARY PUBLIC IN AND FOR THE  
PROVINCE OF ONTARIO



## ASSIGNMENT OF INVENTION

This Assignment is effective the 5<sup>th</sup> day of May 2007, ~~2006~~ *MS* Feb 15, 2008

In consideration of One (\$1.00) Dollar and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, I,

- (a) **SWAIN, Margaret**, whose post office address is 270 Albert Street, Ottawa, Ontario K1P 5G8, Canada;

confirm that I have sold, assigned and transferred in an assignment document executed by Andreas Tsangaris to Plasco Energy Group Inc. on July 30, 2007 with regard to the invention entitled **"A Low Temperature Gasification Facility with a Horizontally Oriented Gasifier"** and by these presents do hereby sell, assign and transfer to Plasco Energy Group Inc. (hereinafter the "Assignee"), whose full post office address is **1145 Innovation Drive, Suite 100, Kanata, Ontario K2K 3G8, Canada**, all our right, title and interest throughout the world in and to (1) my invention(s) relating to

**A Low Temperature Gasification Facility with a Horizontally Oriented Gasifier**, as described and/or claimed in International Patent Application No. PCT/US07/68407 filed on May 7, 2007;

**A Low Temperature Gasification Facility with a Horizontally Oriented Gasifier**, as described and/or claimed in Argentina Patent Application No. **P070101975** filed on May 7, 2007, and for which an assignment from Andreas Tsangaris to Plasco Energy Group Inc. was executed on June 20, 2007;

**A Low Temperature Gasification Facility with a Horizontally Oriented Gasifier**, as described and/or claimed in Bahamas Patent Application No. filed on May 25, 2007;

**A Low Temperature Gasification Facility with a Horizontally Oriented Gasifier**, as described and/or claimed in Chilean Patent Application No. **1288-2007** filed on May 7, 2007, and for which an assignment from Andreas Tsangaris to Plasco Energy Group Inc. was executed on June 20, 2007;

**A Low Temperature Gasification Facility with a Horizontally Oriented Gasifier**, as described and/or claimed in Jamaican Patent Application No. **18/1/4628** filed on May 7, 2007;

**A Low Temperature Gasification Facility with a Horizontally Oriented Gasifier**, as described and/or claimed in Panamanian Patent Application No. **87255** filed on May 7, 2007, and for which an assignment from Andreas Tsangaris to Plasco Energy Group Inc. was executed on June 20, 2007;

**A Low Temperature Gasification Facility with a Horizontally Oriented Gasifier**, as described and/or claimed in Taiwanese Patent Application No. 96116178 filed on May 7, 2007, and for which an assignment from Andreas Tsangaris to Plasco Energy Group Inc. was executed on June 20, 2007;

**A Low Temperature Gasification Facility with a Horizontally Oriented Gasifier**, as described and/or claimed in Venezuelan Patent Application No. 07-0926 filed on May 7, 2007, and for which an assignment from Andreas Tsangaris to Plasco Energy Group Inc. was executed on June 20, 2007;

**A Low Temperature Gasification Facility with a Horizontally Oriented Gasifier**, as described and/or claimed in United States Patent Application No. 11/745,438 filed on May 7, 2007;

(2) all improvements, including but not limited to modifications, additions, substitutions, derivatives, and deletions to said invention(s); (3) the above-identified applications in (1) and national phase applications thereof; (4) all other applications for Letters Patent in any country throughout the world for said invention(s) and improvements, including but not limited to all divisional, continuation, continuation-in-part, renewal, reissue, and substitute applications; (5) any Letters Patent which may issue from any of said applications as exemplified in (3) and (4) above in any country throughout the world; (6) all Convention or Treaty rights derived from any of said applications, including without limitation, all rights of priority throughout the world in and to said applications; and (7) the full and complete right to file applications for Letters Patent in the name of the Assignee, or in my name at the Assignee's election, on said invention(s) and improvements in all countries throughout the world.

For said consideration, I agree, upon the request and at the expense of the Assignee, its successors and assigns, to execute any and all divisional, continuation, continuation-in-part, reissue and substitute applications for said invention(s) and improvements, and acknowledge and agree that all rights therein shall vest in the Assignee, its successors and assigns, whereby said Letters Patent will be held and enjoyed by said Assignee, its successors and assigns, to the full end of the term for which said Letters Patent will be granted, as fully and entirely as the same would have been held and enjoyed by the undersigned if this assignment had not been made. In addition, I will, at the request of the Assignee, execute any and all documents required by the Assignee to fully and properly vest the aforementioned rights in the Assignee.

The undersigned hereby grants to the firm of MBM & CO. whose full post office address is P.O. Box 809, Station B, Ottawa, Ontario, Canada, K1P 5P9, the power to insert on this assignment any further information and/or correct any clerical error in the information pertaining to the referenced application above, which may be necessary or desirable in order to comply with the patent legislation for recordation of this document.

**Execution by Assignor:**

**ASSIGNOR:**

By: M. Swan  
(Signature)  
Margaret Swan  
(Name)  
September 28, 2007  
(Date Signed)  
Ottawa, Canada  
(City & Country Where Assignment Executed)

**WITNESS:**

By: A. Athanasiadis  
(Signature)  
ARIADNI ATHANASIADIS  
(Name)  
Sept 28/07  
(Date Signed)

**Notarization of Witness to Signature of Assignor:**

I, ARIADNI ATHANASIADIS, of 42 MACLEOD ST, OTTAWA, ON, CANADA  
(Witness name) (Witness address)

declare that I was personally present and did witness the abovementioned Assignor duly sign and execute the above Assignment.

Sworn Before Me at OTTAWA  
(City)

CANADA on SEPTEMBER 28, 2007  
(Country) (Date)

[Signature]  
(Commissioner's Name) DIANA MANSOUR

A Commissioner for taking Oaths and Affidavits for the jurisdiction of ONTARIO  
(State, Province, etc)

A. Athanasiadis  
(Signature of Witness)

**Execution by Assignee:**

**ASSIGNEE:**

By: [Signature]  
(Signature)  
Randy Bennett VP Business Dev.  
(Name)  
October 1, 2007  
(Date Signed)  
Ottawa, Canada  
(City & Country Where Assignment Executed)

**WITNESS:**

By: [Signature]  
(Signature)  
Steve Ruytor  
(Name)  
OCT 1, 2007  
(Date Signed)

**Notarization of Witness to Signature of Assignee:**

I, Steve Ruytor, of 1145 Innovation Dr, Ottawa On Canada  
(Witness name) (Witness address)

declare that I was personally present and did witness the abovementioned Assignee duly sign and execute the above Assignment.

Sworn Before Me at OTTAWA,  
(City)  
CANADA on OCTOBER 1, 2007.  
(Country) (Date)

[Signature]  
(Commissioner's Name) DINA NANSOUR

A Commissioner for taking Oaths and Affidavits for the  
jurisdiction of ONTARIO  
(State, Province, etc)

[Signature]  
(Signature of Witness)

CONSULADO DE COLOMBIA

No. 284 Ottawa, Canadá, el 2 de Diciembre de 2008

Visto en este Consulado para autenticar la firma de VALERIE TAILLEUR quien en esta fecha ejercía las funciones de OFICIAL DE AUTENTICACIONES M.R.E DE CANADÁ

Cónsul de Colombia

MINISTERIO DE RELACIONES EXTERIORES

9 DE ENERO DE 2009 – 860073

JEFE DE LEGALIZACIONES BOGOTÁ, D.C.

CANADÁ )

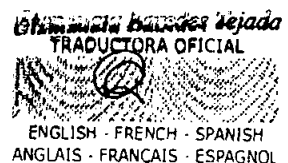
Provincia de Ontario )

A TODOS LOS QUE PUEDAN VER O CONOCER  
LOS PRESENTES

Consideración: )

Yo, Michelle Ai Ling Li, un Notario Público en y para la Provincia de Ontario, debidamente nombrado por la Autoridad Real y residente en la ciudad de Ottawa, en la Provincia de Ontario, CERTIFICO Y ATESTIGUO que el documento anexo es una copia fiel de un documento dirigido y presentado ante mí y corresponde a la Asignación de la invención con fecha de entrada en vigor el 5 de mayo de 2007; comparé la copia con el documento original, un acto que me fue solicitado, y he otorgado bajo mi firma y sello notarial de la oficina para servir de acuerdo como sea requerido.

Resolución  
6694/78  
Minjusticia



MINISTERIO DE  
RELACIONES EXTERIORES

NO SE ASUME  
RESPONSABILIDAD  
DEL TEXTO

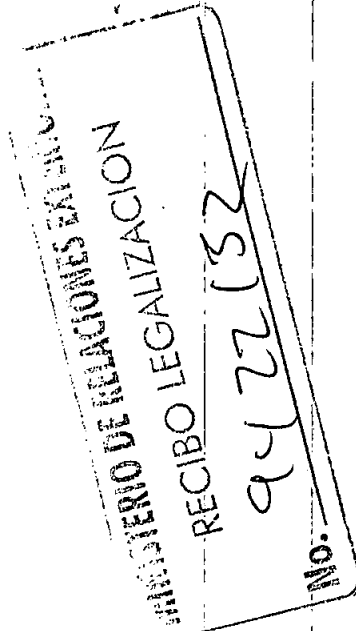
2009 ENE 21 A 9:58

864946

*msa*  
JEFE DE LEGALIZACIONES  
BOGOTA D.C.

*Cleresca Paredes*

COPIA HA APARECE EN EL  
DOCUMENTO DESEMPENA  
AS FUNCIONES INDICADAS



EN TESTIMONIO DE LO CUAL he suscrito mi nombre y fijado mi sello notarial de la  
Oficina en la ciudad de Ottawa, este día 12 de noviembre de 2008.

(Sello)

UN NOTARIO PÚBLICO EN Y PARA LA PROVINCIA DE ONTARIO

Certificado en el Departamento de Relaciones Exteriores y Comercio Internacional para la  
legalización de la firma anterior de  
Ministro de Relaciones Exteriores  
CANADÁ

Resolución  
6694/78  
Ministerio

*Eleonora Barrios Tejeda*  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

## ASIGNACIÓN DE LA INVENCION

Esta asignación entra en vigor el 5 de mayo de 2007. 15 febrero de 2008

En consideración de un (\$1.00) dólar y otras consideraciones buenas y valiosas, cuyo recibo y suficiencia se reconoce por medio del presente, yo

(a) SWAIN, Margaret, cuya dirección es 270 Albert Street, Ottawa, Ontario, K1P 5G8, Canadá;

confirmando que he vendido, asignado y transferido en un documento de asignación ejecutado por Andreas Tsangaris a **Plasco Energy Group Inc.**, el 30 de julio de 2007 con respecto a la invención titulada **“Una instalación de gasificación de baja temperatura con un gasificador orientado horizontalmente”** y mediante el presente vendo, asigno y transfiero a Plasco Energy Group Inc. (de ahora en adelante el “Cesionario”), con oficinas ubicadas en 1145 Innovation Drive, Suite 100, Kanata, Ontario K2K 3G8, Canadá, todos mis derechos, título e intereses en todo el mundo en y sobre (1) mis invenciones relacionadas con

**Una instalación de gasificación de baja temperatura con un Gasificador orientado horizontalmente**, tal como se describe y/o reivindica en la Solicitud de patente Internacional No. PCT/US07/68407 radicada el 7 de mayo de 2007;

Rosebud  
6694/78  
Minjusticia

**Información de la Oficina**  
**TRADUCTORA OFICIAL**  
ENGLISH · FRENCH · SPANISH  
ANGLAIS · FRANÇAIS · ESPAGNOL

**Una instalación de gasificación de baja temperatura con un Gasificador orientado horizontalmente**, tal como se describe y/o reivindica en la Solicitud de patente Argentina No. P070101975 radicada el 7 de mayo de 2007, y por la cual se ejecutó una asignación de Andreas Tsangaris a Plasco Energy Group Inc., el día 20 de junio de 2007;

**Una instalación de gasificación de baja temperatura con un Gasificador orientado horizontalmente**, tal como se describe y/o reivindica en la Solicitud de patente de Bahamas No.                    radicada el 25 de mayo de 2007;

**Una instalación de gasificación de baja temperatura con un Gasificador orientado horizontalmente**, tal como se describe y/o reivindica en la Solicitud de patente chilena No. 1288-2007 radicada el 7 de mayo de 2007, y por la cual se ejecutó una asignación de Andreas Tsangaris a Plasco Energy Group Inc., el día 20 de junio de 2007;

**Una instalación de gasificación de baja temperatura con un Gasificador orientado horizontalmente**, tal como se describe y/o reivindica en la Solicitud de patente jamaicana No. 18/1/4628 radicada el 7 de mayo de 2007;

**Una instalación de gasificación de baja temperatura con un Gasificador orientado horizontalmente**, tal como se describe y/o reivindica en la Solicitud de patente panameña No. 87255 radicada el 7 de mayo de 2007, y por la cual se ejecutó una asignación de Andreas Tsangaris a Plasco Energy Group Inc., el día 20 de junio de 2007;

Resolución  
6694/78  
Minjusticia

**Glennora Rueda Tejada**  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

**Una instalación de gasificación de baja temperatura con un Gasificador orientado horizontalmente**, tal como se describe y/o reivindica en la Solicitud de patente taiwanesa No. 96116178 radicada el 7 de mayo de 2007, y por la cual se ejecutó una asignación de Andreas Tsangaris a Plasco Energy Group Inc., el día 20 de junio de 2007;

**Una instalación de gasificación de baja temperatura con un Gasificador orientado horizontalmente**, tal como se describe y/o reivindica en la Solicitud de patente venezolana No. 07-0926 radicada el 7 de mayo de 2007, y por la cual se ejecutó una asignación de Andreas Tsangaris a Plasco Energy Group Inc., el día 20 de junio de 2007;

**Una instalación de gasificación de baja temperatura con un Gasificador orientado horizontalmente**, tal como se describe y/o reivindica en la Solicitud de patente estadounidense No. 11/745,438 radicada el 7 de mayo de 2007;

(2) todas las mejoras, incluyendo sin limitación las modificaciones, adiciones, sustituciones, derivaciones y eliminaciones de dicha invención; (3) las solicitudes antes identificadas en (1) y las solicitudes de la fase nacional; (4) todas las demás solicitudes para las Cartas de Patente en cualquier país del mundo para dichas invenciones y mejoras, incluyendo sin limitación todas las solicitudes divisionales, continuaciones, continuaciones en parte, renovaciones, remisiones y solicitudes sustitutas; (5) todas las Cartas de Patente que se puedan expedir de cualquiera de dichas solicitudes tal como se ejemplifica en los numerales (3) y (4) anteriores en cualquier país del mundo; (6) todos los derechos de Convenciones o Tratados derivados de dichas solicitudes, incluyendo sin limitación, todos

Resolución  
6694/78  
Minjusticia

~~Elmancía Parados Fejada~~  
TRADUCTORA OFICIAL  
  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

los derechos de propiedad en todo el mundo en y sobre dichas solicitudes y (7) el derecho total y completo para radicar las solicitudes por Cartas de Patente a nombre de Cesionario, o en mi nombre a elección del Cesionario, sobre dichas invenciones y mejoras en todos los países del mundo.

Por dicha consideración, acuerdo, a solicitud y por cuenta del Cesionario, sus sucesores y asignados, ejecutar cualquiera y todas las solicitudes divisionales, continuaciones, continuaciones en parte, remisiones y sustitutas para dichas invenciones y mejoras y reconozco y acuerdo que todos los derechos serán investidos en el Cesionario, sus sucesores y asignados, hasta el final del término por el cual se otorgarán dichas Cartas de Patente, tan completamente y totalmente como hubieran sido mantenidas y disfrutadas por el suscrito si no se hiciera esta asignación. Además, a solicitud del Cesionario, ejecutar cualquiera y todos los documentos requeridos por el Cesionario para invertir completamente y apropiadamente los derechos antes mencionados en el Cesionario.

El suscrito por medio del presente le otorga a la firma **MBM & CO**, con oficinas ubicadas en P.O Box 809, Station B, Ottawa, Ontario, Canadá K1P 5P9, el poder para insertar en esta asignación cualquier información adicional y/o corregir errores de oficina en la información pertinente a la solicitud referenciada anteriormente, lo cual puede ser necesario o deseable para la recordación de este documento.

Resolución  
6694/78  
Minjusticia

*Guadalupe Arredes Tejeda*  
TRADUCTORA OFICIAL  
  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

Ejecución por parte del Cedente

CEDENTE

TESTIGO:

Por

Por

A. MARGARET SWAN

ARIADNI ATHANASSIADIS

Rosemary Genest

28 de septiembre de 2007

28 de septiembre de 2007

OTTAWA, CANADÁ

(Ciudad y país en donde se ejecuta la asignación)

Autenticación de la firma del testigo del Cedente

Yo, ARIADNI ATHANASSIADIS, de 42 MACLAREN ST, OTTAWA, ONTARIO, CANADÁ, declaro que estuve personalmente y fui el testigo del Cedente antes mencionado quien firmó y ejecutó debidamente la Asignación anterior.

Juramentado ante mí en Ottawa

Canadá, el 28 de septiembre de 2007

FIRMADO

Nombre del Comisionado

Firma del Comisionado

Un Comisionado para tomar juramentos y declaraciones para la jurisdicción de Ontario.

Recepción  
6694/78  
Minjusticia

*Gloria Vasquez Rojas*  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

**Ejecución por parte del Cesionario**

Cesionario

Testigo

Por

Por

Nombre: RANDY BENNETH

STEVE RUNSTOR

VP BUSINESS DEV

1 de octubre de 2007

1 de octubre de 2007

OTTAWA, CANADÁ

(Ciudad y país en donde se ejecuta la asignación)

**Autenticación de la firma del testigo del Cesionario**

Yo, STIVE RYYTER, de 1145 (ILEGIBLE), CANADÁ, declaro que estuve personalmente y fui el testigo del Cesionario antes mencionado quien firmó y ejecutó debidamente la Asignación anterior.

Juramentado ante mí en Ottawa

Canadá, el 1 de octubre de 2007

FIRMADO

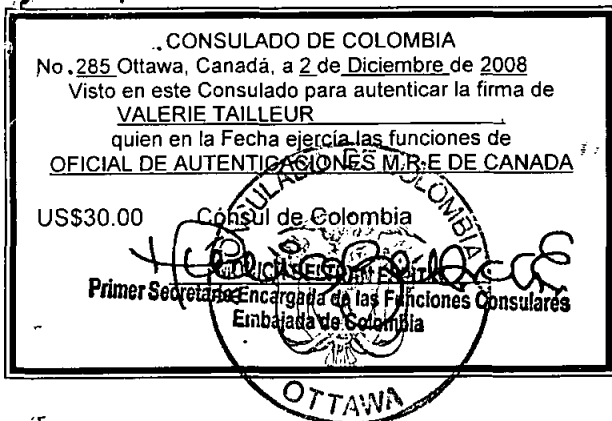
Nombre del Comisionado: DIANA MANSOUR

Un Comisionado para tomar juramentos y declaraciones para la jurisdicción de Ontario.

Resolución  
6694/78  
Minjusticia

~~Comisión de la Justicia~~  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

23



MINISTERIO DE  
RELACIONES EXTERIORES

2009 ENE -9 A 8:52

JEFE DE LEGALIZACIONES  
BOGOTA D.C.

NO SE ASUME  
RESPONSABILIDAD  
DEL TEXTO

860070  
Nancy De Hran  
BOYA FILM, FOTOREDE EN EL  
DOCUMENTO DESEMPEÑA  
AS FUNCIONES INDICADAS

CANADA

)

TO ALL TO WHOM THESE  
PRESENTS MAY

)

Province of Ontario

)

COME, BE SEEN OR KNOWN

)

To Wit:

)

I, Michelle Ai Ling Li, a Notary Public in and for the Province of Ontario, by Royal Authority duly appointed, and residing at the City of Ottawa, in the Province of Ontario, **DO CERTIFY AND ATTEST** that the paper hereto annexed is a true copy of a document produced and shown to me and being the notarized Assignment of Invention, executed on the 1<sup>st</sup> day of October, 2007, the copy having been compared by me with the original notarized document, an act which, having been requested, I have granted under my notarial form and seal of office to serve as shall be required.

**IN TESTIMONY WHEREOF** I have hereto subscribed my name and affixed my Notarial Seal of Office at the City of Ottawa, this 12<sup>th</sup> day of November, 2008.

(Seal)

*Michelle Li*  
A NOTARY PUBLIC IN AND FOR THE  
PROVINCE OF ONTARIO



## ASSIGNMENT OF INVENTION

This Assignment is effective the 5<sup>th</sup> day of May 2007, 2006. *At Feb 6, 2008*

In consideration of One (\$1.00) Dollar and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, I,

- (a) **TSANGARIS, Andreas**, whose post office address is 29 Confederation Private, Ottawa, Ontario K1V 9W6, Canada;

confirm that I have sold, assigned and transferred in an assignment document executed by Andreas Tsangaris to Plasco Energy Group Inc. on July 30, 2007 with regard to the invention entitled "**A Low Temperature Gasification Facility with a Horizontally Oriented Gasifier**" and by these presents do hereby sell, assign and transfer to **Plasco Energy Group Inc.** (hereinafter the "Assignee"), whose full post office address is **1145 Innovation Drive, Suite 100, Kanata, Ontario K2K 3G8, Canada**, all my right, title and interest throughout the world in and to (1) my invention(s) relating to

**A Low Temperature Gasification Facility with a Horizontally Oriented Gasifier**, as described and/or claimed in International Patent Application No. PCT/US07/68407 filed on May 7, 2007;

**A Low Temperature Gasification Facility with a Horizontally Oriented Gasifier**, as described and/or claimed in Argentina Patent Application No. **P070101975** filed on May 7, 2007, and for which an assignment from Andreas Tsangaris to Plasco Energy Group Inc. was executed on June 20, 2007;

**A Low Temperature Gasification Facility with a Horizontally Oriented Gasifier**, as described and/or claimed in Bahamas Patent Application No. filed on May 25, 2007;

**A Low Temperature Gasification Facility with a Horizontally Oriented Gasifier**, as described and/or claimed in Chilean Patent Application No. **1288-2007** filed on May 7, 2007, and for which an assignment from Andreas Tsangaris to Plasco Energy Group Inc. was executed on June 20, 2007;

**A Low Temperature Gasification Facility with a Horizontally Oriented Gasifier**, as described and/or claimed in Jamaican Patent Application No. **18/1/4628** filed on May 7, 2007;

**A Low Temperature Gasification Facility with a Horizontally Oriented Gasifier**, as described and/or claimed in Panamanian Patent Application No. **87255** filed on May 7, 2007, and for which an assignment from Andreas Tsangaris to Plasco Energy Group Inc. was executed on June 20, 2007;

**A Low Temperature Gasification Facility with a Horizontally Oriented Gasifier**, as described and/or claimed in Taiwanese Patent Application No. 96116178 filed on May 7, 2007, and for which an assignment from Andreas Tsangaris to Plasco Energy Group Inc. was executed on June 20, 2007;

**A Low Temperature Gasification Facility with a Horizontally Oriented Gasifier**, as described and/or claimed in Venezuelan Patent Application No. 07-0926 filed on May 7, 2007, and for which an assignment from Andreas Tsangaris to Plasco Energy Group Inc. was executed on June 20, 2007;

**A Low Temperature Gasification Facility with a Horizontally Oriented Gasifier**, as described and/or claimed in United States Patent Application No. 11/745,438 filed on May 7, 2007;

(2) all improvements, including but not limited to modifications, additions, substitutions, derivatives, and deletions to said invention(s); (3) the above-identified applications in (1) and national phase applications thereof; (4) all other applications for Letters Patent in any country throughout the world for said invention(s) and improvements, including but not limited to all divisional, continuation, continuation-in-part, renewal, reissue, and substitute applications; (5) any Letters Patent which may issue from any of said applications as exemplified in (3) and (4) above in any country throughout the world; (6) all Convention or Treaty rights derived from any of said applications, including without limitation, all rights of priority throughout the world in and to said applications; and (7) the full and complete right to file applications for Letters Patent in the name of the Assignee, or in my name at the Assignee's election, on said invention(s) and improvements in all countries throughout the world.

For said consideration, I agree, upon the request and at the expense of the Assignee, its successors and assigns, to execute any and all divisional, continuation, continuation-in-part, reissue and substitute applications for said invention(s) and improvements, and acknowledge and agree that all rights therein shall vest in the Assignee, its successors and assigns, whereby said Letters Patent will be held and enjoyed by said Assignee, its successors and assigns, to the full end of the term for which said Letters Patent will be granted, as fully and entirely as the same would have been held and enjoyed by the undersigned if this assignment had not been made. In addition, I will, at the request of the Assignee, execute any and all documents required by the Assignee to fully and properly vest the aforementioned rights in the Assignee.

The undersigned hereby grants to the firm of MBM & CO. whose full post office address is P.O. Box 809, Station B, Ottawa, Ontario, Canada, K1P 5P9, the power to insert on this assignment any further information and/or correct any clerical error in the information pertaining to the referenced application above, which may be necessary or desirable in order to comply with the patent legislation for recordation of this document.

**Execution by Assignor:**

**ASSIGNOR:**

By: [Signature]  
(Signature)  
ANDREAS TSANGARIS  
(Name)  
OCT. 1, 2007  
(Date Signed)  
OTTAWA, CANADA  
(City & Country Where Assignment Executed)

**WITNESS:**

By: [Signature]  
(Signature)  
Randy Bennett  
(Name)  
October 1, 2007  
(Date Signed)

**Notarization of Witness to Signature of Assignor:**

I, Randy Bennett, of 1145 Innovation Dr, Ottawa,  
(Witness name) (Witness address)

declare that I was personally present and did witness the abovementioned Assignor duly sign and execute the above Assignment.

Sworn Before Me at OTTAWA,  
(City)  
CANADA on OCTOBER 1, 2007.  
(Country) (Date)

[Signature]  
(Diana Mansour)

A Commissioner for taking Oaths and Affidavits for the  
jurisdiction of ONTARIO  
(State, Province, etc)

[Signature]  
(Signature of Witness)

**Execution by Assignee:**

**ASSIGNEE:**

By: [Signature]  
(Signature)  
Randy Bennett VP Business Dev.  
(Name)  
October 1, 2007  
(Date Signed)  
Ottawa, Canada  
(City & Country Where Assignment Executed)

**WITNESS:**

By: [Signature]  
(Signature)  
GEORGE W. CARTER  
(Name)  
Oct 01/07  
(Date Signed)

**Notarization of Witness to Signature of Assignee:**

I, GEORGE W. CARTER of 800 CHAPMAN BLVD OTTAWA ON K1G 1T9  
(Witness name) (Witness address)

declare that I was personally present and did witness the abovementioned Assignee duly sign and execute the above Assignment.

Sworn Before Me at OTTAWA  
(City)

CANADA on OCTOBER 1, 2007  
(Country) (Date)

[Signature]  
(Diana Mansour)

A Commissioner for taking Oaths and Affidavits for the jurisdiction of ONTARIO  
(State, Province, etc)

[Signature]  
(Signature of Witness)

CONSULADO DE COLOMBIA

No. 285 Ottawa, Canadá, el 2 de Diciembre de 2008

Visto en este Consulado para autenticar la firma de VALERIE TAILLEUR quien en esta fecha ejercía las funciones de OFICIAL DE AUTENTICACIONES M.R.E DE CANADÁ  
Cónsul de Colombia

MINISTERIO DE RELACIONES EXTERIORES

9 DE ENERO DE 2009 – 860070

JEFE DE LEGALIZACIONES BOGOTÁ, D.C.

CANADÁ )

Provincia de Ontario )

A TODOS LOS QUE PUEDAN VER O CONOCER  
LOS PRESENTES

Consideración: )

Yo, Michelle Ai Ling Li, un Notario Público en y para la Provincia de Ontario, debidamente nombrado por la Autoridad Real y residente en la ciudad de Ottawa, en la Provincia de Ontario, CERTIFICO Y ATESTIGUO que el documento anexo es una copia fiel de un documento dirigido y presentado ante mí y corresponde a la Asignación de la invención dado el 1 de octubre de 2007; comparé la copia con el documento original, un acto que me fue solicitado, y he otorgado bajo mi firma y sello notarial de la oficina para servir de acuerdo como sea requerido.

Rogeluisén  
6694/78  
Minjusticia

Clemente Paraisa Tejeda  
TRADUCCION OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANCAIS - ESPAGNOL

MINISTERIO DE  
RELACIONES EXTERIORES

2009 ENE 21 A 9:58

*MSL*  
JEFE DE LEGALIZACIONES  
BOGOTA D.C.

NO SE ASUME  
RESPONSABILIDAD  
DEL TEXTO

864945

*CERVOCA*  
COTAFORMULA SECE EN EL  
DOCUMENTO DESEMPERA  
AS FUNCIONES INDICADAS  
*PROCES*

MINISTERIO DE RELACIONES EXTERIORES

RECIBO LEGALIZACION

No. *9422152*

EN TESTIMONIO DE LO CUAL he suscrito mi nombre y fijado mi sello notarial de la  
Oficina en la ciudad de Ottawa, este día 12 de noviembre de 2008.

(Sello)

UN NOTARIO PÚBLICO EN Y PARA LA PROVINCIA DE ONTARIO

Certificado en el Departamento de Relaciones Exteriores y Comercio Internacional para la  
legalización de la firma anterior de

Ministro de Relaciones Exteriores

CANADÁ

Recepción  
6694/78  
Minjusticia

*Clementina Patricia Tejada*  
TRADUCCION OFICIAL  
  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

## ASIGNACIÓN DE LA INVENCION

Esta asignación entra en vigor el 5 de mayo de 2007, 6 de febrero de 2008

En consideración de un (\$1.00) dólar y otras consideraciones buenas y valiosas, cuyo recibo y suficiencia se reconoce por medio del presente, yo

(a) TSANGARIS, Andreas, cuya dirección es 29 Confederation Private, Ottawa, Ontario K1V 9W6, Canadá;

Acuerdo y confirmo que he vendido, asignado y transferido en un documento de asignación elaborado por Andreas Tsangaris a Plasco Energy Group Inc., el 30 de julio de 2007 con respecto a la invención titulada "Una Instalación de gasificación de baja temperatura con un gasificador orientado horizontalmente" y mediante el presente vendo, asigno y transfiero a Plasco Energy Group Inc., (de ahora en adelante el "Cesionario"), con oficinas ubicadas en 1145 Innovation Drive, Suite 400, Kanata, Ontario K2K 3G8, Canadá, todos mis derechos, títulos e intereses en todo el mundo en y sobre (1) mi invención relacionada con:

**Una instalación de gasificación de baja temperatura con un Gasificador orientado horizontalmente**, tal como se describe y/o reivindica en la Solicitud de patente Internacional No. PCT/US07/68407 radicada el 7 de mayo de 2007;

**Una instalación de gasificación de baja temperatura con un Gasificador orientado horizontalmente**, tal como se describe y/o reivindica en la Solicitud de patente Argentina

Resolución  
6694/78  
Minjusticia

**Clementina Paredes Tejada**  
TRADUCTORA OFICIAL  
  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

No. P070101975 radicada el 7 de mayo de 2007, y por la cual se ejecutó una asignación de Andreas Tsangaris a Plasco Energy Group Inc., el día 20 de junio de 2007;

**Una instalación de gasificación de baja temperatura con un Gasificador orientado horizontalmente**, tal como se describe y/o reivindica en la Solicitud de patente de Bahamas No.                radicada el 25 de mayo de 2007;

**Una instalación de gasificación de baja temperatura con un Gasificador orientado horizontalmente**, tal como se describe y/o reivindica en la Solicitud de patente chilena No. 1288-2007 radicada el 7 de mayo de 2007, y por la cual se ejecutó una asignación de Andreas Tsangaris a Plasco Energy Group Inc., el día 20 de junio de 2007;

**Una instalación de gasificación de baja temperatura con un Gasificador orientado horizontalmente**, tal como se describe y/o reivindica en la Solicitud de patente jamaicana No. 18/1/4628 radicada el 7 de mayo de 2007;

**Una instalación de gasificación de baja temperatura con un Gasificador orientado horizontalmente**, tal como se describe y/o reivindica en la Solicitud de patente panameña No. 87255 radicada el 7 de mayo de 2007, y por la cual se ejecutó una asignación de Andreas Tsangaris a Plasco Energy Group Inc., el día 20 de junio de 2007;

**Una instalación de gasificación de baja temperatura con un Gasificador orientado horizontalmente**, tal como se describe y/o reivindica en la Solicitud de patente taiwanesa

Recepción  
6694/78  
Minjusticia

~~Clendinning Parades Tejado~~  
TRADUCCION OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

No. 96116178 radicada el 7 de mayo de 2007, y por la cual se ejecutó una asignación de Andreas Tsangaris a Plasco Energy Group Inc., el día 20 de junio de 2007;

**Una instalación de gasificación de baja temperatura con un Gasificador orientado horizontalmente**, tal como se describe y/o reivindica en la Solicitud de patente venezolana No. 07-0926 radicada el 7 de mayo de 2007, y por la cual se ejecutó una asignación de Andreas Tsangaris a Plasco Energy Group Inc., el día 20 de junio de 2007;

**Una instalación de gasificación de baja temperatura con un Gasificador orientado horizontalmente**, tal como se describe y/o reivindica en la Solicitud de patente estadounidense No. 11/745,438 radicada el 7 de mayo de 2007;

(2) todas las mejoras, incluyendo sin limitación las modificaciones, adiciones, sustituciones, derivaciones y eliminaciones de dicha invención; (3) las solicitudes antes identificadas en (1) y las solicitudes de la fase nacional; (4) todas las demás solicitudes para las Cartas de Patente en cualquier país del mundo para dichas invenciones y mejoras, incluyendo sin limitación todas las solicitudes divisionales, continuaciones, continuaciones en parte, renovaciones, remisiones y solicitudes sustitutas; (5) todas las Cartas de Patente que se puedan expedir de cualquiera de dichas solicitudes tal como se ejemplifica en los numerales (3) y (4) anteriores en cualquier país del mundo; (6) todos los derechos de Convenciones o Tratados derivados de dichas solicitudes, incluyendo sin limitación, todos los derechos de propiedad en todo el mundo en y sobre dichas solicitudes y (7) el derecho total y completo para radicar las solicitudes por Cartas de Patente a nombre de Cesionario,

Resolución  
6694/78  
Minjusticia

Clementina Páez Tejeda  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

o en mi nombre a elección del Cesionario, sobre dichas invenciones y mejoras en todos los países del mundo.

Por dicha consideración, acuerdo, a solicitud y por cuenta del Cesionario, sus sucesores y asignados, ejecutar cualquiera y todas las solicitudes divisionales, continuaciones, continuaciones en parte, remisiones y solicitudes sustitutas para dichas invenciones y mejoras y reconozco y acuerdo que todos los derechos serán investidos en el Cesionario, sus sucesores y asignados, hasta el final del término por el cual se otorgarán dichas Cartas de Patente, tan completamente y totalmente como hubieran sido mantenidas y disfrutadas por el suscritos si no se hiciera esta asignación. Además, a solicitud del Cesionario, ejecutar cualquiera y todos los documentos requeridos por el Cesionario para investir completamente y apropiadamente los derechos antes mencionados en el Cesionario.

El suscrito por medio del presente le otorga a la firma **MBM & CO**, con oficinas ubicadas en P.O Box 809, Station B, Ottawa, Ontario, Canadá K1P 5P9, el poder para insertar en esta asignación cualquier información adicional y/o corregir errores de oficina en la información pertinente a la solicitud referenciada anteriormente, lo cual puede ser necesario o deseable para la recordación de este documento.

Resolución  
6694/78  
Minjusticia

*Clara María Paredón Tejeda*  
TRADUCCION OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

Ejecución por parte del Cedente

CEDENTE

TESTIGO:

Por

Por

ANDREAS TSANGARIS

RANDY BENNET

1 de octubre de 2007

1 de octubre de 2007

OTTAWA, CANADÁ

(Ciudad y país en donde se ejecuta la asignación)

Autenticación de la firma del testigo del Cedente

Yo, RANDY BENNETT, de 1145 Innovation Dr. Ottawa, declaro que estuve personalmente y fui el testigo del Cedente antes mencionado quien firmó y ejecutó debidamente la Asignación anterior.

Juramentado ante mí en OTTAWA

Canadá, el 1 de octubre de 2007

Nombre del Comisionado

Firma del Comisionado

Un Comisionado para tomar juramentos y declaraciones para la jurisdicción de Alberta.

Resolución  
6694/78  
Minjusticia

Comisionado Paralelo Refada  
TRADUCCION OFICIAL  
ENGLISH · FRENCH · SPANISH  
ANGLAIS · FRANÇAIS · ESPAGNOL

### **Ejecución por parte del Cesionario**

Cesionario

Testigo

Por

Por

Nombre: RANDY BENNETT

GEORGE W. CARTER

Cargo: Vicepresidente comercial

1 de octubre de 2007

1 de octubre de 2007

OTTAWA, CANADÁ

(Ciudad y país en donde se ejecuta la asignación)

### **Autenticación de la firma del testigo del Cesionario**

Yo, GEORGE W. CARTER de 600 CHAPMAN BLVD OTTAWA ON K1G 1T9, declaro que estuve personalmente y fui el testigo del Cesionario antes mencionado quien firmó y ejecutó debidamente la Asignación anterior.

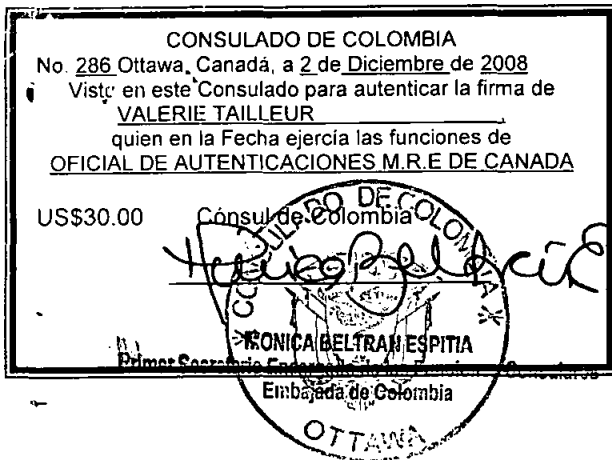
Juramentado ante mí en Ottawa (Kanata)

Canadá, el 1 de octubre de 2007

Nombre del Comisionado

Firma del Comisionado

Un Comisionado para tomar juramentos y declaraciones para la jurisdicción de Ontario.



MINISTERIO DE  
RELACIONES EXTERIORES

2009 ENE -9 A 8:51

JEFE DE LEGALIZACIONES  
BOGOTA D.C.

NO SE ASUME  
RESPONSABILIDAD  
DEL TEXTO

860068

Monica Beltran  
COVA F... EN EL  
DOCUMENTO DESEMPEÑA  
AS FUNCIONES INDICADAS

CANADA )

TO ALL TO WHOM THESE  
PRESENTS MAY

Province of Ontario )

COME, BE SEEN OR KNOWN

To Wit: )

I, Ariadni Athanassiadis, a Notary Public in and for the Province of Ontario, by Royal Authority duly appointed, and residing at the City of Ottawa, in the Province of Ontario, **DO CERTIFY AND ATTEST** that the paper hereto annexed is a true copy of a document produced and shown to me and being the Assignment of Intellectual Property between Nipun Soni and Plasco Energy Group Inc. dated November 29, 2005, the copy having been compared by me with the original document, an act which, having been requested, I have granted under my notarial form and seal of office to serve as shall be required.

**IN TESTIMONY WHEREOF** I have hereto subscribed my name and affixed my Notarial Seal of Office at the City of Ottawa, this 20<sup>th</sup> day of November, 2008.

(Seal)

*A. Athanassiadis* C.A. ATHANASSIADIS  
A NOTARY PUBLIC IN AND FOR THE  
PROVINCE OF ONTARIO



## ASSIGNMENT OF INTELLECTUAL PROPERTY

BETWEEN:

Nipun Soni

(hereinafter referred to as the "Employee")

- and -

**PLASCO ENERGY GROUP INC.**

a corporation incorporated under  
the laws of Canada

(hereinafter referred to as "Company")

**WHEREAS** the Employee is employed by the Company for the development and implementation of systems incorporating the Company's patented plasma gasification process for the environmentally safe disposal of all waste streams including industrial hazardous waste, hereinafter referred to as the "Work";

**AND WHEREAS** due to the nature of the Work, the Company wishes to ensure that the Employee does not acquire - and to the extent that he or she does acquire, that Employee assigns - any intellectual property interest relating to his or her past or future employment and the Work, including but not limited to any copyright, patent or other interest of an intellectual property nature;

**NOW THEREFORE**, in consideration of the payment of the sum of \$1.00 to the Employee and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged:

1. Employee acknowledges and agrees that all right, title and interest in the Intellectual Property (as defined, below) is the property of the Company at all times, and that Employee has and will acquire no rights in the foregoing as a result of his or her employment. The Company will have the unlimited right to use, commercialize, reproduce, distribute, disclose and publish the Intellectual Property, without any claim on the part of the Employee.
2. To the extent that the Employee has acquired or acquires rights in the Intellectual Property, at law or otherwise, the Employee hereby assigns to Company, and its successors and assigns, all of the Employee's right, title and interest to inventions, improvements, processes, patented and copyrighted works which the Employee has made or conceived or will make or conceive during the period of his or her past or future employment with the Company, including without limitation the entire right, title and interest in the intellectual property relating to the Work, wherever the same subsists or shall subsist, and any renewal, extension or reversion of copyright, and any related trademarks and the goodwill arising therefrom, and all other related rights of any nature whatsoever, including know-how and all related rights of action, powers and benefits to a belonging or accrued (collectively, the "Intellectual Property") and including, but not limited to,

.../2

the right to make such changes therein and such uses thereof as Company may determine and the right to restrain any distortion, mutilation or other modification of the Intellectual Property that would be prejudicial to Company's goodwill or reputation.

3. The Employee hereby waives any moral rights which the Employee may have, now or in the future, with respect to the creation of any of the Intellectual Property.
4. The Company hereby accepts the foregoing assignments and waivers.
5. At the request and expense of the Company, the Employee shall do all acts necessary and sign all applications, assignments and other documentation necessary in order to ensure Company's ownership of the Intellectual Property, including but not limited to providing all reasonable assistance to the Company in the prosecution of any patent application, copyright registration or trade-mark application, and providing to Company any other documents required to enable Company to document rights to and/or register patents, copyrights, trade marks, industrial designs and such other protections as Company considers advisable anywhere in the world.
6. Employee agrees not to bring onto Company premises or make any unauthorized use whatsoever of any trade secrets, confidential information or proprietary property of any third party, including without limitation any trademarks or copyrighted materials, during the period of his or her employment with the Company.
7. This Assignment of Intellectual Property and all of the Employee's obligations herein shall survive beyond the termination of the period of the Employee's employment with the Company, and shall be binding on the assigns, executors, administrators and other legal representatives of the Employee.

DATED at Ottawa this 29<sup>th</sup> day of November, 2005.

K. Campbell  
Witness

[Signature]  
Wipun Som

PLASCO ENERGY GROUP INC.

Per: [Signature]

CONSULADO DE COLOMBIA

No. 286 Ottawa, Canadá, el 2 de Diciembre de 2008

Visto en este Consulado para autenticar la firma de VALERIE TAILLEUR quien en esta fecha ejercía las funciones de OFICIAL DE AUTENTICACIONES M.R.E DE CANADÁ

Cónsul de Colombia

MINISTERIO DE RELACIONES EXTERIORES

9 DE ENERO DE 2009 – 860068

JEFE DE LEGALIZACIONES BOGOTÁ, D.C.

CANADÁ )

Provincia de Ontario ) A TODOS LOS QUE PUEDAN VER O CONOCER  
LOS PRESENTES

Consideración: )

Yo, Ariadni Athanassiadis, un Notario Público en y para la Provincia de Ontario, debidamente nombrado por la Autoridad Real y residente en la ciudad de Ottawa, en la Provincia de Ontario, CERTIFICO Y ATESTIGUO que el documento anexo es una copia fiel de un documento dirigido y presentado ante mí y corresponde a la Asignación de la Propiedad Intelectual entre Nipun Soni y Plasco Energy Group Inc., dado en la fecha 29 de noviembre de 2005; comparé la copia con el documento original, un acto que me fue

Resolución  
6694/78  
Minjusticia

*Clementina Morales Tejeda*  
TRADUCCION OFICIAL  
  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

MINISTERIO DE  
RELACIONES EXTERIORES

NO SE ASUME  
RESPONSABILIDAD  
DEL TEXTO

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*msl*  
JEFE DE LEGALIZACIONES  
BOGOTÁ D.C.

864940

*Clerencia PAREDES*

LOGRA FIRMAR Y VERIFICAR EN EL  
DOCUMENTO DE EMPERA  
AS FUNCIONES INDICADAS

MINISTERIO DE RELACIONES EXTERIORES

RECIBO LEGALIZACION

No. *242257*

solicitado y he otorgado bajo mi firma y sello notarial de la oficina para servir de acuerdo como sea requerido.

EN TESTIMONIO DE LO CUAL he suscrito mi nombre y fijado mi sello notarial de la Oficina en la ciudad de Ottawa, este día 20 de noviembre de 2008.

(Sello)

UN NOTARIO PÚBLICO EN Y PARA LA PROVINCIA DE ONTARIO

Certificado en el Departamento de Relaciones Exteriores y Comercio Internacional para la legalización de la firma anterior de

Ministro de Relaciones Exteriores

CANADÁ

Resolución  
6694/78  
Minjusticia

*Clamanda Durand-Rejada*  
TRADUCTORA OFICIAL  
ENGLISH · FRENCH · SPANISH  
ANGLAIS · FRANÇAIS · ESPAGNOL

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ASIGNACIÓN DE PROPIEDAD INTELECTUAL

ENTRE:

Nipun Soni

(de ahora en adelante referido como el "Empleado")

- y -

PLASCO ENERGY GROUP INC.

una compañía incorporada bajo las leyes de Canadá

(de ahora en adelante referida como la "Compañía")

CONSIDERANDO que el Empleado está contratado por la Compañía para el desarrollo e implementación de los sistemas que incorporan el proceso de gasificación del plasma patentado de la Compañía para la disposición ambientalmente segura de todos los flujos de las basuras, incluyendo los desechos industriales peligrosos, de ahora en adelante referido como el "Trabajo";

Y CONSIDERANDO que, debido a la naturaleza del Trabajo, la Compañía desea asegurarse que el Empleado no adquiera y hasta la extensión que él o ella adquiera que el Empleado asigne – todos los intereses de propiedad intelectual relacionados con su empleo pasado o futuro y el Trabajo, incluyendo sin limitación todos los derechos de propiedad intelectual, patentes u otros intereses de una naturaleza de propiedad intelectual;

AHORA POR LO TANTO, en consideración del pago de la suma de \$1.00 al empleado y

Resolución  
6694/78  
Minjusticia

*Clemente Pascual Tejeda*  
TRANSCRIPCIÓN OFICIAL  
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ANGLAIS - FRANÇAIS - ESPAGNOL

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de otras consideraciones buenas y valiosas, cuyo recibo y suficiencia se reconoce por medio del presente:

1. El empleado reconoce y acuerda que todos los derechos, títulos e intereses en la Propiedad Intelectual (tal como se define a continuación) es de propiedad de la Compañía en todo momento y que el Empleado no tiene ni adquirirá derechos sobre los anteriores como resultado de su empleo. La Compañía tendrá el derecho ilimitado de uso, comercialización, reproducción, distribución, revelación y publicación de la Propiedad Intelectual, sin reclamaciones por parte del Empleado.
2. Hasta la extensión que el Empleado haya adquirido o adquiriera derechos en la Propiedad intelectual, por ley o de manera contraria, el Empleado por medio del presente le asigna a la Compañía, y sus sucesores y asignados, todos los derechos, títulos e intereses del Empleado sobre los inventos, mejoras, procesos, trabajos patentados o con derechos de autor que el Empleado haya hecho o concebido o que hará o concebirá durante el período de su empleo pasado o futuro con la Compañía, incluyendo sin limitación todos los derechos, títulos e intereses sobre la Propiedad intelectual relacionada con el Trabajo, donde quiera que estos subsistan o deban subsistir y cualquier renovación, extensión o revisión de los derechos de autor y todas las marcas registradas relacionadas y el goodwill surgido de estos, y todos los demás derechos relacionados de cualquier naturaleza en lo absoluto, incluyendo el know-how y todos los derechos relacionados de acción, los poderes y los beneficios que le puedan pertenecer o acumulados (colectivamente, la "Propiedad Intelectual")

Resolución  
6694/78  
Minjusticia

*Eleonora Patricia Tejeda*  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

e incluyendo sin limitación el derecho de hacer cambios en ese aspecto y todos los usos que la Compañía pueda determinar y el derecho de contenerse de cualquier distorsión, mutilación u otra modificación de la Propiedad Intelectual que pueda ser perjudicial para el goodwill o la reputación de la Compañía.

3. El Empleado por medio del presente renuncia a los derechos morales que el Empleado pueda tener, ahora o en el futuro, con respecto a la creación de cualquier Propiedad Intelectual.
4. La Compañía por medio del presente acepta las asignaciones y renunciaciones anteriores.
5. A solicitud y por cuenta de la Compañía, el Empleado debe hacer todos los actos necesarios y firmar todas las solicitudes, asignaciones y demás documentos necesarios para asegurar la titularidad de la Compañía sobre la Propiedad Intelectual, incluyendo sin limitación el ofrecer toda la asistencia razonable a la compañía en los procesos de cualquier solicitud de patentes, registros de derechos de autor o solicitud de marcas registradas y entregar a la Compañía todos los documentos requeridos que le permitan documentar los derechos para registrar las patentes, derechos de autor, marcas registradas, diseños industriales y todas las protecciones que la Compañía considere apropiadas en cualquier parte del mundo.
6. El empleado acuerda no traer a las premisas de la Compañía o hacer usos autorizados en lo absoluto de secretos comerciales, información confidencial o

Regulación  
6694/78  
Minjusticia



ax

propiedad privilegiada de un tercero, incluyendo sin limitación marcas registradas o materiales con derechos de autor, durante el período de su empleo con la Compañía.

7. Esta asignación de Propiedad Intelectual y todas las obligaciones del Empleado en virtud del presente sobrevivirán más allá de la terminación del período del empleo del Empleado con la Compañía, y será obligatoria para todos los asignados, ejecutores, administradores y demás representantes legales del Empleado.

DADO en Ottawa, este día 29 de noviembre de 2005.

Testigo

PLASCO ENERGY GROUP INC

Resolución  
6694/78  
Minjusticia

*Clara María Domínguez Tejeda*  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

95

CONSULADO DE COLOMBIA  
No. 281 Ottawa, Canadá, a 2 de Diciembre de 2008  
Visto en esté Consulado para autenticar la firma de  
VALERIE TAILLEUR  
quien en la Fecha ejercía las funciones de  
OFICIAL DE AUTENTICACIONES M.R.E. DE CANADA  
US\$30.00      Cónsul de Colombia  
  
MONICA BELTRAN ESPITA  
Primer Secretario Encargada de las Funciones Consulares  
Embajada de Colombia

**SECRET**

2009 ENE -9 A 8:52

JEFE DE LEGALIZACIONES  
BOGOTA D.C.

NOV 22 1964  
FBI - NEW YORK  
FBI - NEW YORK

86-0060

Montca Beltran

**CANADA**

**Province of Ontario**

**To Wit:**

TO ALL TO WHOM THESE  
PRESENTS MAY

## COME, BE SEEN OR KNOWN

I, Diana Mansour, a Notary Public in and for the Province of Ontario, by Royal Authority duly appointed, and residing at the City of Ottawa, in the Province of Ontario, **DO CERTIFY AND ATTEST** that the paper hereto annexed is a true copy of a document produced and shown to me and being the notarized Assignment of Invention, effective December 31, 2007, the copy having been compared by me with the original notarized document, an act which, having been requested, I have granted under my notarial form and seal of office to serve as shall be required.

**IN TESTIMONY WHEREOF** I have hereto subscribed my name and  
my Notarial Seal of Office at the City of Ottawa, this 7<sup>th</sup> day of November, 2006.

(Seal)

A NOTARY PUBLIC IN AND FOR THE PROVINCE OF ONTARIO

Certificate of the Department of Foreign Affairs and  
 International Trade for Legalisation of the  
 Foregoing Signature of: *[Signature]*  
 Certifié au Ministère des Affaires Étrangères et  
 du Commerce international aux fins de légaliser  
 la signature ci-dessous de : *[Signature]*  
 Ministère des Affaires Étrangères  
 Canada  
 Librarian of Parliament  
 Sous-ministre des Affaires étrangères

 $ab$

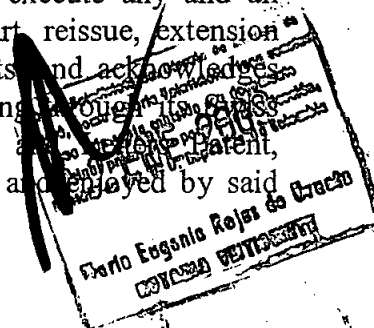
## ASSIGNMENT OF INVENTION

This Assignment is effective as of the 31<sup>st</sup> day of December 2007 ("Effective Date").

In consideration of One Dollar (\$1.00) and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, **Plasco Energy Group Inc.** (hereinafter the "**Assignor**"), whose address is 1000 Innovation Drive, Suite 400, Kanata, Ontario K2K 3E7, Canada, confirms that by way of a Contribution Agreement executed on December 31, 2007 by and between Plasco Energy Group Inc. and PlascoEnergy IP Holdings, S.L., it has contributed, assigned, transferred and conveyed and does hereby contribute, assign, transfer and convey to PlascoEnergy IP Holdings, S.L., acting through its Schaffhausen Branch (**PlascoEnergy IP Holdings, S.L., Bilbao, Schaffhausen Branch**) (hereinafter the "**Assignee acting through its Swiss Branch**"), whose address is Vordergasse 3, CH-8200 Schaffhausen, Switzerland, all its right, title and interest throughout the world, except Canada and the United States, in and to the following:

- (1) the inventions relating to the patent applications/patents listed in **Schedule A** attached hereto;
- (2) all improvements, including but not limited to modifications, additions, substitutions, derivatives, and deletions to said invention(s);
- (3) the above-identified applications in (1) and national phase applications thereof;
- (4) all other applications for Letters Patent and certifications, notices, publications and registrations in any country throughout the world, except Canada and the United States, for said invention(s) and improvements, including but not limited to all divisional, continuation, continuation-in-part, renewal, reissue, extension and substitute applications;
- (5) any Letters Patent or other rights which may issue or derive from any of said applications, certifications, notices, publications and registrations as exemplified in (3) and (4) in any country throughout the world, except Canada and the United States;
- (6) all Convention and/or Treaty rights derived from any of said applications throughout the world except Canada and the United States;
- (7) all rights of priority throughout the world in and to said applications; and
- (8) the full and complete right to file applications for Letters Patent in the name of the Assignee acting through its Swiss Branch, or in the Assignor's name at the election of the Assignee acting through its Swiss Branch, on said invention(s) and improvements in all countries throughout the world, except Canada and the United States.

For said consideration, the Assignor agrees, upon the request of the Assignee acting through its Swiss Branch, its successors and assigns, to execute any and all documents relating to divisional, continuation, continuation-in-part, reissue, extension and substitute applications for said invention(s) and improvements and acknowledges and agrees that all rights therein shall vest in the Assignee acting through its Swiss Branch, its successors and assigns, whereby said applications, certifications, notices, publications and registrations will be held and controlled by said



The undersigned hereby grants to the firm of **MBM Intellectual Property Law, LLP**, whose full post office address is P.O. Box 809, Station B, Ottawa, Ontario, Canada, K1P 5P9, the power to insert on this Assignment any further information and/or correct any clerical error in the information pertaining to the referenced application above, which may be necessary or desirable in order to comply with patent legislation for recordation of this document.

Page 2 of 4



## EXECUTION OF ASSIGNMENT OF INVENTION

IN WITNESS WHEREOF the Assignor and the Assignee acting through its Swiss Branch have caused this Assignment to be executed in two duplicate originals by their duly authorized representatives to be effective as of the Effective Date.

### Execution by Assignor

|                                                                     |                                       |
|---------------------------------------------------------------------|---------------------------------------|
| <b>PLASCO ENERGY GROUP INC.:</b>                                    | <b>WITNESS:</b>                       |
| By: <u>[Signature]</u><br>(Signature)                               | By: <u>[Signature]</u><br>(Signature) |
| <u>Tim Savinors</u><br>(Name)                                       | <u>LISA SOULIERE</u><br>(Name)        |
| <u>10/31/2008</u><br>(Date Signed)                                  | <u>10/31/2008</u><br>(Date Signed)    |
| <u>Ottawa, Canada</u><br>(City & Country Where Assignment Executed) |                                       |

### Notarization of Witness to Signature of Assignor

I, LISA SOULIERE, of 13 LOUG GATE COURT NEPEAN ONT.  
(Witness name) (Witness address)

declare that I was personally present and did witness the above-mentioned Assignor duly sign and execute the above Assignment.

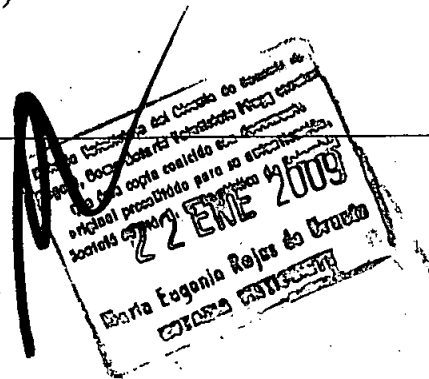
Sworn Before Me at Ottawa,  
(City)

Canada on Oct. 31, 2008.  
(Country) (Date)

[Signature]  
(Commissioner's Name)

A Commissioner for taking Oaths and Affidavits for the jurisdiction of Ontario  
(State, Province, etc.)

[Signature]  
(Signature of Witness)



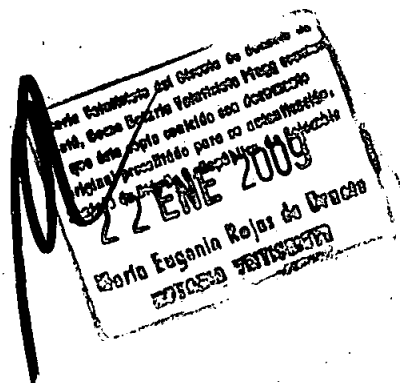
## EXECUTION OF ASSIGNMENT OF INVENTION

### *Execution by Assignee acting through its Swiss Branch*

|                                                                                                                                                                                                                                                                                                 |                                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>PLASCOENERGY IP HOLDINGS, S.L.,<br/>BILBAO, SCHAFFHAUSEN BRANCH:</b><br>By: <u>[Signature]</u><br>(Signature)<br>Name: Dr. Herbert Trachsler<br>Title: Branch Manager<br><u>3 November 2008</u><br>(Date Signed)<br><u>Zurich, Switzerland</u><br>(City & Country Where Assignment Executed) | <b>WITNESS:</b><br>By: <u>[Signature]</u><br>(Signature)<br><u>Esther Buesser</u><br>(Name)<br><u>3 November 2008</u><br>(Date Signed) |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|

### *Notarization of Witness to Signature of Assignee acting through its Swiss Branch*

|                                                                                                                                                                           |                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| I, <u>ESTHER BUESSER</u> , of <u>CH - 8000 GRAFENAU</u><br>(Witness name) (Witness address)                                                                               |                        |
| <del>declare that I was personally present and did witness the above mentioned Assignee acting through its Swiss Branch duly sign and execute the above Assignment.</del> |                        |
| Sworn Before Me at _____<br>(City)                                                                                                                                        | )                      |
| _____ on _____<br>(Country) (Date)                                                                                                                                        | )                      |
| _____ (Commissioner's Name)                                                                                                                                               | )                      |
| A Commissioner for taking Oaths and Affidavits for the jurisdiction of _____<br>(State, Province, etc)                                                                    | )                      |
|                                                                                                                                                                           | (Signature of Witness) |



## Official Certification

Seen for authentication of the reverse side signature, affixed in our presence by  
swiss citizen of Notariat Riesbach-Zürich

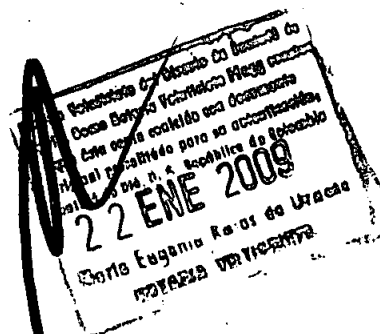
Ms. **Esther BÜSSER**, born 1. December 1948, Nationality: Netstal GL, according to her information residing at Am Pfisterhölzli 48, 8606 Greifensee, personally known to us.

Zürich, 3. November 2008  
BK no. 3545-3546/ems  
Fee CHF 20.00

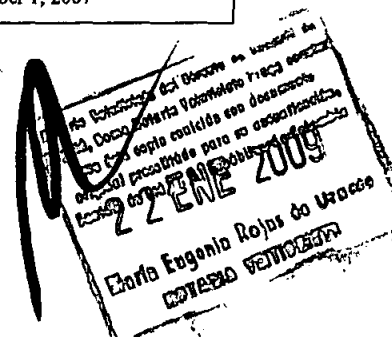


NOTARIAT RIESBACH-ZÜRICH

Stefan Walder, deputy notary public



| APPLICANT COUNTRY                                                                                 |                                                          | FILED DATE               |
|---------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------|
| Nepal                                                                                             | Nepal Application No. Not Yet Available                  | Filed: November 2, 2007  |
| Peru                                                                                              | Peru Application No. 001514-2007/OIN                     | Filed: November 5, 2007  |
| Pakistan                                                                                          | Pakistan Application No. 1280/2007                       | Filed: November 2, 2007  |
| Paraguay                                                                                          | Paraguay Application No. 37.568                          | Filed: November 2, 2007  |
| Thailand                                                                                          | Thailand Application No. 0701005569                      | Filed: November 2, 2007  |
| Tonga                                                                                             | Tonga Application No. TO/P/07/00008                      | Filed: November 2, 2007  |
| Uruguay                                                                                           | Uruguay Application No. 30.689                           | Filed: November 5, 2007  |
| Yemen                                                                                             | Yemen Application No. Not Yet Available                  | Filed: November 6, 2007  |
| <b>FAMILY VIII: A Low Temperature Gasification Facility With A Horizontally Oriented Gasifier</b> |                                                          |                          |
| International (PCT)*                                                                              | International Application No. PCT/US07/68407             | Filed: May 7, 2007       |
| Argentina                                                                                         | Argentina Application No. P-070101975                    | Filed: May 7, 2007       |
| Bahamas                                                                                           | Bahamian Application No. 1982                            | Filed: May 25, 2007      |
| Chile                                                                                             | Chile Application No. 1288-2007                          | Filed: May 7, 2007       |
| Jamaica                                                                                           | Jamaica Application No. 18/1/4628                        | Filed: May 7, 2007       |
| Panama                                                                                            | Panama Application No. PI/PA01/87255-01                  | Filed: May 7, 2007       |
| Taiwan                                                                                            | Taiwan Application No. 96116178                          | Filed: May 7, 2007       |
| Venezuela                                                                                         | Venezuela Application No. 07-0926                        | Filed: May 7, 2007       |
| Aruba                                                                                             | Aruba Application No. OCT-02/071105                      | Filed: November 5, 2007  |
| Bangladesh                                                                                        | Bangladesh Application No. 242/2007                      | Filed: November 4, 2007  |
| Burundi                                                                                           | Burundi Application No. Not Yet Available                | Filed: November 5, 2007  |
| Bolivia                                                                                           | Bolivia Application No. SP-270345                        | Filed: November 1, 2007  |
| Gulf Cooperation Council (Oman, Bahrain, Qatar, U.A.E., Saudi Arabia, Kuwait)                     | Gulf Cooperation Council Application No. GCC/P/2007/9412 | Filed: November 5, 2007  |
| Iran                                                                                              | Iran Application No. 38609165                            | Filed: November 27, 2007 |
| Jordan                                                                                            | Jordan Application No. 460/2007                          | Filed: November 4, 2007  |
| Lebanon                                                                                           | Lebanon Application No. 6837                             | Filed: November 1, 2007  |



CONSULADO DE COLOMBIA

No. 281 Ottawa, Canadá, el 2 de Diciembre de 2008

Visto en este Consulado para autenticar la firma de VALERIE TAILLEUR quien en esta fecha ejercía las funciones de OFICIAL DE AUTENTICACIONES M.R.E DE CANADÁ  
Cónsul de Colombia

MINISTERIO DE RELACIONES EXTERIORES

9 DE ENERO DE 2009 – 860069

JEFE DE LEGALIZACIONES BOGOTÁ, D.C.

CANADÁ )

Provincia de Ontario )

A TODOS LOS QUE PUEDAN VER O CONOCER  
LOS PRESENTES

Consideración: )

Yo, Diana Mansour, un Notario Público en y para la Provincia de Ontario, debidamente nombrado por la Autoridad Real y residente en la ciudad de Ottawa, en la Provincia de Ontario, CERTIFICO Y ATESTIGUO que el documento anexo es una copia fiel de un documento dirigido y presentado ante mí y corresponde a la Asignación de la invención notariada con fecha efectiva 31 de diciembre de 2007; comparé la copia con el documento original, un acto que me fue solicitado, y he otorgado bajo mi firma y sello notarial de la oficina para servir de acuerdo como sea requerido.



MINISTERIO DE  
RELACIONES EXTERIORES

2009 ENE 21 A 9:57

*msl*  
JEFE DE LEGALIZACIONES  
BOGOTÁ D.C.

BO SE AGUPE  
RESPONSABILIDAD  
DEL TERN

864941

*C/Coerencia PAREDES*

COERENCIA PAREDES EN EL  
GOBIERNO DE COLOMBIA  
ASIGNACIONES INDICADAS

MINISTERIO DE RELACIONES EXTERIORES  
RECIBO LEGALIZACION  
No. 9422(32)

Autenticado por el Director de Registro de  
Bogotá, fecha de autenticación 22 de ENE 2009  
que este copia realizada con documento  
original presentado para su autenticación  
Bogotá de 2009, D. C. República de Colombia

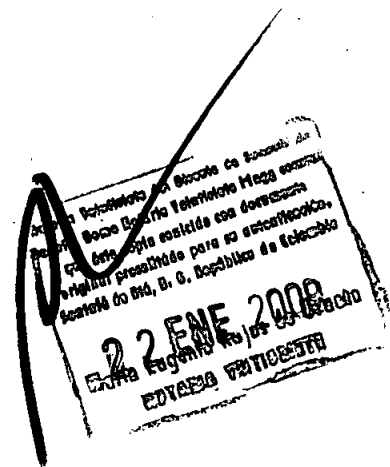
**22 ENE 2009**  
Merla Eugenia Rojas de Urzeta  
BOGOTÁ, VEINTIDOS

EN TESTIMONIO DE LO CUAL he suscrito mi nombre y fijado mi sello notarial de la  
Oficina en la ciudad de Ottawa, este día 7 de noviembre de 2008.

(Sello)

UN NOTARIO PÚBLICO EN Y PARA LA PROVINCIA DE ONTARIO

Certificado en el Departamento de Relaciones Exteriores y Comercio Internacional para la  
legalización de la firma anterior de  
Ministro de Relaciones Exteriores  
CANADÁ



Resolución  
6694/78  
Minjusticia

Traducción Oficial  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

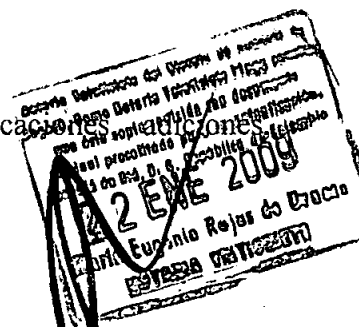
## ASIGNACIÓN DE LA INVENCION

Esta asignación entra en vigor el 31 de diciembre de 2007

En consideración de un (\$1.00) dólar y otras consideraciones buenas y valiosas, cuyo recibo y suficiencia se reconoce por medio del presente, Plasco Energy Group Inc., (de ahora en adelante referido como el "Cedente"), cuya dirección es 1000 Innovation Drive, Suite 400, Kanata, Ontario K2K 3E7, Canadá, confirmo en forma de un Contrato de Contribución celebrado el 31 de diciembre de 2007 por y entre Plasco Energy Group Inc., y PlascoEnergy IP Holdings, S.L., ha contribuido, asignado, transferido y cedido y por medio del presente contribuyo, asigno, transfiero y cedo a PlascoEnergy IP Holdings, S.L., actuando mediante su sucursal Schaffhausen (PlascoEnergy IP Holdings, S.L., Bilbao, Sucursal Schaffhausen) (de ahora en adelante el "Cedente actuando mediante su Sucursal Suiza"), cuya dirección es Vordergasse 3, CH-8200 Schaffhausen, Suiza, todos sus derechos, títulos e intereses en todo el mundo, excepto Canadá y los Estados Unidos, en y sobre lo siguiente:

- 1) Las invenciones relacionadas con las solicitudes de patente/patentes listadas en el Programa A anexo;
- 2) todas las mejoras, incluyendo sin limitación las modificaciones, sustituciones, derivaciones y eliminaciones de dicha invención;
- 3) las solicitudes antes identificadas en (1) y las solicitudes de la fase nacional;

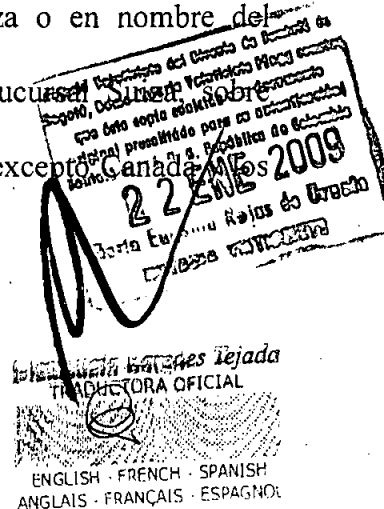
Resolución  
6694/78  
Minjusticia



Clemente Parades Tejeda  
TRADUCTORA OFICIAL  
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- 4) todas las demás solicitudes para las Cartas de Patente y certificaciones, notificaciones, publicaciones y restricciones en cualquier país del mundo, excepto Canadá y Estados Unidos, para dichas invenciones y mejoras, incluyendo sin limitación todas las solicitudes divisionales, continuaciones, continuaciones en parte, renovaciones, remisiones y solicitudes sustitutas;
- 5) todas las Cartas de Patente u otros derechos que se puedan expedir o derivar de cualquiera de dichas solicitudes, certificaciones, notificaciones, publicaciones y registros, tal como se ejemplifica en los numerales (3) y (4) anteriores en cualquier país del mundo, excepto Canadá y los Estados Unidos;
- 6) todos los derechos de Convenciones o Tratados derivados de dichas solicitudes en todo el mundo, excepto Canadá y los Estados Unidos.
- 7) Todos los derechos de prioridad en todo el mundo en y sobre dichas solicitudes; y
- 8) el derecho total y completo para radicar las solicitudes por Cartas de Patente a nombre de Cesionario actuando mediante su Sucursal Suiza o en nombre del Cedente a elección del Cesionario actuando mediante su Sucursal Suiza sobre dichas invenciones y mejoras en todos los países del mundo, excepto Canadá y Estados Unidos.

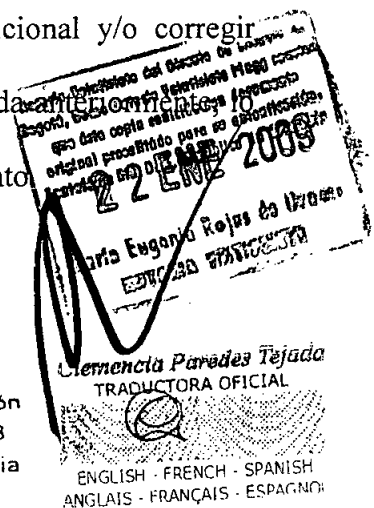
Resolución  
6694/78  
Minjusticia



Por dicha consideración, el Cedente acuerda, a solicitud del Cesionario, actuando mediante su Sucursal Suiza, sus sucesores y asignados, ejecutar cualquiera y todas las solicitudes divisionales, continuaciones, continuaciones en parte, remisiones y solicitudes sustitutas para dichas invenciones y mejoras y reconozco y acuerdo que todos los derechos serán investidos en el Cesionario actuando mediante su Sucursal Suiza, sus sucesores y asignados, mediante el cual dichas solicitudes y Cartas de Patente, certificaciones, notificaciones, publicaciones y registros serán mantenidos y disfrutados por dicho Cesionario actuando mediante su Sucursal suiza, sus sucesores y asignados, hasta la terminación completa del término por el cual se otorgaran dichas Cartas de Patente, certificaciones, notificaciones, publicaciones y registros, totalmente y completamente como si esta asignación no se hubiera hecho. Además, a solicitud del Cesionario actuando mediante su Sucursal Suiza, ejecutar cualquiera y todos los documentos requeridos por el Cesionario actuando mediante su Sucursal Suiza para invertir completamente y apropiadamente los derechos antes mencionados en el Cesionario actuando mediante su Sucursal Suiza.

El suscrito por medio del presente le otorga a la firma **MBM Intellectual Property Law, LLP**, con oficinas ubicadas en P.O Box 809, Station B, Ottawa, Ontario, Canadá K1P 5P9, el poder para insertar en esta asignación cualquier información adicional y/o corregir errores de oficina en la información pertinente a la solicitud referenciada anteriormente, la cual puede ser necesario o deseable para la recordación de este documento.

Resolución  
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Minjusticia



## EJECUCIÓN DE LA ASIGNACIÓN DE LA INVENCION

En testimonio de lo cual el Cedente y el Cesionario actuando mediante su Sucursal Suiza ha causado la ejecución de esta Asignación a ser ejecutada en dos originales por sus representantes debidamente autorizados que entra en vigor a partir de la fecha efectiva.

Ejecución por parte del Cedente

PLASCO ENERGY GROUP INC.

TESTIGO:

Por

Por

TIM SAUNDERS

LISA SOULIERE

31 de octubre de 2008

31 de octubre de 2008

OTTAWA, CANADÁ

(Ciudad y país en donde se ejecuta la asignación)

Autenticación de la firma del testigo del Cedente

Yo, LISA SOULIERE, de 13 LONG GATE COURT NEPEAU ONT, declaro que estuve personalmente y fui el testigo del Cedente antes mencionado quien firmó y ejecutó debidamente la Asignación anterior.

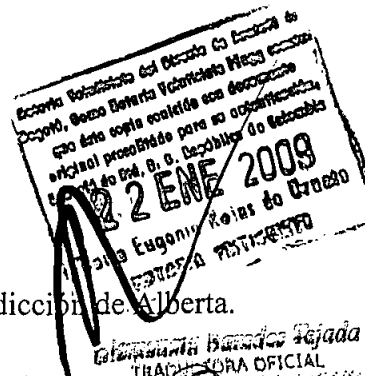
Juramentado ante mí en OTTAWA

Canadá, el 31 de octubre de 2008

Nombre del Comisionado

Firma del Comisionado

Un Comisionado para tomar juramentos y declaraciones para la jurisdicción de Alberta.



REGISTRAR  
6694/78  
Minjusticia

Notary Public Seal for Eugénie Kéris de Grosse, Notary Public, Alberta, Canada. The seal includes the date 2 ENE 2009 and the text 'Eugénie Kéris de Grosse', 'Notary Public', 'Alberta, Canada'.

## EJECUCIÓN DE LA ASIGNACIÓN DE LA INVENCION

### Ejecución por parte del Cesionario actuando mediante su Sucursal Suiza

PLASCO ENERGY IP HOLDINGS, SL.,

TESTIGO

BILBAO, SCHAFFHAUSEN BRANCH

Por

Por

Nombre: Dr. Herbert Trachsler

Esther Buesser

Cargo: Gerente sucursal

3 de noviembre de 2008

3 de noviembre de 2008

ZURICH, SUIZA

(Ciudad y país en donde se ejecuta la asignación)

### Autenticación de la firma del testigo del Cesionario actuando mediante su Sucursal Suiza

Yo, ESTHER BUESSER de CH (ILEGIBLE), declaro que estuve personalmente y fui el testigo del Cesionario antes mencionado quien firmó y ejecutó debidamente la Asignación anterior.

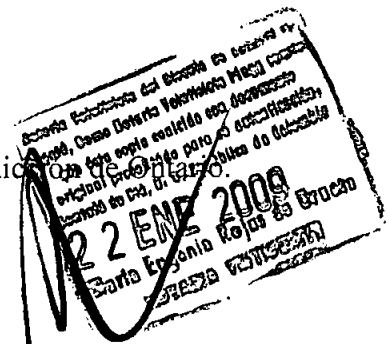
Juramentado ante mí en

Nombre del Comisionado

Firma del Comisionado

Un Comisionado para tomar juramentos y declaraciones para la jurisdicción

Resolución  
6694/78  
Minjusticia



Elaborada por Esther Buesser  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

**Certificación oficial**

Visto para la autenticación de la firma en el lado reverso, fijada en nuestra presencia por la Sra. Esther BUSSER, nacida el 1 de diciembre de 1948, ciudadana suiza, de acuerdo con su información residente en Am Pfisterholzli 48, 8606 Greifensee, personalmente conocida por nosotros.

Zurich, 3 de noviembre de 2008

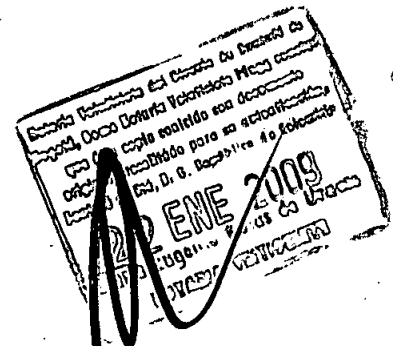
BK No. 3545-3546/ems

**NOTARIO**

Stefan Walder, notario público delegado

**PROGRAMA A**

| Pais                                                                                                             | Solicitud No                                  | Fecha de Solicitud |
|------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------|
| <b>FAMILIA VIII: Instalación de Gasificación a Baja Temperatura con un Gasificador Orientado Horizontalmente</b> |                                               |                    |
| <b>PCT INTERNACIONAL</b>                                                                                         | Solicitud Internacional No.<br>PCT/US07/68407 | Mayo 7 de 2007     |



Resolución  
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Minjusticia

**Eleonora Patricia Tejada**  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

**HUMBERTO RUBIO & CIA LTDA.**  
**ABOGADOS**

Propiedad Industrial e Intelectual

**PODER**

El abajo firmado

PlascoEnergy IP Holdings, S.L., Bilbao,  
Schaffhausen Branch

domiciliado en Vordergasse 3, CH-8200

Schaffhausen, Suiza

por el presente conferimos poder amplio y suficiente a **HUMBERTO RUBIO CAMACHO y/o TINEKE STOL TERZANI y/o HUMBERTO RUBIO STOL** domiciliados en Bogotá, Colombia, para solicitar de las oficinas y autoridades correspondientes la obtención de registros, renovaciones, traspasos y en general todo lo relacionado con el mantenimiento, obtención y protección de sus marcas de fábrica, denominaciones comerciales, marcas de comercio y patentes, licencias sanitarias a cuyo efecto le faculta para dar ante dichas autoridades todos los pasos necesarios en cumplimiento del objeto indicado; elevar solicitudes, descripciones, protestas, declaraciones, apelaciones y reclamos; abonar todos los impuestos y cuotas de cualquier otros pagos determinados por la Ley; recibir todos los documentos presentados, solicitar testimonios, desistir y enmendar solicitudes, cobrar y percibir para oponerse y protestar contra cualquier solicitud, que a juicio del apoderado, pudieran prestarse a confusión o infringir o de cualquier modo perjudicar las marcas, denominaciones o patentes del Mandante. A los mandatarios se les otorga autorización amplia y bastante para contestar todos los reclamos y las demandas presentadas ante autoridades administrativas y judiciales, desistir de procedimientos, transar conflictos, pudiendo así mismo sustituir este Poder en todo o en parte y revocar dichas sustituciones.

Dado y firmado hoy

en

**NOTARIZATION AND LEGALIZATION BY  
APOSTILLE OR COLOMBIAN CONSULATE  
IS REQUIRED.**

**BOGOTA - COLOMBIA**

Para patentes, modelos, dibujos, marcas de fábrica de comercio y servicio, enseñanzas y nombres comerciales. Licencias y registros sanitarios.

For patents, designs, trademarks, emblems, commercial names. License health registrations.

**POWER OF ATTORNEY**

The undersigned

**PlascoEnergy IP Holdings, S.L., Bilbao,**  
**Schaffhausen Branch**

from

Vordergasse 3, CH-8200 Schaffhausen,  
Switzerland.

hereby grant full and sufficient Power of Attorney to a **HUMBERTO RUBIO CAMACHO y/o TINEKE STOL TERZANI y/o HUMBERTO RUBIO STOL** from Bogotá, Colombia, to apply to the proper officers and authorities for the issue of registrations, renewals, assignments, proofs of renewals and in general all that is related to the maintenance, obtention and protection of its trademarks, tradenames, commercial marks, patents and sanitary licenses; to which end it empowers them to take all steps necessary before said authorities for the object stated; to file petitions, prepare descriptions; make protests, declarations, appeals and objections; pay taxes and other charges required by law; apply for certifications, receive documents and take testimony abandon and amend applications and collect refunds; to oppose, ask for the cancellation of and protest any application or registration which in their judgment could lend to confusion or could be considered an infringement or could in any form prejudice the undersigned's trademarks, tradenames, patents and commercial marks. To the said mandatory sufficient Power is granted hereby to answer in the matter of all claims and demands that maybe presented, before administrative or judicial officers of any class, giving them likewise Power to abandon proceeding, settle conflicts, substitute these present in whole or in part and revoke such substitutions.

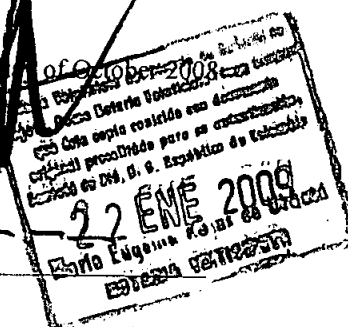
Given and signed this 23<sup>rd</sup>

In Kanata, Ontario, Canada

Signature

By: Herbert Trachsler

Title: Branch Manager



**HUMBERTO RUBIO & CIA LTDA.**  
**ABOGADOS**

Propiedad Industrial e Intelectual

**CERTIFICADO NOTARIAL (Individuo)**

A los            días del mes de            ante mi,  
Notario Público de compareció personalmente

a quien(es) doy fe de conocer y me consta que  
es(son) la(s) persona(s) firmante(s) del documento  
que precede, y quien(es) tiene(n) capacidad legal  
para otorgarlo.

**CERTIFICADO NOTARIAL (SOCIEDAD)**

Hoy 23 de Oct de 2008  
compareció(eron) personalmente

Herbert Trachsler

a quien(es) conozco como la(s) persona(s) que  
firma(n) este documento en representa- ción de la  
sociedad/compañía denominada

PlascoEnergy IP Holdings, S.L., Bilbao,  
Schaffhausen Branch

Certifico:

a) Que PlascoEnergy IP Holdings, S.L.,  
Bilbao, Schaffhausen Branch  
es una sociedad/compañía legalmente constituida  
y existente de acuerdo con las Leyes de  
Suiza

b) Que el domicilio de dicha sociedad/compañía  
es Vordergasse 3, CH-8200, Schaffhausen  
Suiza

c) Que el objeto u objetos para los cuales se  
otorga el presente poder están comprendidos  
dentro del objeto social de la mencionada  
sociedad/compañía.

d) Que

Herbert Trachsler  
está autorizado para otorgar el presente poder. Lo  
anterior está probado por medio de los siguientes  
documentos, que certifico he visto:

Ciudad            hoy de  
de

**NOTARIAL CERTIFICATE (Individual)**

On this    day of            before me, a Notary  
Public of            personally appeared to  
me known, and known to me to be the person(s)  
who executed that foregoing document, and who  
has (have) legal capacity to execute it.

**NOTARIAL CERTIFICATE (Corporation)**

On this 23rd day of October 2008  
personally appeared Herbert Trachsler

whom I know to be the person(s) who signed this  
document as representative(s) of the  
corporation/company named **PlascoEnergy IP  
Holdings, S.L., Bilbao, Schaffhausen Branch**

I Certify:

a) That **PlascoEnergy IP Holdings, S.L., Bilbao,  
Schaffhausen Branch**

is a corporation/company legally constituted and  
in existence accordance with the law of  
Switzerland

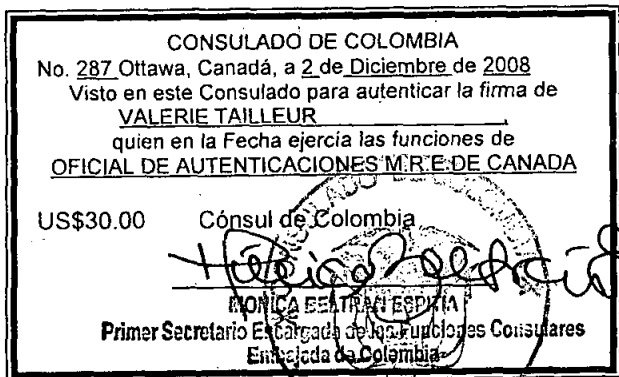
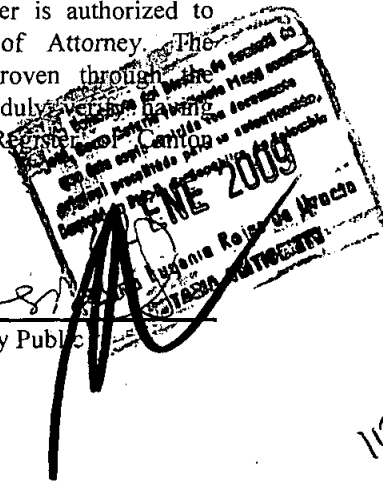
b) That the domicile of said corporation/company  
is Vordergasse 3, CH-8200 Schaffhausen,  
Switzerland.

c) That the purpose or purposes for which the  
present Power of Attorney is granted are  
compromised within the object set forth in the  
charter of the mentioned corporation/company.

d) That Dr. Herbert Trachsler is authorized to  
grant the present Power of Attorney. The  
aforementioned was duly proven through the  
following documents and I duly verified having  
seen them – Commercial Register of Canton  
Schaffhausen.

This 23<sup>rd</sup> day of October 2008

*Ariadni Athanassiadis*  
Ariadni Athanassiadis – Notary Public



112

NO SE ASUME  
RESPONSABILIDAD  
DEL TEXTO

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SECRETARÍA DE DEFENSA  
ASISTENTE SOCIAL

MINISTERIO DE  
RELACIONES EXTERIORES

2009 ENE - 9 A 8:51

Quito

JEFE DE LA LEGACIÓN  
QUITO D. C.

Original del Estado de Ecuador  
Copia, como Material Fotográfico, para ser  
uso de esta copia es el único en el Estado  
original procedente para su autenticación  
Secretaría de G. D. C. República de Ecuador  
**22 ENE 2009**  
Mario Eugenio Rojas de Urquiza  
ESTASIO VARGAS

CERTIFICADO EN EL DEPARTAMENTO DE ASUNTOS EXTRANJEROS Y  
COMERCIO INTERNACIONAL PARA LEGALIZACION DE LA PRESENTE FIRMA  
CANADA

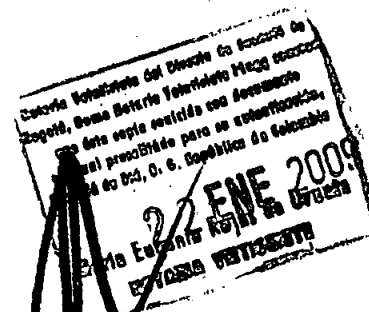
DIPUTADO DEL MINISTERIO DE ASUNTOS EXTRANJEROS

MINISTERIO DE RELACIONES EXTERIORES NO. 860067

FECHA: ENERO 9 DE 2009

JEFE DE LEGALIZACION DE SANTA FE DE BOGOTA

YO CLEMENCIA PAREDES TRADUCTORA OFICIAL COMPETENTE DE INGLES-  
ESPAÑOL-INGLES Y FRANCES-ESPAÑOL-FRANCES DEBIDAMENTE  
REGISTRADA ANTE EL MINISTERIO DE ASUNTOS EXTRANJEROS SEGUN LA  
RESOLUCION 6694/78 EXPEDIDO POR EL MINISTERIO DE JUSTICIA, CERTIFICO:  
QUE ESTA ES UNA TRADUCCION COMPLETA Y PRECISA EN LO MEJOR DE MI  
CONOCIMIENTO Y CREENCIA DEL DOCUMENTO ANEXO  
BOGOTA, DC. ENERO 16, 2009.



Resolución  
6694/78  
Minjusticia

Clemencia Paredes Tejada  
TRADUCTORA OFICIAL  
ENGLISH - FRENCH - SPANISH  
ANGLAIS - FRANÇAIS - ESPAGNOL

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CLARENCE

04933  
Clemens  
Paces

*[Faint, illegible markings]*

RECIBO LEGALIZACION



251227b

Superior Autoridade Judiciária do Estado do Rio de Janeiro  
 Superior Tribunal de Justiça do Estado do Rio de Janeiro  
 Este é o original autêntico com documento  
 original presente para a autenticação,  
 Estado do Rio de Janeiro, República do Brasil

22 ENE 2009  
 Mario Eugenio Rojas de Urbina  
 DISTRITO VOTACION

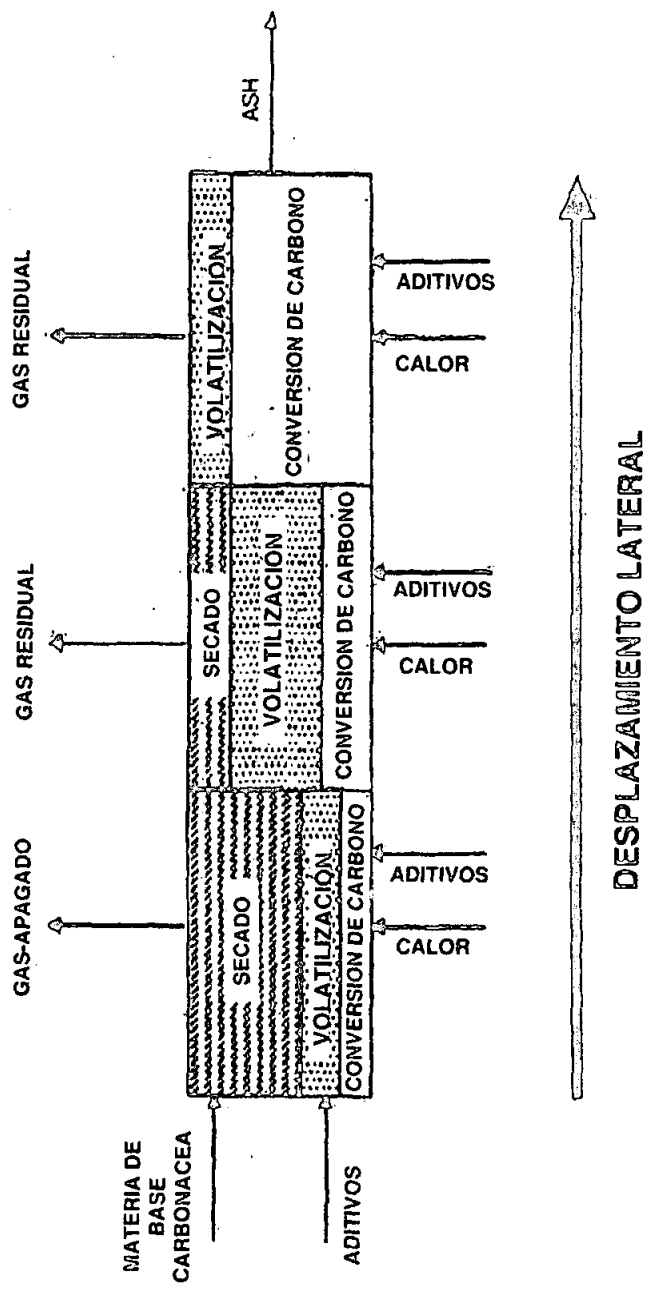


FIGURA 1

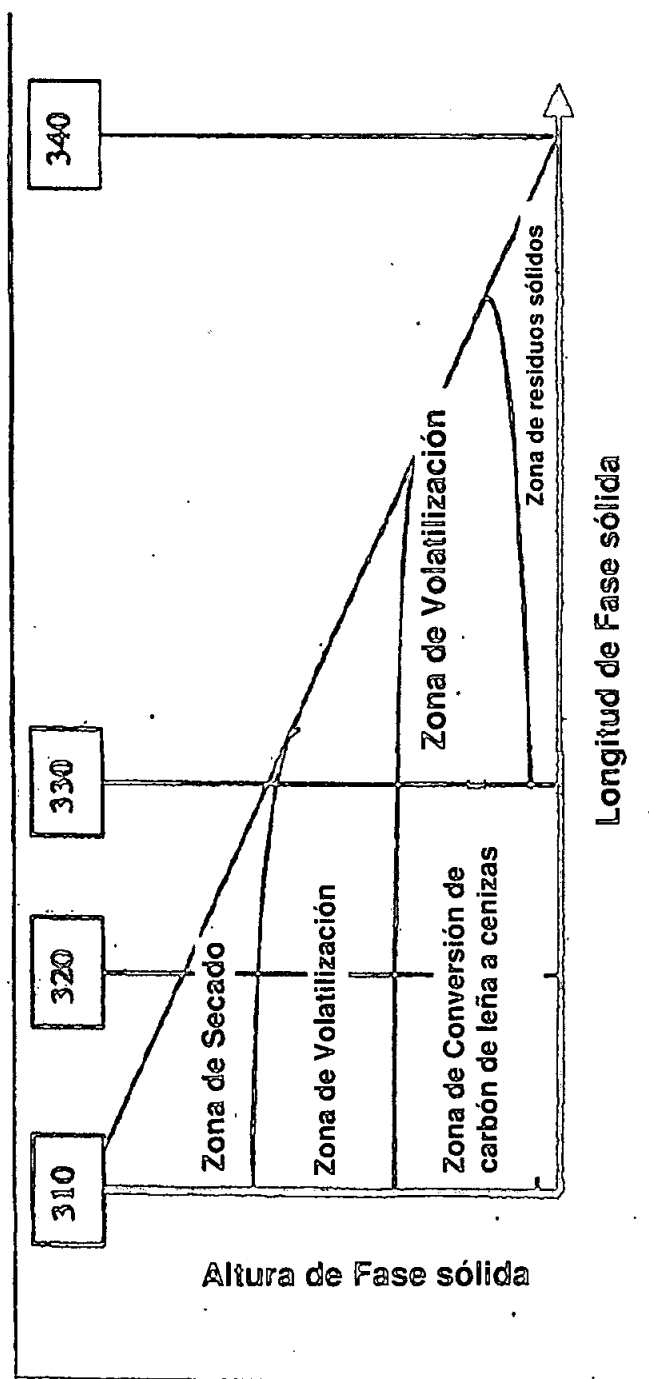
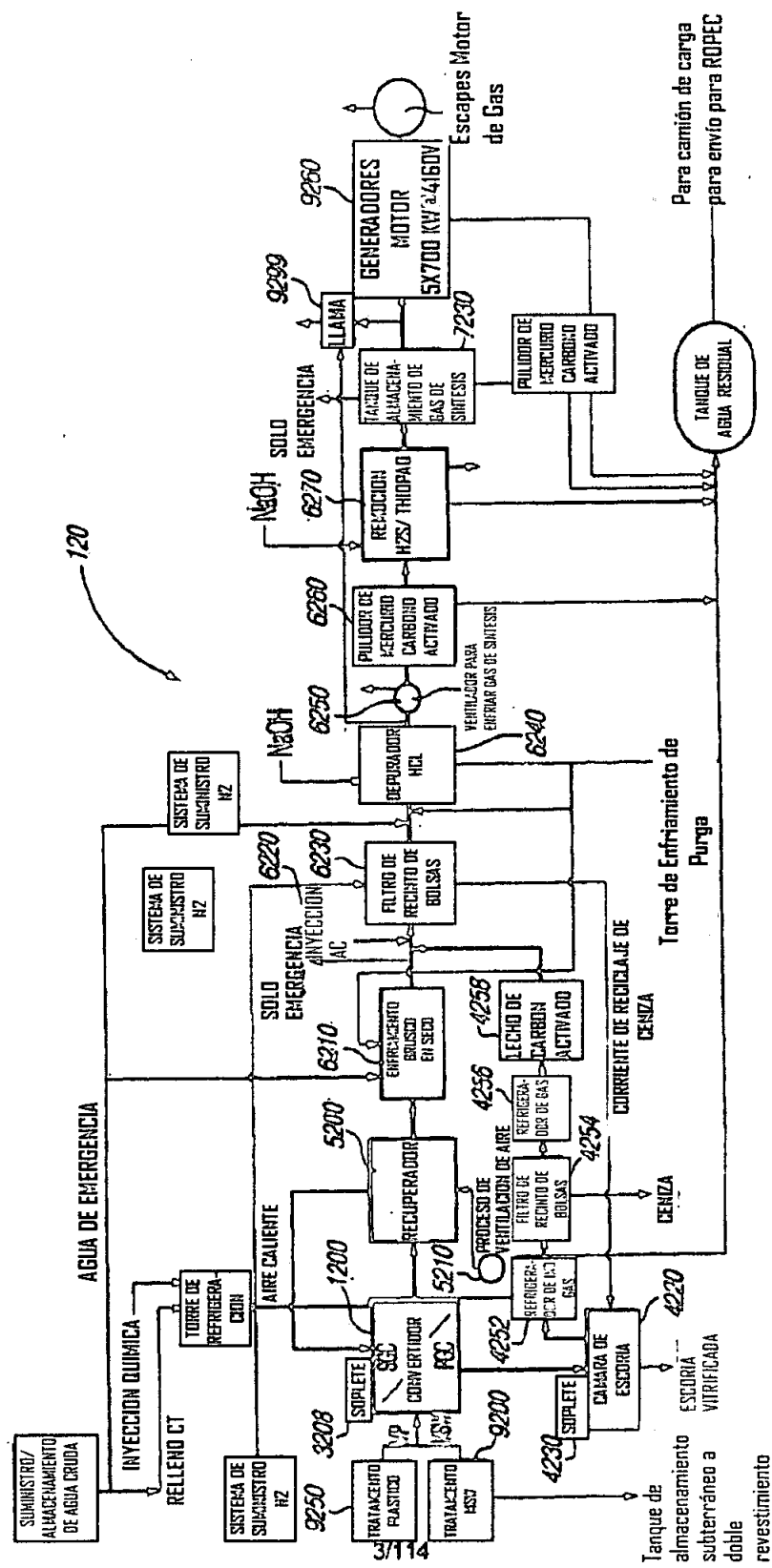


FIGURA 2



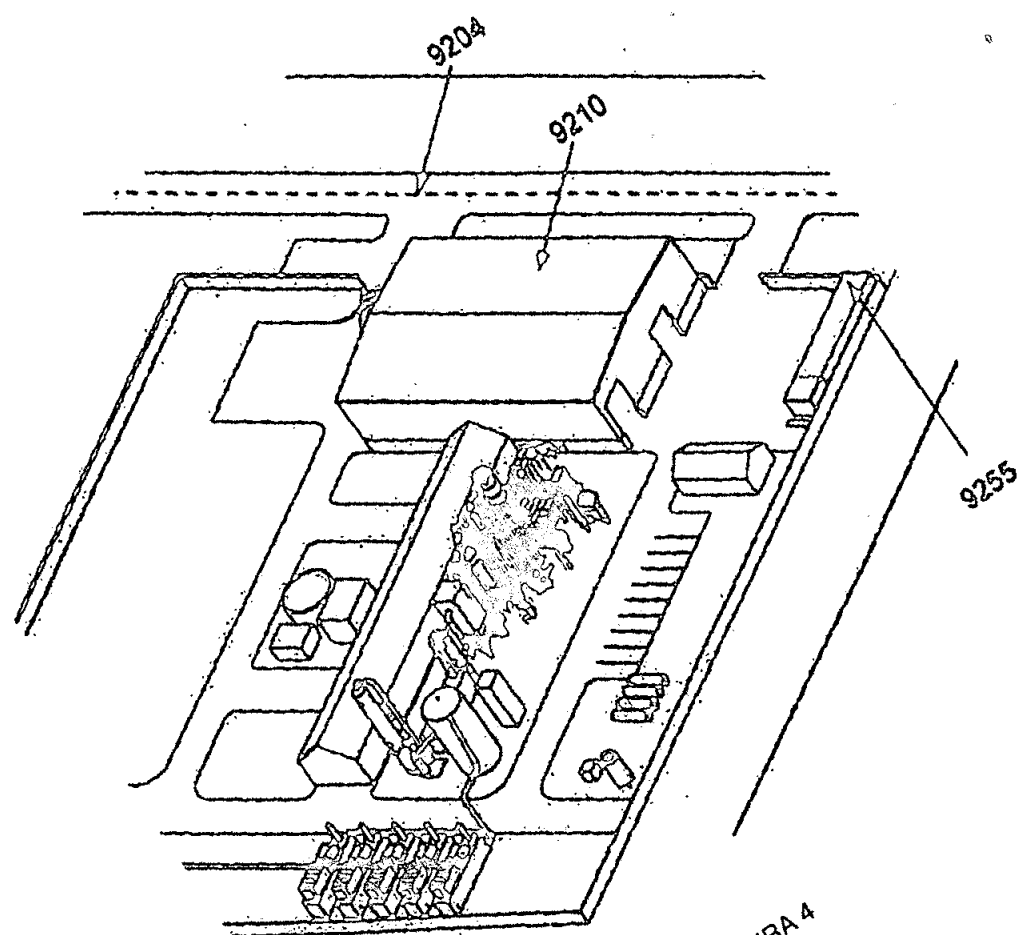


FIGURA 4

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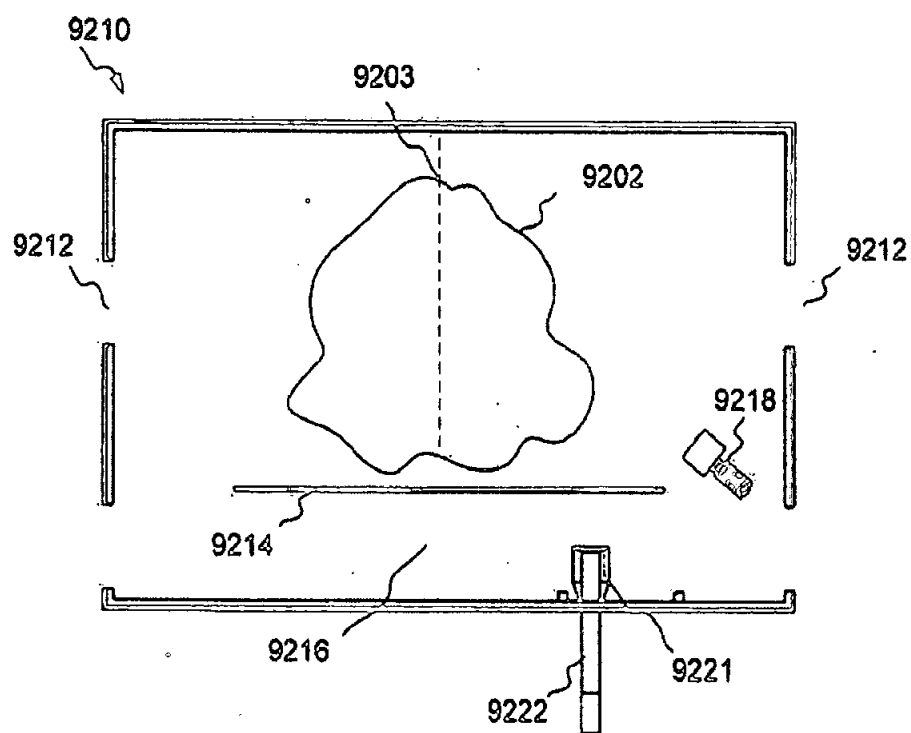


FIGURA 5

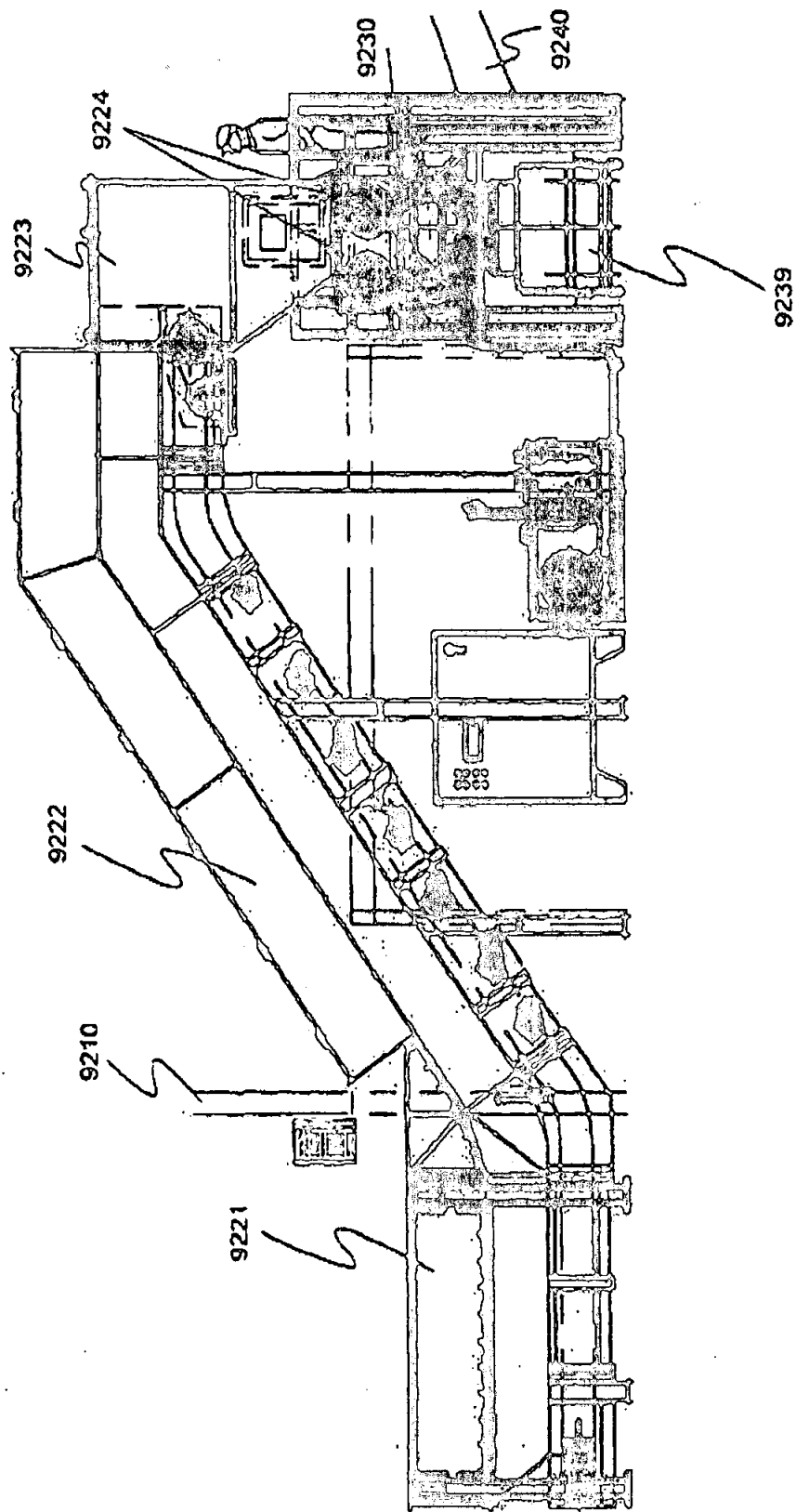


FIGURA 5A

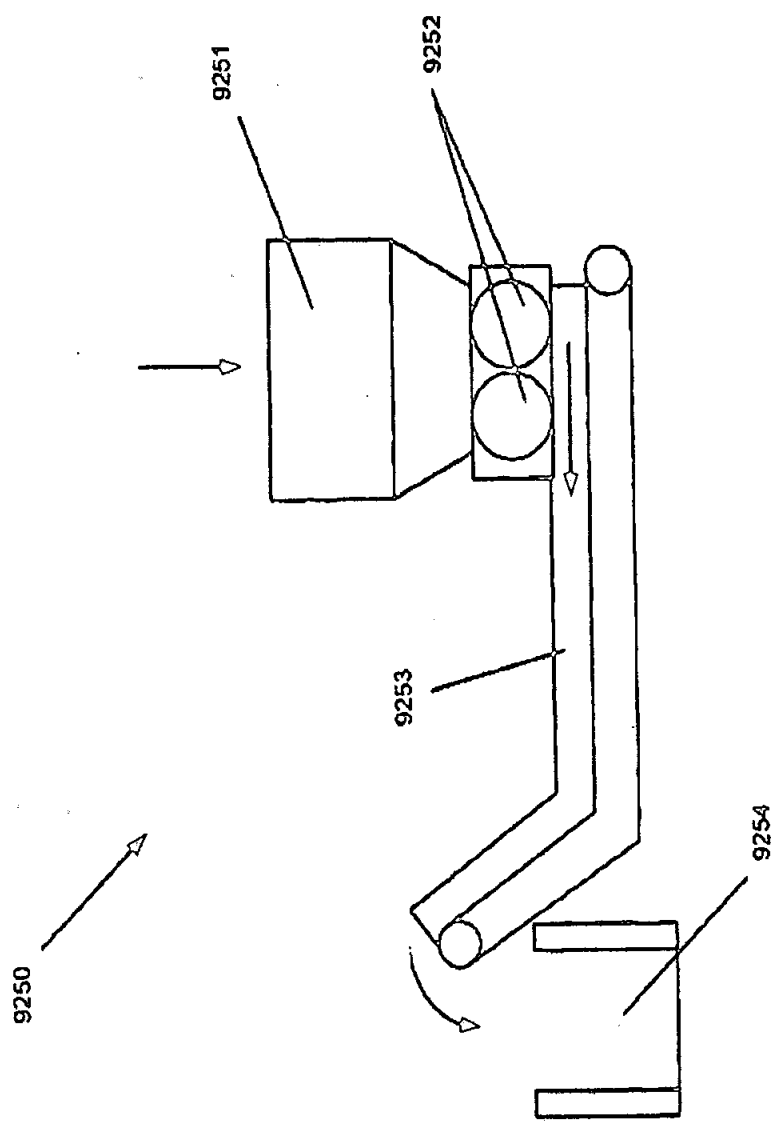


FIGURA 5B

7/114

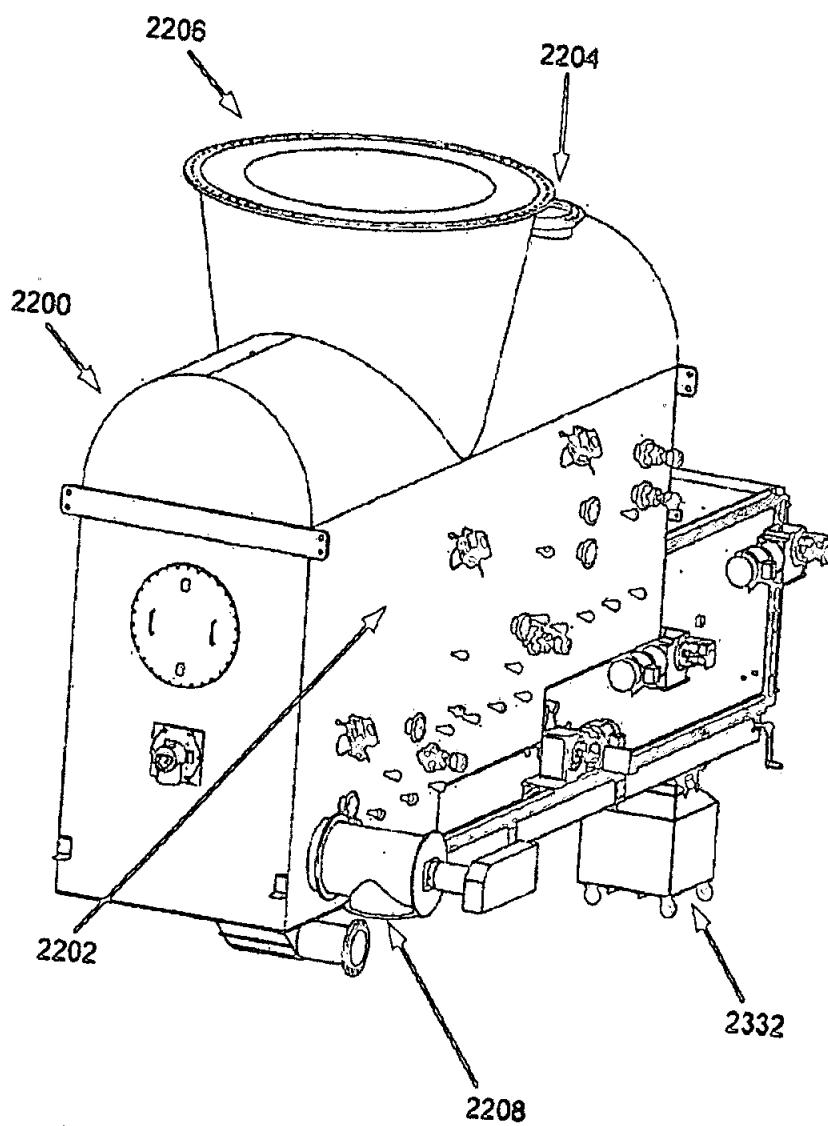
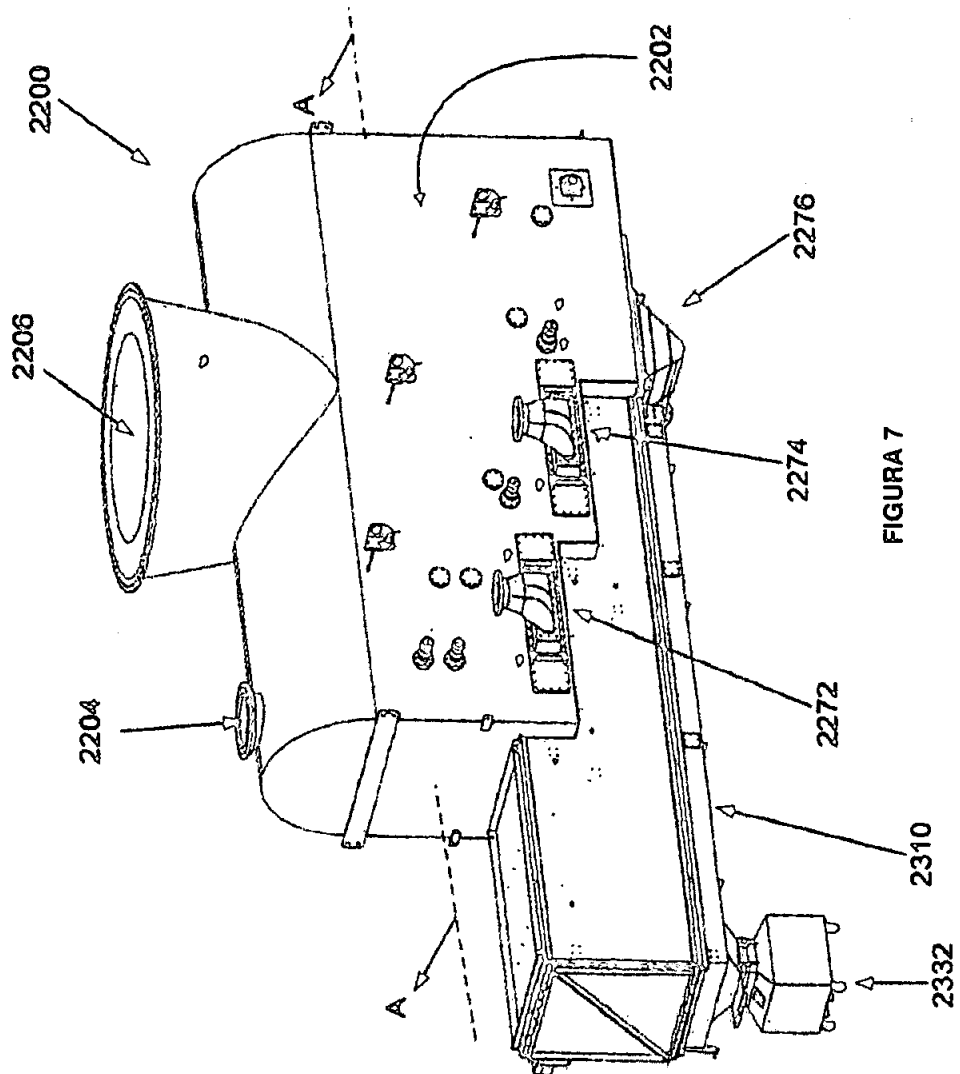


FIGURA 6



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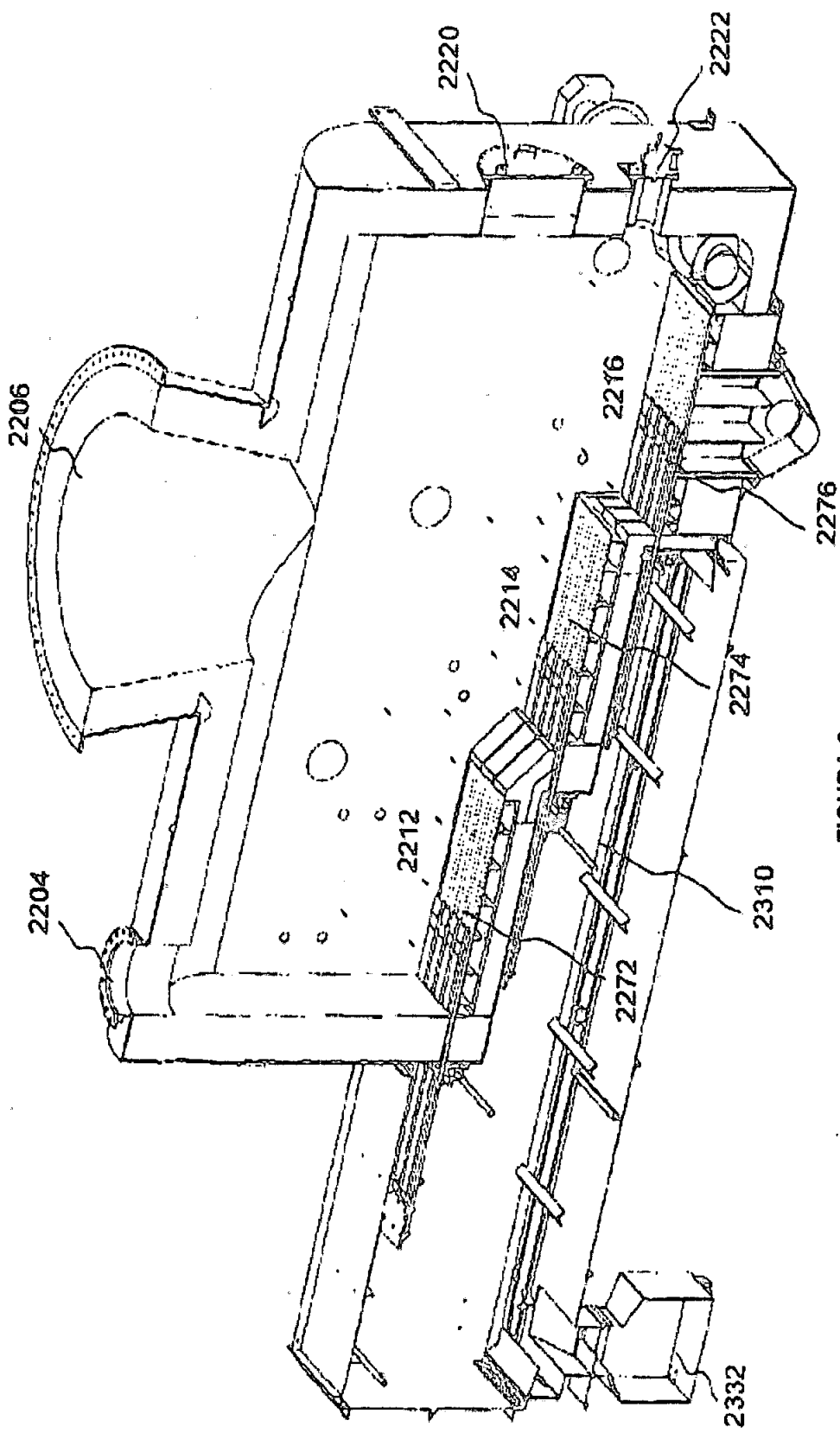


FIGURA 8

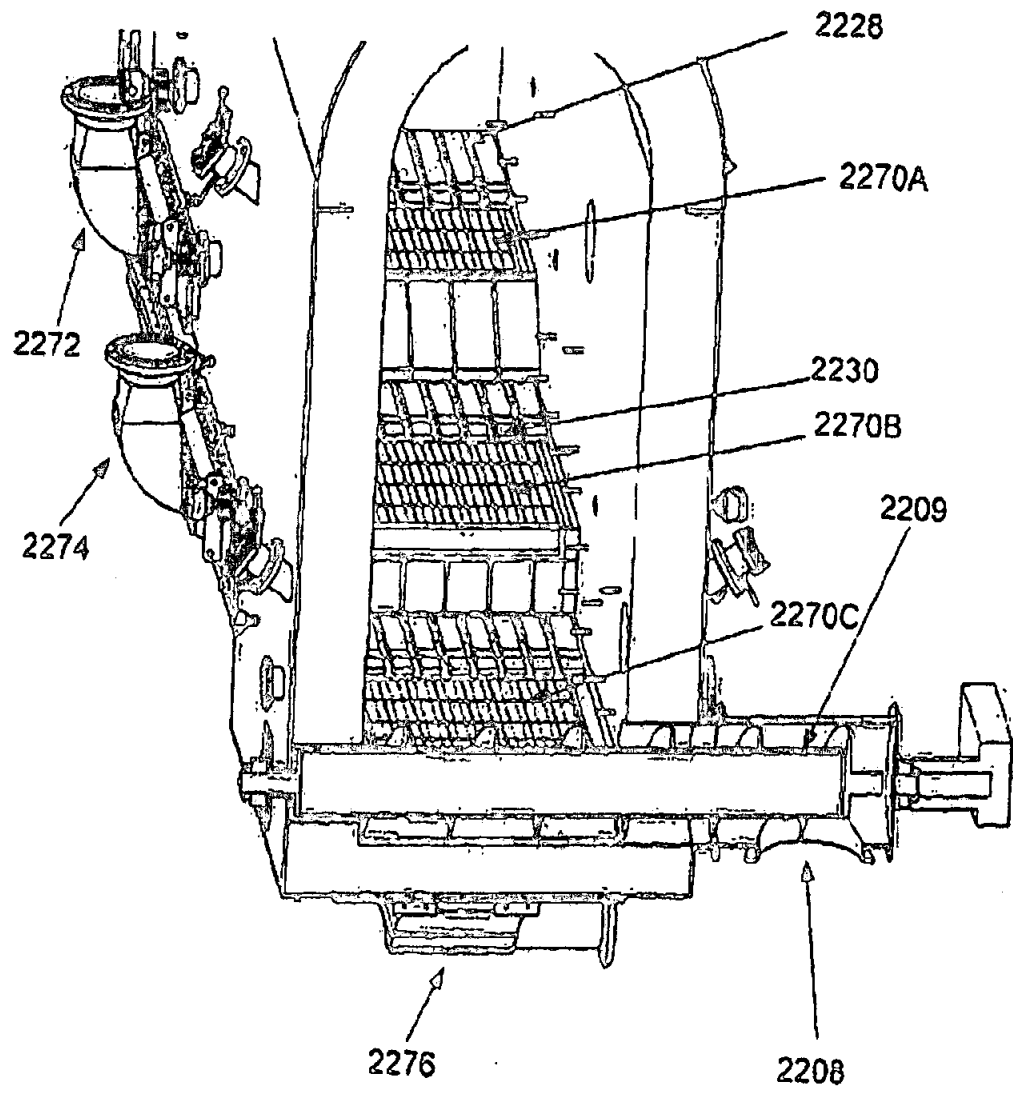


FIGURA 9

11/114

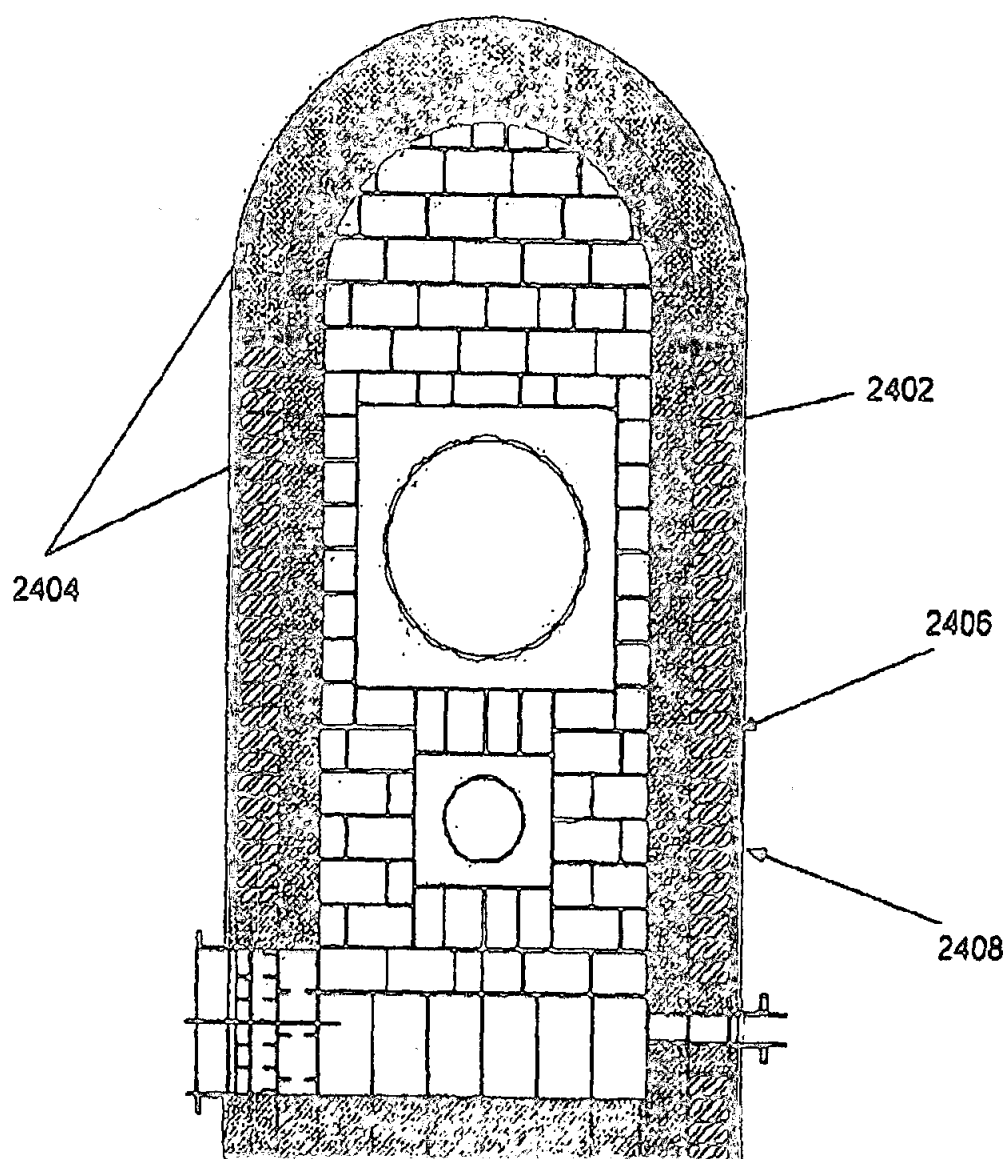
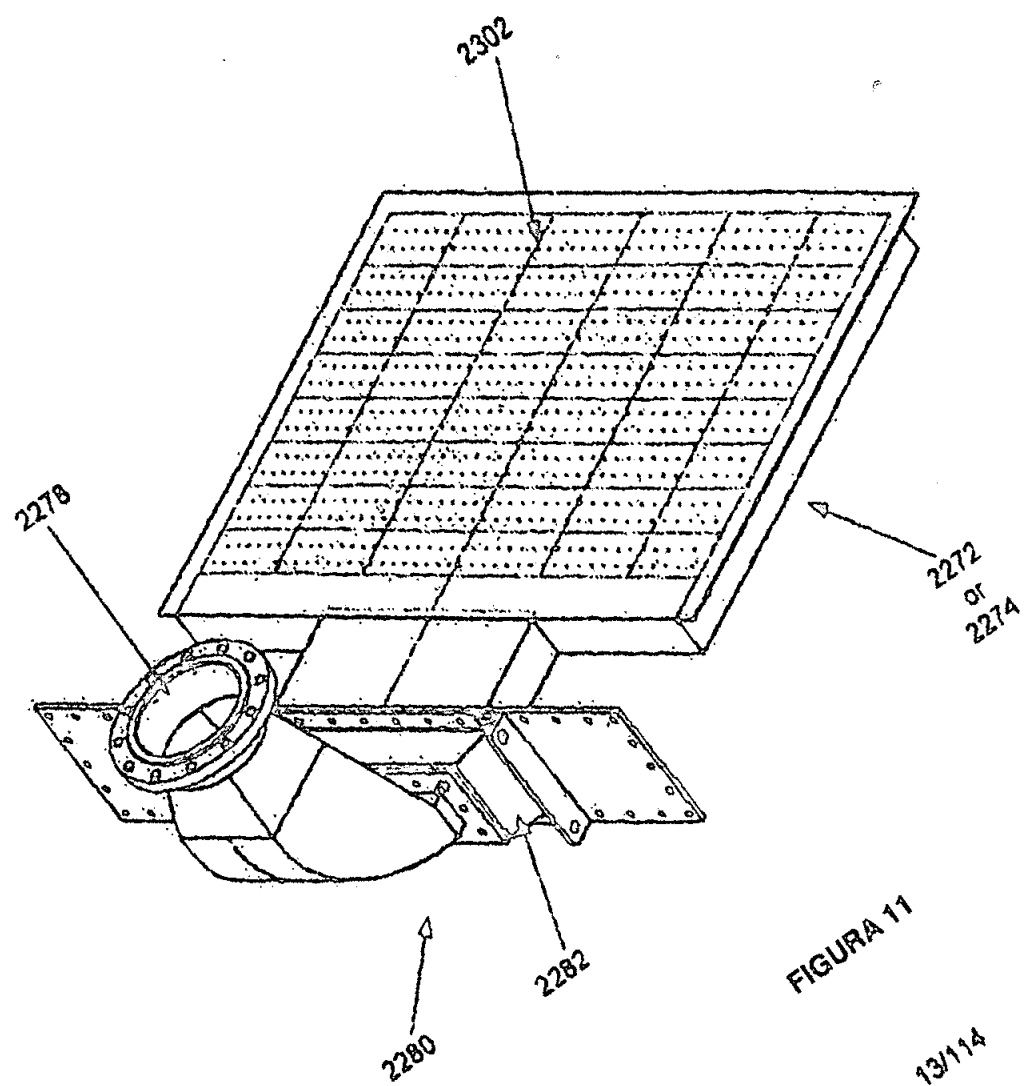


FIGURA 10

12/114



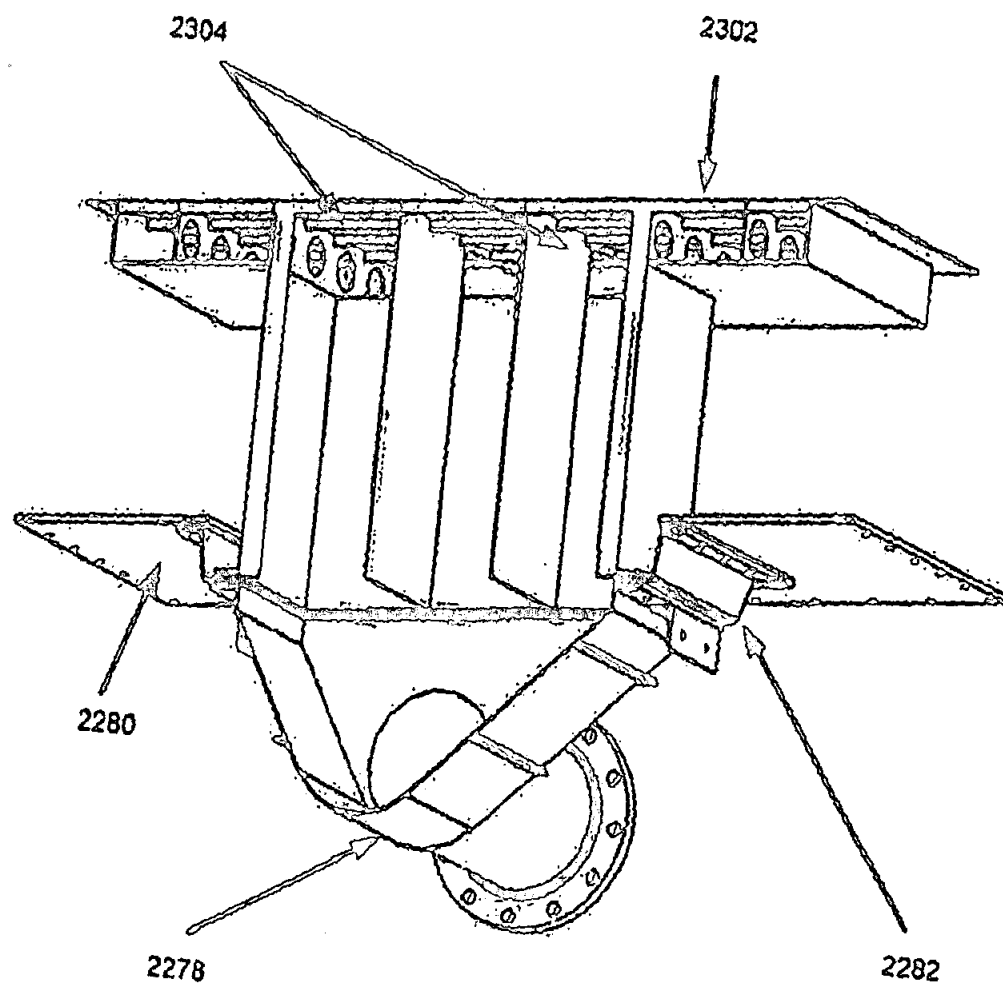


FIGURA 12

14/114

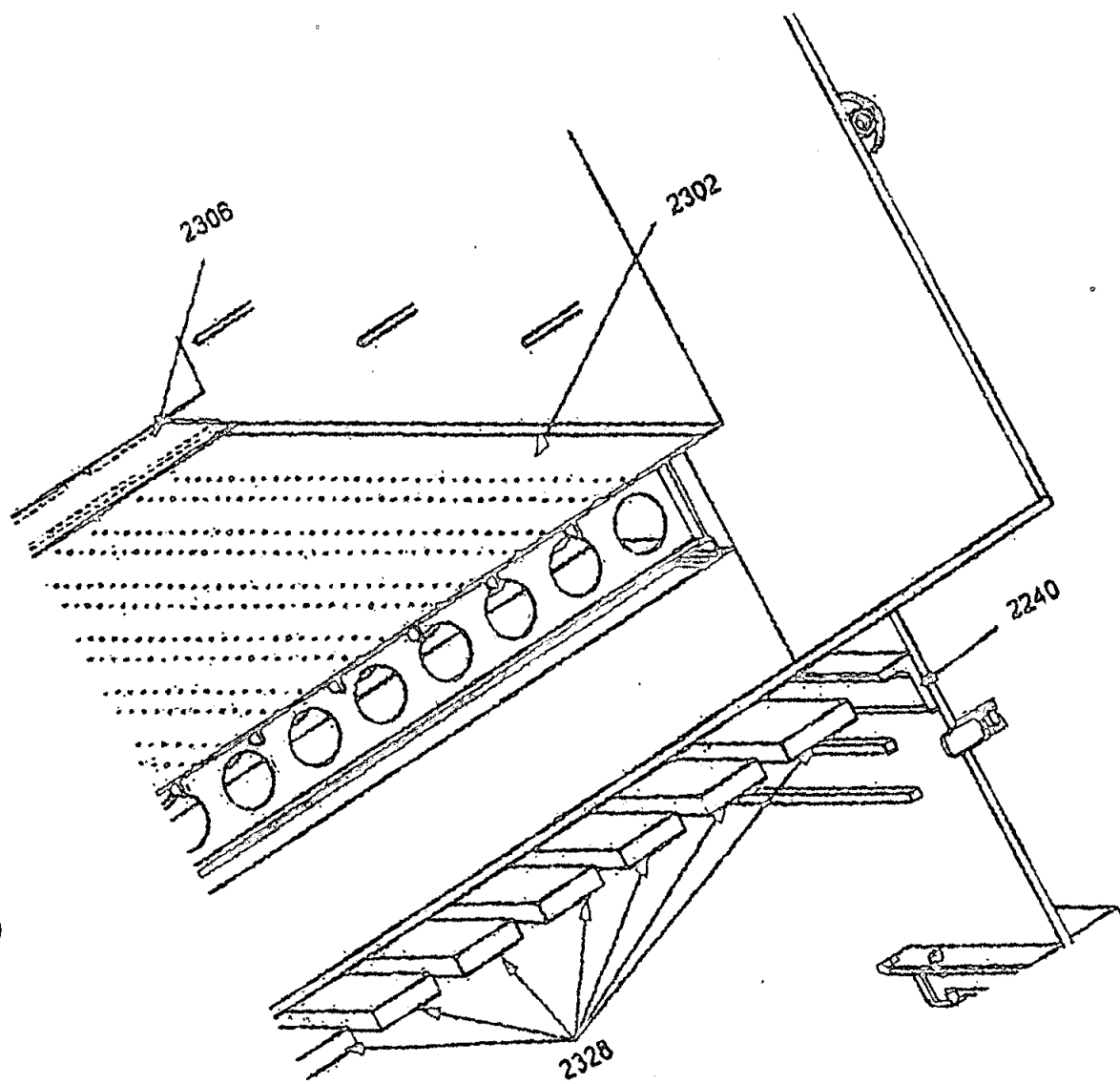


FIGURA 13

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2308

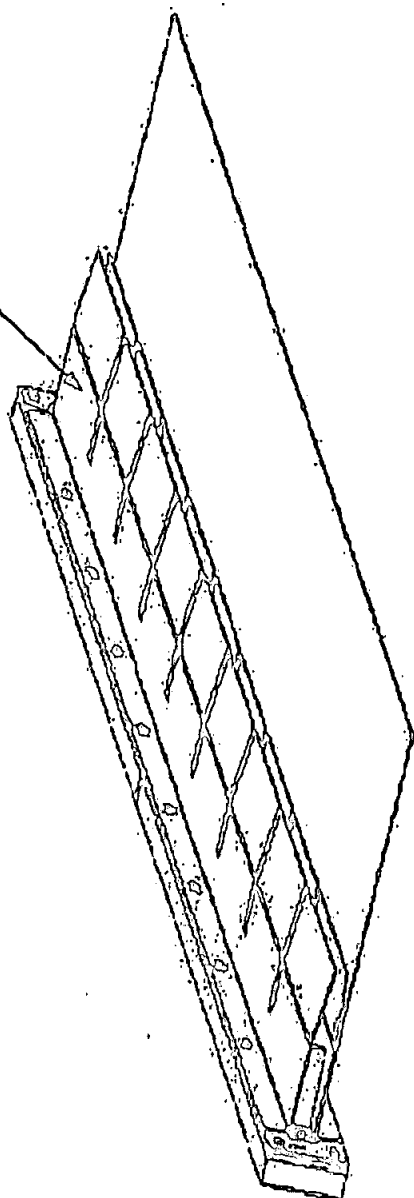


FIGURA 14

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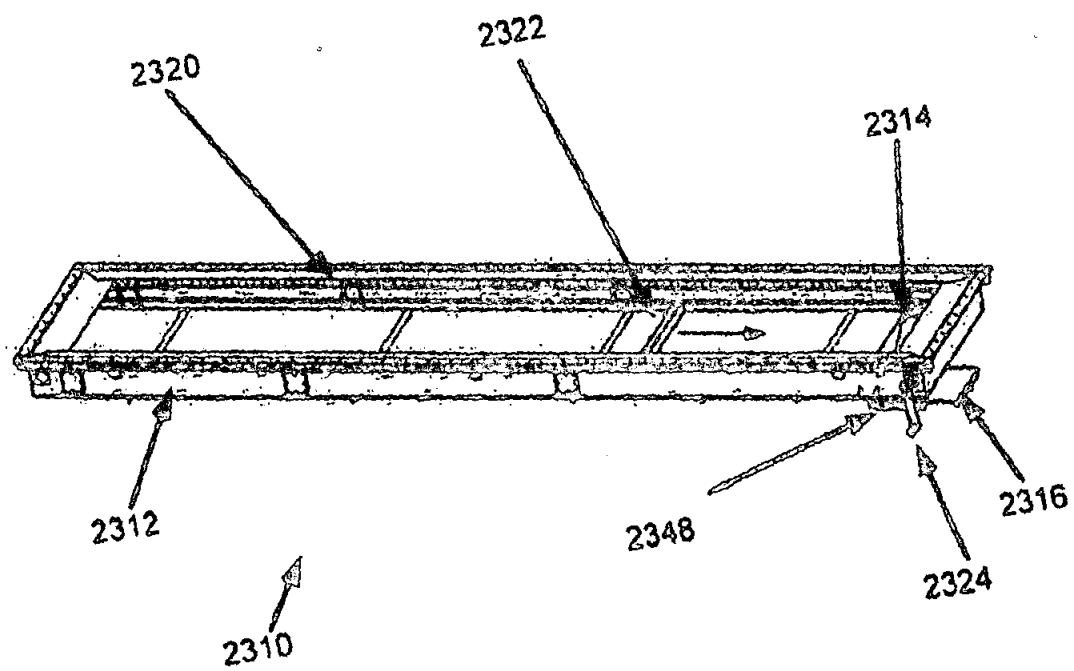


FIGURA 15

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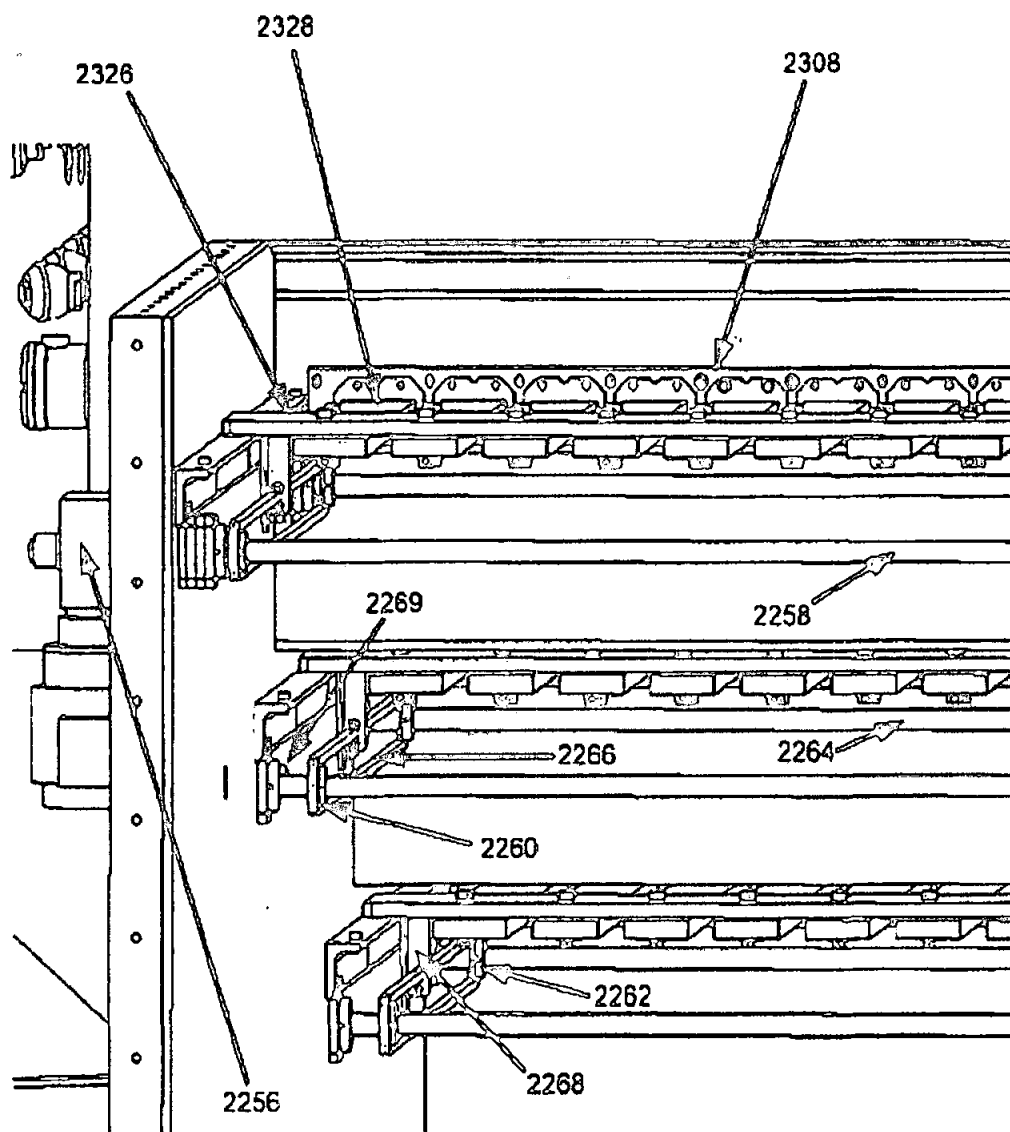


FIGURA 16

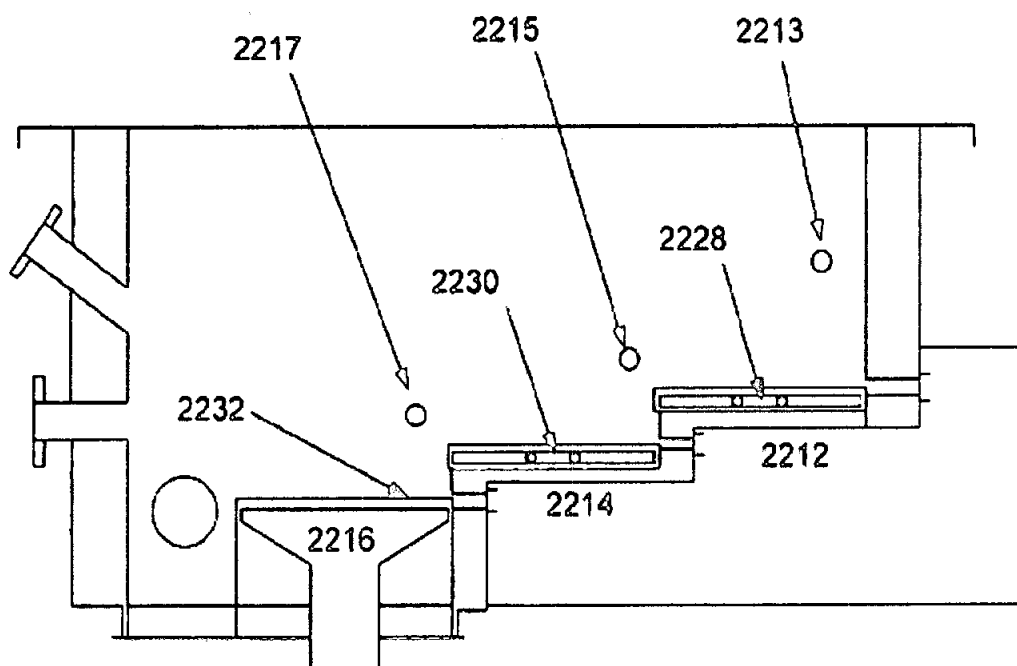


FIGURA 17

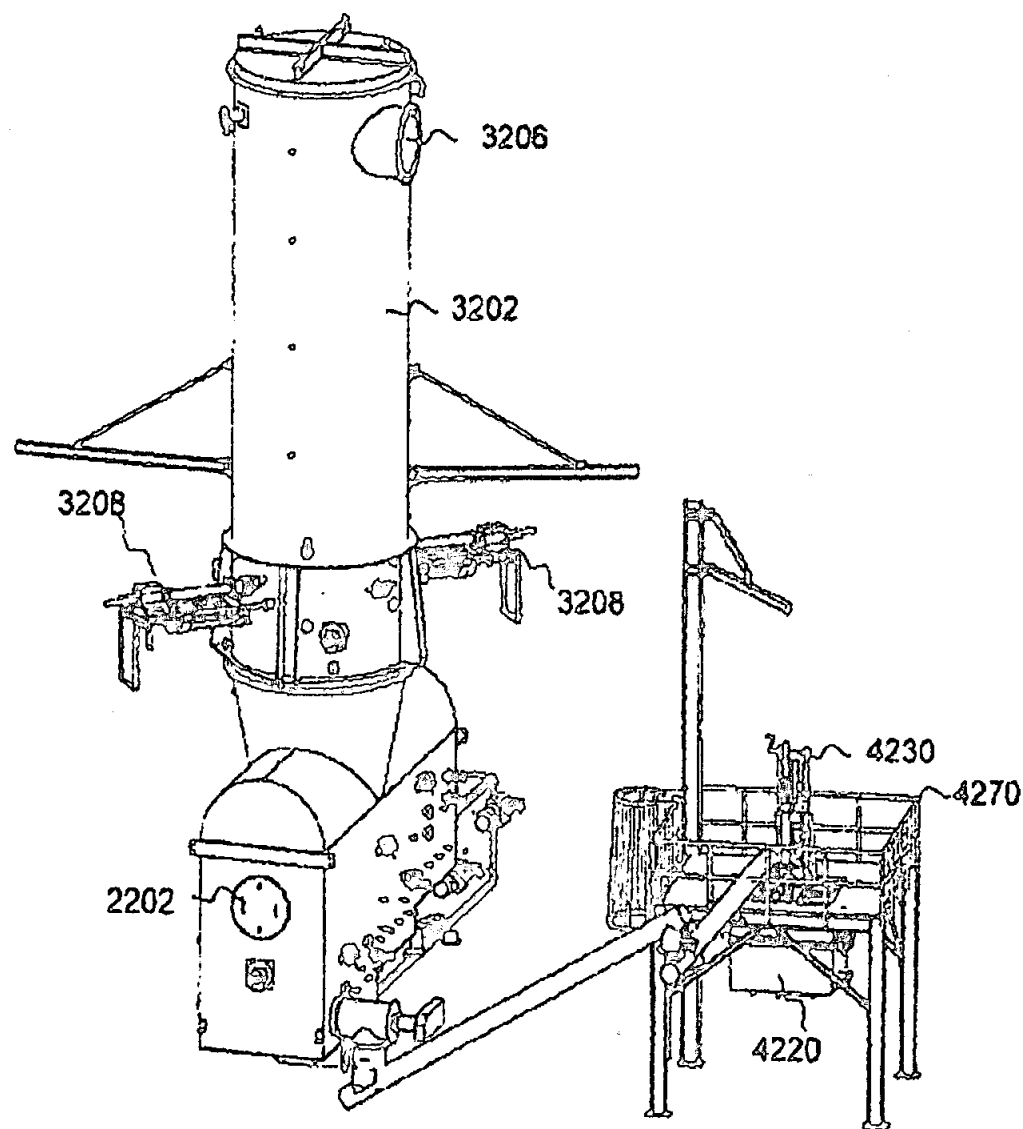


FIGURA 18

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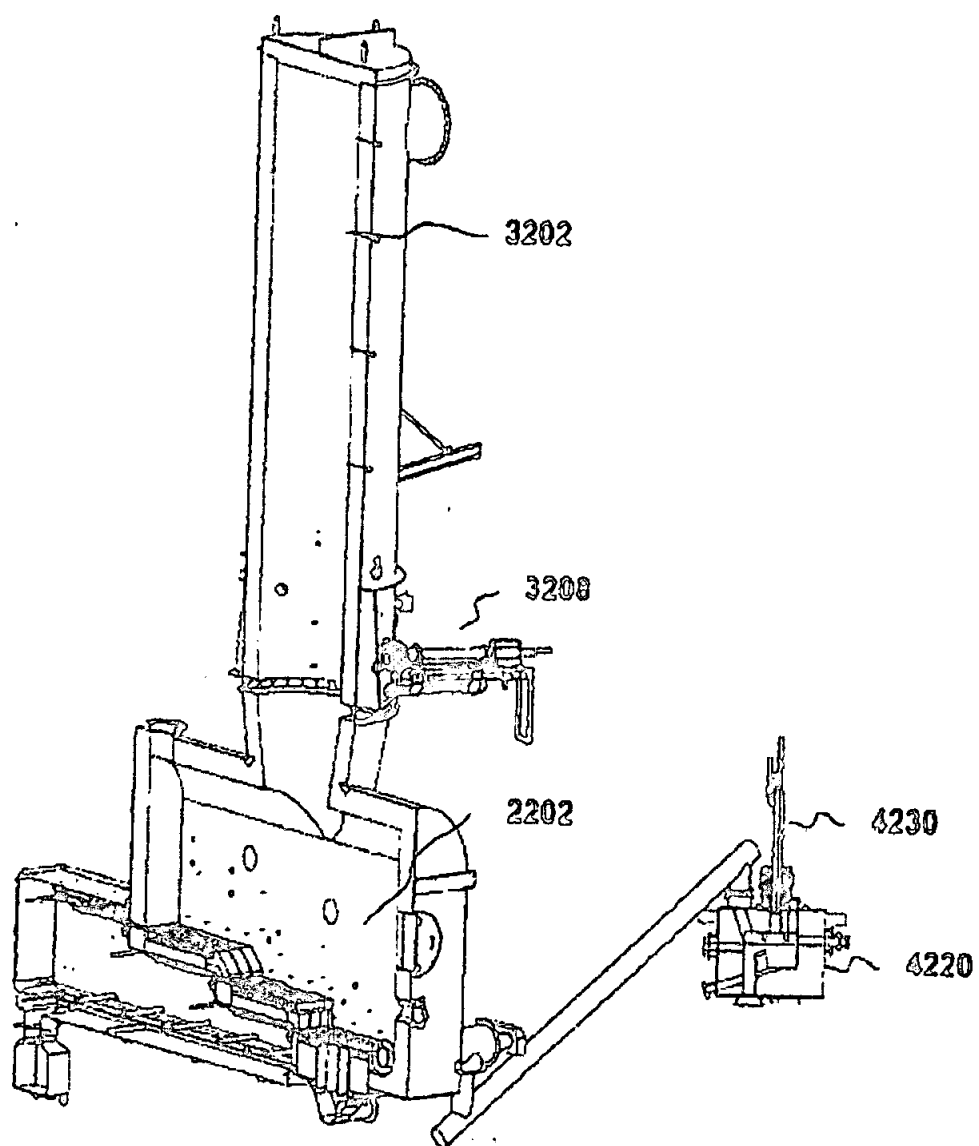
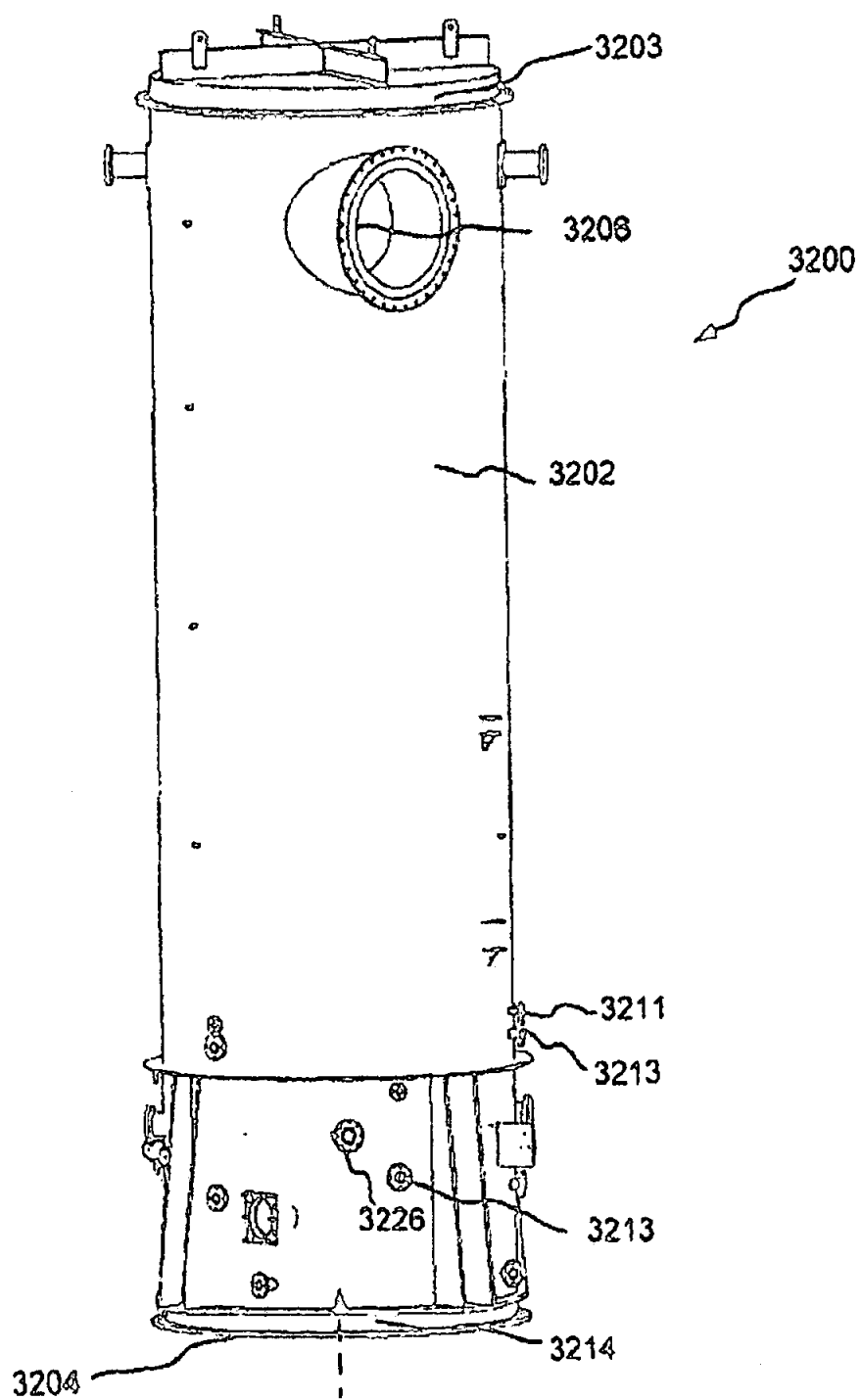


FIGURA 19

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GAS RESIDUAL DESDE  
EL GASIFICADOR

FIGURA 20

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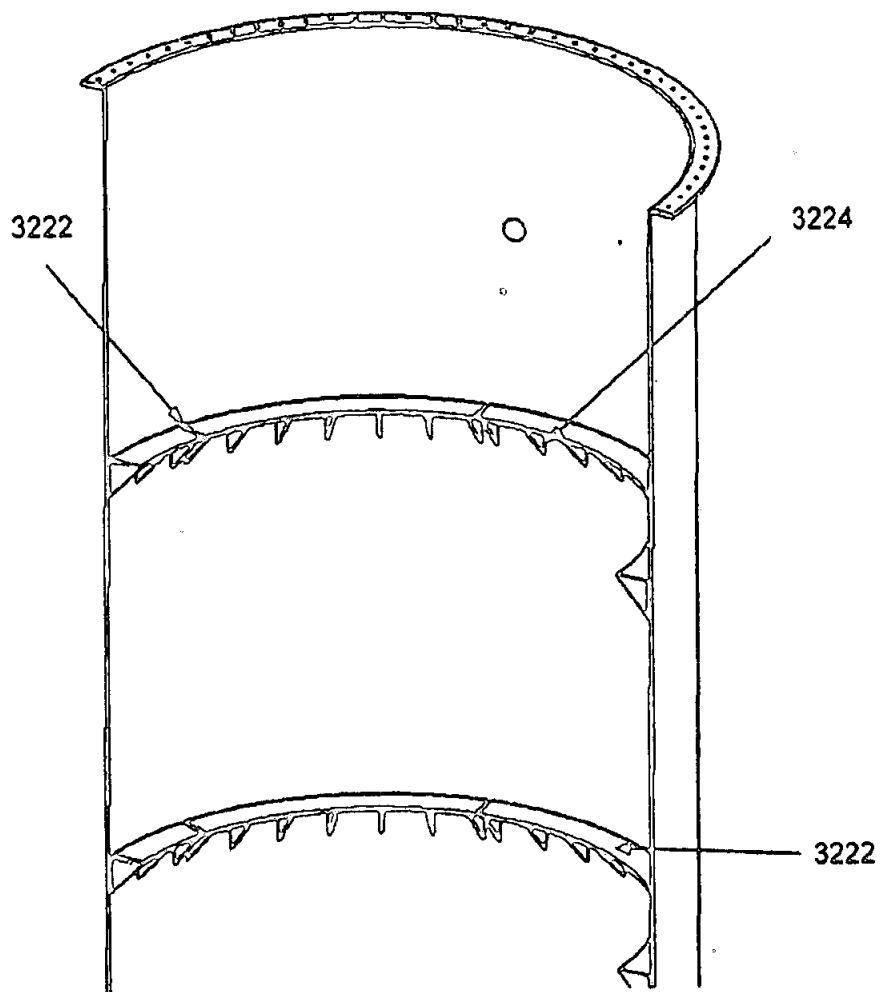


FIGURA 21

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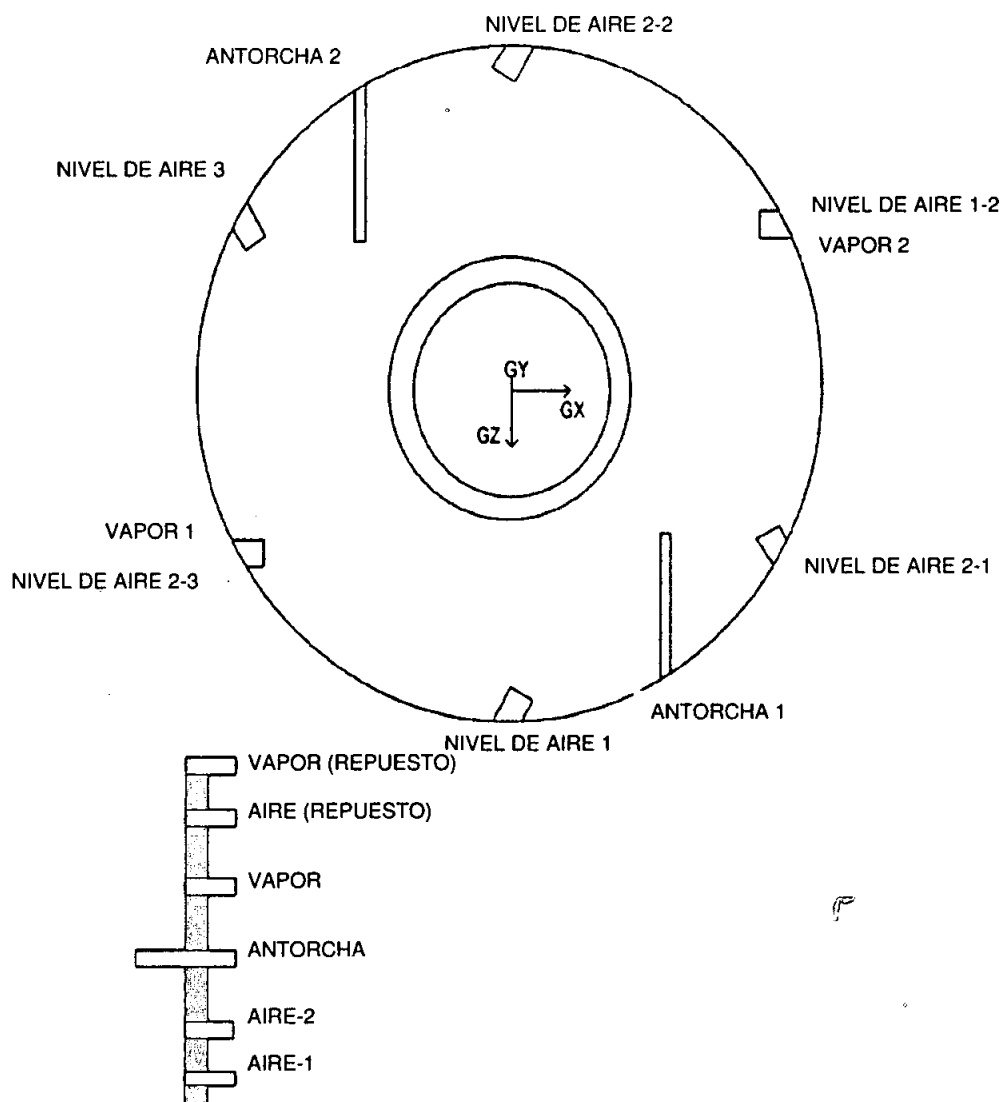


FIGURA 22

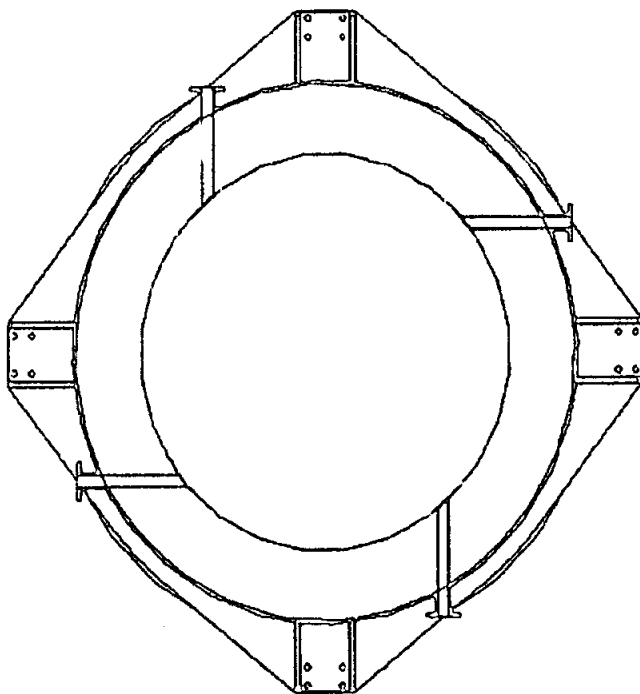


FIGURA 23

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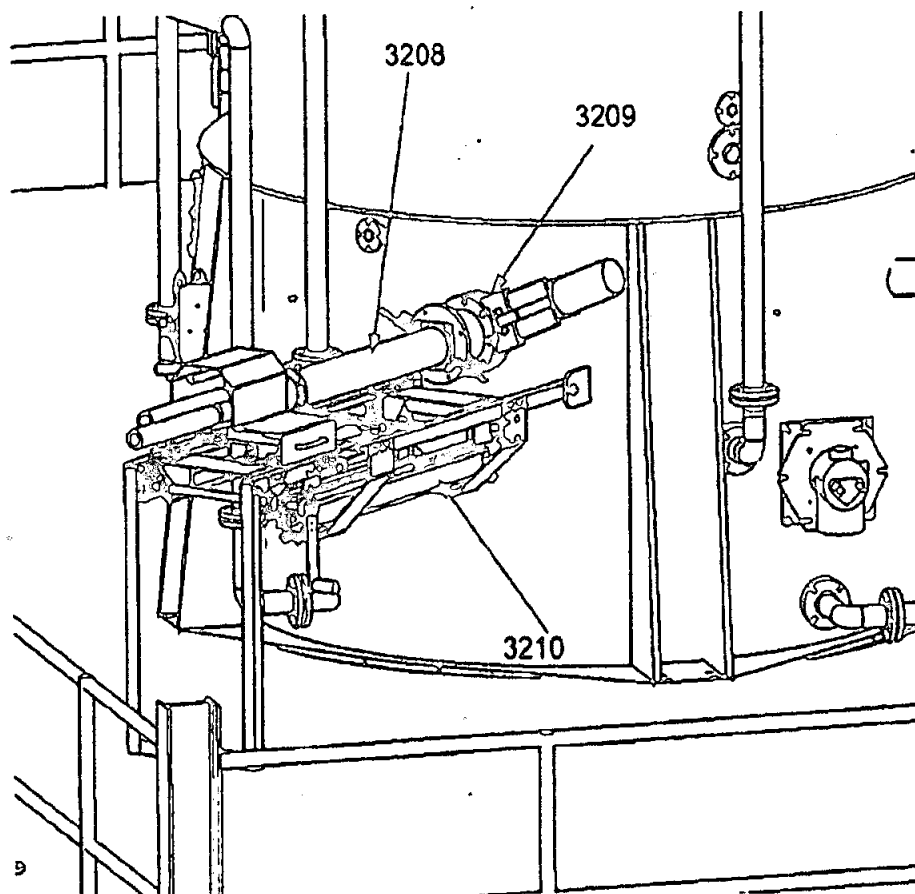


FIGURA 24

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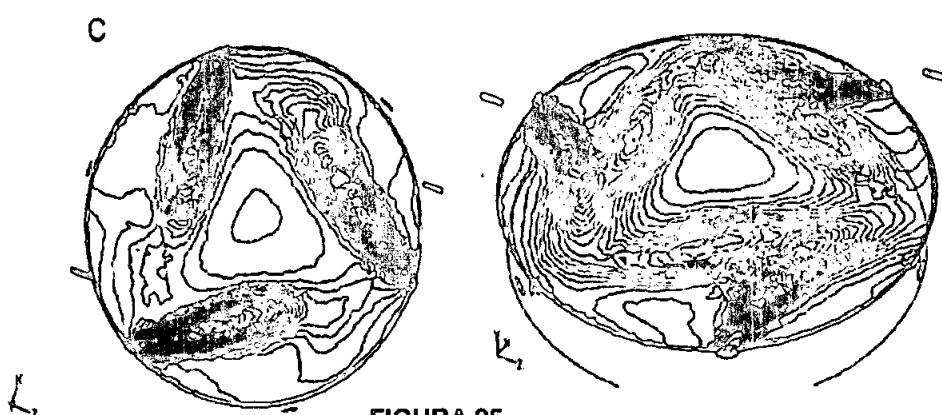
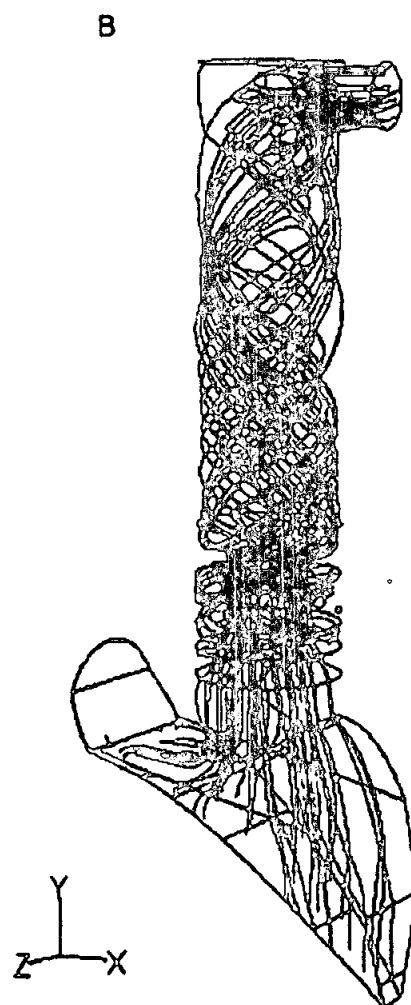
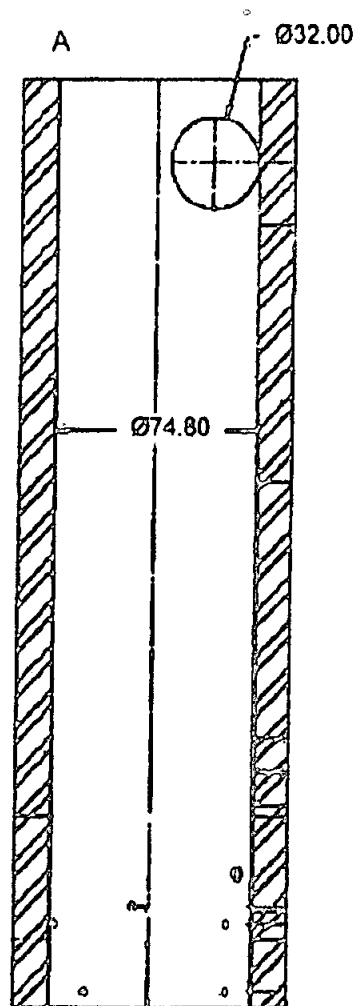


FIGURA 25

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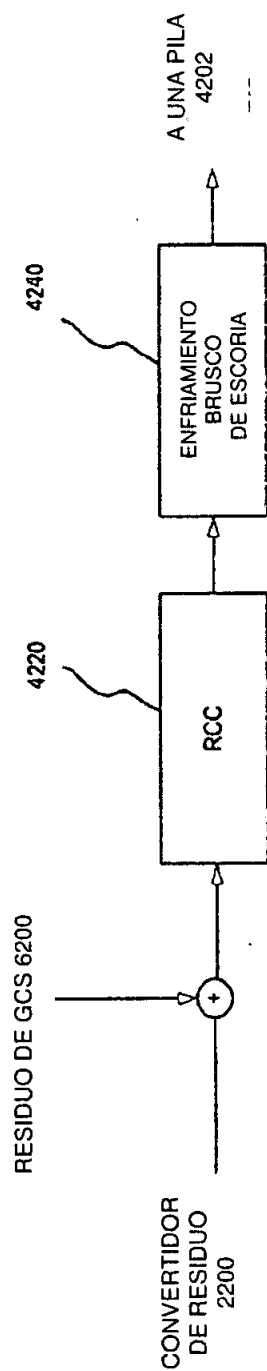


FIGURA 26

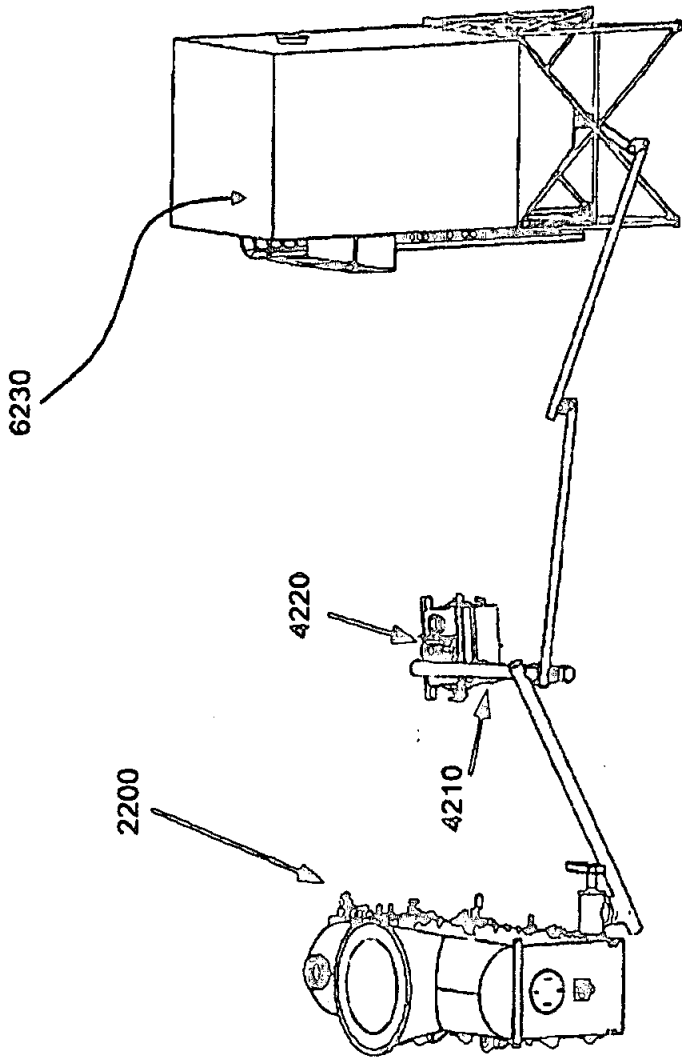


FIGURA 27

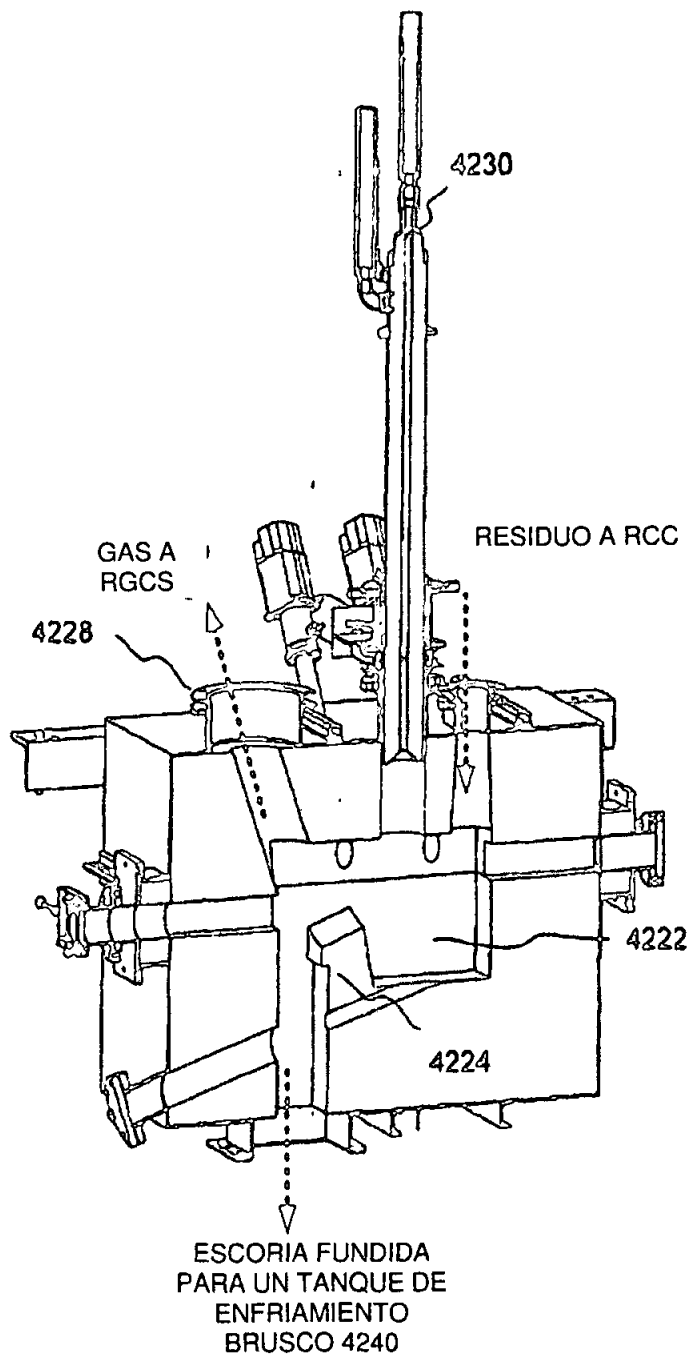


**FIGURA 28**

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3

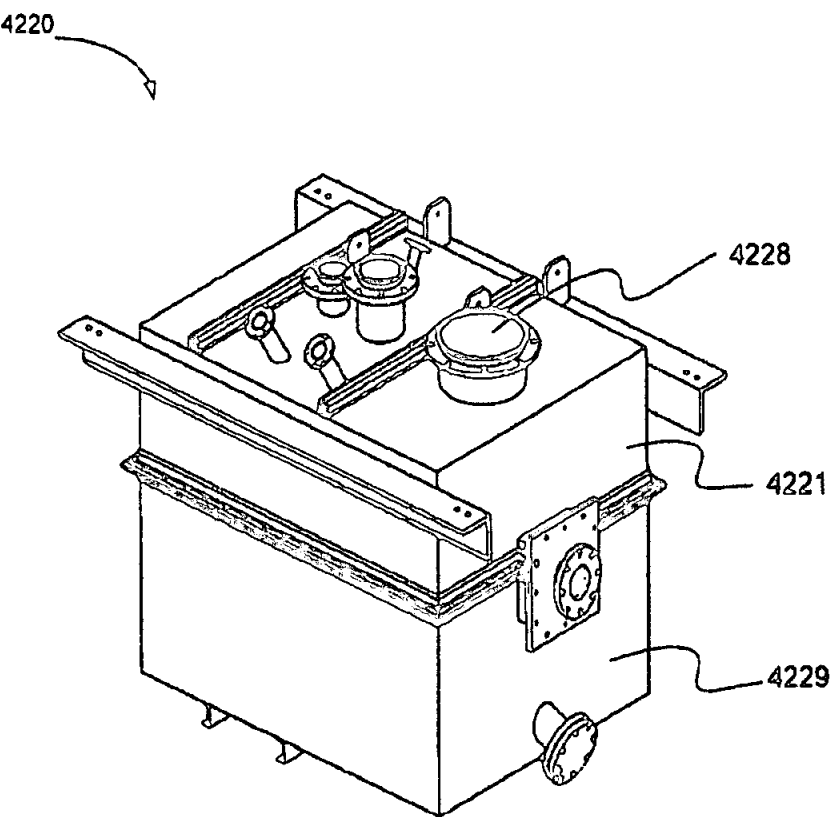


FIGURA 28

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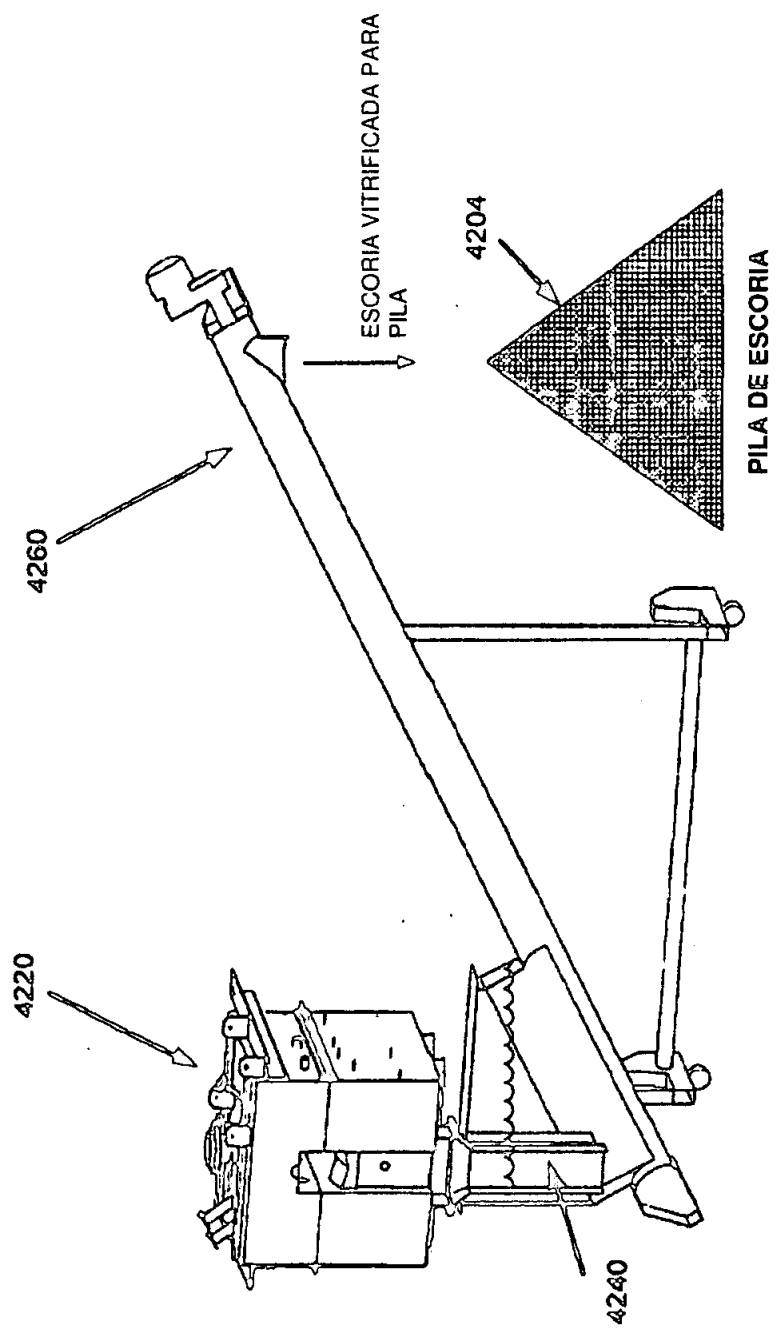


FIGURA 30

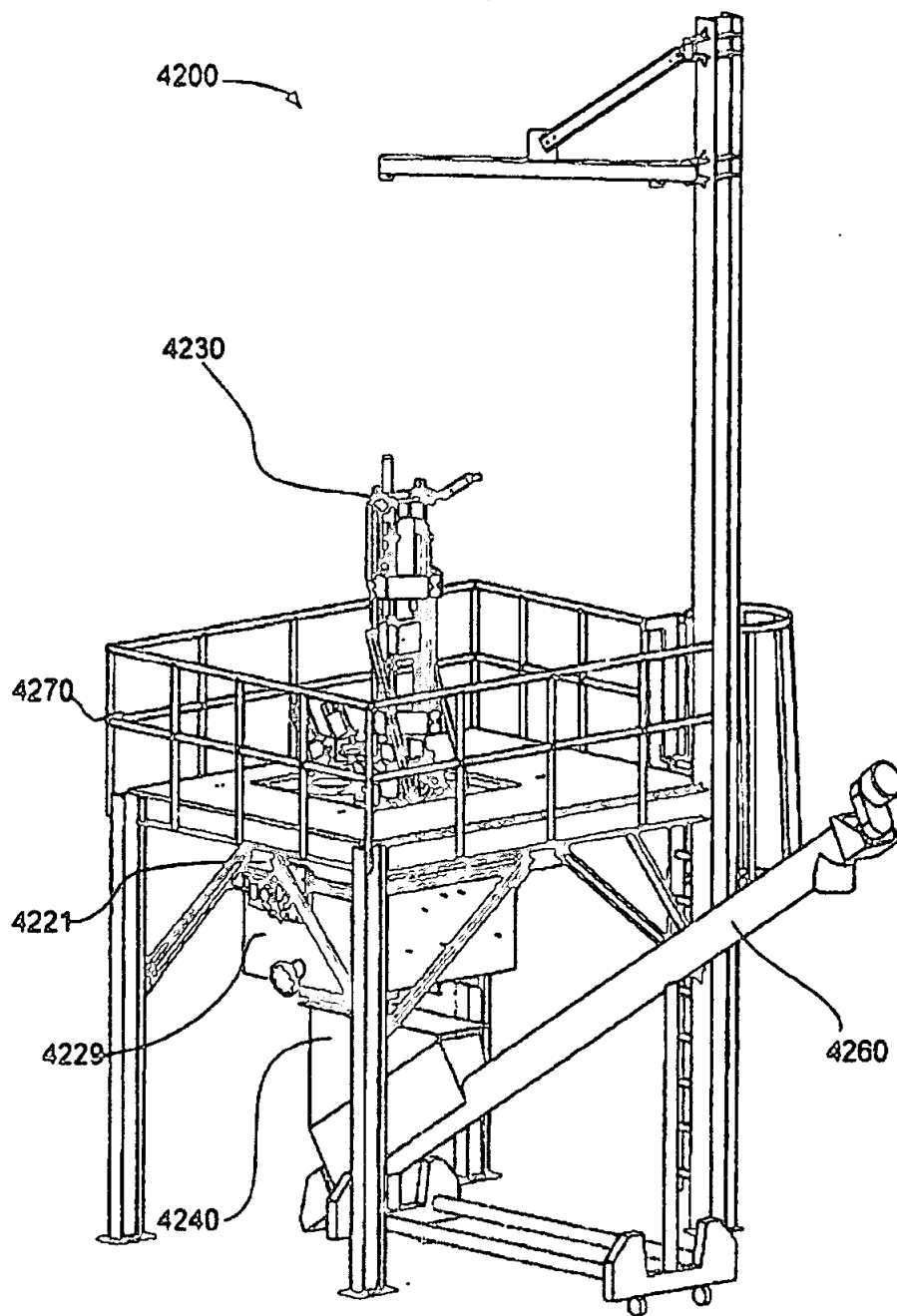


FIGURA 31

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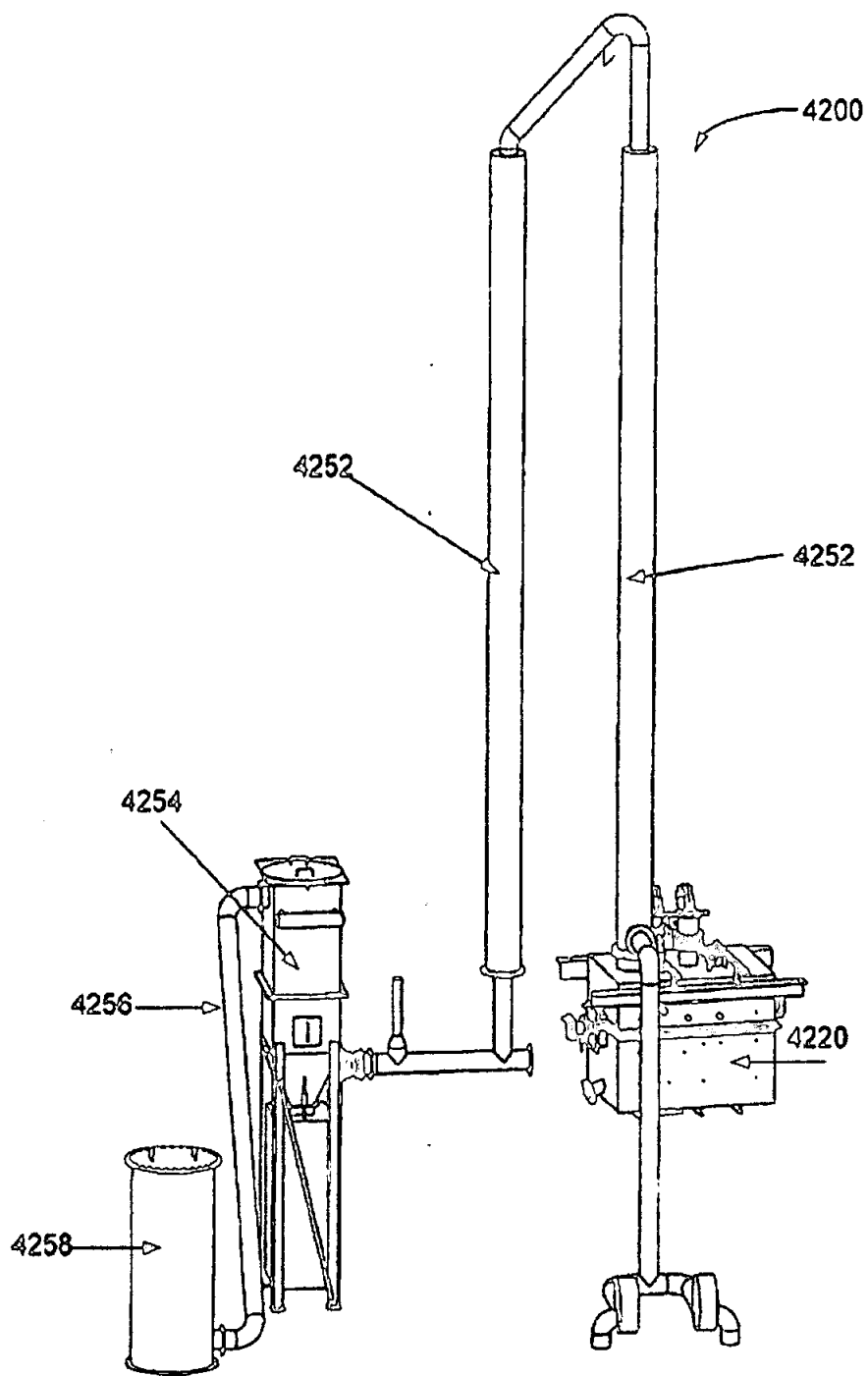


FIGURA 32

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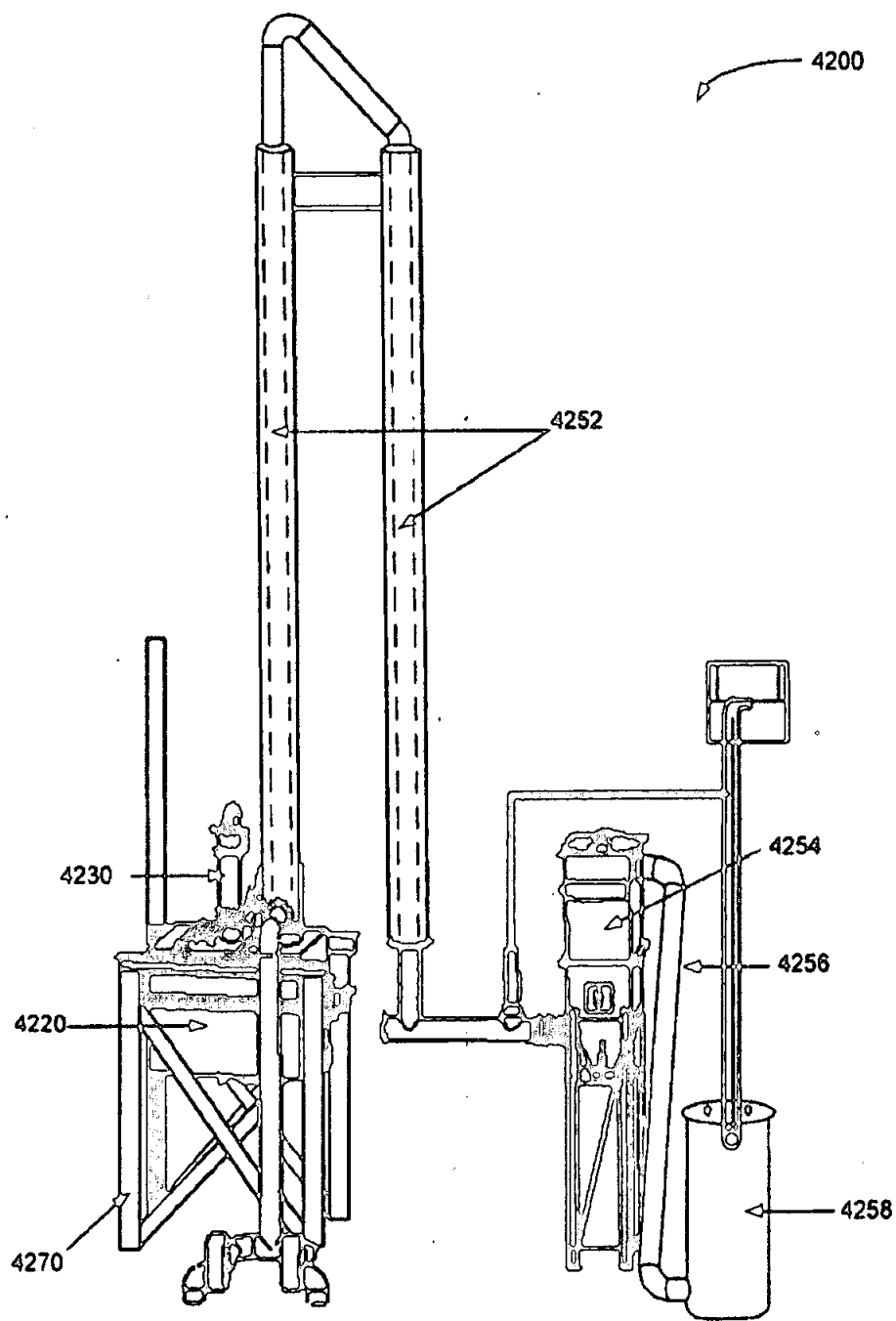


FIGURA 32A

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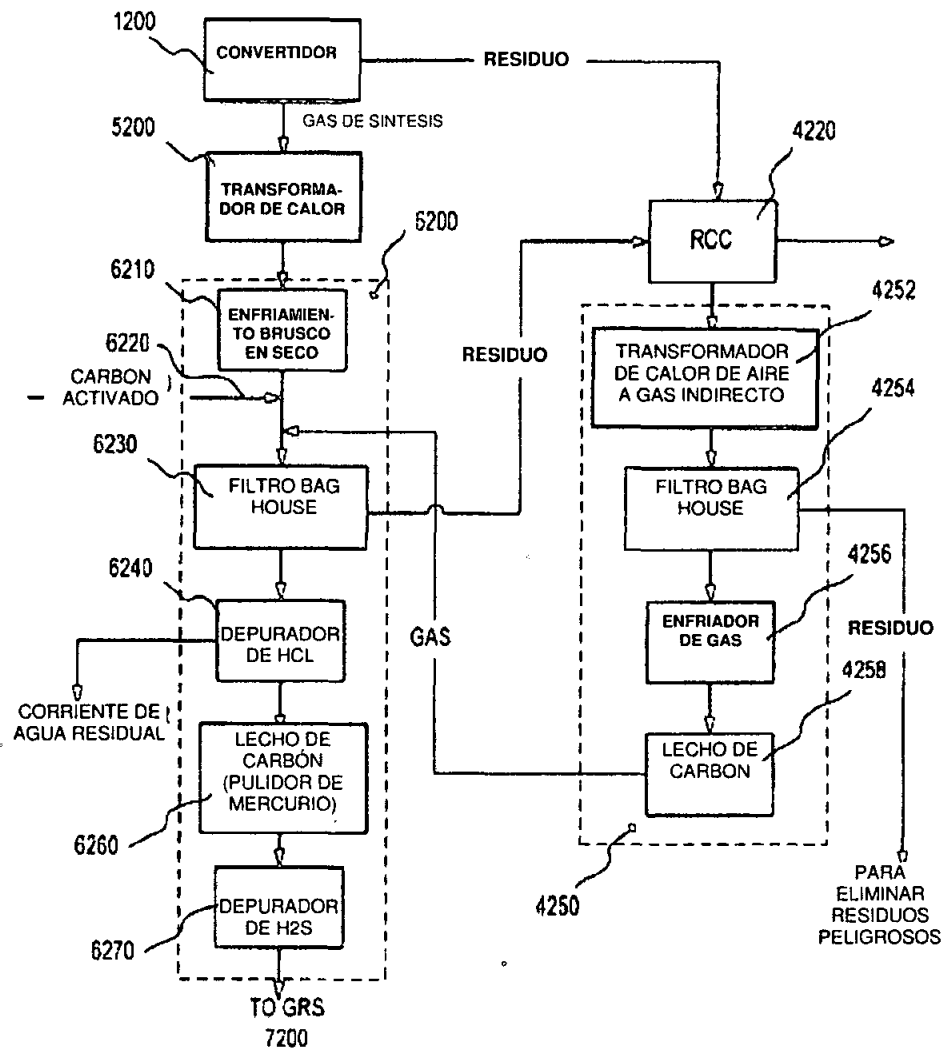


FIGURA 33



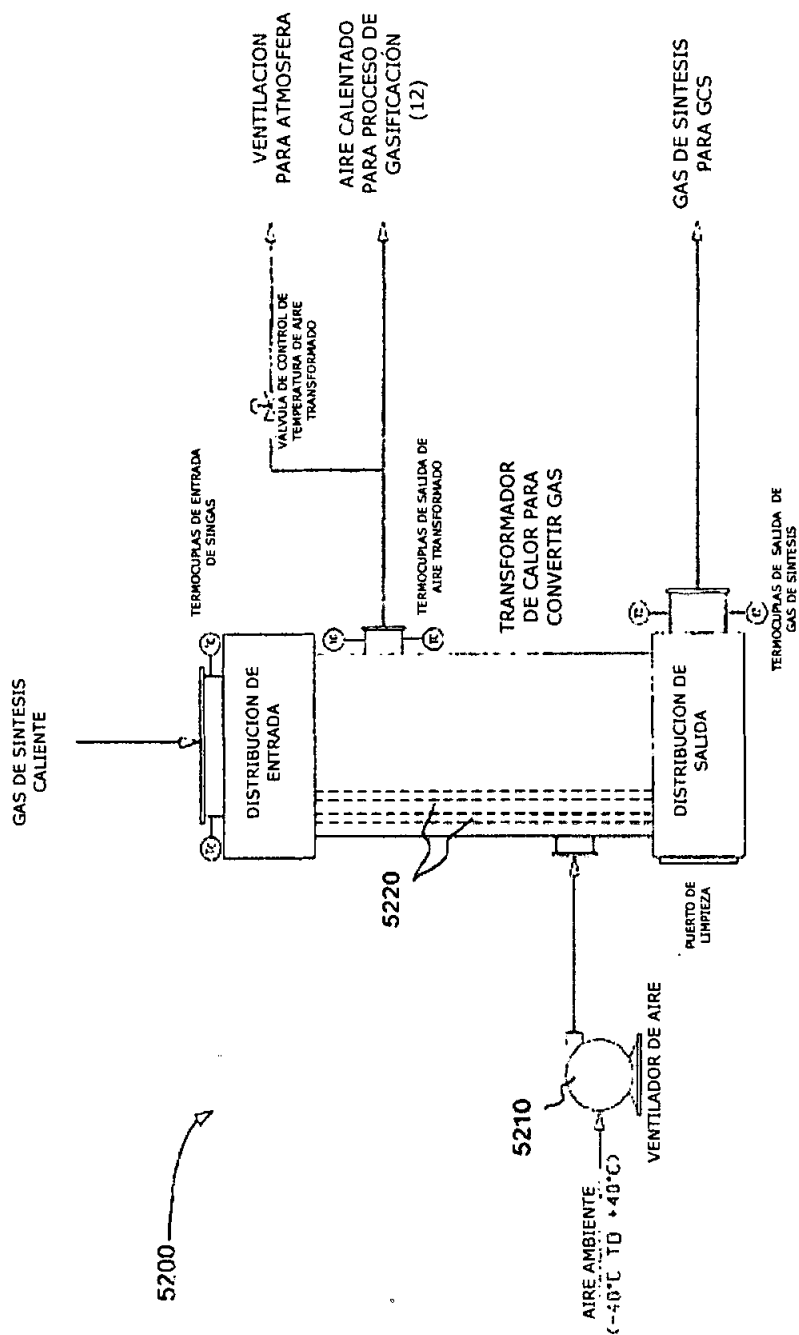


FIGURA 35

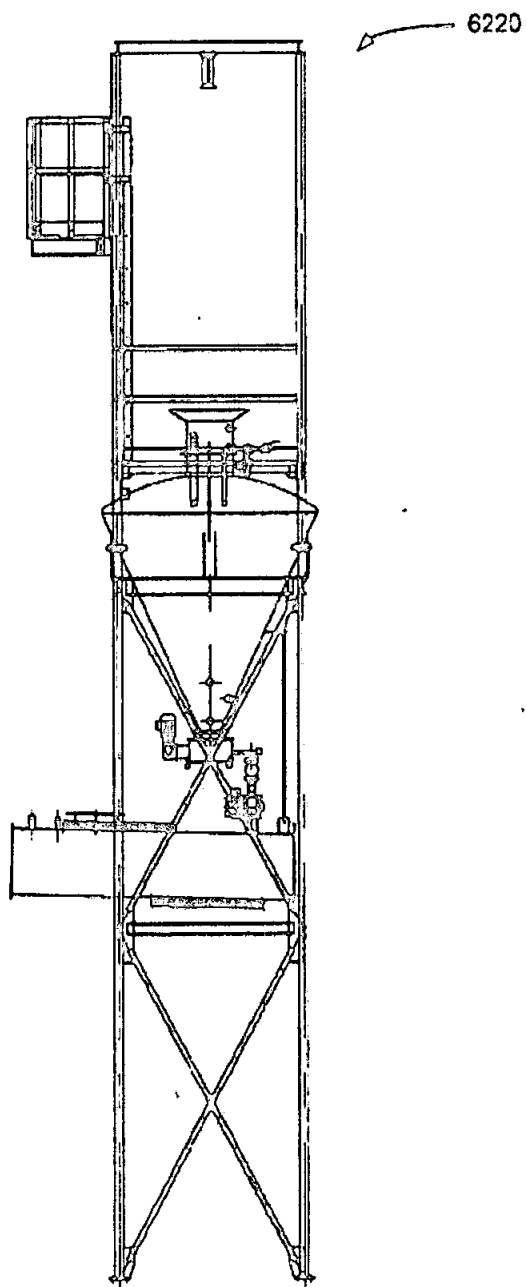


FIGURA 36

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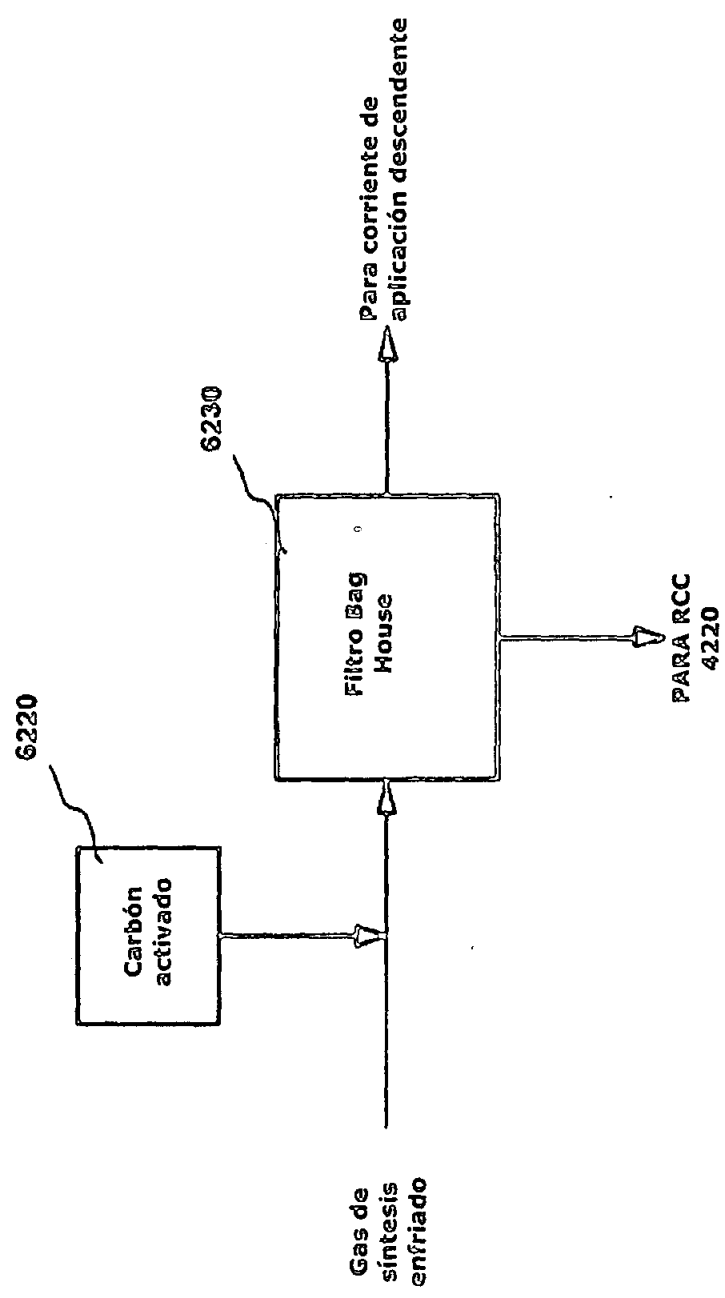


FIGURA 37

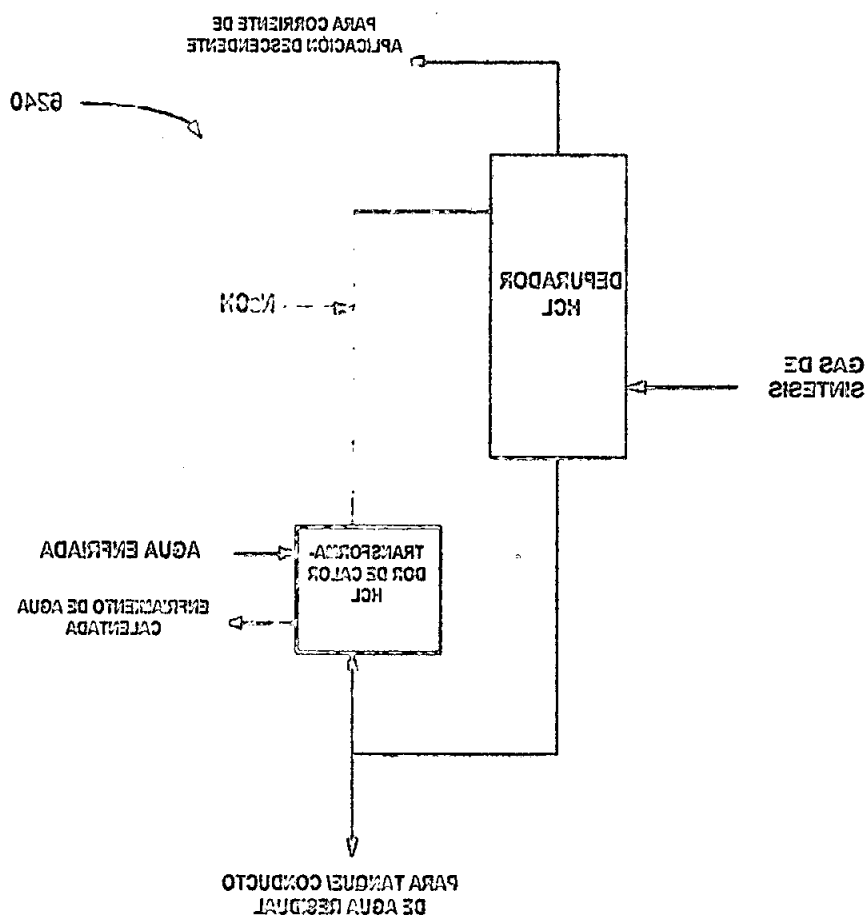


FIGURA 38

41110

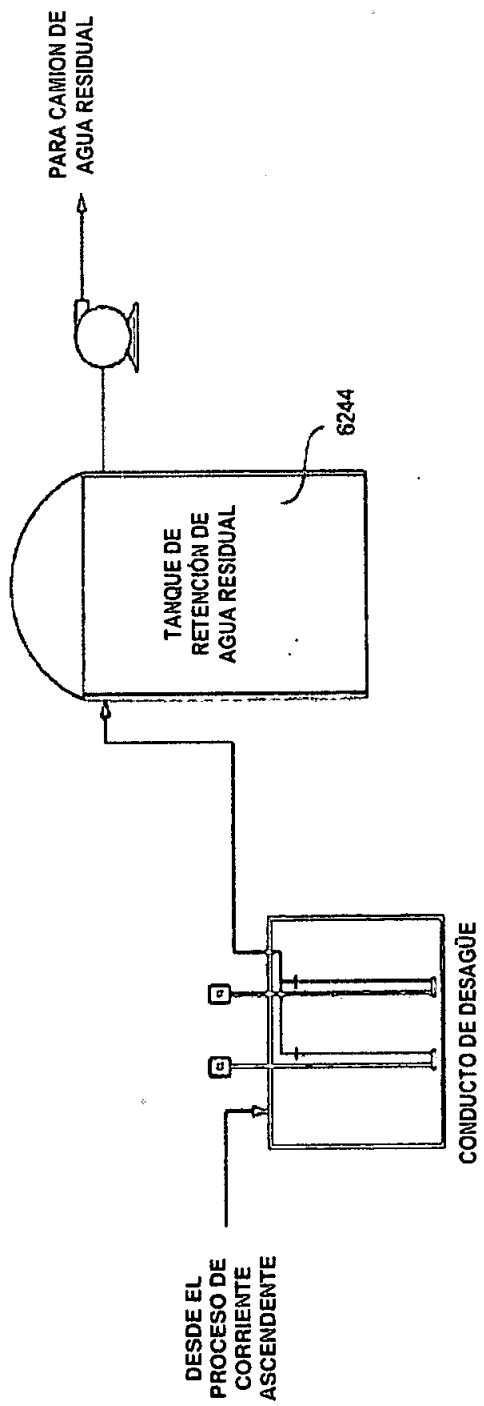


FIGURA 39

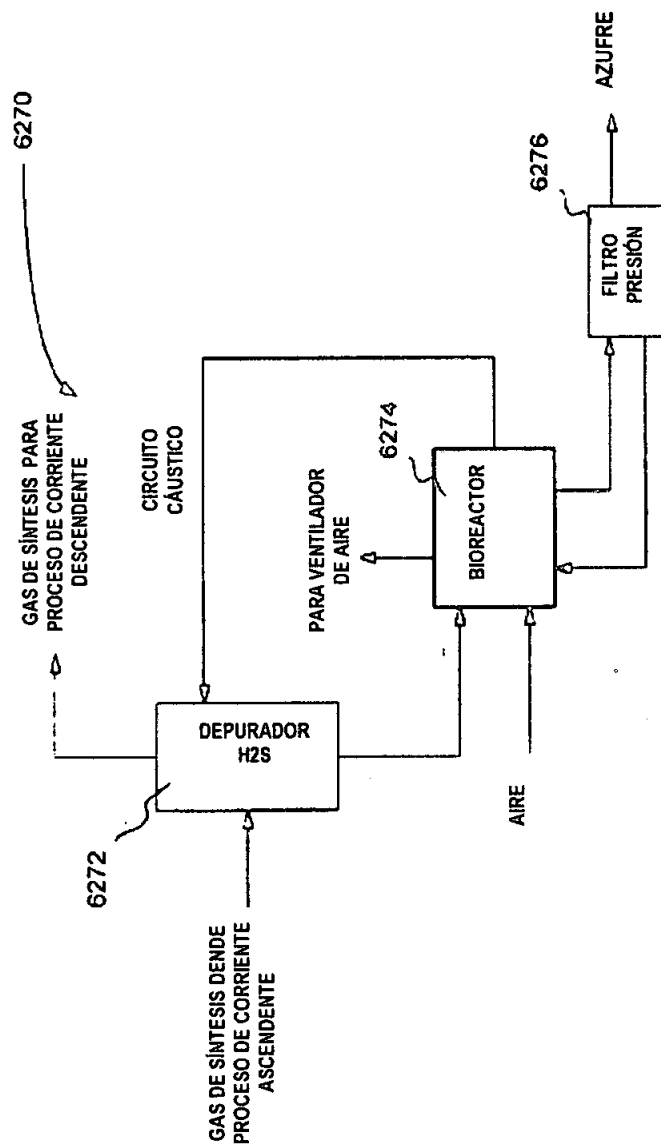


FIGURA 40

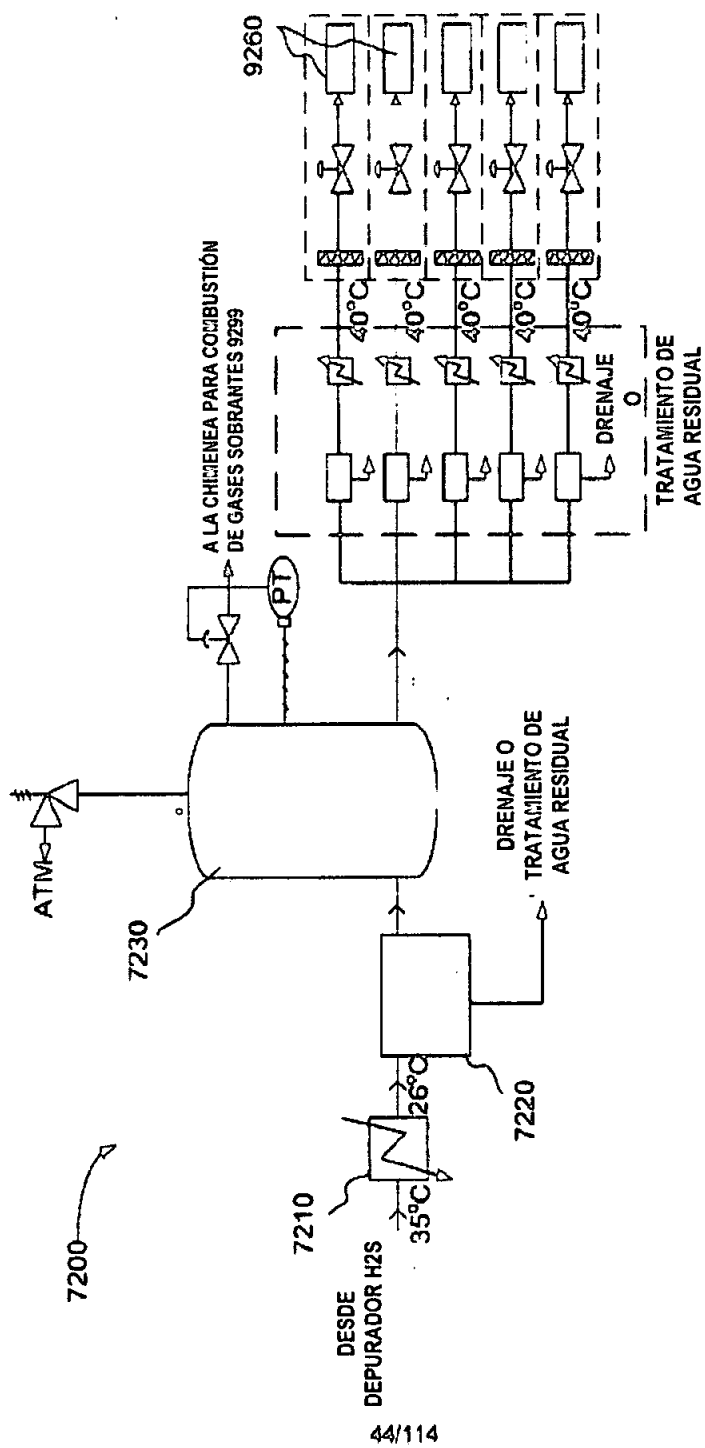


FIGURA 41



FIGURA 42

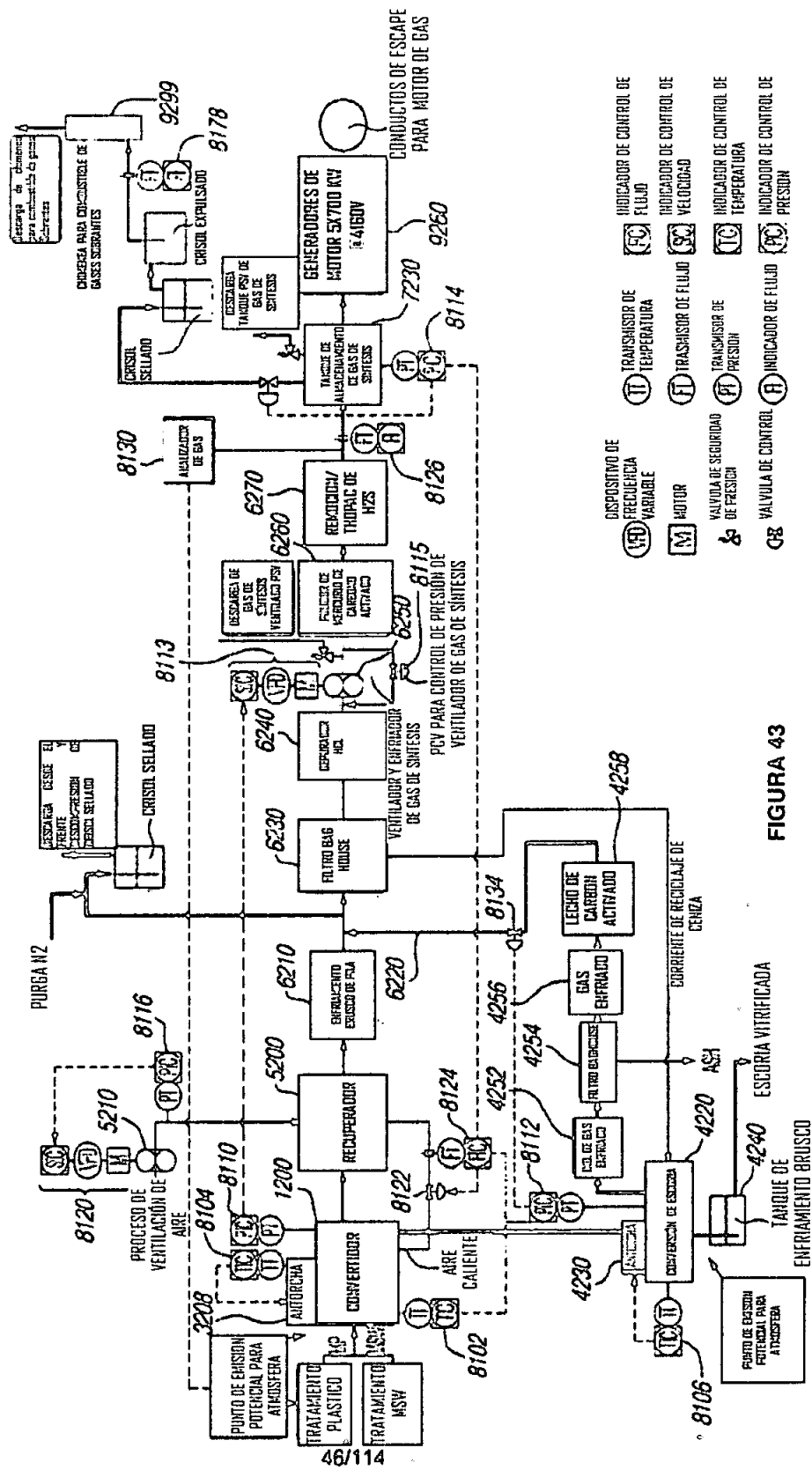


FIGURA 43

DISPOSITIVO DE FRECUENCIA VARIABLE (VF) TRANSMISOR DE TEMPERATURA (TT) TRANSMISOR DE FLUIDO (FT) MOTOR (M) VALVULA DE SEGURIDAD DE PRESION (PS) VALVULA DE CONTROL (CV) INDICADOR DE CONTROL DE FLUIDO (FI) INDICADOR DE CONTROL DE TEMPERATURA (TI) INDICADOR DE CONTROL DE VELOCIDAD (VI) INDICADOR DE CONTROL DE PRESION (PI) INDICADOR DE CONTROL DE PRESION (PC)



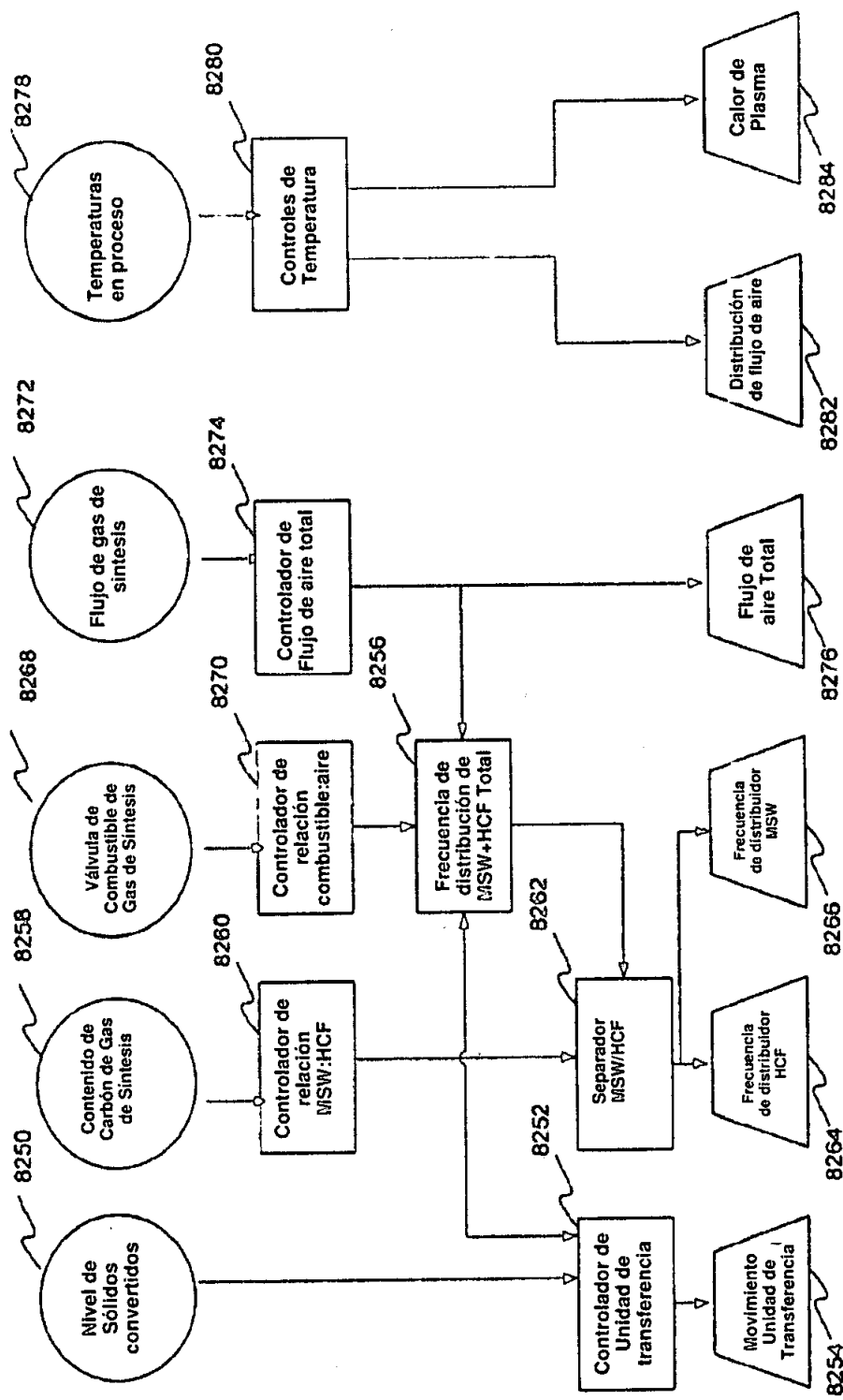


FIGURA 45

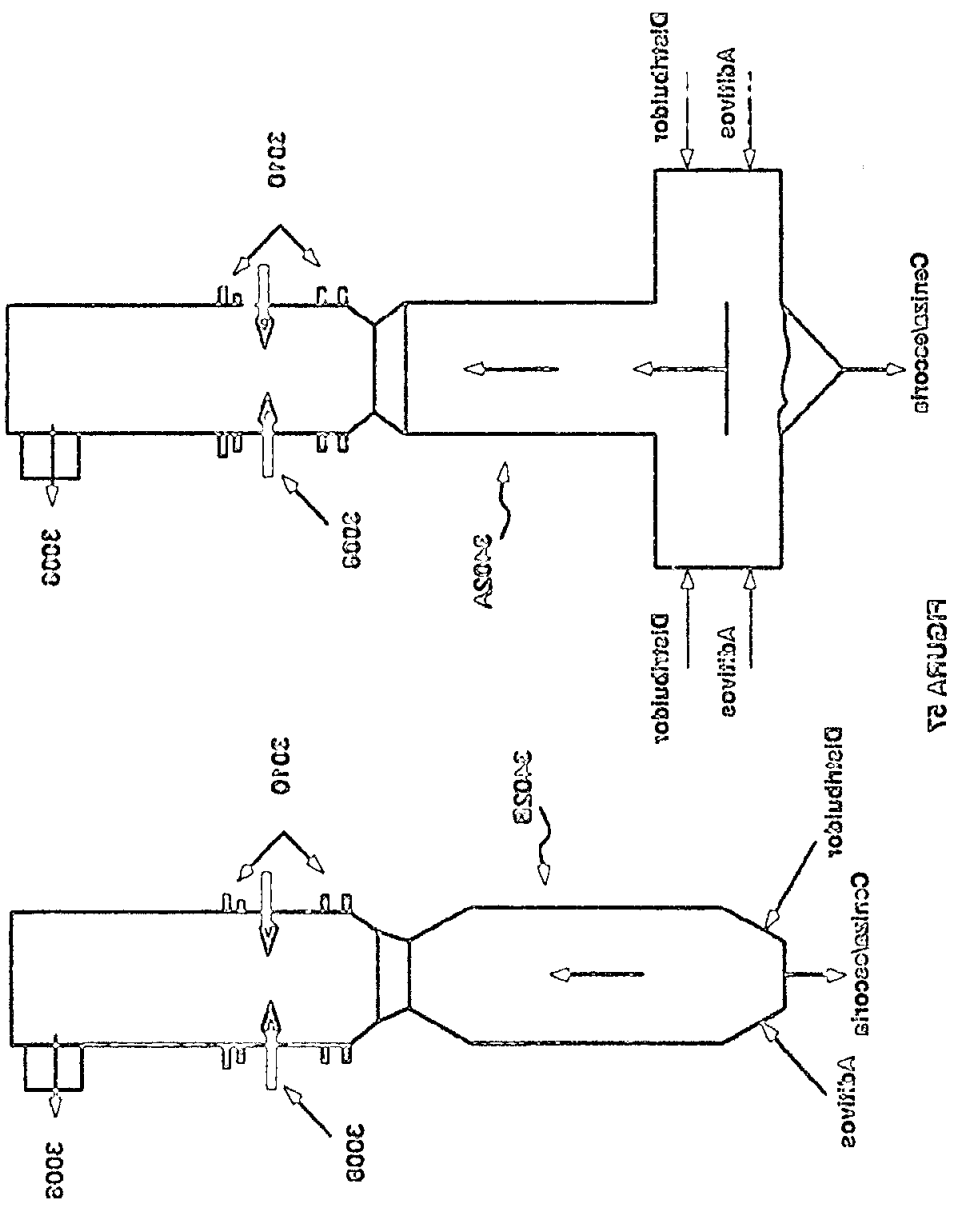


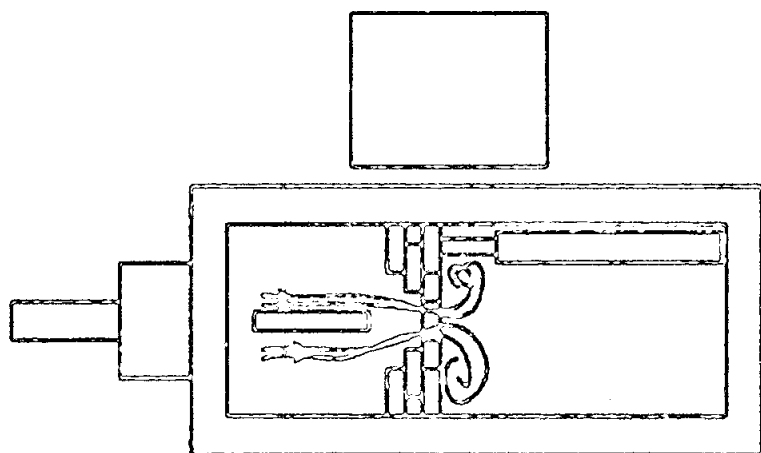
FIGURA 2A

FIGURA 2B

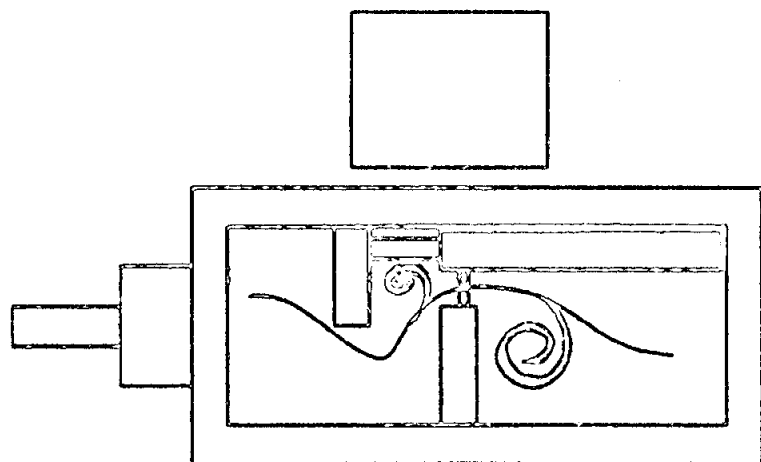


25M40

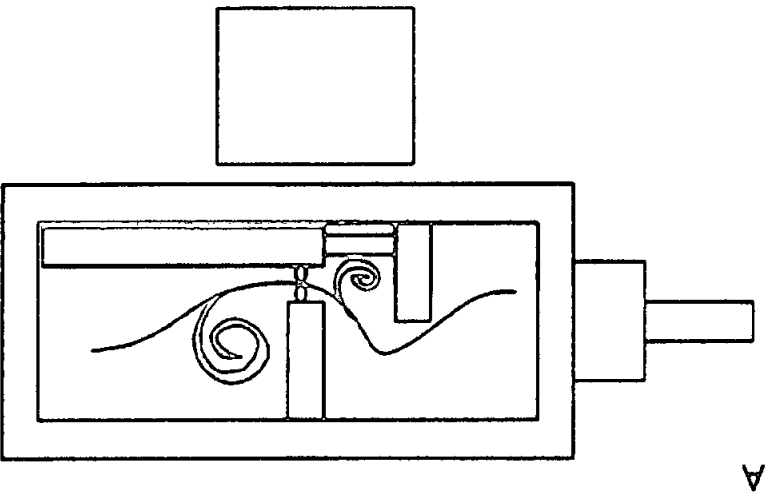
FIGURE 22



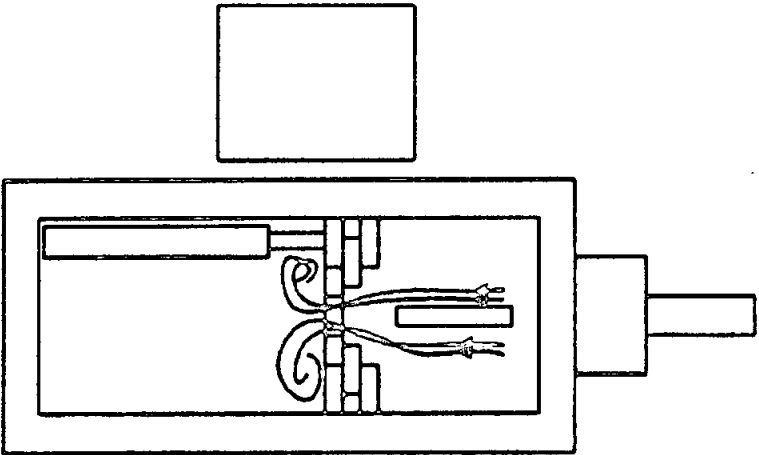
30



31



A



B

FIGURA 55

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FIGURE 20  
AS ABLUTION

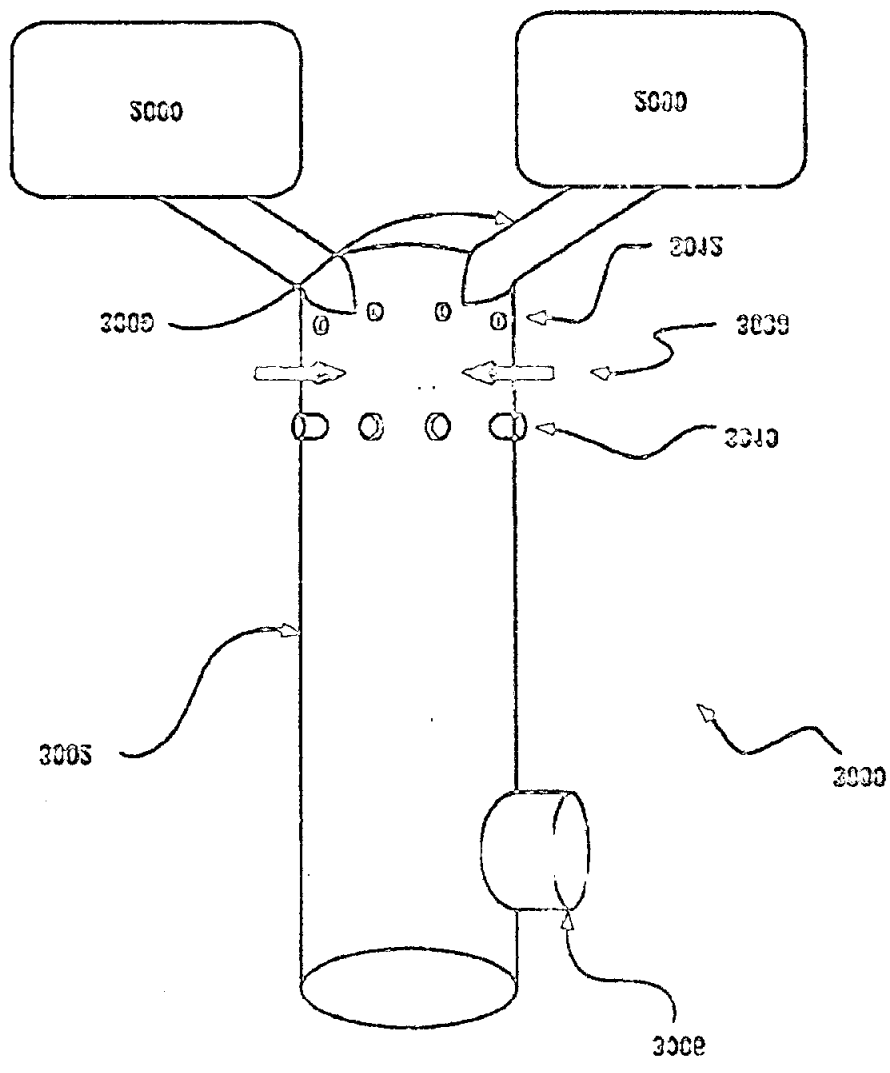


FIGURA 54  
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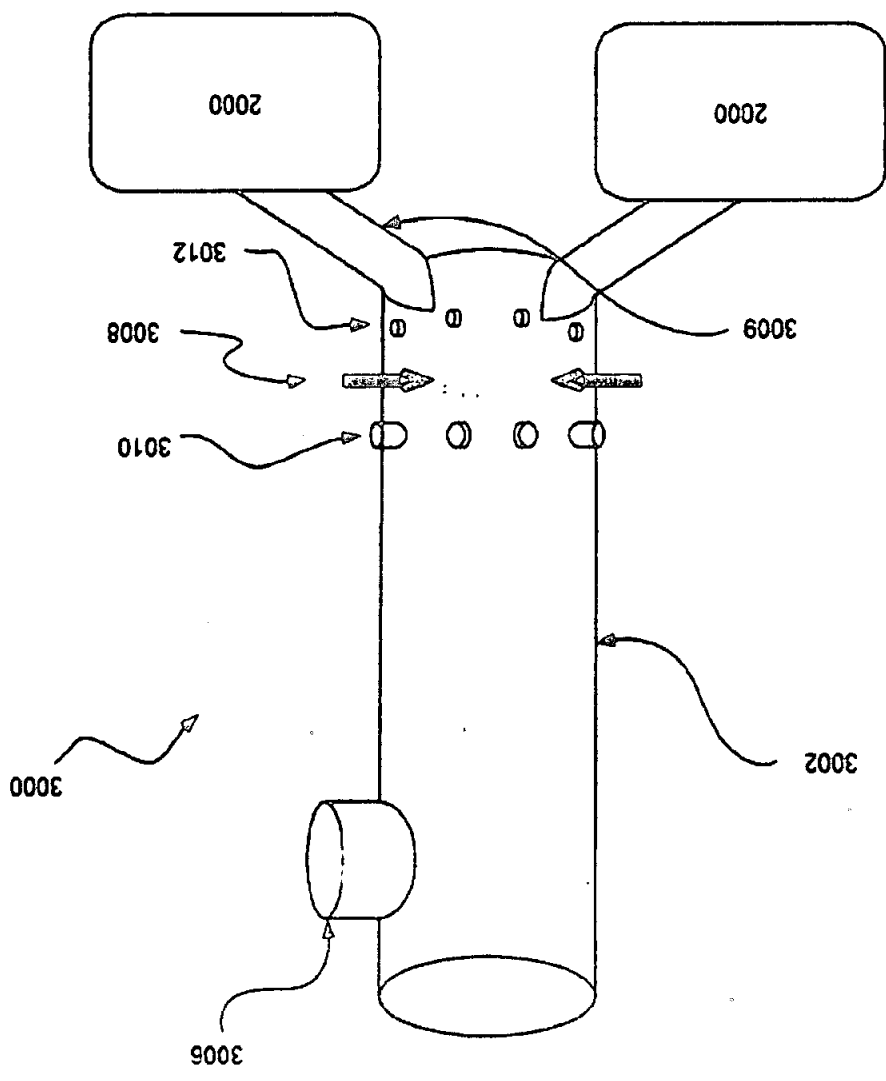
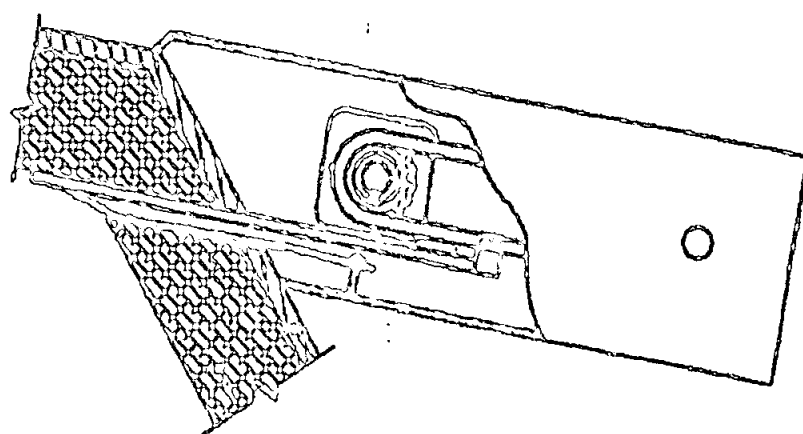
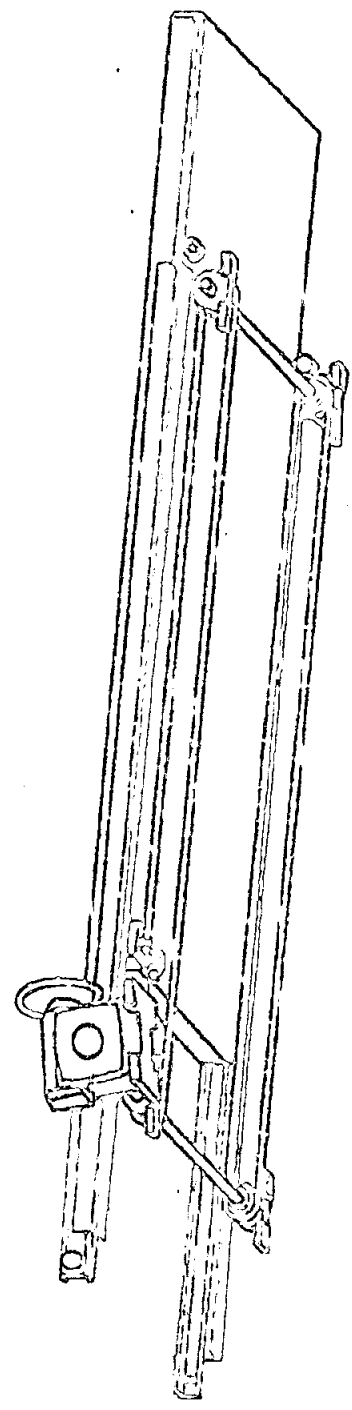


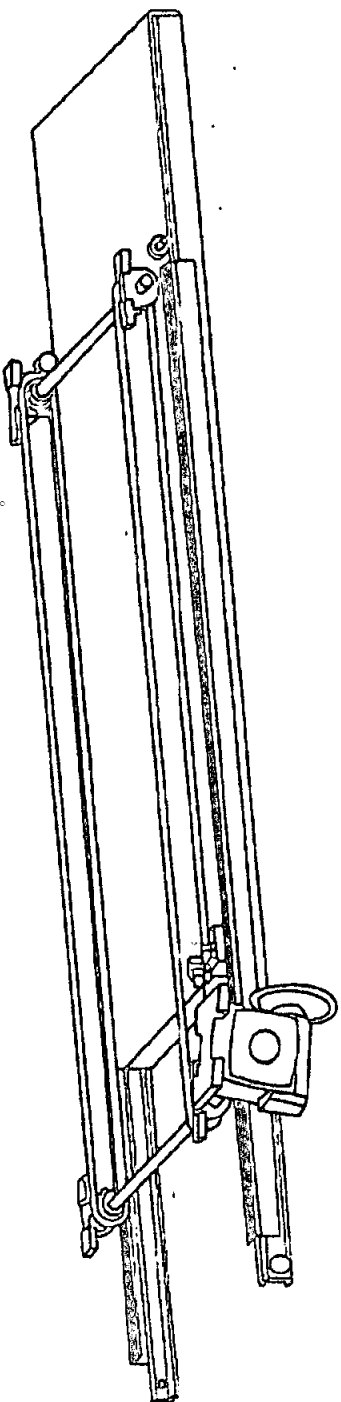
FIGURE 23  
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FIGURA 52

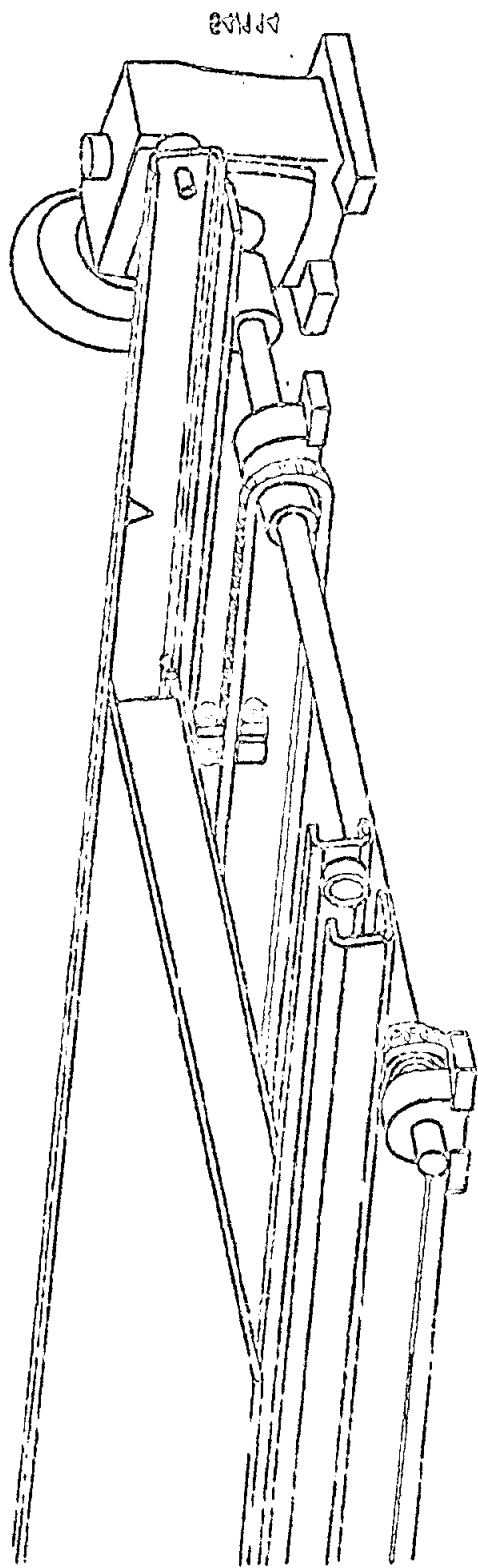


FIGURE 21

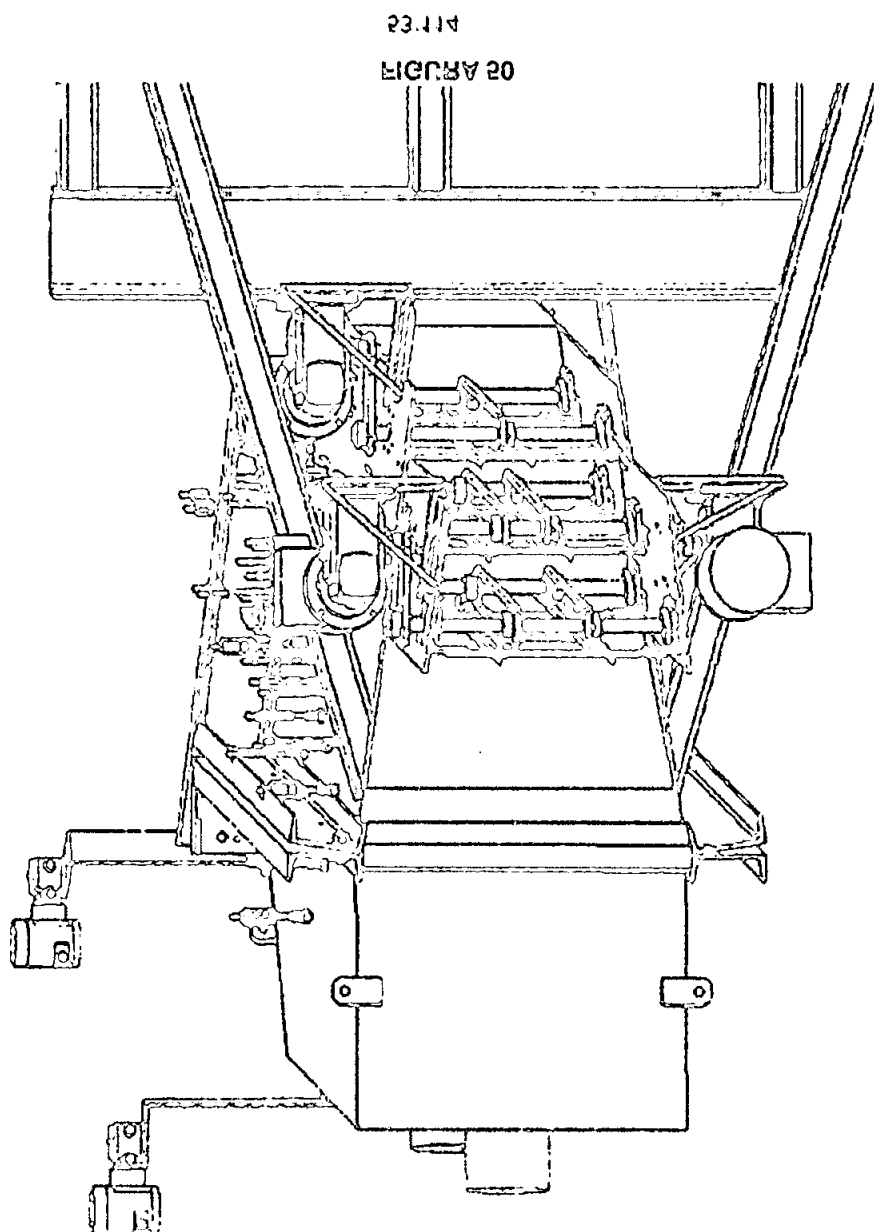
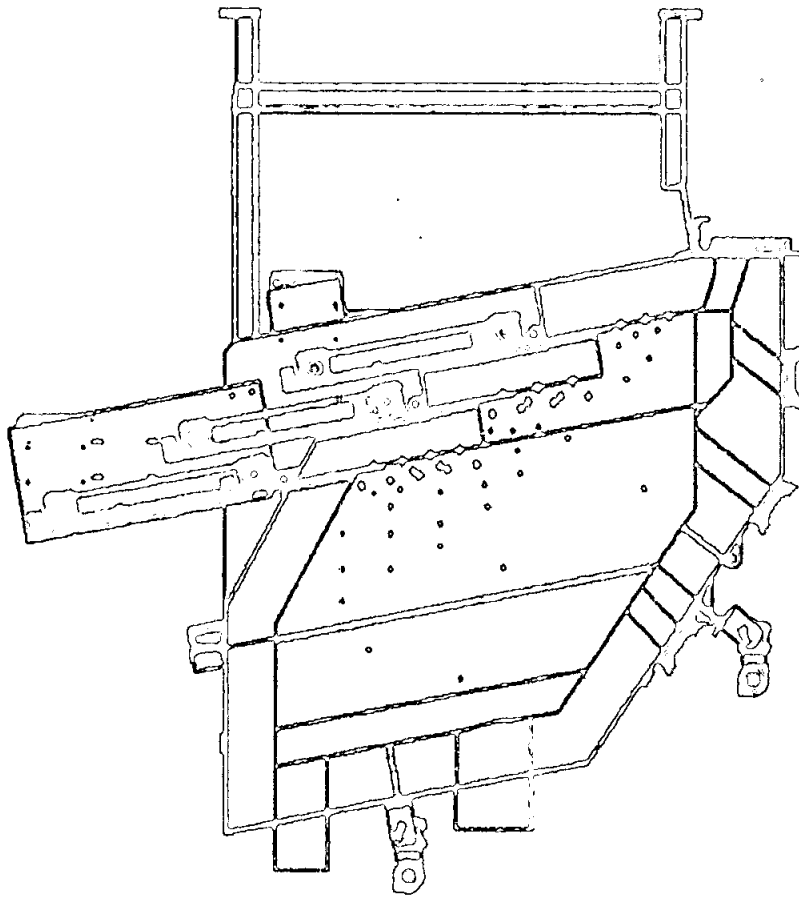


FIGURE 8



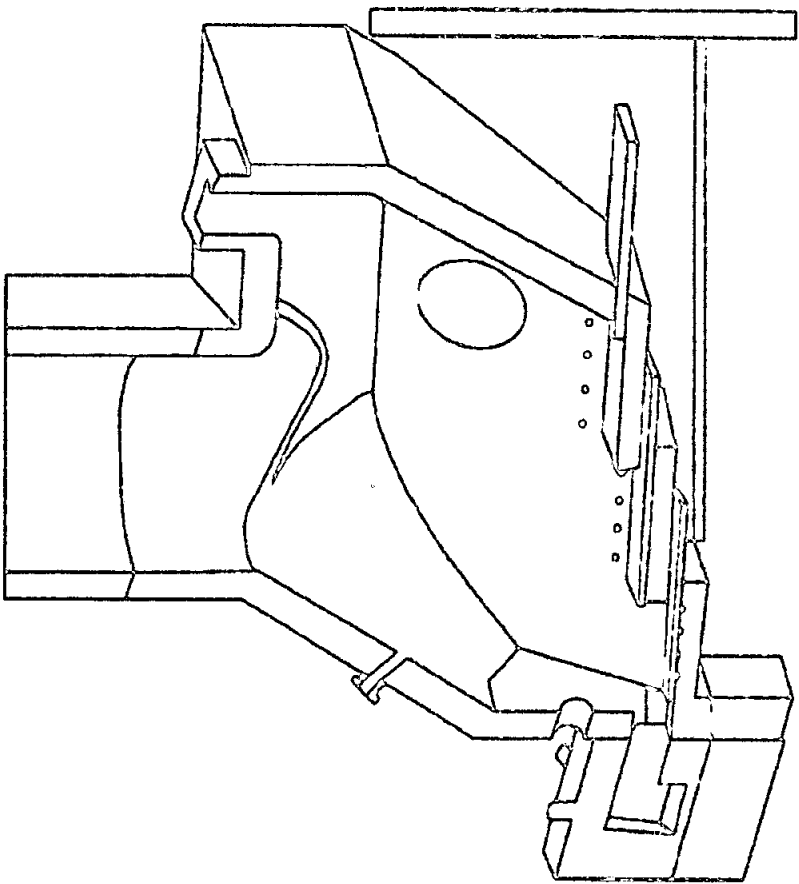


FIGURE 1

FIGURE 2



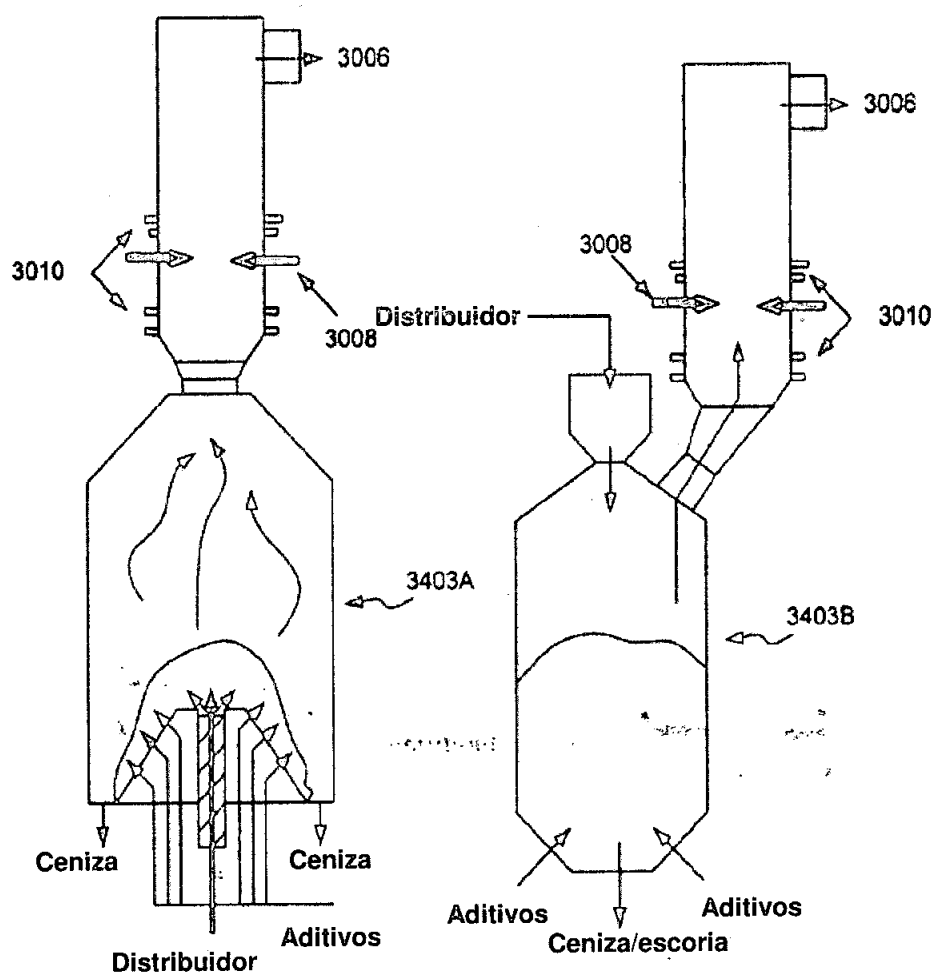


FIGURA 58

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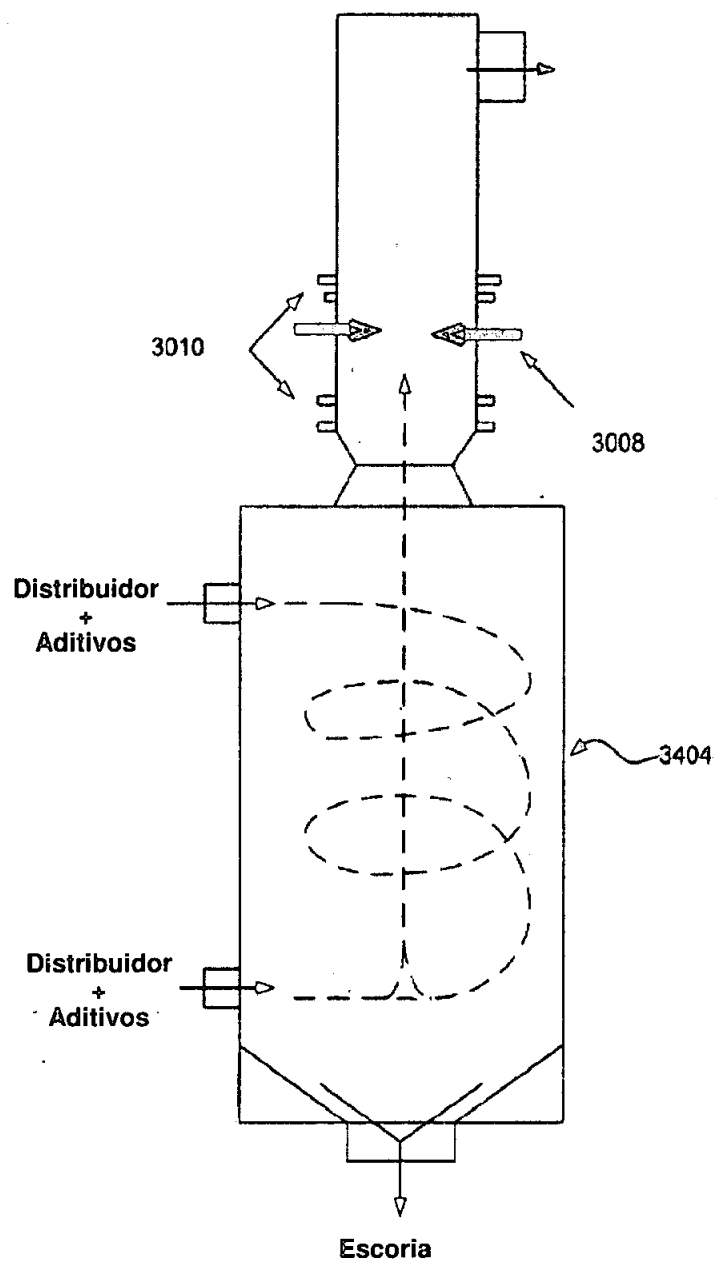


FIGURA 59  
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# TRANSFORMADOR DE CALOR Y GENERADOR DE VAPOR RECUPERADO DE CALOR

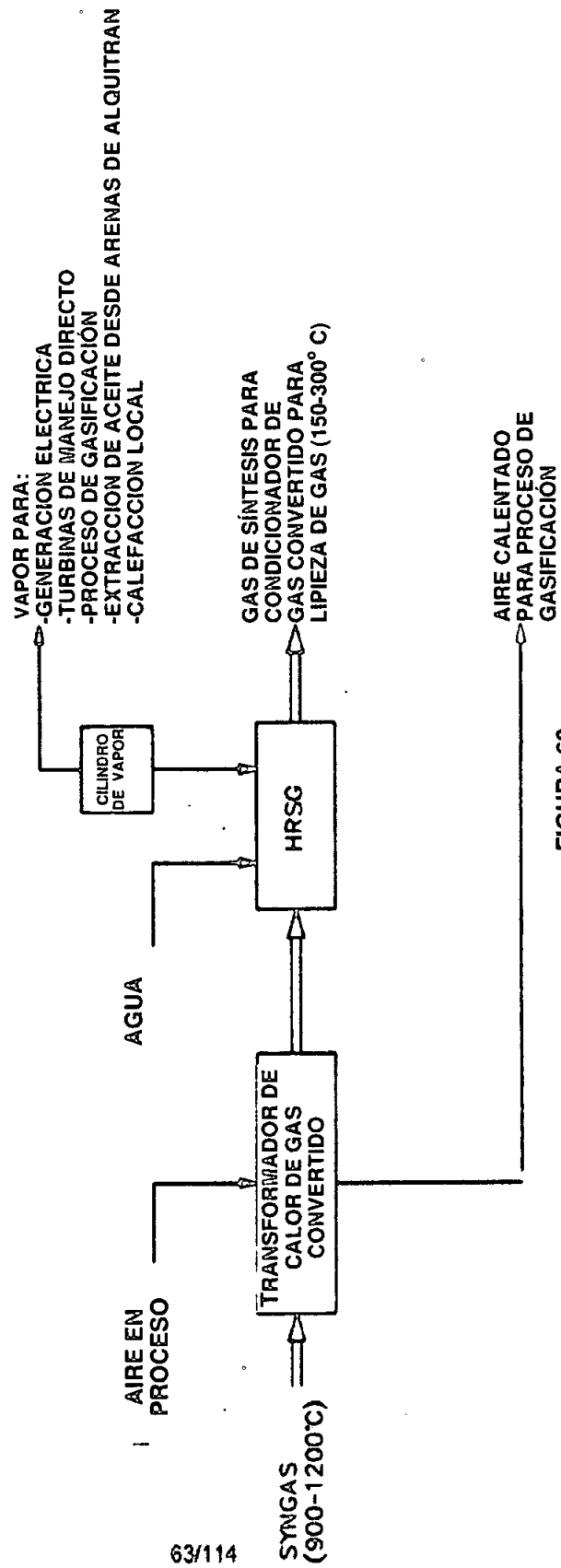


FIGURA 60

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TRANSFORMADOR DE CALOR Y ENFRIAMIENTO BRUSCO

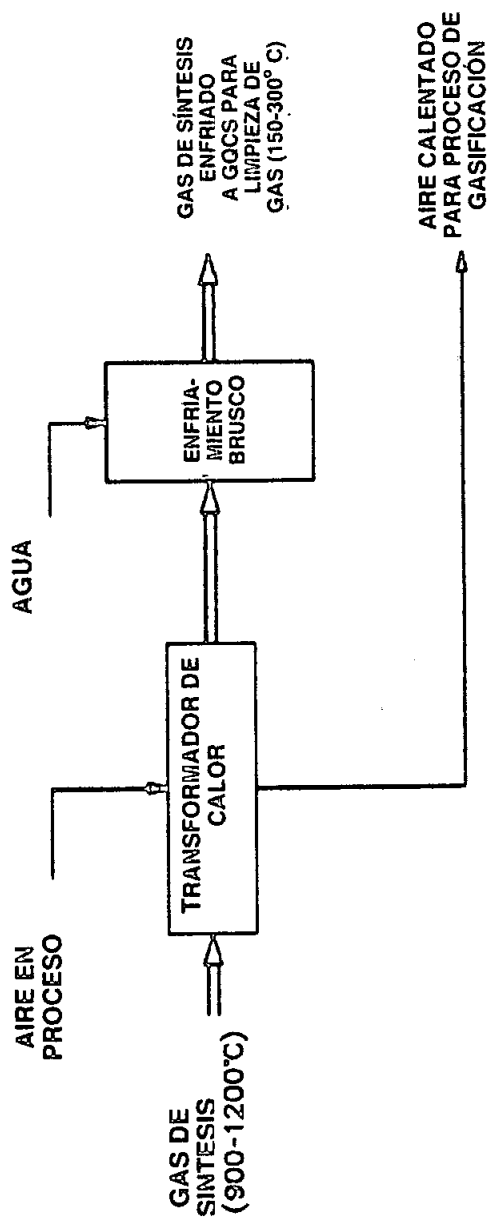


FIGURA 61

TRANSFORMADORES DE CALOR VARIOS

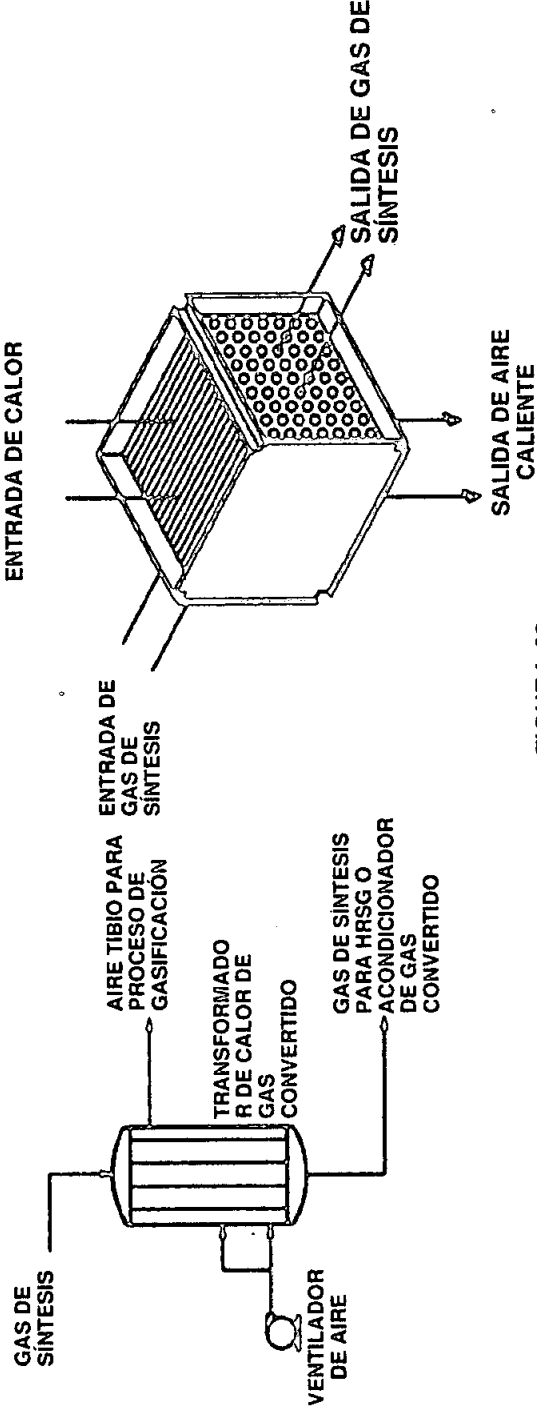


FIGURA 62

MEDIOS PARA TRANSFERIR EL AIRE  
TRANSFORMADO A EL REACTOR DE GASIFICACIÓN

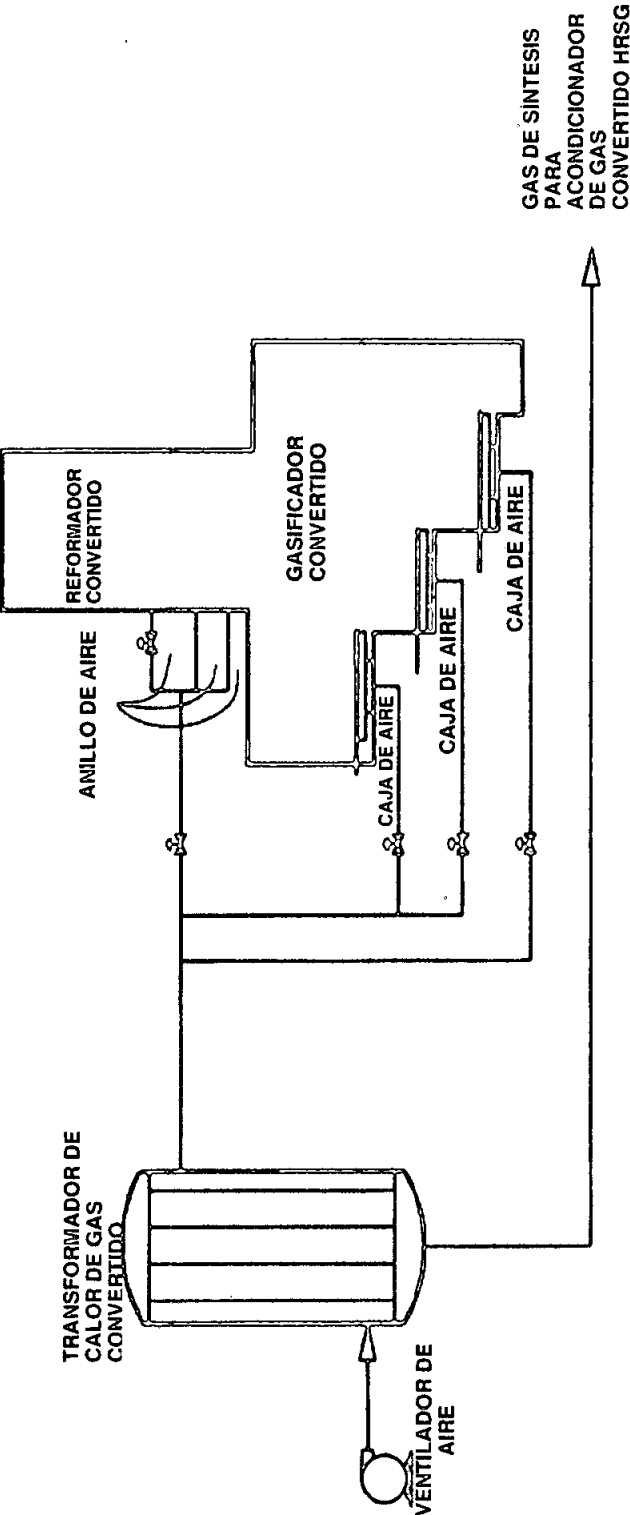


FIGURA 63

GENERADOR DE VAPOR RECUPERADO DE CALOR Y TRANSFORMADOR DE CALOR (HRSG)

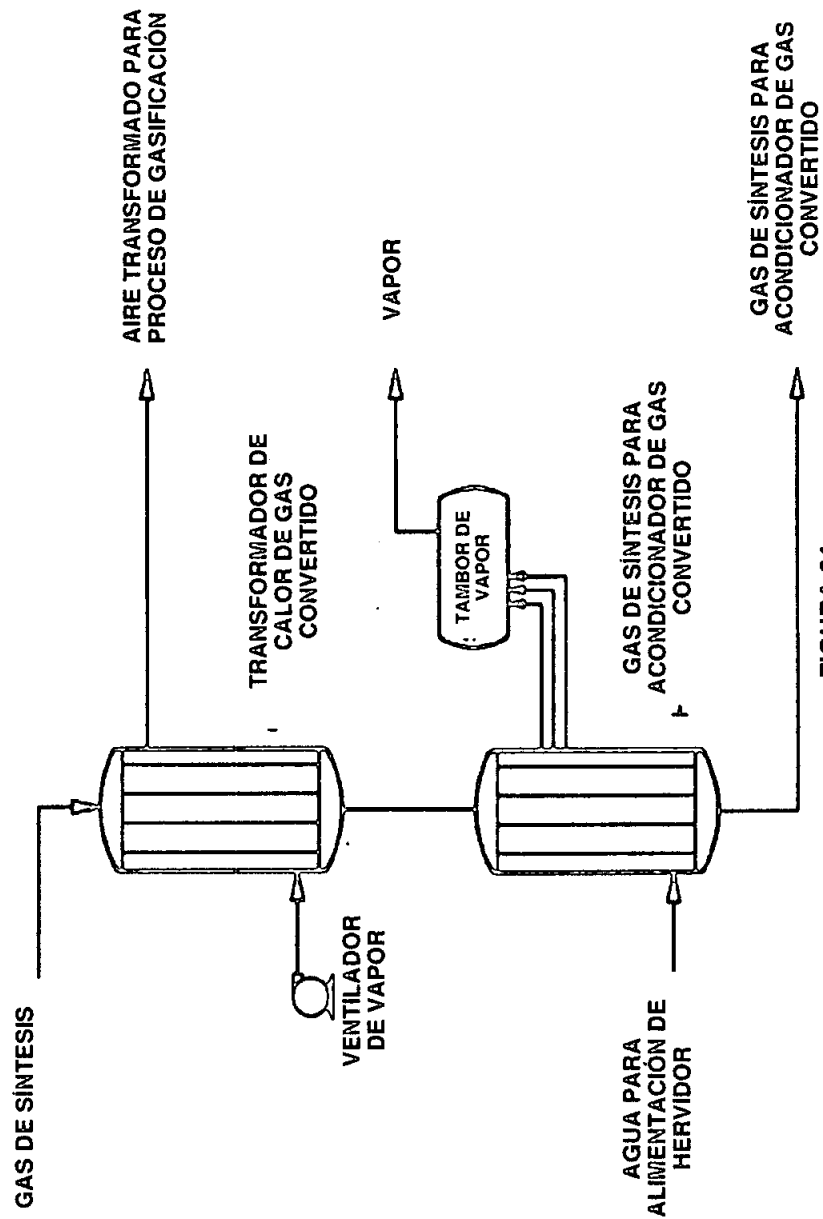


FIGURA 64

**CONTROL DE PRESIÓN/FLUIDO DE GAS  
DE SINTESIS**

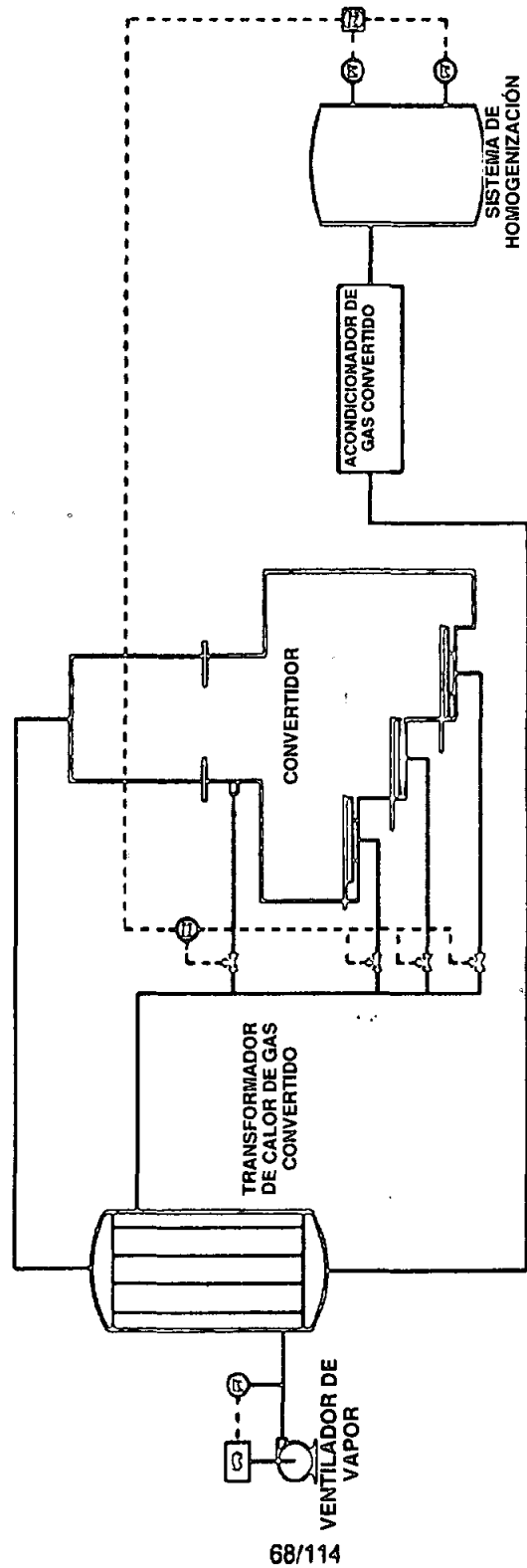


FIGURA 65

CONTROL DE TEMPERATURA

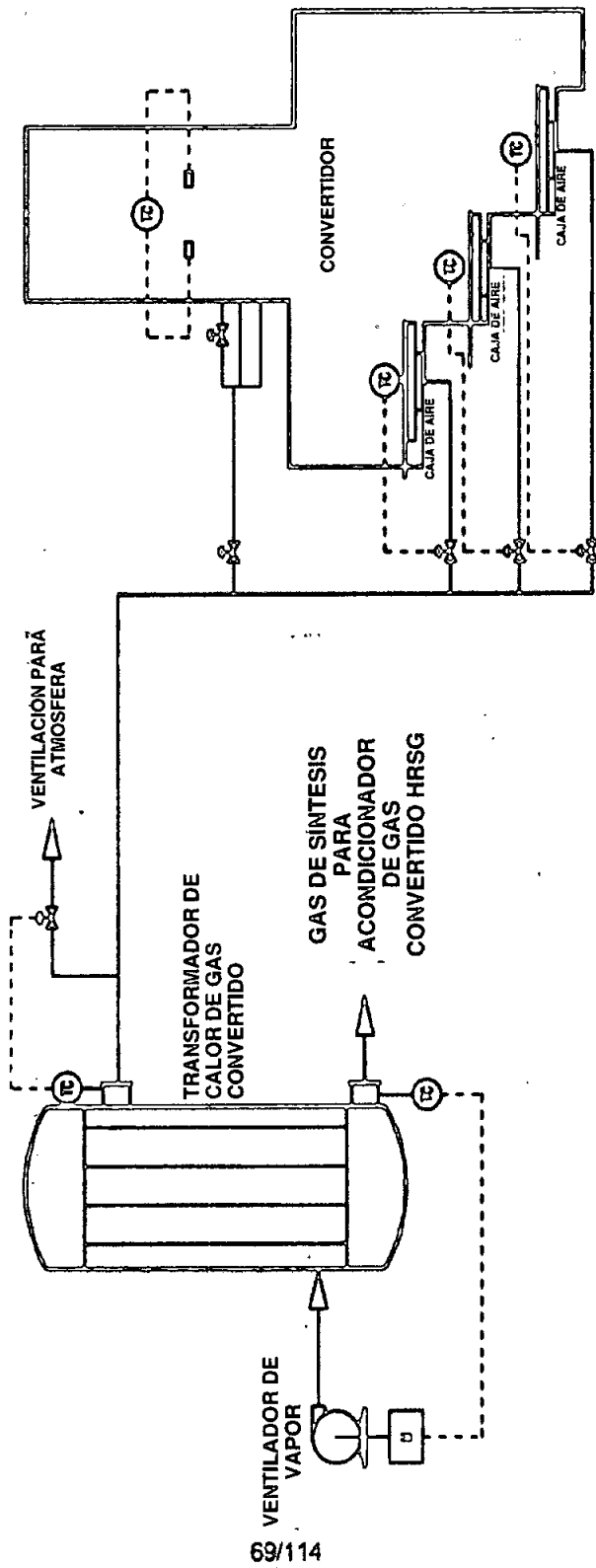


FIGURA 66

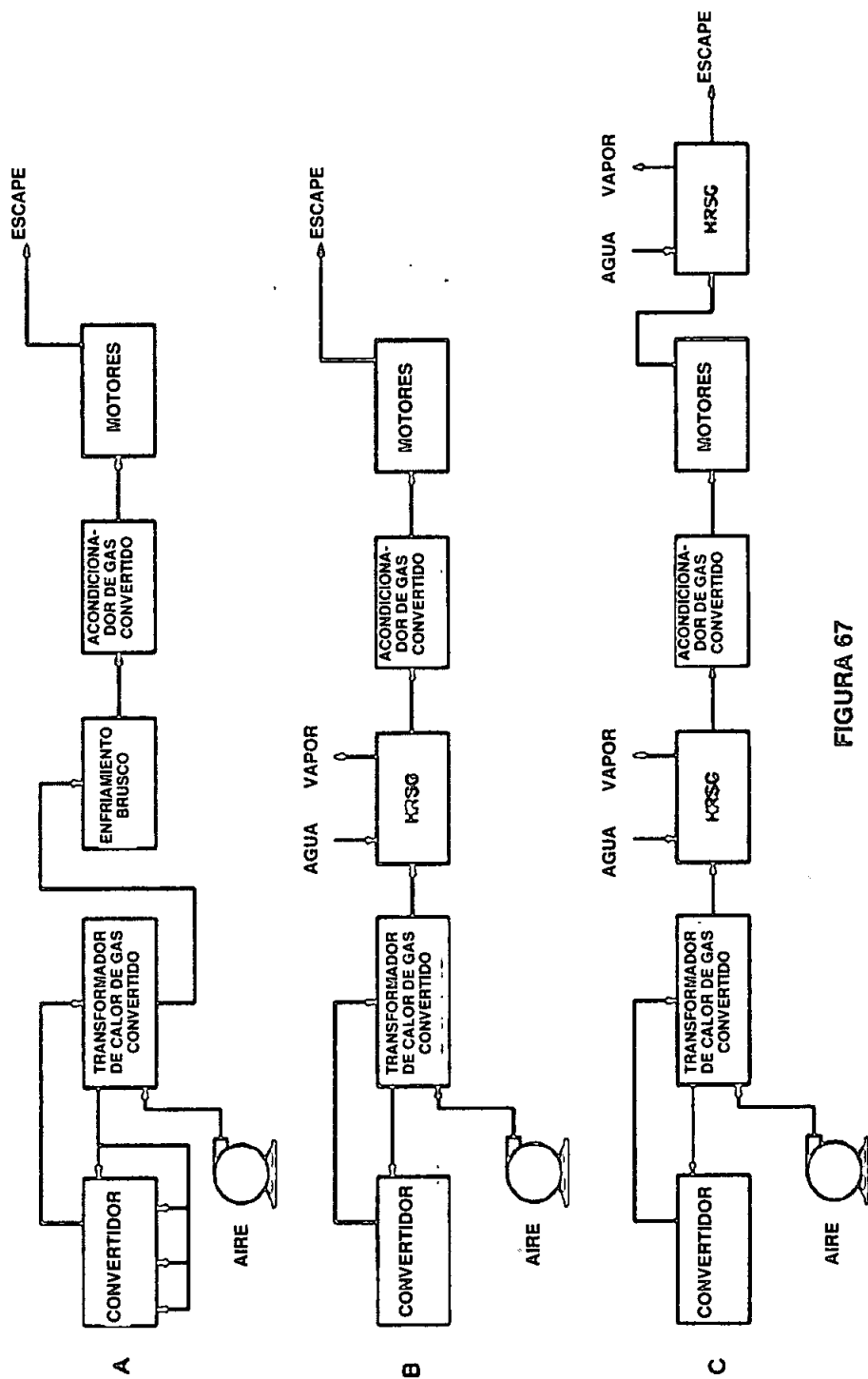


FIGURA 67

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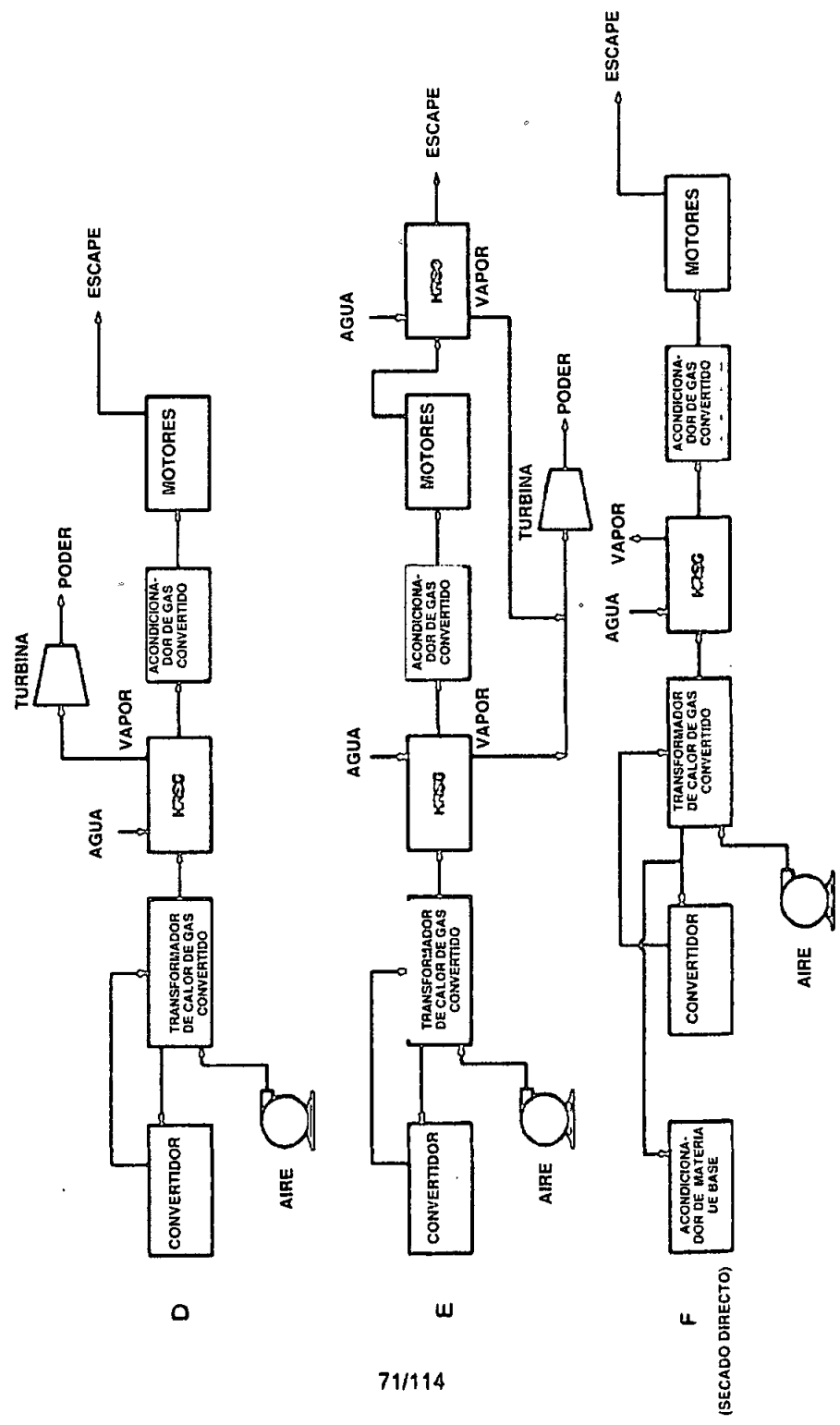


FIGURA 67 (CON.)

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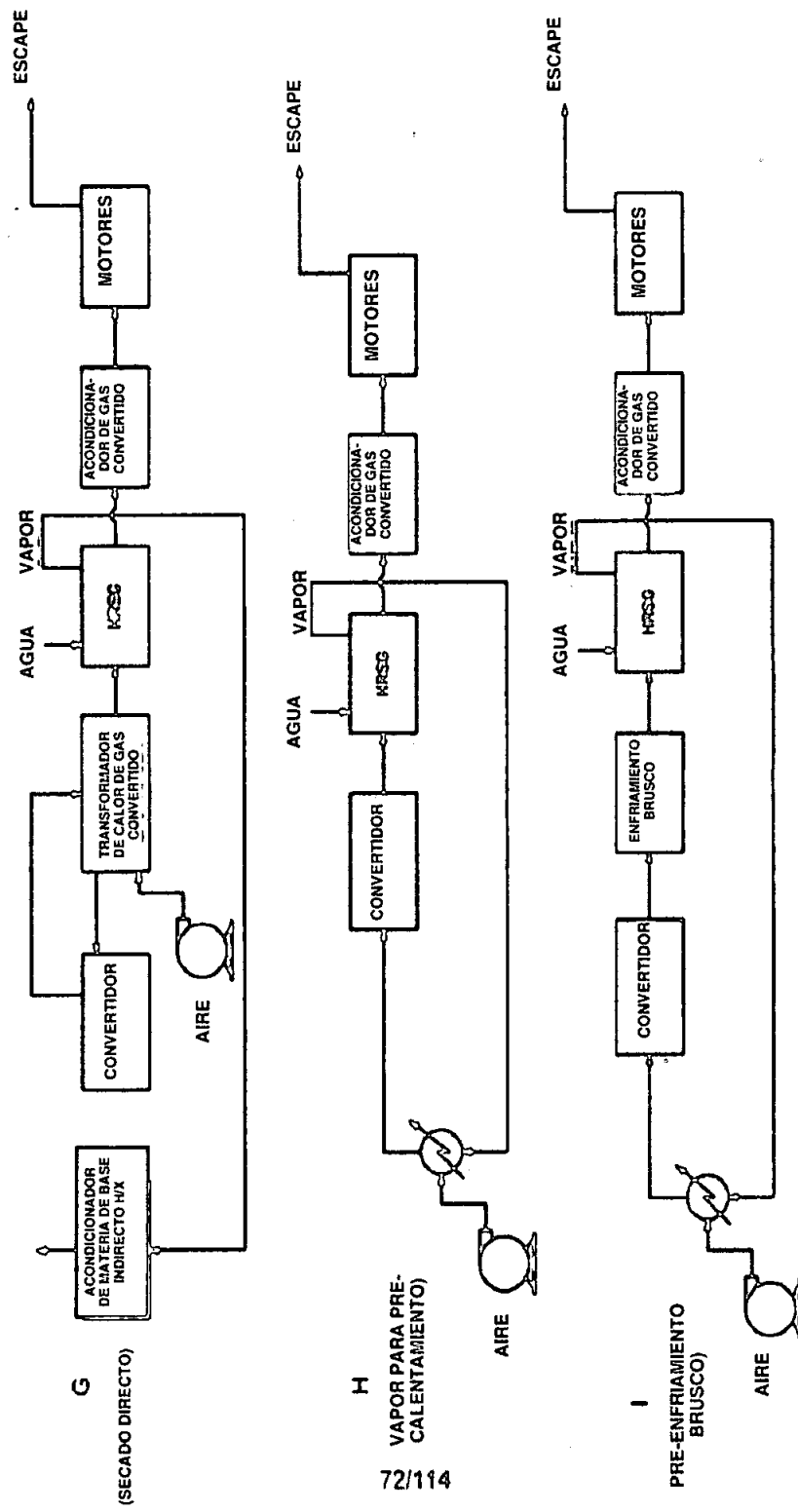


FIGURA 67 (CON.)

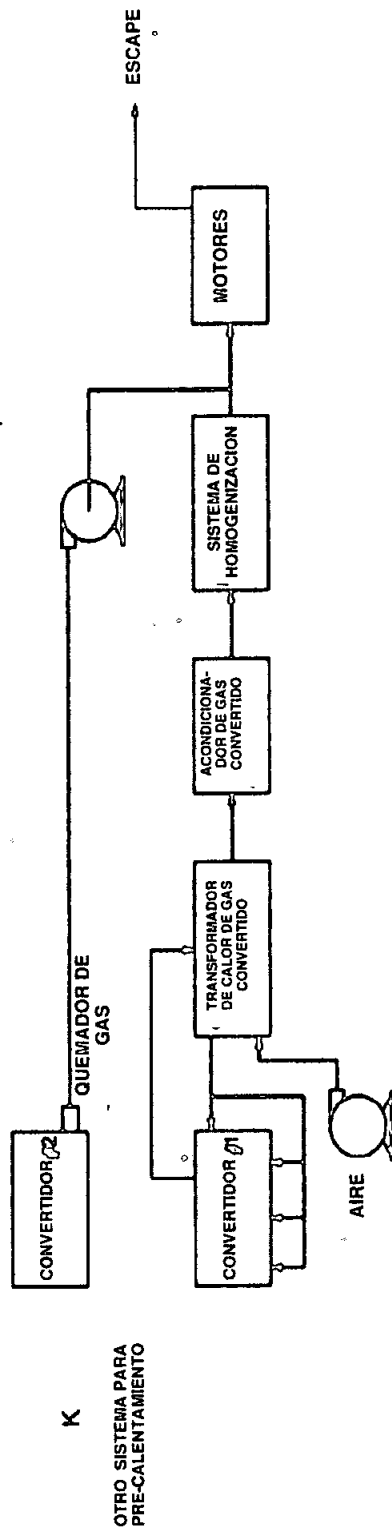
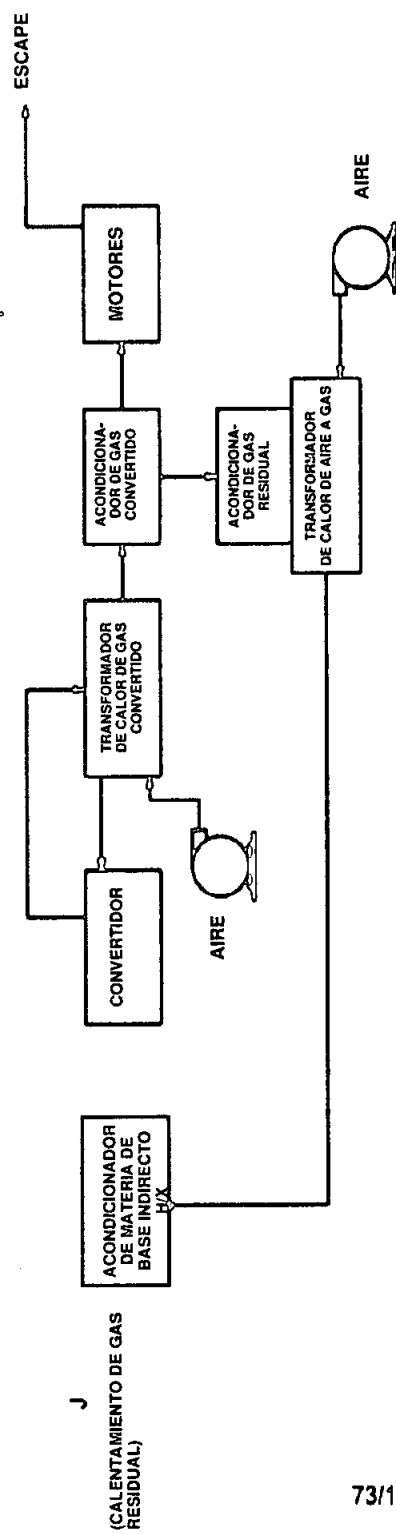


FIGURA 67 (CON.)

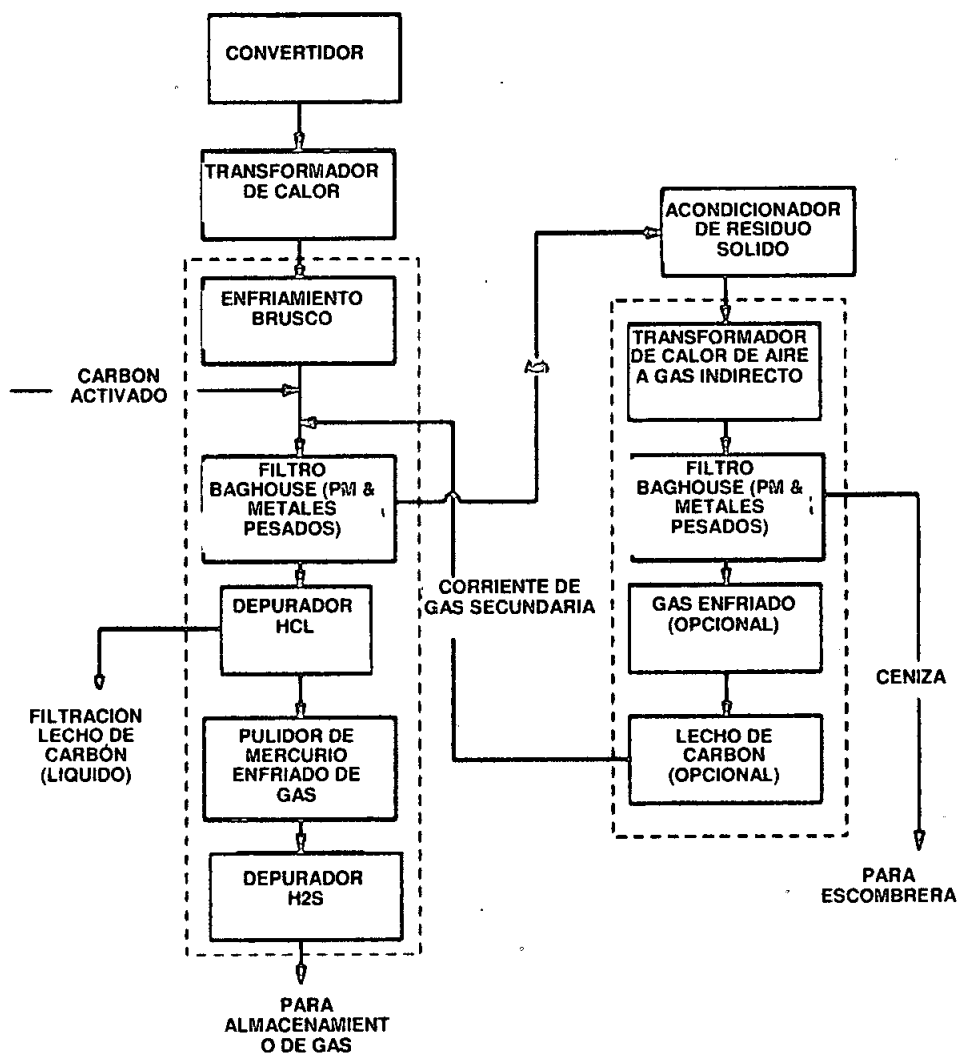


FIGURA 68

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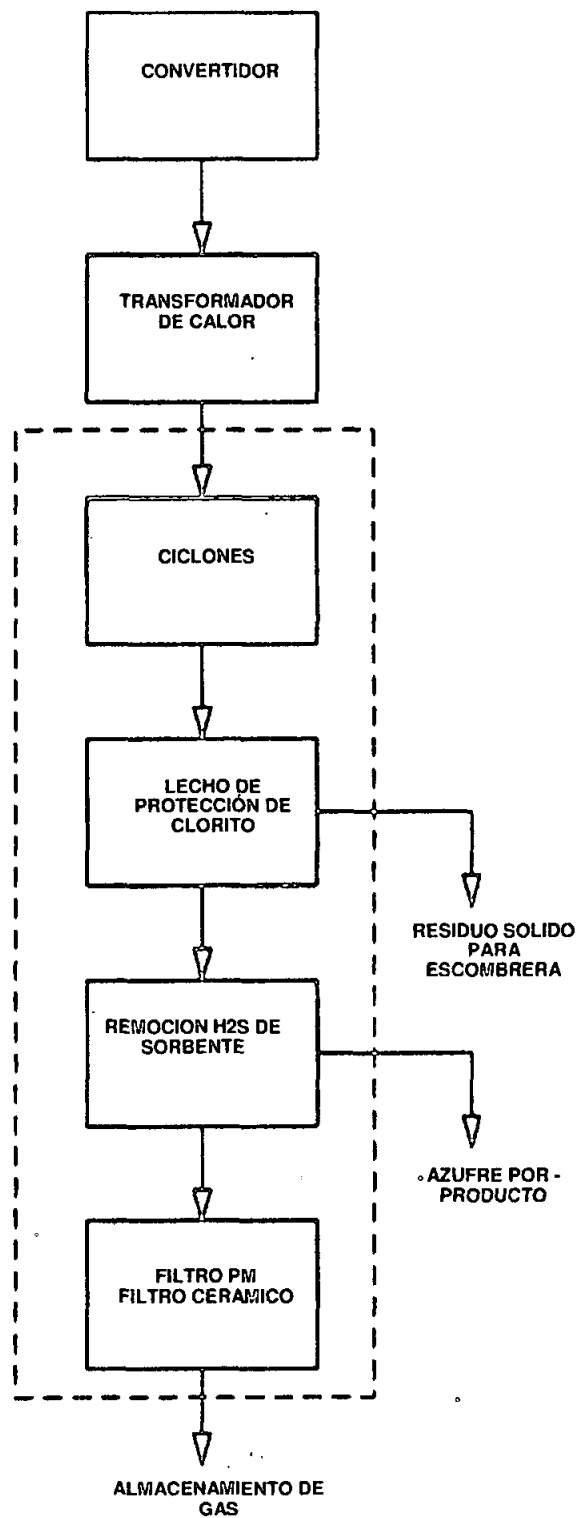


FIGURA 69

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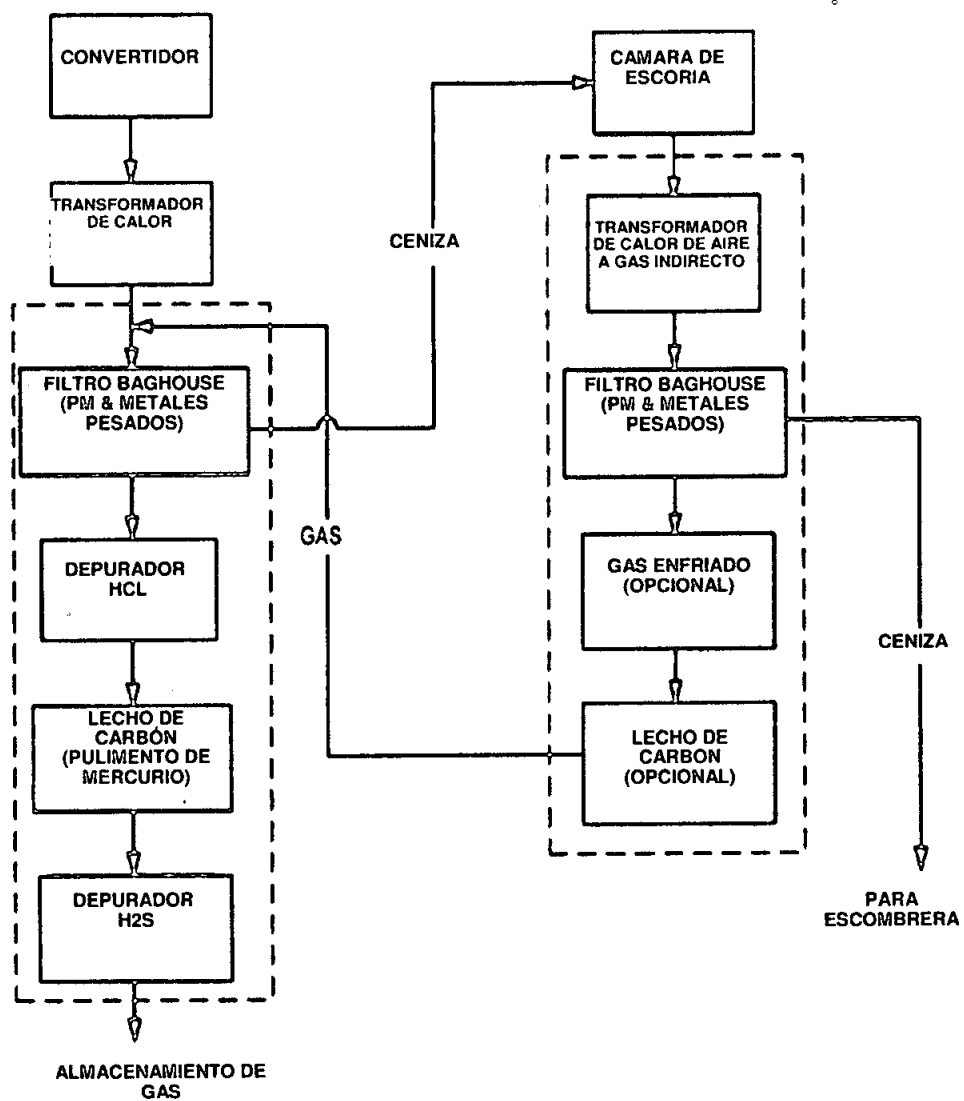


FIGURA 70

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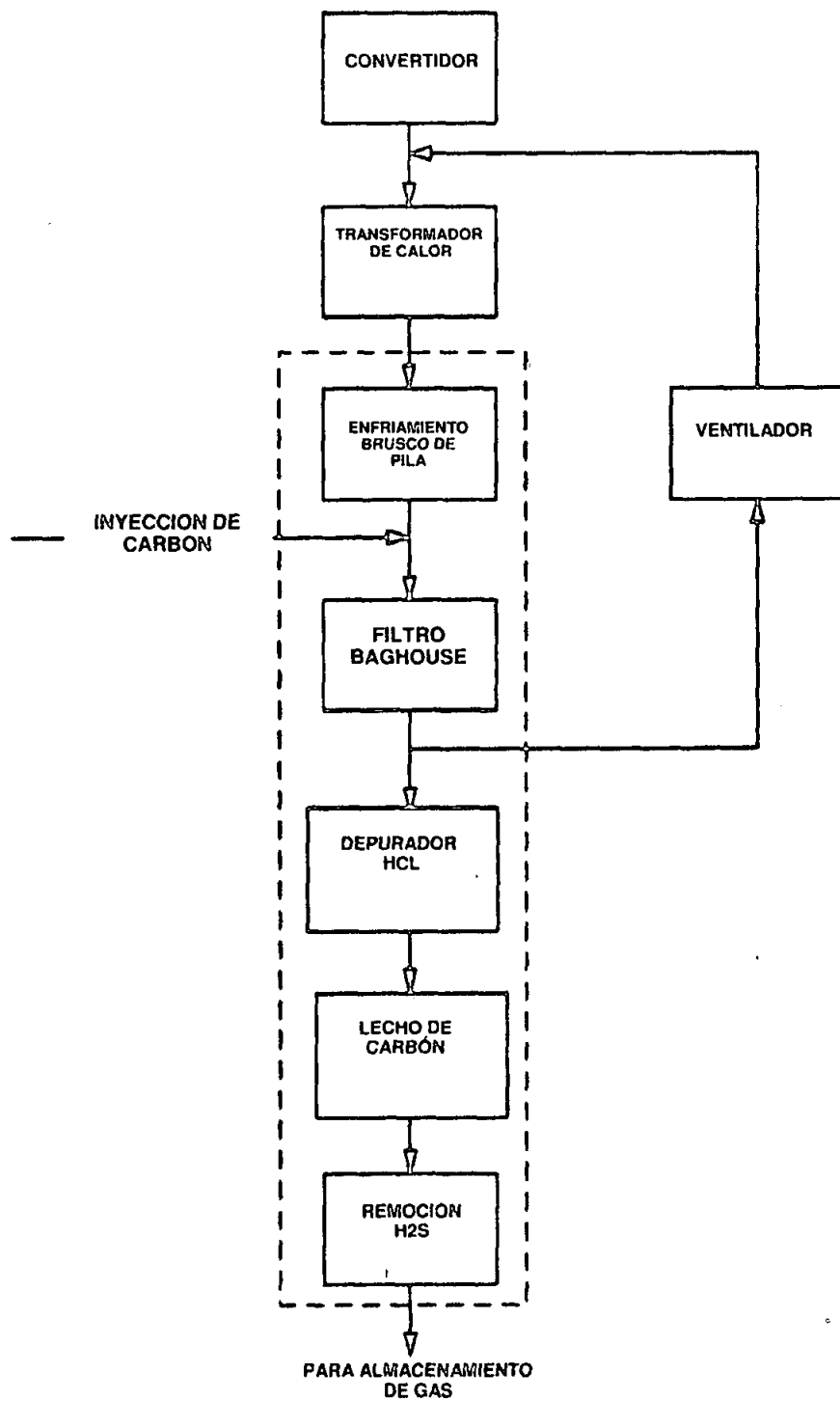


FIGURA 71

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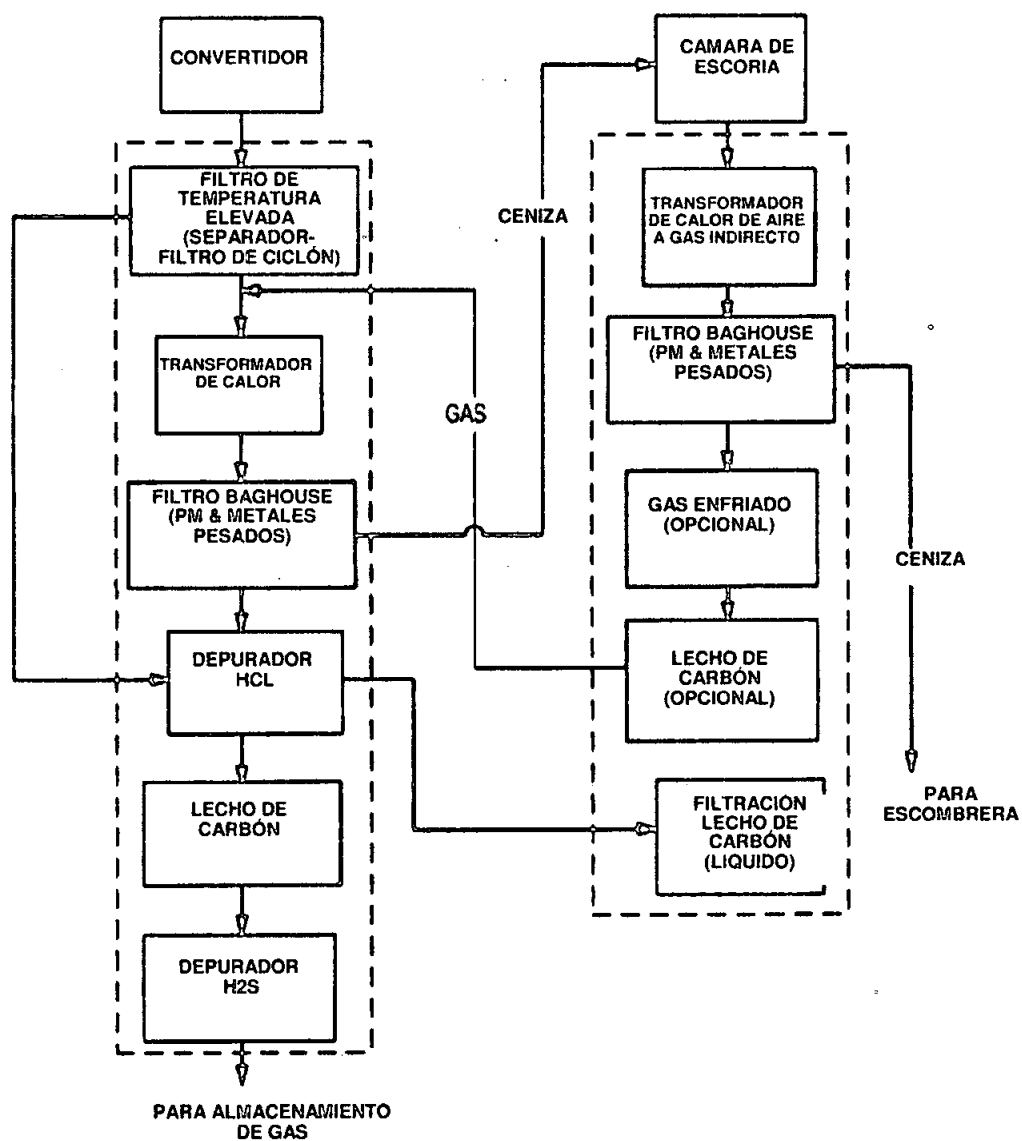


FIGURA 72

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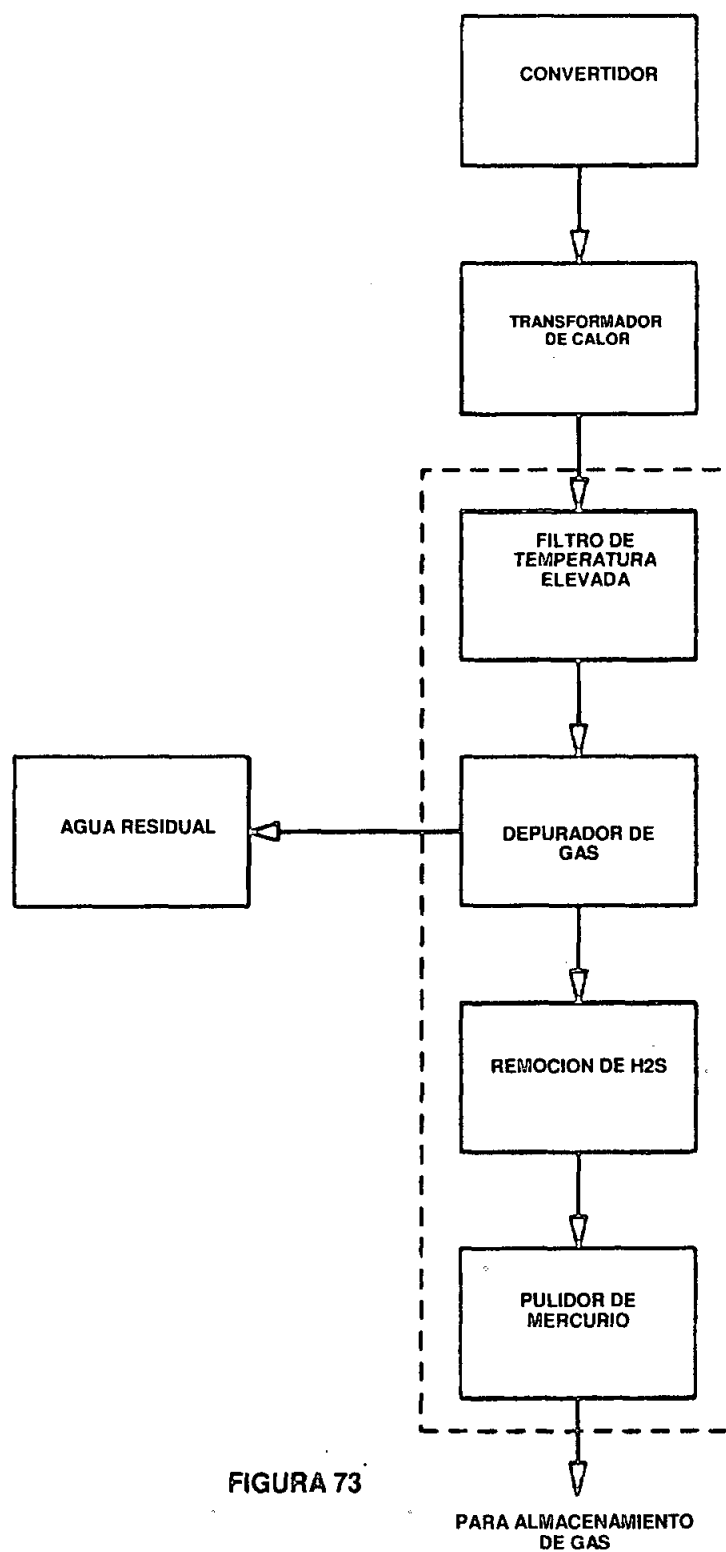
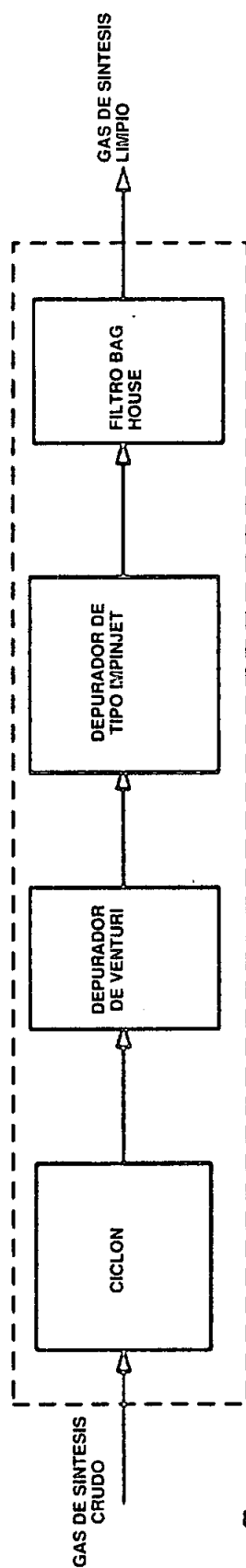


FIGURA 73

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FIGURA 74

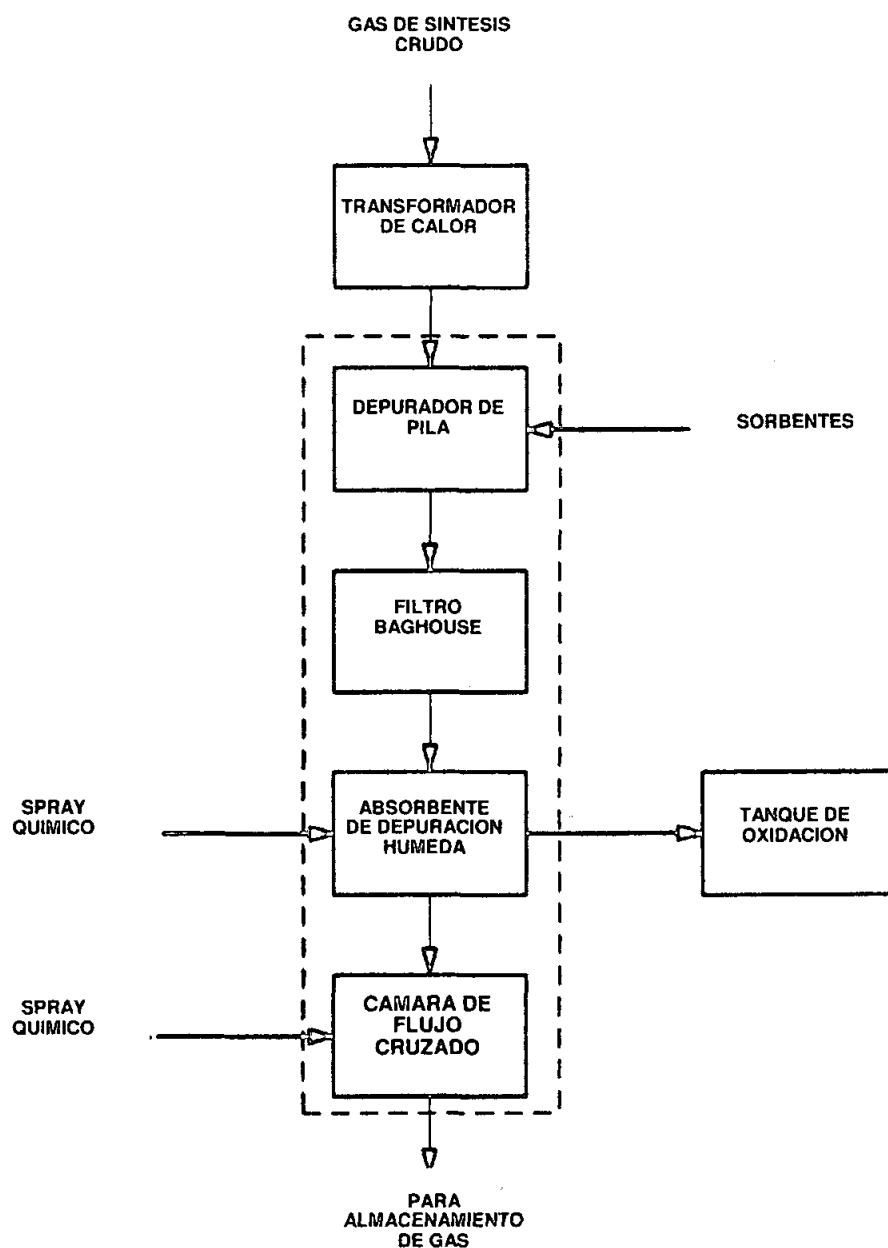


FIGURA 75

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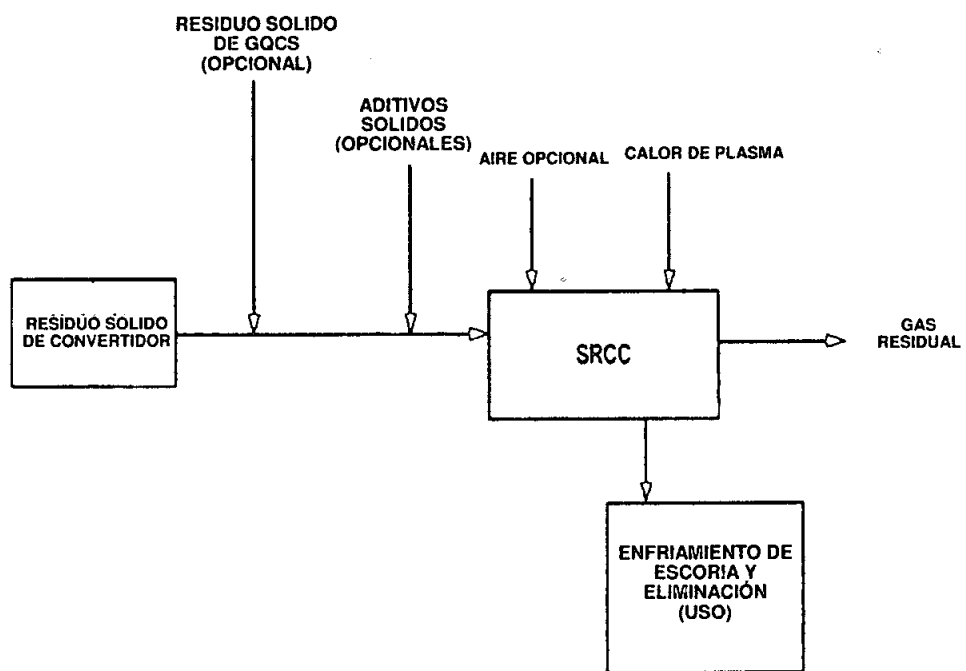


FIGURA 76

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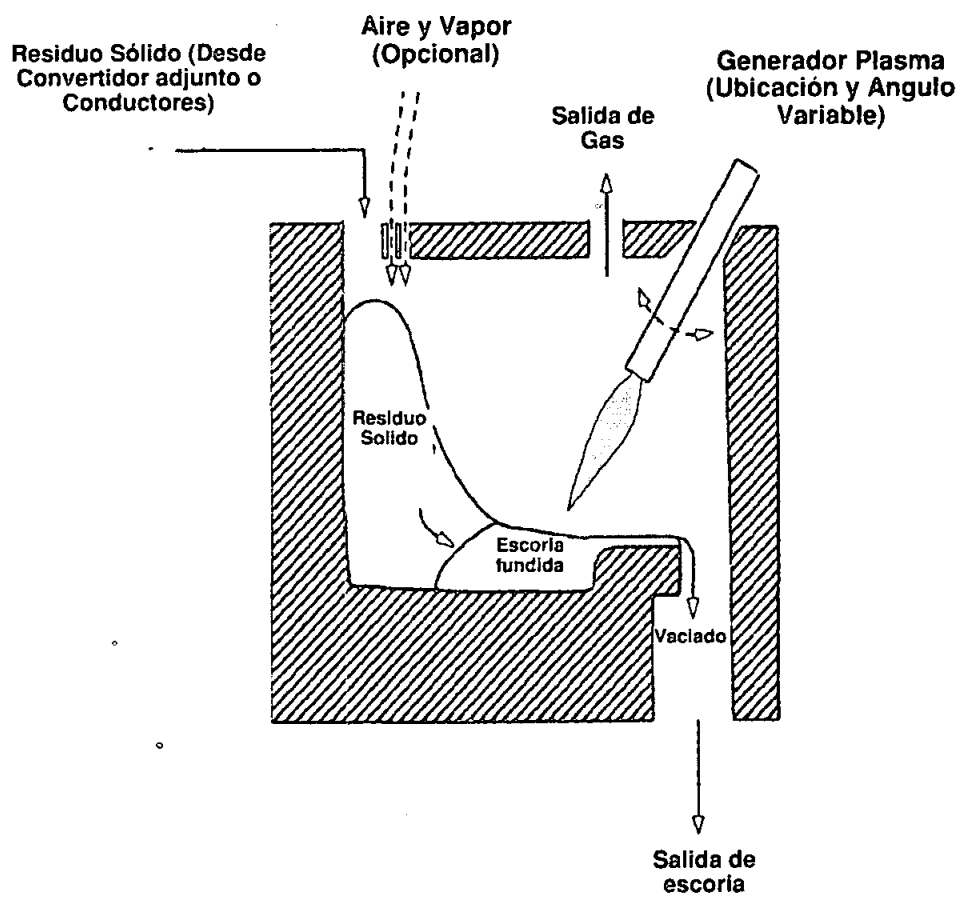
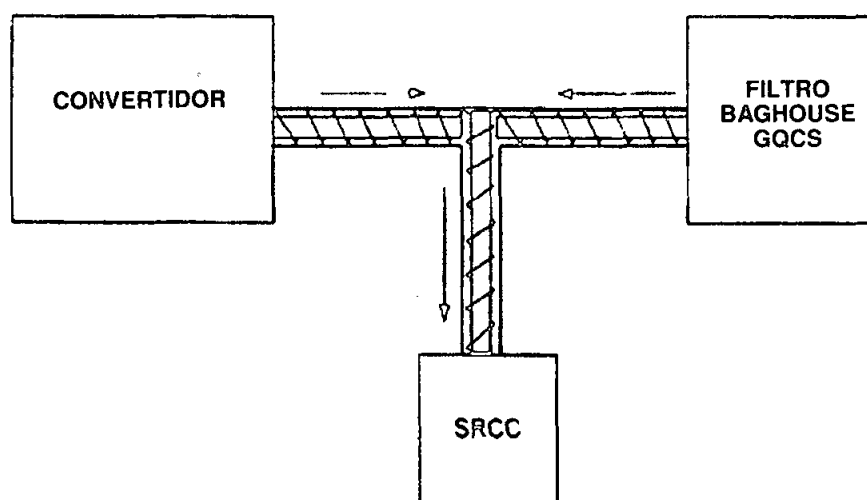


FIGURA 77

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A



B

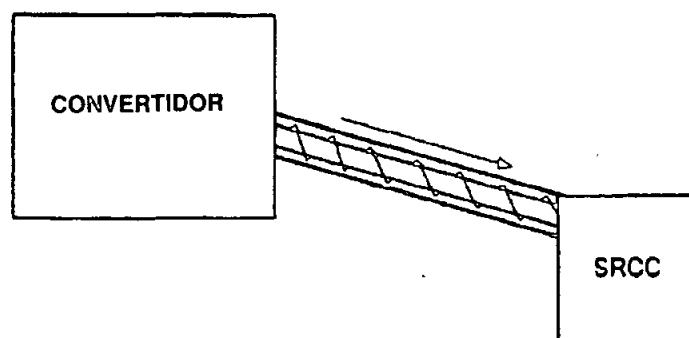


FIGURA 78

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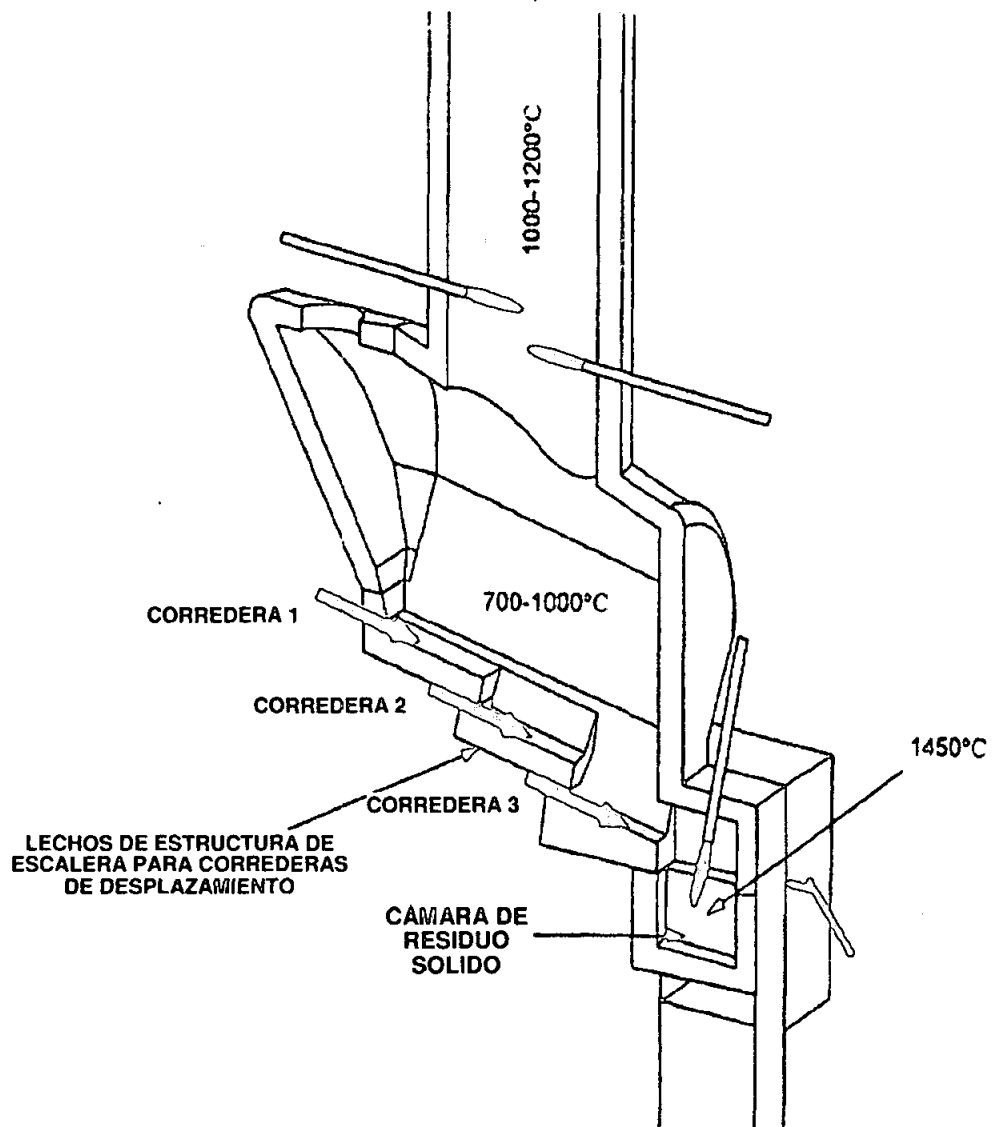


FIGURA 79

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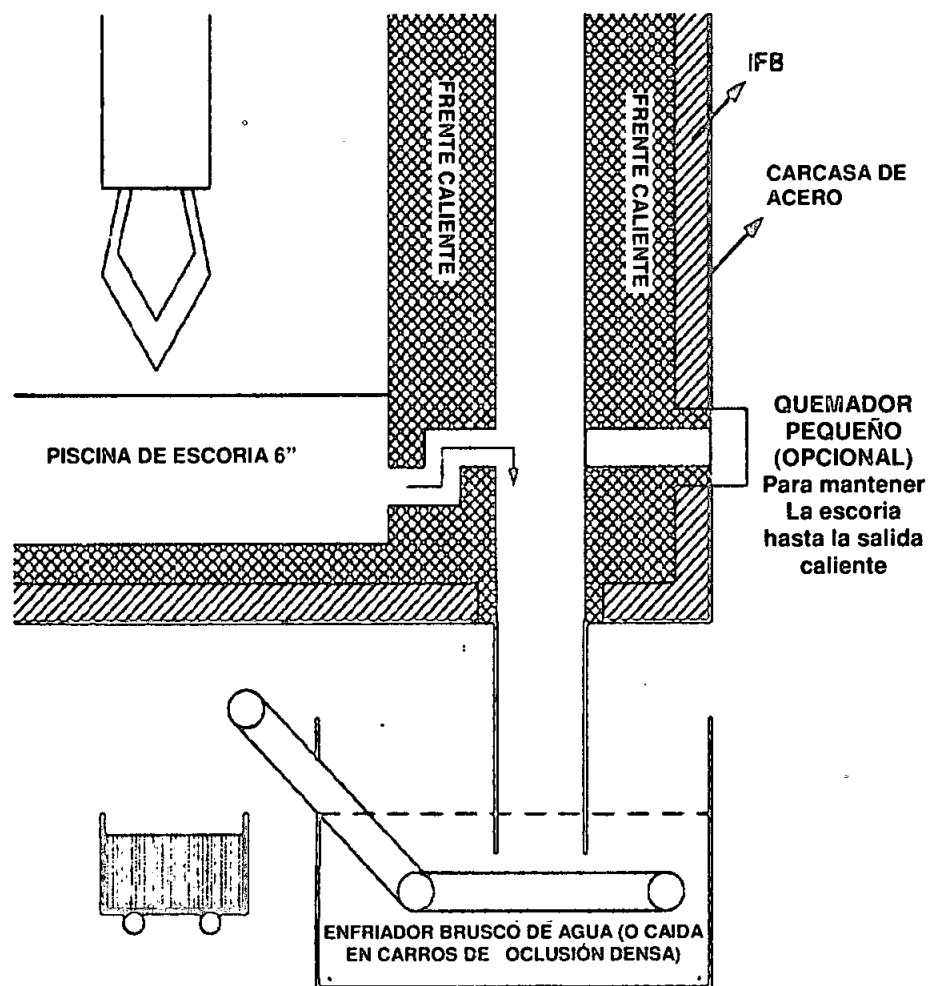


FIGURA 80

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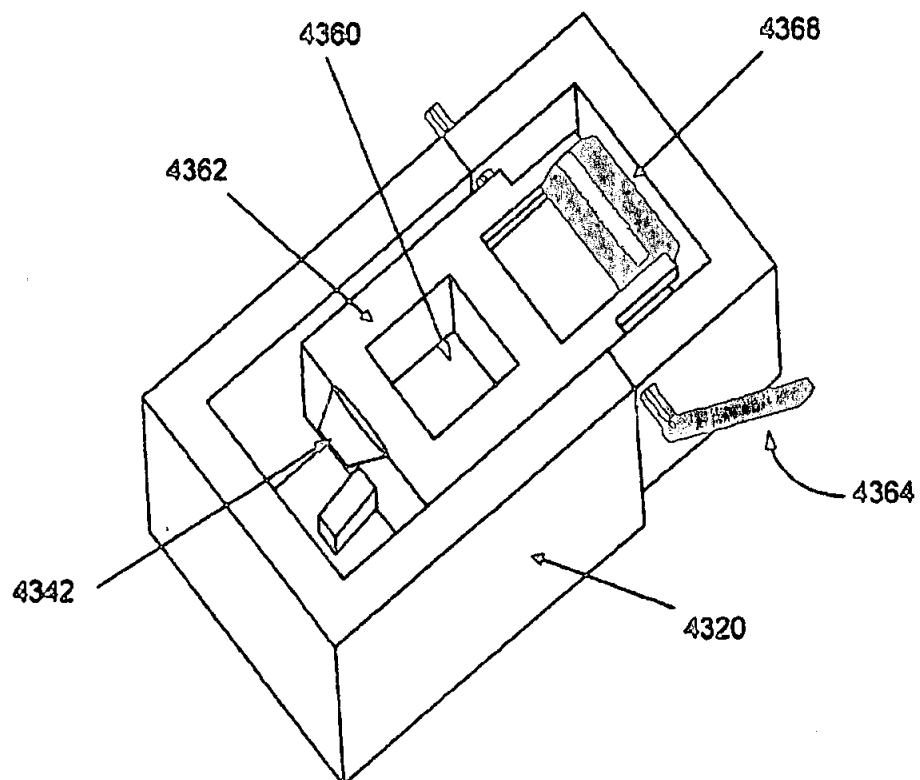


FIGURA 81

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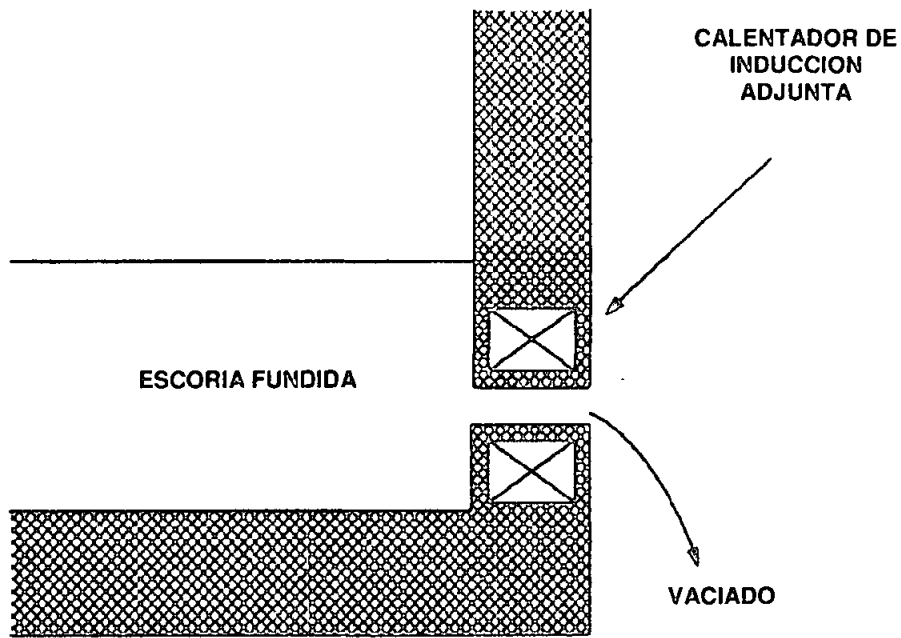


FIGURA 82

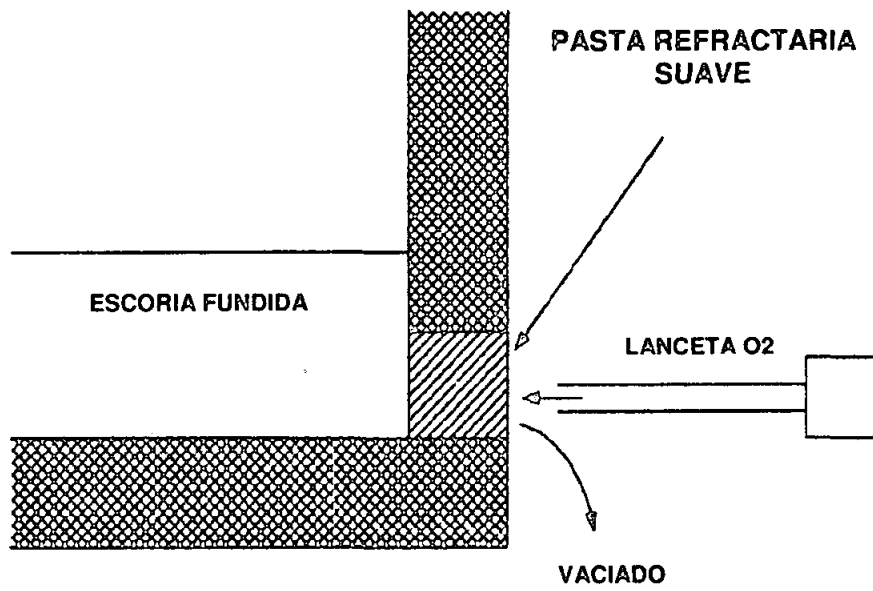


FIGURA 83

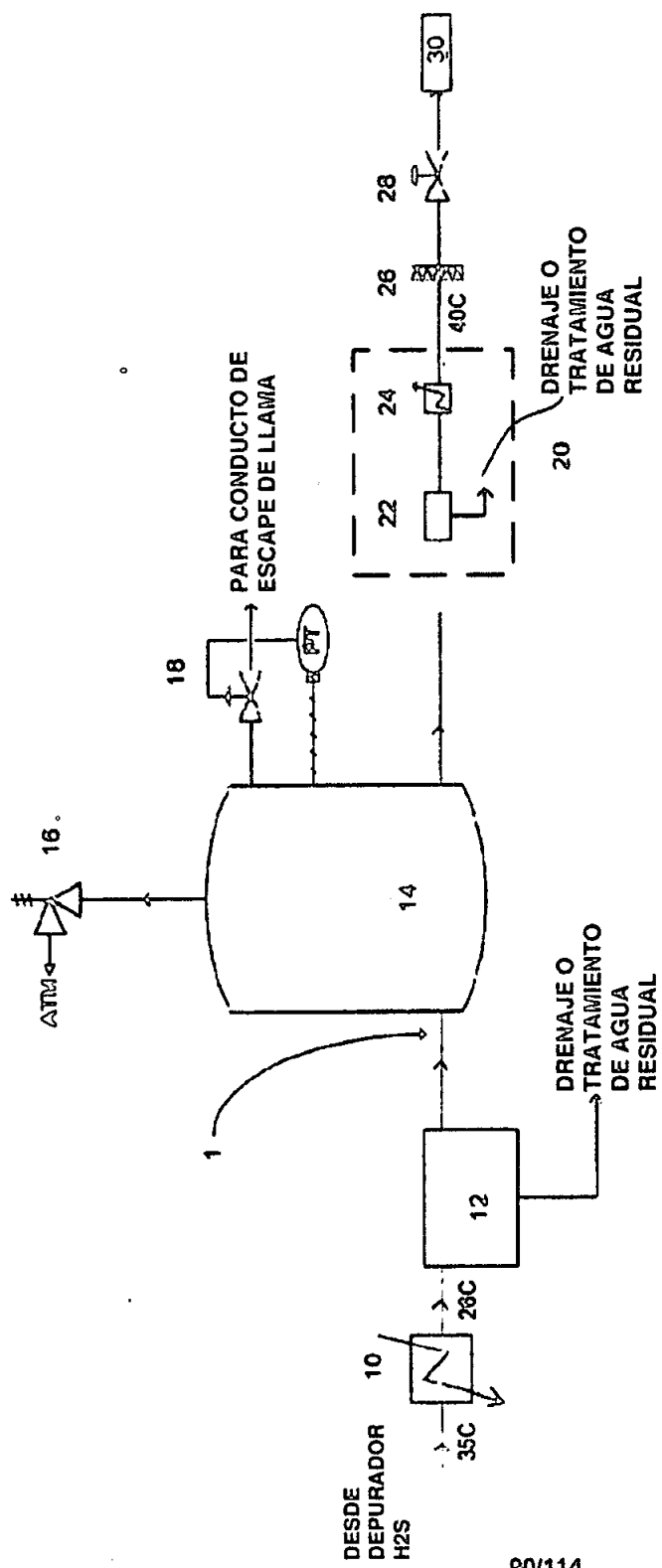


FIGURA 86

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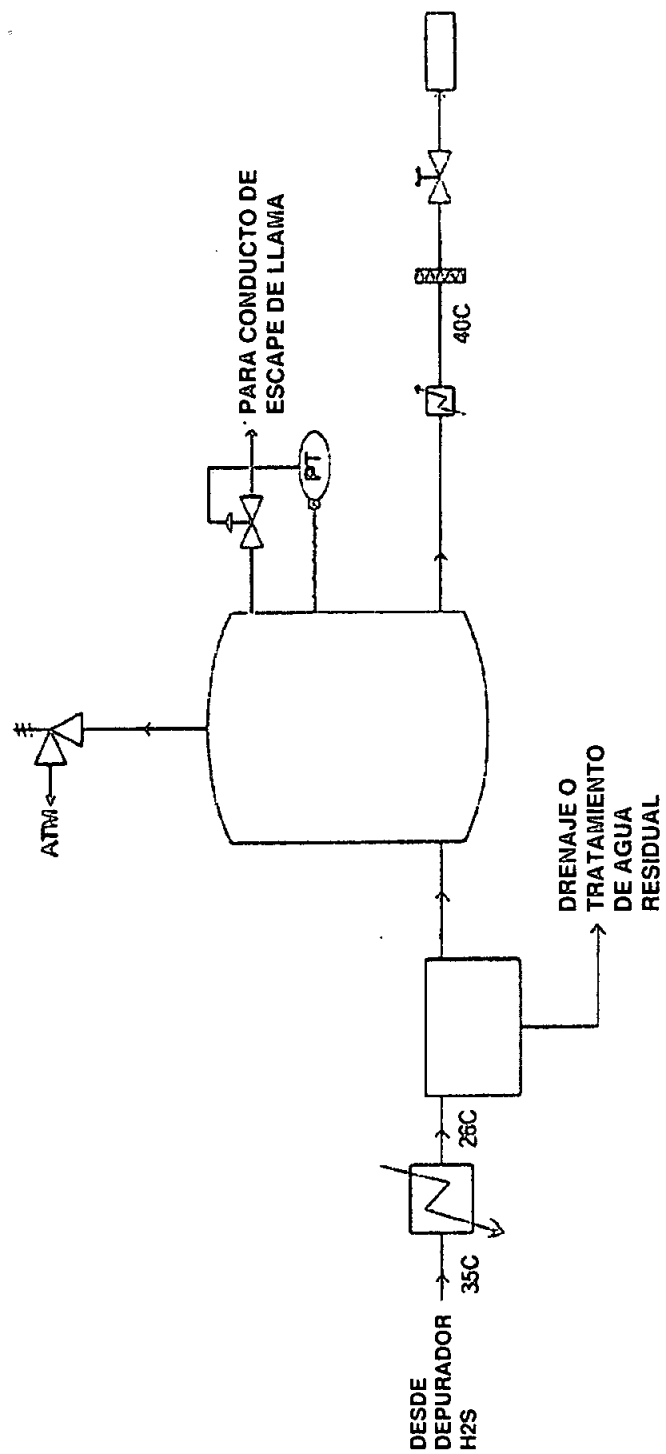


FIGURA 87

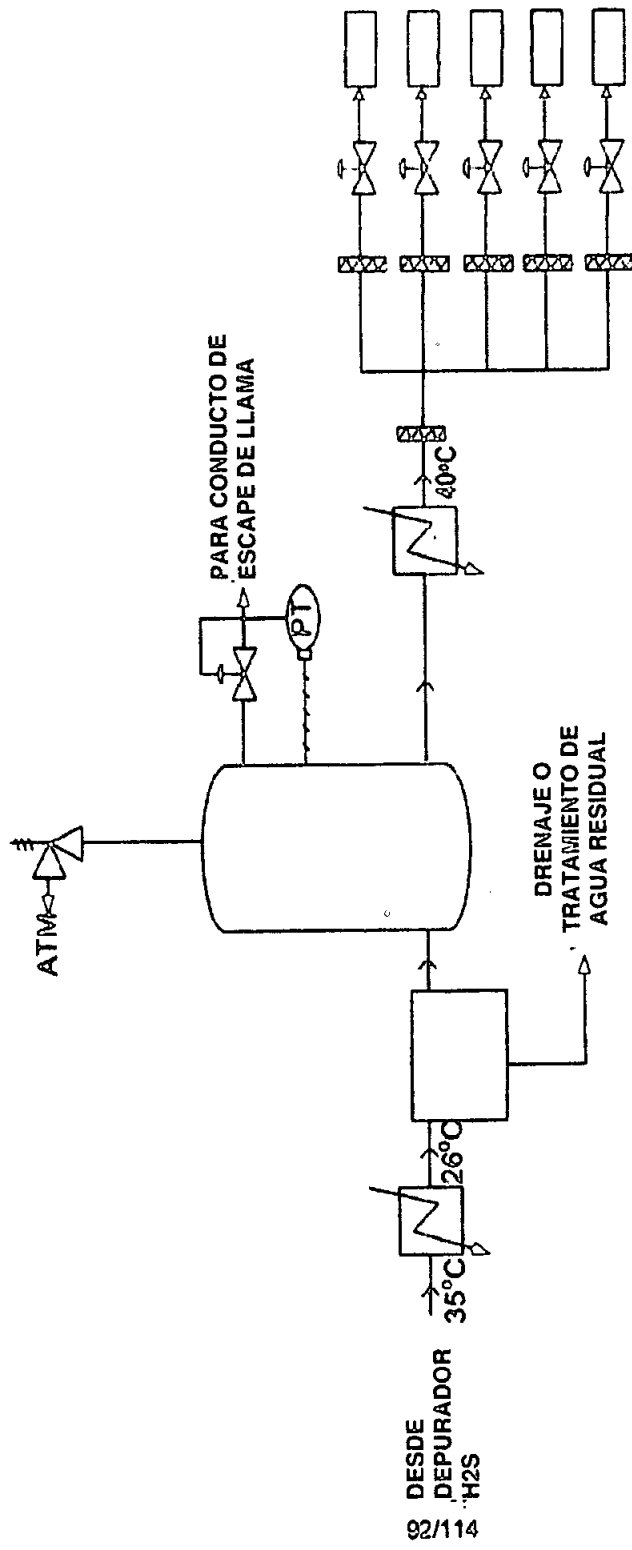


FIGURA 88

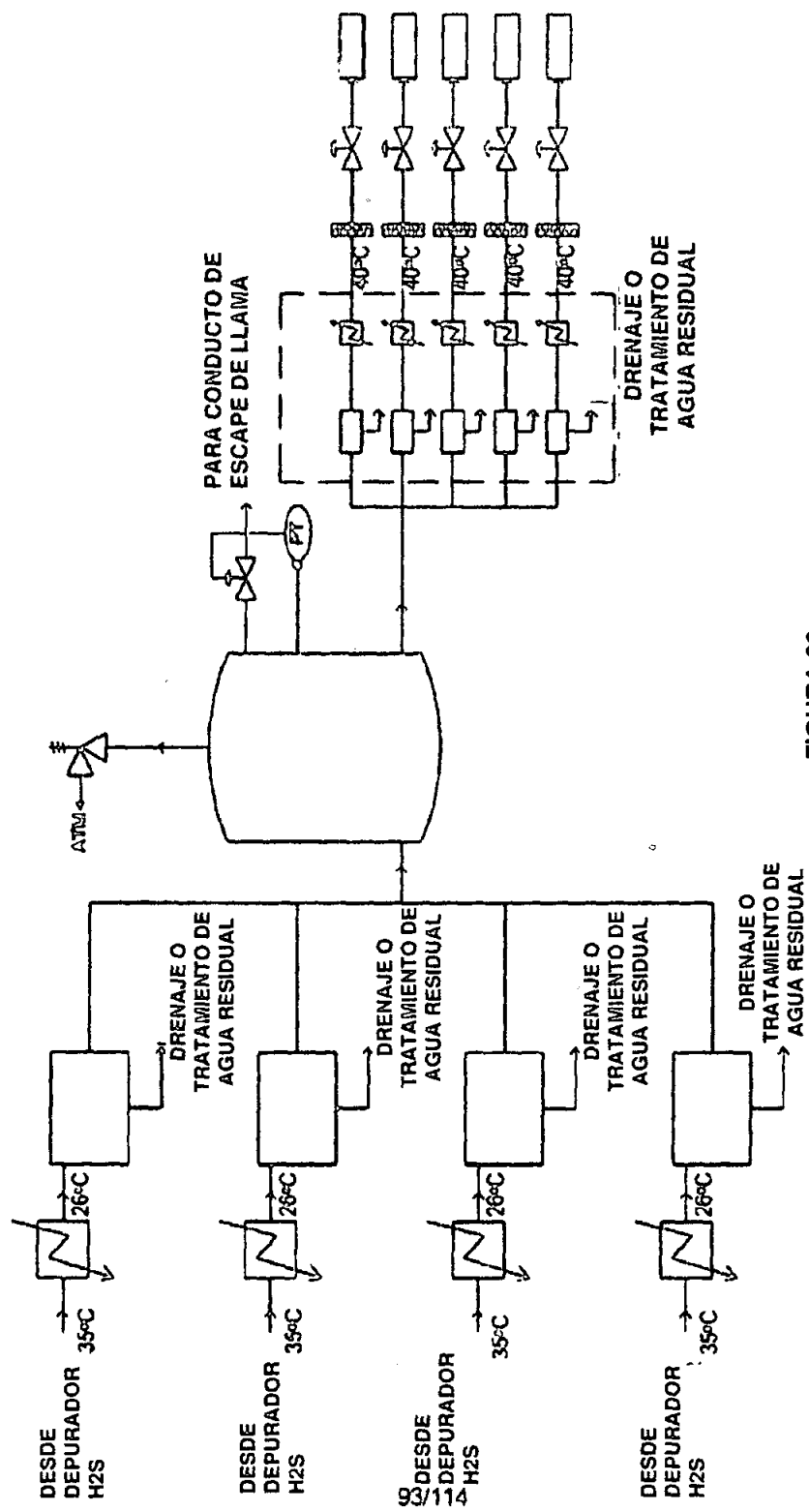


FIGURA 89

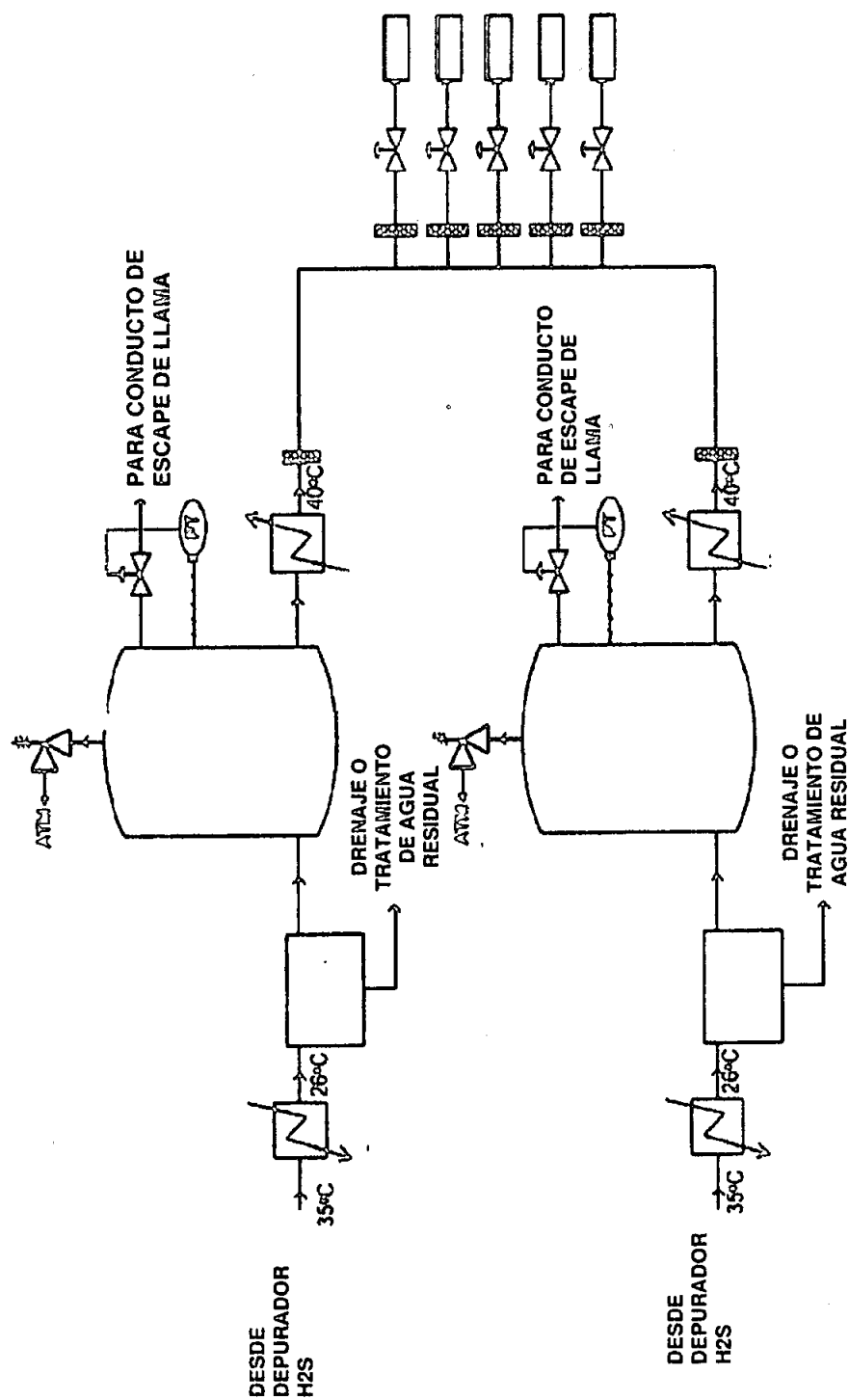


FIGURA 90

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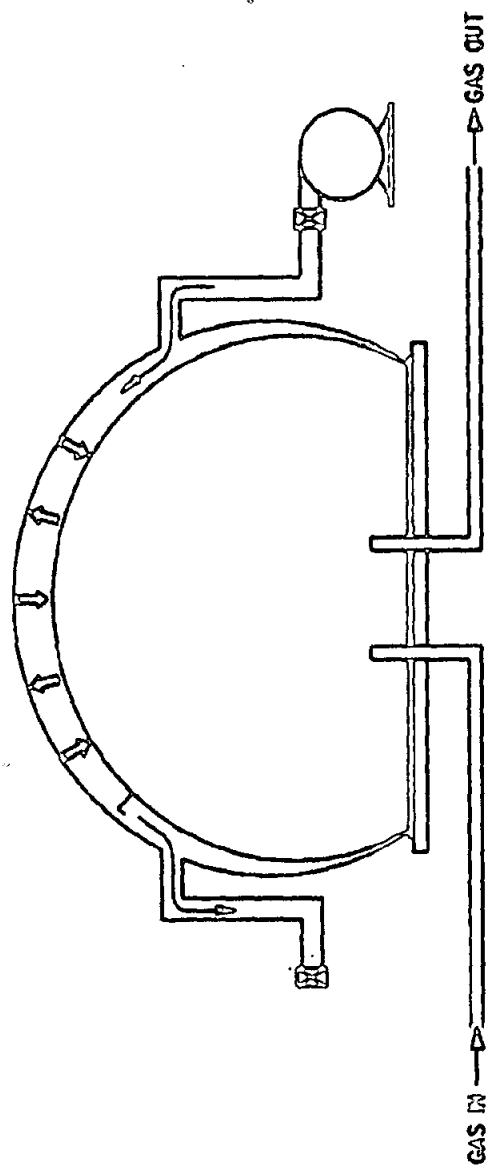


FIGURA 93

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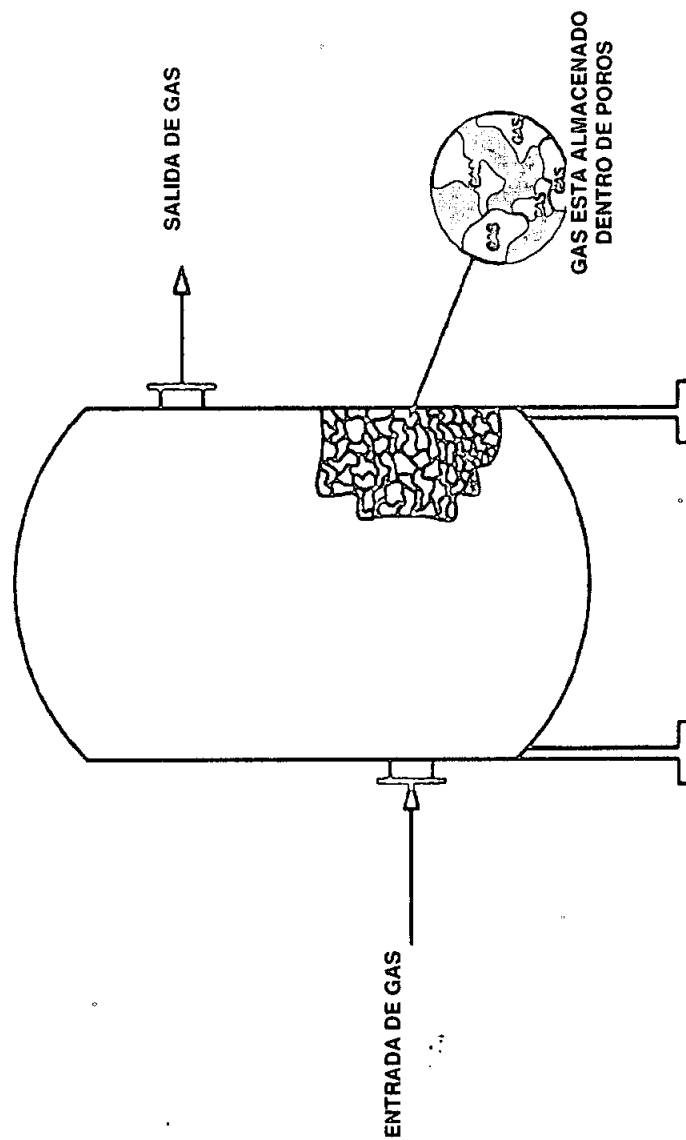


FIGURA 94

SALIDA DE GAS

ENTRADA DE GAS

FIGURA 95

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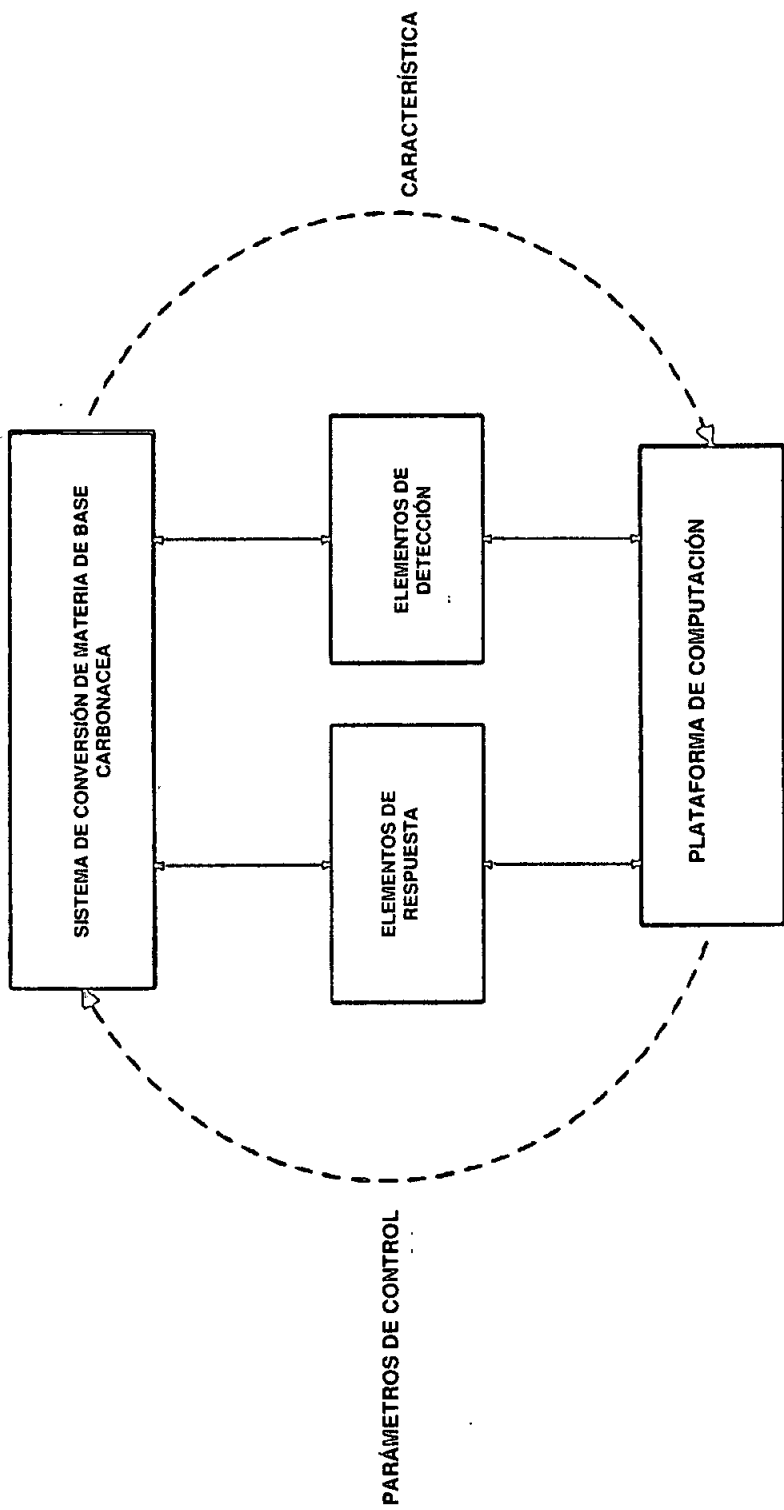


FIGURA 96

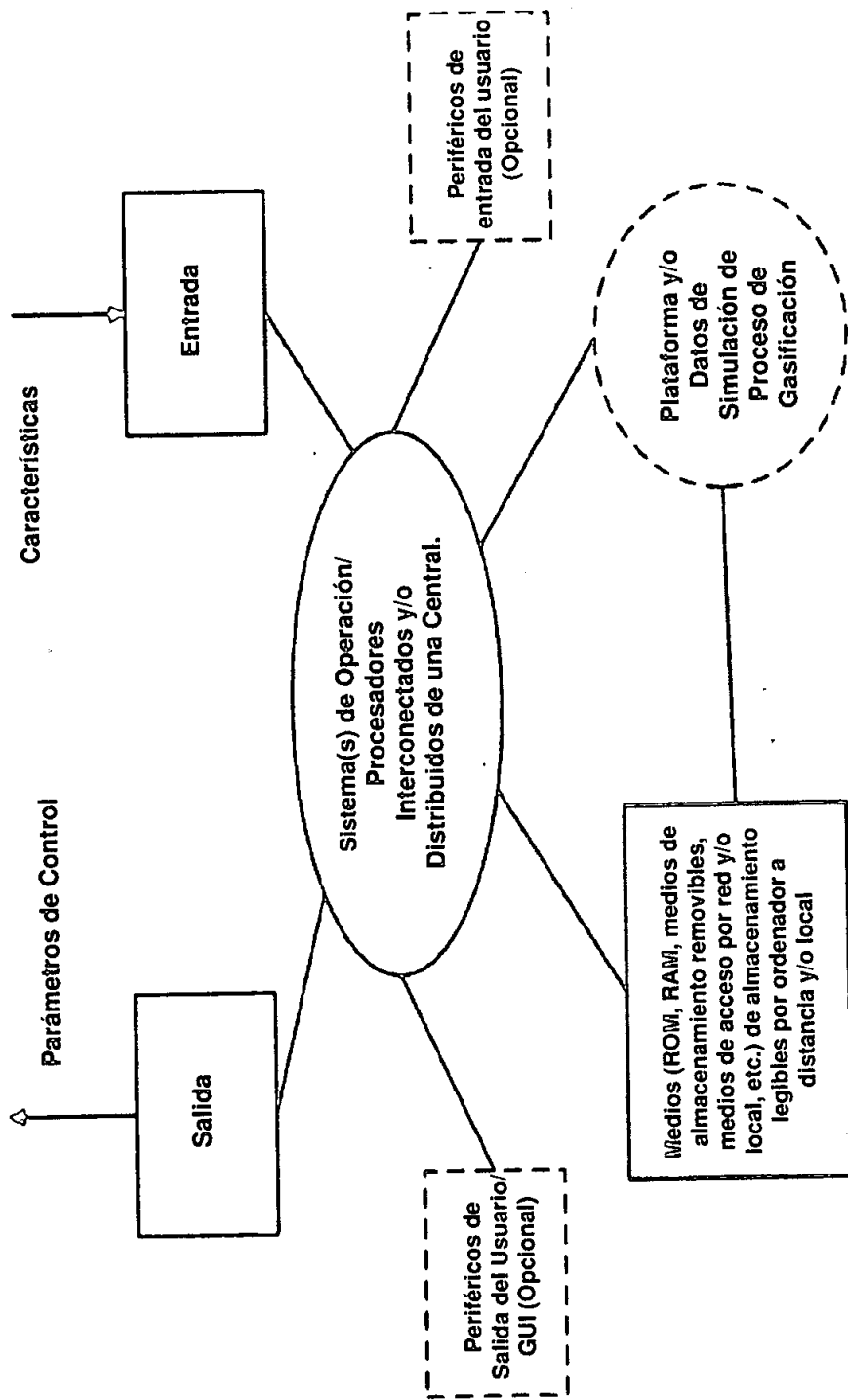


FIGURA 97

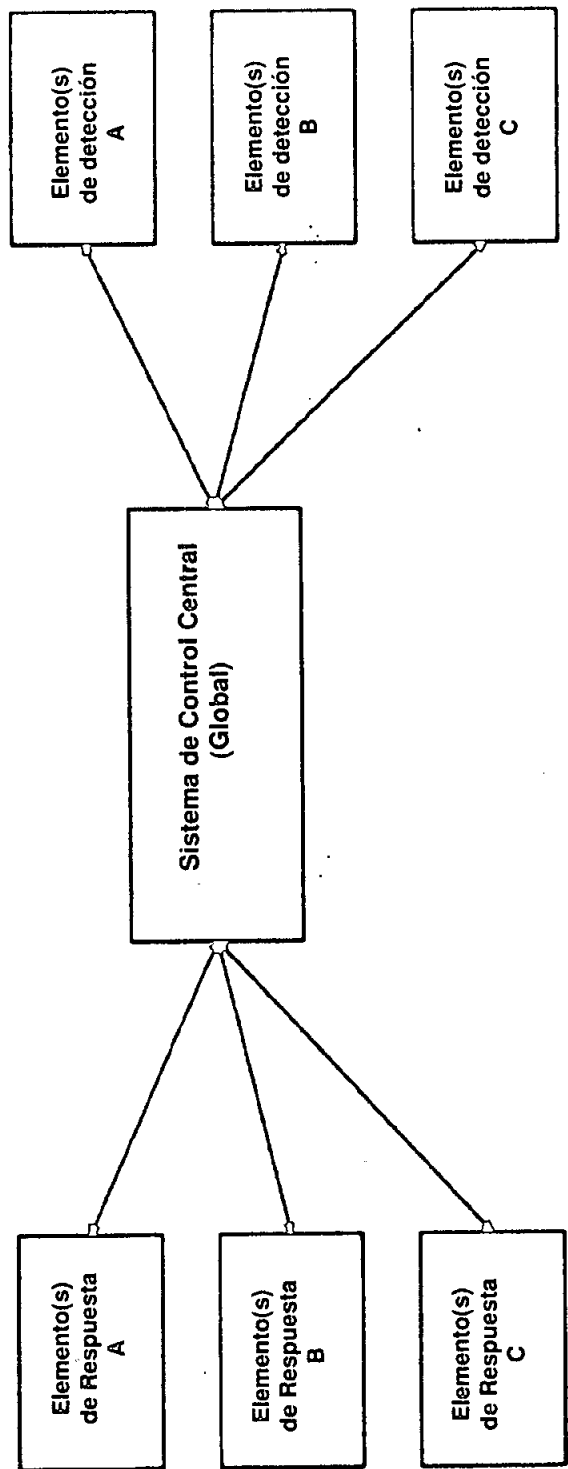


FIGURA 98

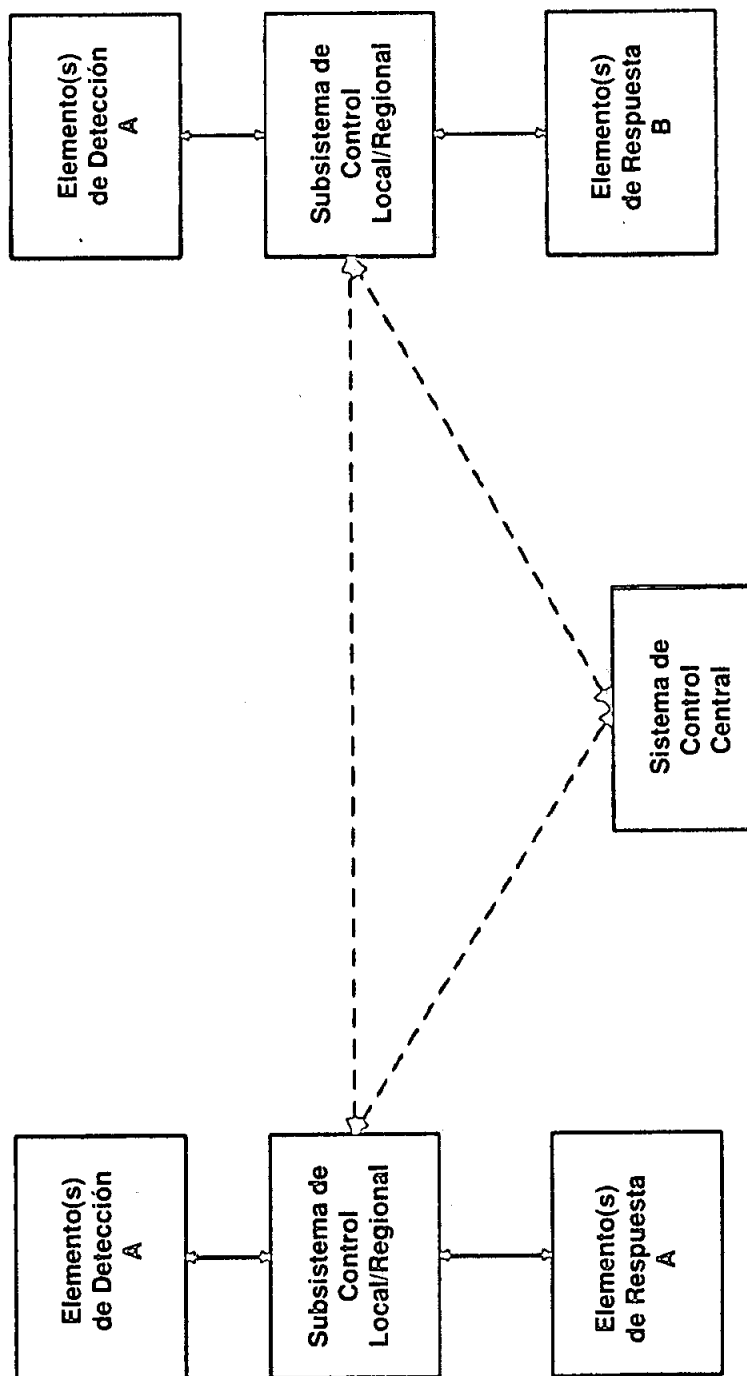


FIGURA 99

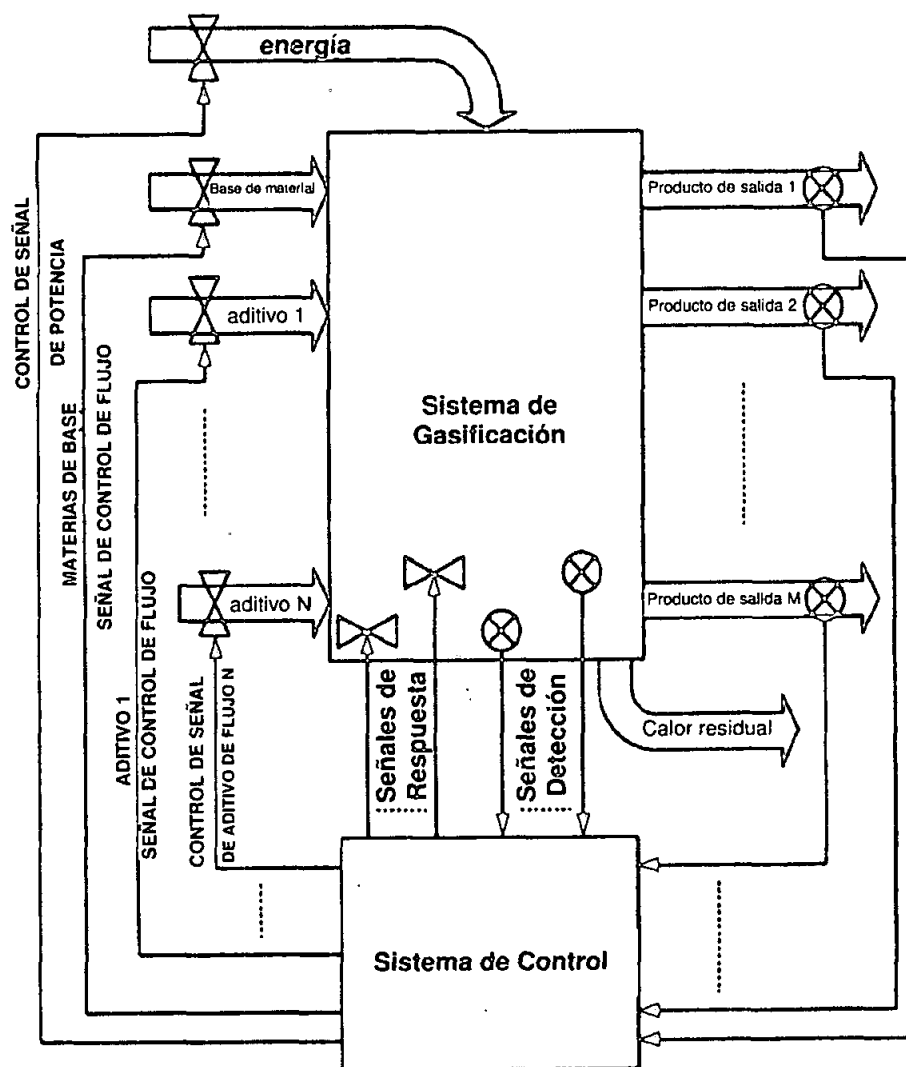


FIGURA 100

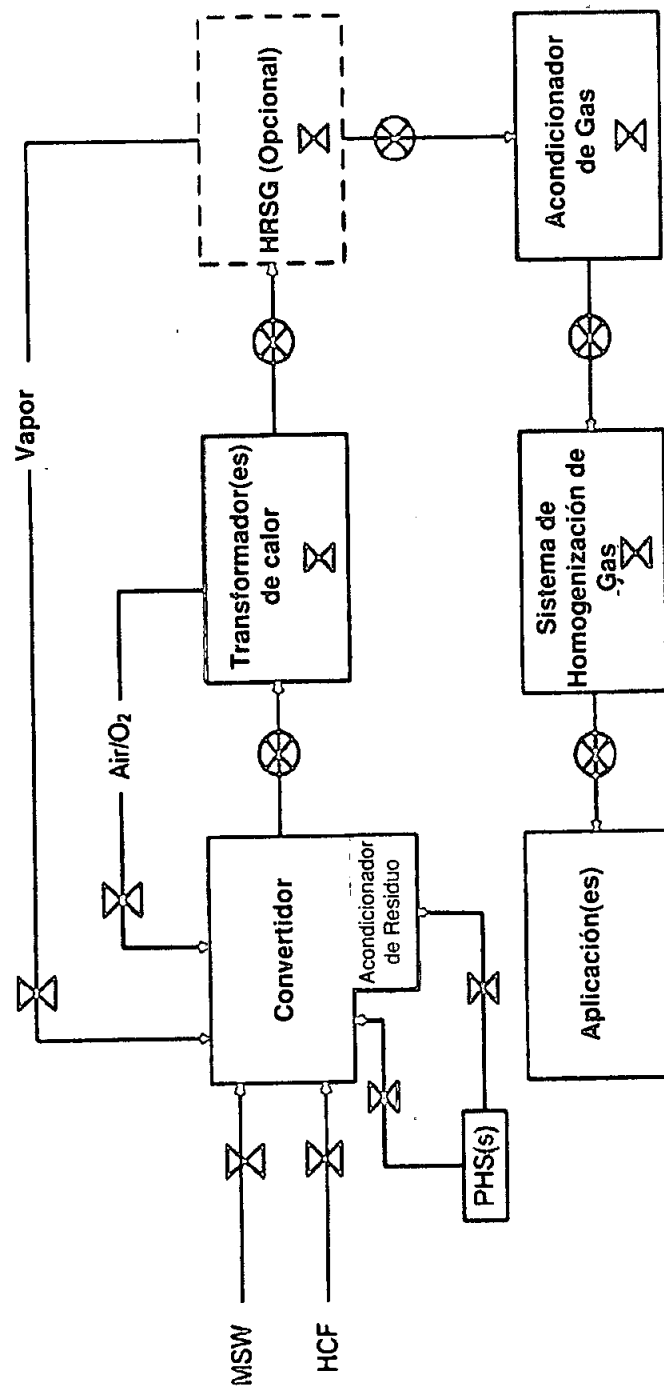


FIGURA 101

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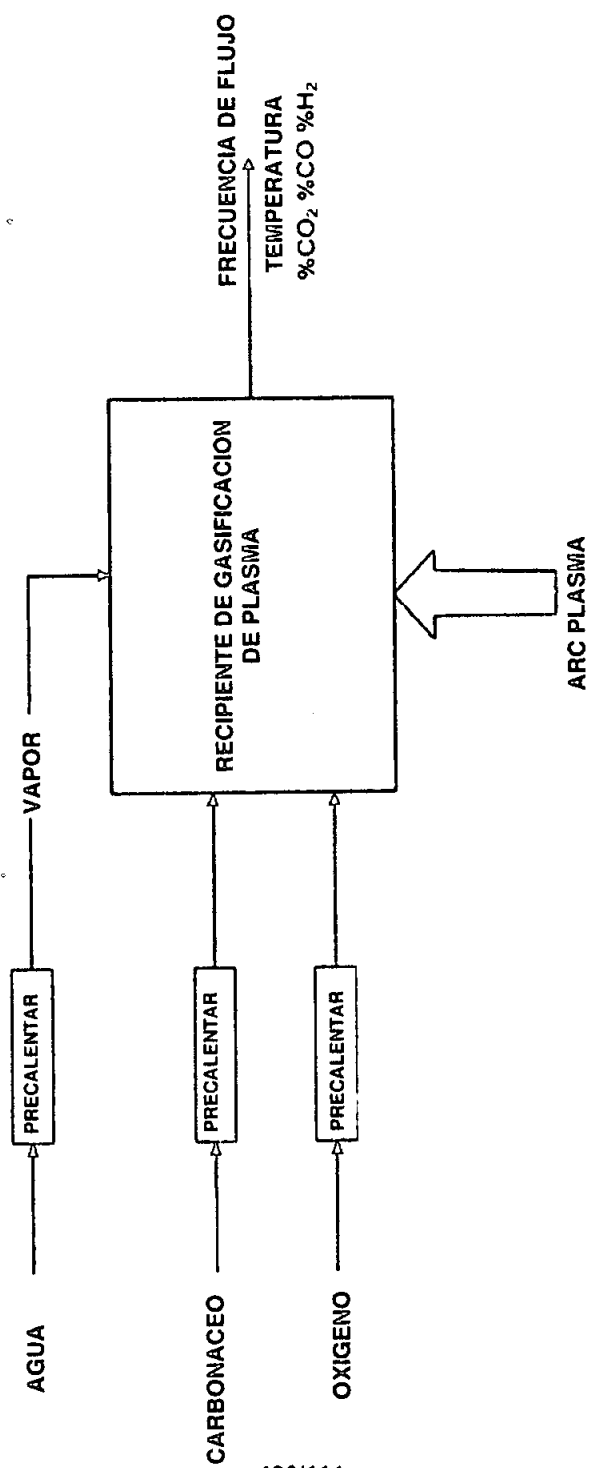


FIGURA 102

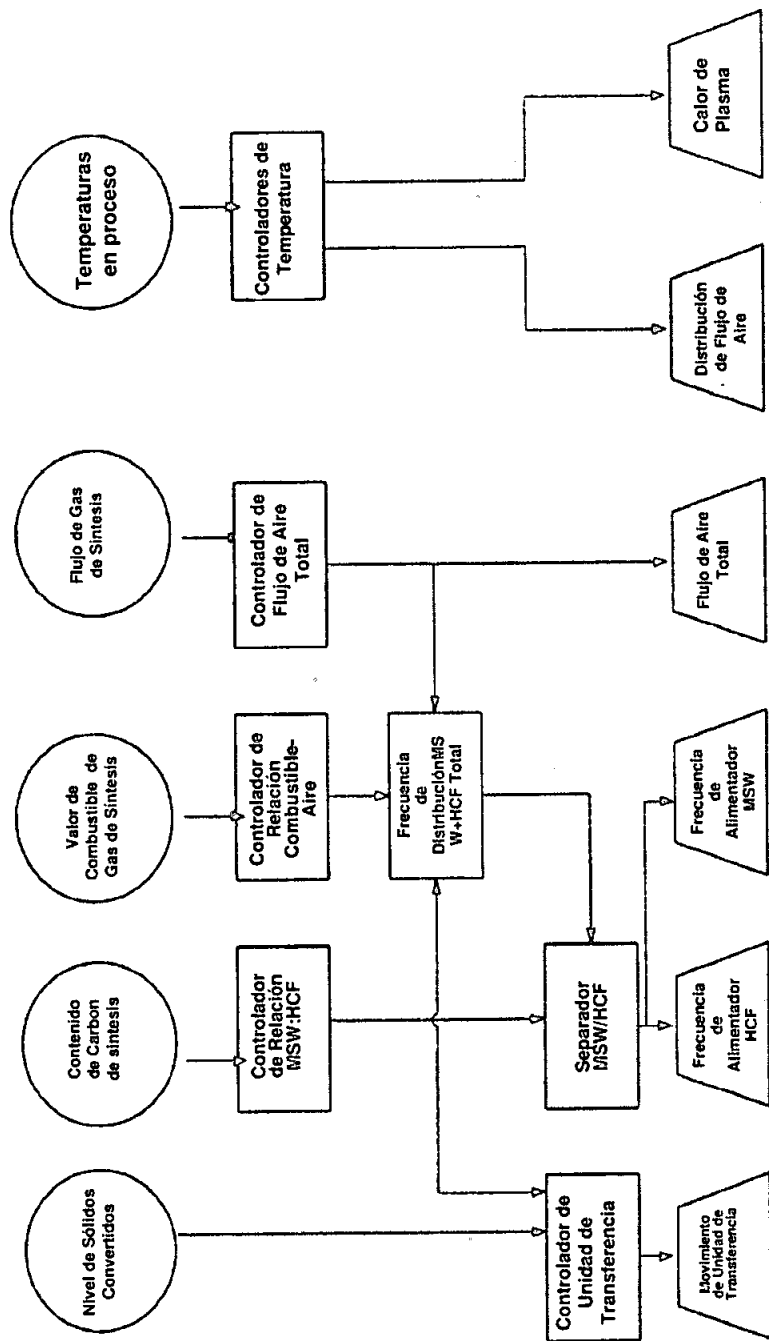


FIGURA 103

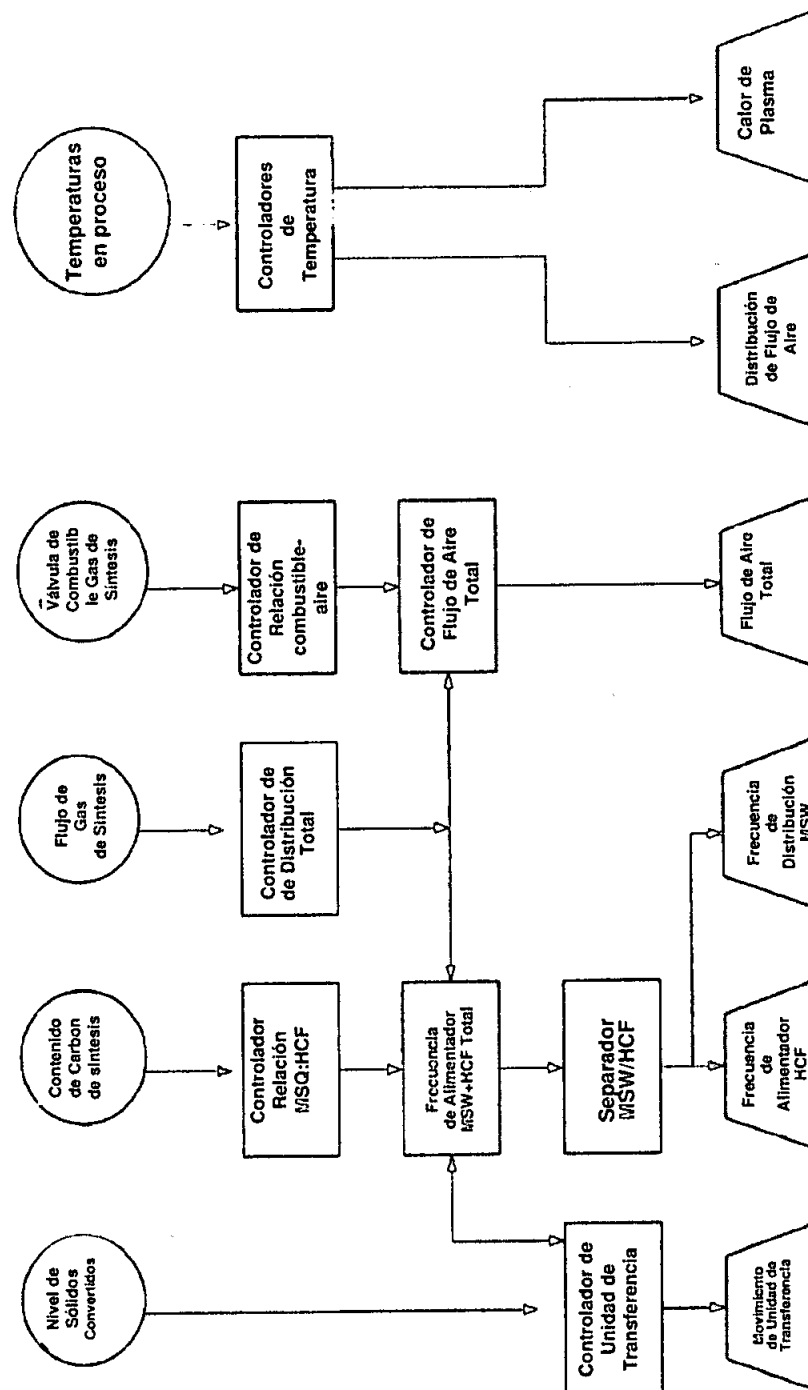


FIGURA 104

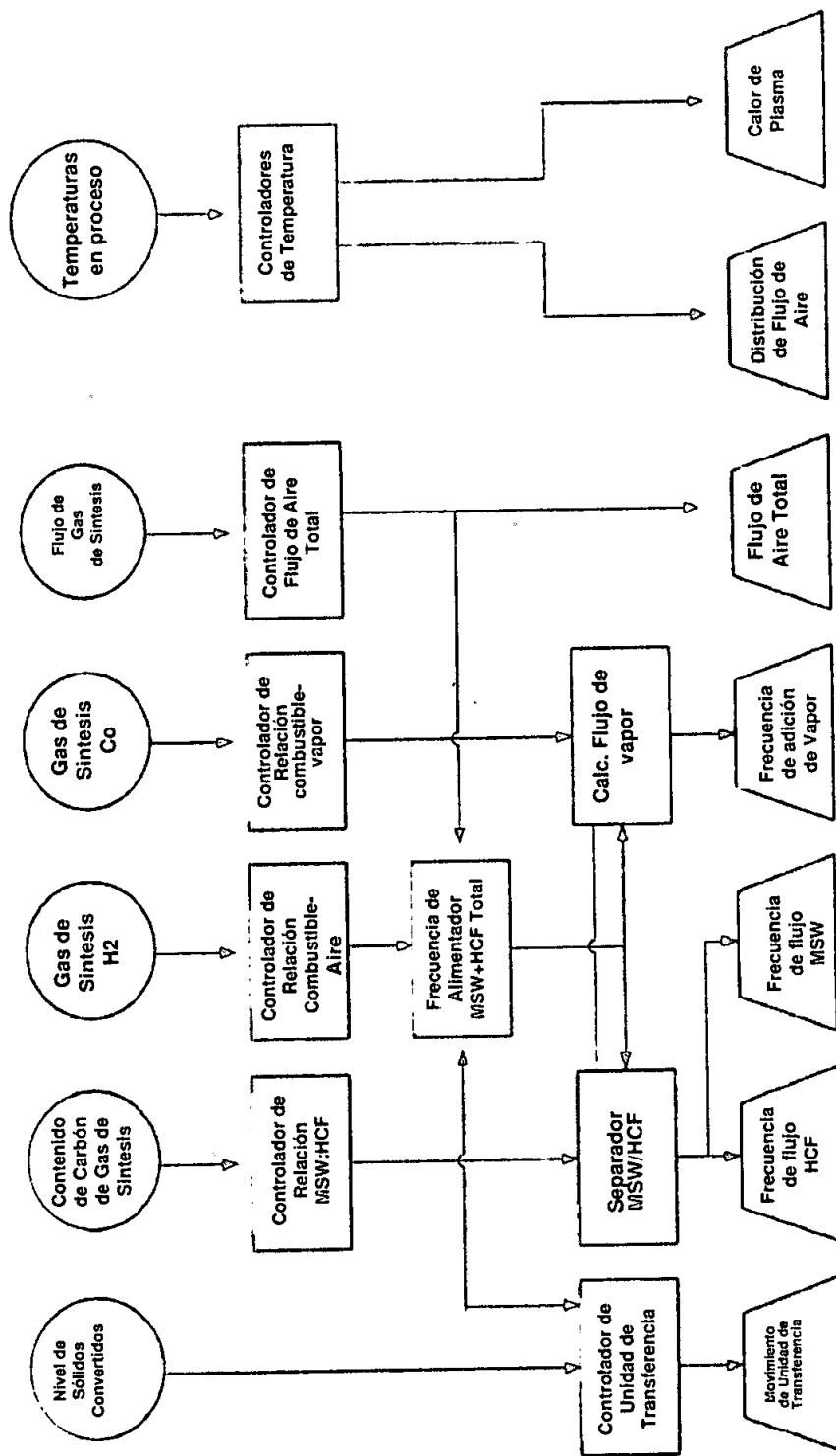


FIGURA 105

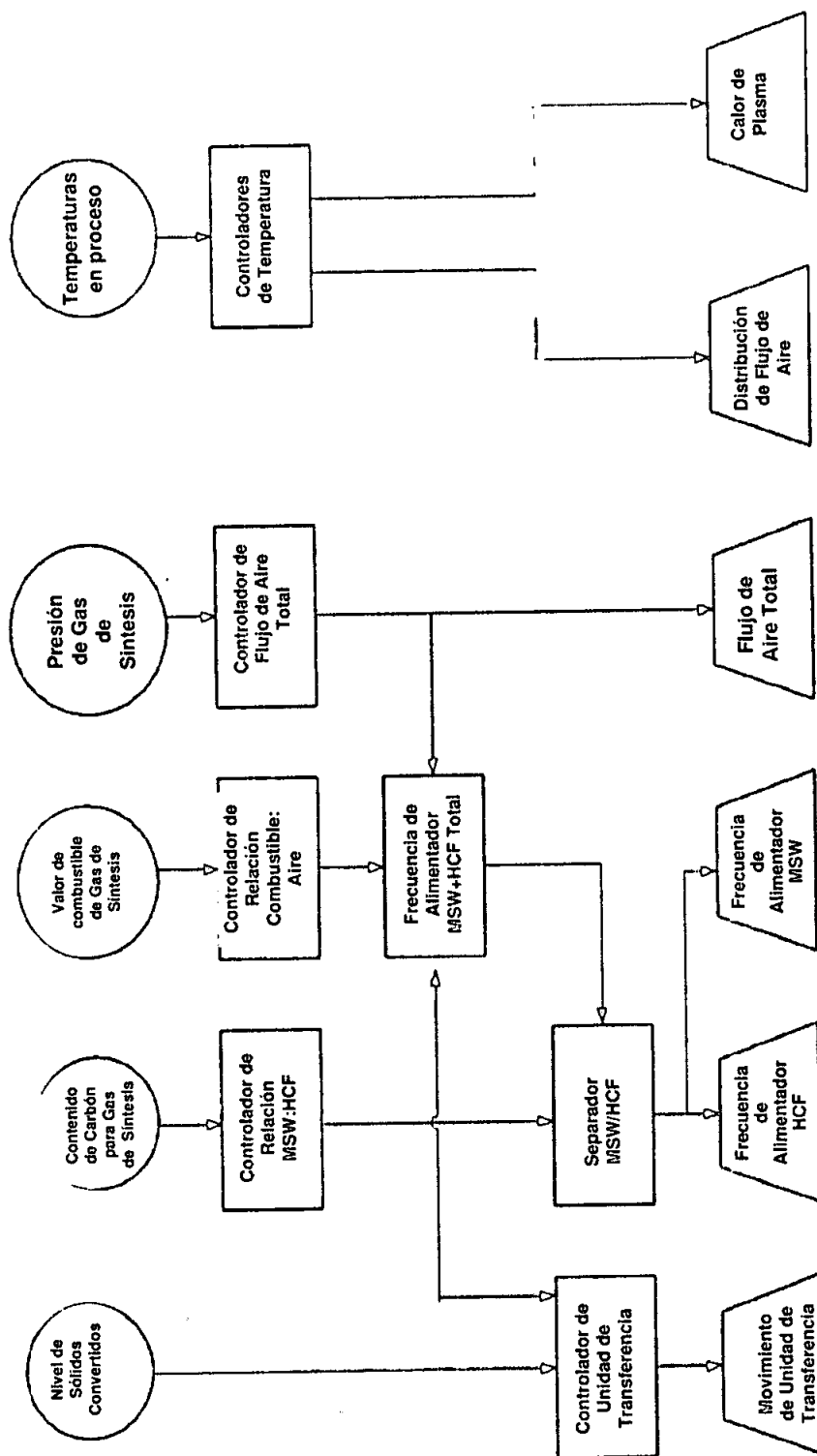


FIGURA 106

DOS SISTEMAS DE GASIFICACIÓN SEPARADOS

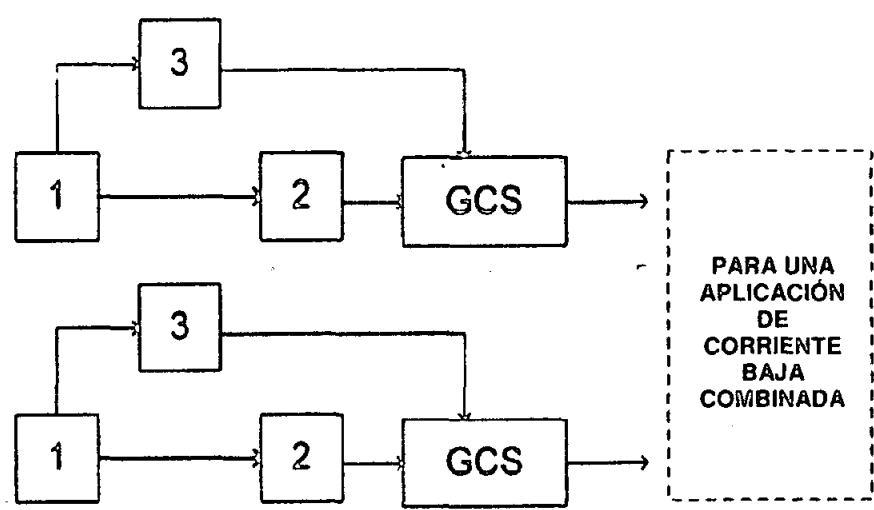


FIGURA 107

111/114

COMBINACIÓN DE 2 FUNCIONES

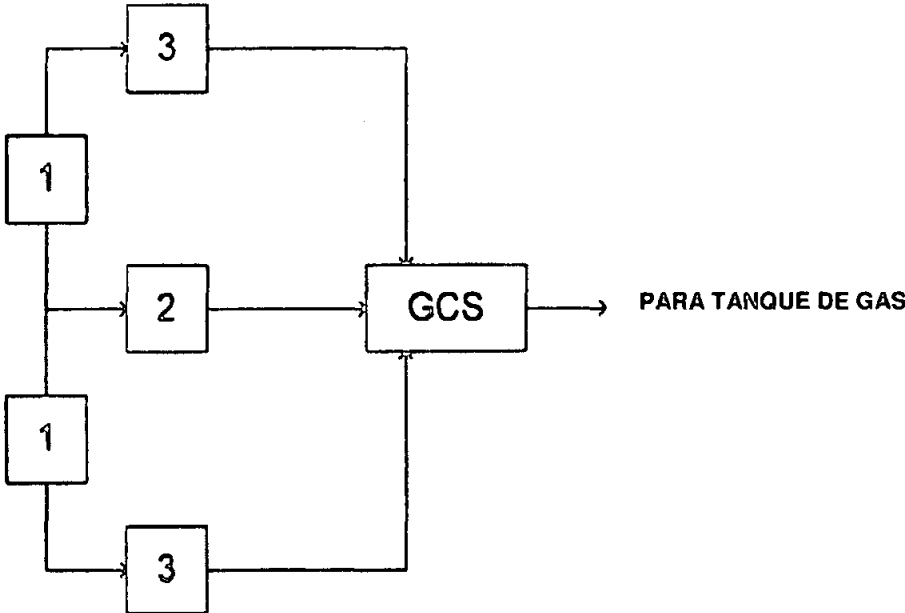


FIGURA 108

112/114

COMBINACIÓN DE FUNCIONES 2 Y 3

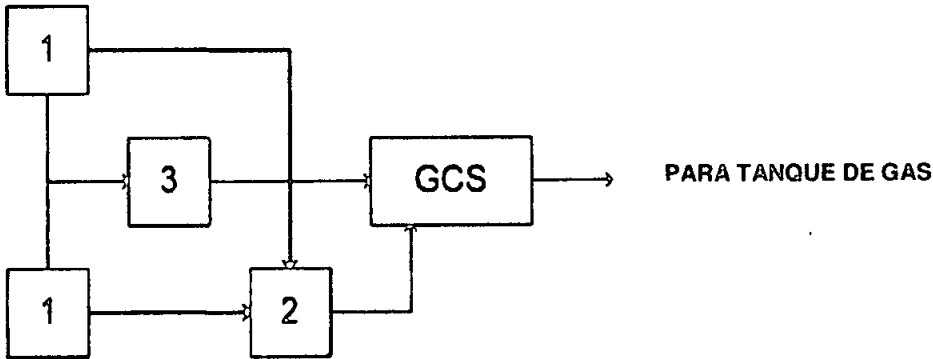


FIGURA 110

# HUMBERTO RUBIO & CIA.

## ABOGADOS

Cra. 7a # 74 - 64 Oficina 506  
Tel: (571) 3132408 - 3132423 - 3132410 - 3131759  
Fax: (571) 3131647 - 3132367  
E-mail: rubiolaw@cable.net.co  
Apartado Aereo 21848  
Bogota, D.C. - Colombia

Doctora

**Alix Carmenza CESPEDES DE VERGEL**

**Jefe de la División de Nuevas Creaciones**

**Superintendencia de Industria y Comercio**

**E. S. D.**

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 08-117920- -00003-0000

Fecha: 2009-03-17 15:18:55 Dep. 2020 NUECREACIONI  
Tra. 11 PATENTEIYII Eve: 379 FASENACIONALI  
Act. 444 RESPUESTAREQUE Folios: 63

Expediente No.

**08-117.920**

Patente de Invención:

**"INSTALACIÓN DE GASIFICACIÓN A  
BAJA TEMPERATURA CON UN  
GASIFICADOR ORIENTADO  
HORIZONTALMENTE"**

Fase nacional PCT:

**PCT/US2007/068407**

Titular:

**PlascoEnergy IP Holdings, S.L.,  
Bilbao, Schaffhausen Branch**

### **DESTINO: 444**

**HUMBERTO RUBIO CAMACHO**, mayor de edad, domiciliado en Bogotá, D.C., identificado con la cédula de ciudadanía número 17.192.062 de Bogotá, abogado en ejercicio, portador de la Tarjeta Profesional No. 50.007 expedida por el Consejo Superior de la Judicatura, actuando en carácter de **APODERADO** de la Sociedad **PlascoEnergy IP Holdings, S.L., Bilbao, Schaffhausen Branch**, domiciliada en Vordergasse 3, CH-8200 Schaffhausen, Suiza; encontrándome dentro del término legal para dar contestación al auto proferido por su Despacho mediante Oficio No. 547 notificado por fijación en lista el 23 de Enero de 2009, me permito manifestar y anexar:

#### **1. MANIFIESTO**

1.1- Mediante escrito radicado ante su Despacho el 22 de Enero de 2009, fueron aportados los siguientes documentos:

- i.) Fotocopia auténtica del documento de Poder y Certificado Notarial que acredita la existencia y representación legal de mi representada la sociedad **PlascoEnergy IP Holdings, S.L., Bilbao, Schaffhausen Branch**, el cual se encuentra debidamente notariado y legalizado por el Consulado de Colombia en Canadá, traducido oficialmente del idioma Inglés al Español y avalado por el Ministerio de Relaciones Exteriores de Colombia.
- ii.) Fotocopia auténtica del documento de **Traspaso** por medio del cual la sociedad **Plasco Energy Group Inc.**, traspaso los derechos de la solicitud en referencia, a la sociedad **PlascoEnergy IP Holdings, S.L., Bilbao,**

**Schaffhausen Branch.** Documento que se encuentra debidamente notariado y legalizado por el Consulado de Colombia en Canadá, traducido oficialmente del idioma Inglés al Español y avalado por el Ministerio de Relaciones Exteriores de Colombia.

- ii.) Documentos de **cesión** otorgados por los inventores, debidamente legalizados por el Consulado de Colombia en Canadá; traducidos oficialmente del idioma Inglés al Español y reconocidos por el Ministerio de Relaciones Exteriores en Colombia; por medio de los cuales se ceden todos los derechos poseídos sobre la presente invención a favor de la Sociedad **Plasco Energy Group Inc.**
- iv.) Nuevo pliego de Dibujos con su traducción al español.

- 1.2. Las modificaciones a las reivindicaciones presentadas junto con la solicitud de patente citada en referencia, radicada ante su Despacho el día 5 de noviembre de 2008, corresponden a las modificaciones efectuadas dentro del termino legal ante la Oficina Internacional (Art.34).

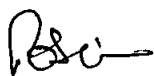
El Reporte de Examen Preliminar de Patentabilidad que se anexa, fue realizado según modificaciones presentadas en la solicitud internacional.

## **2. ANEXO**

- 2.1.- Copia simple del memorial radicado ante su despacho el 22 de Enero de 2009, por medio del cual se adjuntaron los documentos mencionados anteriormente.
- 2.2.- Reporte de Examen Preliminar Internacional junto con sus anexos (IPRP). La traducción de los anexos (capítulo reivindicatorio) fue radicado junto con la solicitud fase nacional.

Teniendo en cuenta lo expuesto anteriormente y los documentos aportados, solicito muy respetuosamente continuar con el trámite correspondiente.

Atentamente,



**HUMBERTO RUBIO CAMACHO**  
**C.C. 17.192.062 de Bogotá**  
**T.P. 50.007 Consejo Superior**  
**de la Judicatura.**  
**COD. 4134**

08/2590/P000738

# HUMBERTO RUBIO & CIA.

## ABOGADOS

Cra. 7a # 74 - 64 Oficina 506  
Tel: (571) 3132408 - 3132423 - 3132410 - 3131759  
Fax: (571) 3131647 - 3132367  
E-mail: rubiolaw@cablenet.co  
Apartado Aéreo:  
Bogotá, D.C. - Co

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 08-117920-00002-0000

Fecha: 2009-01-22 18:11:00 Dep. 2020 NUECREACIONE  
Tra. 11 PATENTEIYII Evt: 379 FASENACIONALII  
Act. 329 CTOINFORMACION Folios: 227

Señor

**SUPERINTENDENTE DE INDUSTRIA Y COME  
DIVISION DE NUEVAS CREACIONES**

E. S. D.

Expediente No.:  
Patente de Invención:

**08-117.920**

**"INSTALACIÓN DE GASIFICACIÓN A  
BAJA TEMPERATURA CON UN  
GASIFICADOR HORIZONTALMENTE"**

Titular:

**PlascoEnergy IP Holdings, S.L., Bilbao,  
Schaffhausen Branch**

### DESTINO: 09

**HUMBERTO RUBIO CAMACHO**, mayor de edad, domiciliado en Bogotá, D.C., identificado con la cédula de ciudadanía número 17.192.062 de Bogotá, abogado en ejercicio, portador de la Tarjeta Profesional No. 50.007 expedida por el Consejo Superior de la Judicatura, actuando en carácter de **APODERADO** de la Sociedad **PlascoEnergy IP Holdings, S.L., Bilbao, Schaffhausen Branch** domiciliada en Vordergasse 3, CH-8200 Schaffhausen, Suiza; me permito anexar:

- 1.- Documentos de **cesión** otorgados por los inventores, debidamente legalizados por el Consulado de Colombia en Canadá; traducidos oficialmente del idioma Inglés al Español y reconocidos por el Ministerio de Relaciones Exteriores en Colombia; por medio de los cuales se ceden todos los derechos poseídos sobre la presente invención a favor de la Sociedad **Plasco Energy Group Inc.**
- 2.- Fotocopia auténtica del documento de **Traspaso** por medio del cual la sociedad **Plasco Energy Group Inc.**, traspasa los derechos de la solicitud en referencia, a la sociedad **PlascoEnergy IP Holdings, S.L., Bilbao, Schaffhausen Branch**. Documento que se encuentra debidamente notariado y legalizado por el Consulado de Colombia en Canadá, traducido oficialmente del idioma Inglés al Español y avalado por el Ministerio de Relaciones Exteriores de Colombia.
- 3.- Fotocopia auténtica del documento de **Poder** y Certificado Notarial que acredita la existencia y representación legal de mi representada la sociedad **PlascoEnergy IP Holdings, S.L., Bilbao, Schaffhausen Branch**, el cual se encuentra debidamente notariado y legalizado por el Consulado de Colombia en Canadá, traducido oficialmente del idioma Inglés al Español y avalado por el Ministerio de Relaciones Exteriores de Colombia.
- 4- Nuevo pliego de Dibujos

Teniendo en cuenta lo anterior solicito se continúe con el trámite correspondiente.

Atentamente,

*Original Signed By*  
**Humberto Rubio**

**HUMBERTO RUBIO CAMACHO**  
C.C. 17.192.062 de Bogotá  
T.P. 50.007 Consejo Superior  
de la Judicatura.  
COD. 4134

08/2590/P000768  
Bap

# PATENT COOPERATION TREATY

from the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:  
DAVID J. LORENZ  
POWLEY & GIBSON, P.C.  
304 HUDSON STREET  
2ND FLOOR  
NEW YORK, NY 10013

## PCT

NOTIFICATION OF TRANSMITTAL OF  
INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

(PCT Rule 71.1)

Date of mailing  
(day/month/year) **18 FEB 2009**

Applicant's or agent's file reference

**IMPORTANT NOTIFICATION**

322.2(PCT)

International application No.

International filing date (day/month/year)

Priority date (day/month/year)

PCT/US07/68407

07 May 2007 (07.05.2007)

05 May 2006 (05.05.2006)

Applicant

PLASCO ENERGY GROUP INC.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary report on patentability and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

### 4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)(Article 39(1))(see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the *PCT Applicant's Guide*.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed invention is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the IPEA/ US

Mail Stop PCT, Attn: IPEA/US  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Facsimile No. (571) 273-3201

Authorized officer

Alexa Neckel

Telephone No. (571) 272-9813

Form PCT/IPEA/416 (January 2004)

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                        |                                                                    |                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------|
| Applicant's or agent's file reference<br>322.2(PCT)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>FOR FURTHER ACTION</b>                                              |                                                                    | See Form PCT/IPEA/416 |
| International application No.<br>PCT/US07/68407                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | International filing date (day/month/year)<br>07 May 2007 (07.05.2007) | Priority date (day/month/year)<br>05 May 2006 (05.05.2006)         |                       |
| International Patent Classification (IPC) or national classification and IPC<br>IPC: Please See Continuation Sheet<br>USPC: 48/61,197R,202,210                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                        |                                                                    |                       |
| Applicant<br>PLASCO ENERGY GROUP INC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                        |                                                                    |                       |
| <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>8</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (sent to the applicant and to the International Bureau) a total of <u>51</u> sheets, as follows:</p> <p style="margin-left: 40px;"><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p style="margin-left: 40px;"><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> |                                                                        |                                                                    |                       |
| <p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input checked="" type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                        |                                                                    |                       |
| Date of submission of the demand<br>14 May 2008 (14.05.2008)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                        | Date of completion of this report<br>02 February 2009 (02.02.2009) |                       |
| Name and mailing address of the IPEA/ US<br>Mail Stop PCT, Attn: IPEA/US<br>Commissioner for Patents<br>P.O. Box 1450<br>Alexandria, Virginia 22313-1450<br>Facsimile No. (571) 273-3201                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                        | Authorized officer<br>Alexa Neckel<br>Telephone No. (571) 272-9813 |                       |

Form PCT/IPEA/409 (cover sheet)(April 2007)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/US07/68407

Box No. I Basis of the report

1. With regard to the **language**, this report is based on:

- ☒ the international application in the language in which it was filed.
- ☐ a translation of the international application into English, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3(a) and 23.1(b))
- ☐ publication of the international application (under Rule 12.4(a))
- ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-148 as originally filed/furnished
- pages\* NONE received by this Authority on \_\_\_\_\_
- pages\* NONE received by this Authority on \_\_\_\_\_
- ☒ the claims:
- pages NONE as originally filed/furnished
- pages\* NONE as amended (together with any statement) under Article 19
- pages\* 149-199 received by this Authority on 30 October 2008 (30.10.2008)
- pages\* NONE received by this Authority on \_\_\_\_\_
- ☒ the drawings:
- pages 1-114 as originally filed/furnished
- pages\* NONE received by this Authority on \_\_\_\_\_
- pages\* NONE received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

5. ☐ This report has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 70.2(e)).

\* If item 4 applies, some or all of those sheets may be marked "superseded."

Form PCT/IPEA/409 (Box No. I) (April 2007)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/US07/68407

Box No. IV Lack of unity of invention

1. ☐ In response to the invitation to restrict or pay additional fees the applicant has, within the applicable time limit:
  - ☐ restricted the claims.
  - ☐ paid additional fees.
  - ☐ paid additional fees under protest, and, where applicable, the protest fee
  - ☐ paid additional fees under protest but the applicable protest fee was not paid
  - ☐ neither restricted the claims nor paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is:
  - ☐ complied with.
  - ☒ not complied with for the following reasons:

Please See Continuation Sheet

4. Consequently, this report has been established in respect of the following parts of the international application:
  - ☐ all parts
  - ☒ the parts relating to claims Nos. 1-11

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/US07/68407

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

|                               |                    |     |
|-------------------------------|--------------------|-----|
| Novelty (N)                   | Claims <u>1-11</u> | YES |
|                               | Claims <u>NONE</u> | NO  |
| Inventive Step (IS)           | Claims <u>1-11</u> | YES |
|                               | Claims <u>NONE</u> | NO  |
| Industrial Applicability (IA) | Claims <u>1-11</u> | YES |
|                               | Claims <u>NONE</u> | NO  |

2. Citations and Explanations (Rule 70.7)

D1: US 2004/0245086

Claims 1-11 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest each limitation contained in claims 1 and 9.

D1 teaches an apparatus and method in which a gasifier (102) converts a carbonaceous feedstock into a residue and raw synthesis gas (inherently by gasification, paragraph 54, 110). The raw synthesis gas is then treated in a plasma reformulating system/heater (36, paragraph 54) which produces more CO and H<sub>2</sub> (paragraph 54).

The prior art however, does not teach conditioning the residue with plasma heat and recycling a portion of the heat from the plasma torch to the gasifier.

Furthermore, the prior art does not teach or suggest a gas homogenization system for receiving gas comprising a plasma reformulated gas and providing a substantially homogenized gas.

----- NEW CITATIONS -----

US 2004/0245086 A1 (STEYNBERG et al.) 09 December 2004, see Fig. 2, paragraphs 54-55

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/US07/68407

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

Continuation of IPC:

B01J 7/00( 2006.01);H01M 8/06( 2006.01);C01B 3/36( 2006.01);C10J 3/00( 2006.01),3/46( 2006.01),3/54( 2006.01),3/16( 2006.01);C10K 3/06( 2006.01)

**IV. 2. This Authority found that the requirement of unity of invention is not complied with for the following reasons and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees:**

Group I, claim(s) 1-11, drawn to a facility for conversion of carbonaceous feedstock.

Group II, claim(s) 12-14, 55-69, 74-89, 92-110, 113-134, 137-157, 160-182 and 198-200, drawn to a facility configurable to perform processes comprising generating raw offgas and/or syngas.

Group III, claim(s) 48-54, drawn to a process and apparatus for reformulating a gas in a gasification facility.

Group IV, claim(s) 70-73, drawn to a horizontally oriented progressive processing gasifier and method of using.

Group V, claim(s) 90 and 91, drawn to a residue conditioning system and method of using.

Group VI, claim(s) 111 and 112, drawn to a heat recycling system and method of using.

Group VII, claim(s) 135 and 136, drawn to a gas conditioning system and method of using.

Group VIII, claim(s) 158 and 159, drawn to a gas homogenization system and method of using.

Group IX, claim(s) 183-187, drawn to a process for converting carbonaceous feedstock into a gas comprising a defined composition suitable for downstream applications.

Group X, claim(s) 188 and 189, drawn to a facility and method configurable to perform processes comprising generating a raw syngas.

Group XI, claim(s) 190, drawn to a process for generating syngas from a carbonaceous feedstock.

Group XII, claim(s) 191 and 192, drawn to a facility for handling solid municipal waste.

Group XIII, claim(s) 193, drawn to a plastics handling system.

Group XIV, claim(s) 194 and 195, drawn to a carbonaceous feedstock handling system.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/US07/68407

Supplemental Box

Group XV, claim(s) 196 and 197, drawn to a facility that generates electricity from municipal waste.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I contains two or more laterally distributed processing zones, which is not contained in Group II and Group II contains one or more sensing elements configured to sense one or more characteristics of a process, which is not contained in Group I.

The inventions listed as Groups I and III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I contains two or more laterally distributed processing zones, which is not contained in Group III and Group III contains the gas reformulating system is configured to promote concurrent, countercurrent, radial, tangential, or other feed flow direction, which is not contained in Group I.

The inventions listed as Groups I and IV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I contains two or more laterally distributed processing zones, which is not contained in Group IV and Group IV contains a step of optimizing conditions in each zone to promote successive stages, which is not contained in Group I.

The inventions listed as Groups I and V do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I contains two or more laterally distributed processing zones, which is not contained in Group V and Group V contains a refractory lined residue conditioning chamber operatively associated with the plasma heat source, which is not contained in Group I.

The inventions listed as Groups I and VI do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I contains two or more laterally distributed processing zones, which is not contained in Group VI and Group VI contains one or more gas-to-fluid heat exchangers configured to transfer heat from a hot gas, which is not contained in Group I.

The inventions listed as Groups I and VII do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I contains two or more laterally distributed processing zones, which is not contained in Group VII and Group VII contains one or more Stage One gas conditioning units configured for performing stage one processes, which is not contained in Group I.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/US07/68407

Supplemental Box

The inventions listed as Groups I and VIII do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I contains two or more laterally distributed processing zones, which is not contained in Group VIII and Group VIII contains a gas homogenization chamber comprising one or more GHS inputs associated with one or more sensing and response elements, which is not contained in Group I.

The inventions listed as Groups I and IX do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I contains a plasma reformulated gas containing higher levels of CO and/or H<sub>2</sub>, which is not contained in Group IX and Group IX contains optimization of operating conditions in each of the gasification processing zones, which is not contained in Group I.

The inventions listed as Groups I and X do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I contains a plasma reformulated gas containing higher levels of CO and/or H<sub>2</sub>, which is not contained in Group X and Group X contains a floor of the gasifier having steps, which is not contained in Group I.

The inventions listed as Groups I and XI do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I contains two or more laterally distributed processing zones, which is not contained in Group XI and Group XI contains heating the reactant material to a temperature to promote drying, which is not contained in Group I.

The inventions listed as Groups I and XII do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I contains two or more laterally distributed processing zones, which is not contained in Group XII and Group XII contains one or more municipal solid waste handling systems, which is not contained in Group I.

The inventions listed as Groups I and XIII do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I contains two or more laterally distributed processing zones, which is not contained in Group XIII and Group XIII contains a shredder operatively associated with an inlet hopper, which is not contained in Group I.

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

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PCT/US07/68407

**Supplemental Box**

The inventions listed as Groups I and XIV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I contains two or more laterally distributed processing zones, which is not contained in Group XIV and Group XIV contains one or more conveyors configured to convey shredded carbonaceous material, which is not contained in Group I.

The inventions listed as Groups I and XV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I contains two or more laterally distributed processing zones, which is not contained in Group XV and Group XV contains a municipal waste handling system for the supply of processed municipal waste, which is not contained in Group I.

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**THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE  
PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:**

1. A facility for conversion of carbonaceous feedstock into gas comprising a plasma reformulated gas, the facility comprising:
  - a gasifier for conversion of carbonaceous feedstock into raw off-gas and/or syngas and a residue, the gasifier comprising two or more substantially laterally distributed processing zones;
  - a gas reformulating system in fluid communication with the gasifier, the gas reformulating system comprising a gas reformulating chamber comprising one or more sources of plasma heat and configured for the conversion of raw off-gas and/or syngas produced in the gasifier into a gas comprising a plasma reformulated gas containing higher levels of CO and/or H<sub>2</sub> than the raw off-gas and/or syngas,
  - a control system to regulate operation of the facility,
  - and optionally one or more of:
    - a residue conditioning system operatively associated with one or more sources of plasma heat for converting the residue from the gasifier into molten slag and a residue gas, and/or
    - a heat recycling system for reclaiming heat from gas comprising a plasma reformulated gas and/or a residue gas and recycling at least a portion of the heat to the gasifier,
    - a gas conditioning system for removal of a majority of particulate matter and at least a portion of heavy metal contaminants from gas comprising a plasma reformulated gas and/or a residue gas to provide a conditioned gas comprising plasma reformulated gas and/or residue gas, and/or
    - a gas homogenization system for receiving gas comprising a plasma reformulated gas and providing a substantially homogenized gas comprising a plasma reformulated gas.
2. The facility of claim 1 comprising one or more residue conditioning systems, each residue conditioning system operatively associated with one or more sources of

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plasma heat for converting the residue from the gasifier into molten slag and a residue gas.

3. The facility of claim 1 comprising one or more heat recycling systems for reclaiming heat from the gas comprising a plasma reformulated gas and/or a residue gas and recycling at least a portion of the heat to the gasifier.
4. The facility of claim 1 comprising one or more gas conditioning systems for removal of a majority of particulate matter and at least a portion of heavy metal contaminants from gas comprising a plasma reformulated gas and/or a residue gas to provide a conditioned gas comprising a plasma reformulated gas.
5. The facility of claim 1 comprising one or more gas homogenization systems for receiving gas comprising a plasma reformulated gas and providing a substantially homogenized gas comprising a plasma reformulated gas.
6. The facility of claim 1, wherein the control system comprises:
  - a) one or more sensing elements for monitoring one or more processes occurring within the facility;
  - b) one or more response elements configured to effect one or more changes in one or more of the processes; and
  - c) one or more computing platforms communicatively linked to the one or more sensing elements and to the one or more response elements, the one or more computing platforms configured to receive input signals from at least one sensing element and to provide control signals to at least one response element to either maintain or adjust a process characteristic with the facility,wherein the control system is optionally configured to execute feed forward and/or feedback control schemes, and  
wherein the control system optionally comprises one or more proportional (P), integral (I) or differential (D) controllers, and utilizes adaptive, predictive, and/or fuzzy logic control.

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7. The facility of claim 6, wherein the gasifier comprises one or more inlets for the input of one or more process additives therein, and wherein the control system is configured to determine one or more parameters within the facility, compare the one or more parameters with a specified parameter, and adjust the input of process additives and/or feedstock into the gasifier to adjust the parameters of the process within a specified range of the specified parameter.
8. The facility of claim 1, wherein the gasifier comprises one or more lateral transfer units.
9. A method for the conversion of carbonaceous feedstock into gas comprising plasma reformulated gas of a defined composition, the method comprising the steps of:
  - a) feeding the feedstock to a first zone of a gasifier, the gasifier comprising two or more substantially laterally distributed processing zones;
  - b) laterally transferring the feedstock through each zone of the gasifier as a reactant material and processing the reactant material to provide raw offgas and/or syngas; and
  - c) reformulating the raw off-gas and/or syngas into a gas comprising plasma reformulated gas by the application of plasma heat, the gas comprising plasma reformulated gas containing higher levels of CO and H<sub>2</sub> than the raw off-gas and/or syngas,wherein the carbonaceous feedstock optionally comprises a feedstock additive to adjust the amount of carbon in the reactant material.
10. The method of claim 9, comprising the step of monitoring lateral transfer of the reactant material being processed in step (b) and adjusting the rate of lateral transfer of the reactant material in response thereto.
11. The method of claim 10, wherein monitoring the lateral transfer of the reactant material is via feedstock height sensors operatively associated with the gasifier.

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12. A facility configurable to perform processes comprising generating a raw offgas and/or syngas from carbonaceous feedstock and processes for converting a gas reformulating system input gas (GRS input gas) comprising the raw offgas and/or syngas to a plasma reformulated gas, the facility comprising:
- a) one or more gasifier systems for generating raw offgas and/or syngas from carbonaceous feedstock, the one or more gasifier systems optionally operatively associated with one or more sensing and/or response elements, each gasifier system in fluid communication with one or more GRS input gas inlets;
  - b) one or more gas reformulating systems for reformulating a GRS input gas having a first chemical composition into a plasma reformulated gas having a second chemical composition, the one or more gas reformulating systems optionally operatively associated with one or more sensing and/or response elements, each gas reformulating system comprising one or more plasma heat sources and a gas reformulating chamber comprising one or more GRS input gas inlets for receiving the GRS input gas and one or more plasma reformulated gas outlets, the gas reformulating chamber operatively associated with the one or more plasma heat sources, the plasma heat sources configured to provide heat to promote the dissociation of gaseous molecules in the GRS input gas which then recombine into a plasma reformulated gas; and
  - c) a control system comprising:
    - i. one or more sensing elements configured to sense one or more characteristics of a process, a process device, a process input and/or process output within the facility;
    - ii. one or more response elements configured to affect one or more characteristics of one or more processes within the facility;
    - iii. one or more computing platforms operatively associated with one or more of the sensing elements and one or more of the response elements, the one or more computing platforms configured to receive input signals from at least one sensing element and to provide control signals to at least one response element to either maintain or adjust a process characteristic within the facility;
- wherein the control system is optionally configured to execute feed-forward and/or

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feed-back control schemes; and

wherein the control system optionally comprises one or more proportional (P), integral (I) or differential (D) controllers, and optionally utilizes adaptive, predictive, and/or fuzzy logic control; and

d) optionally one or more of:

one or more residue conditioning systems optionally operatively associated with one or more sensing and/or response elements, the residue conditioning systems in fluid communication with one or more other systems within the facility, wherein at least one of the one or more of the residue conditioning systems comprises one or more sources of plasma heat configured to provide heat for converting a residue generated within the facility into molten slag and a residue gas,

one or more heat recycling systems optionally operatively associated with one or more sensing and/or response elements, the heat recycling systems in fluid communication with one or more other systems within the facility, wherein at least one of the heat recycling systems is configured to recover heat from a gas generated within the facility;

one or more gas conditioning systems optionally operatively associated with one or more sensing and/or response elements, the gas conditioning systems in fluid communication with one or more other systems within the facility, wherein at least one of the gas conditioning systems is configured to remove a majority of particulate matter and at least a portion of heavy metal contaminants from a gas generated within the facility;

one or more gas homogenization systems optionally operatively associated with one or more sensing and/or response elements, the gas homogenization systems in fluid communication with one or more other systems within the facility to receive a gas generated within the facility and configured to provide a substantially homogenized gas.

13. The facility of claim 12, wherein the gas of a first chemical composition and the gas of a second chemical composition comprise different ratios of CO/CO<sub>2</sub> and H<sub>2</sub>/H<sub>2</sub>O.

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14. The facility of claim 12, wherein the gas of a second chemical composition has a desired chemical composition and/or a desired heating value and/or an optimized heating value.
15. The facility of claim 12, wherein the one or more plasma heat sources of the gas reformulating system and the GRS gas inlets are cooperatively configured to promote concurrent, countercurrent, radial, tangential, or other feed flow direction of the GRS input gas relative to the one or more plasma heat sources.
16. The facility of claim 12, wherein the gas reformulating chamber is a refractory-lined chamber and the one or more input gas inlets for receiving the GRS input gas are positioned at or near the upstream end of the chamber, wherein at least one of the input gas inlets is optionally operatively associated with one or more sensing and/or response elements, the chamber comprising:
  - a) one or more gas outlets for releasing the gas comprising a plasma reformulated gas, the one or more gas outlets positioned at or near the downstream end of the chamber, wherein at least one of the gas outlets is optionally operatively associated one or more sensing and/or response elements; and
  - b) one or more process additive inlets in fluid communication with the chamber, wherein at least one of the process additive inlets is optionally operatively associated with one or more sensing and/or response elements;wherein the one or more plasma heat sources and the GRS gas inputs are cooperatively configured to promote concurrent, countercurrent, radial, tangential, or other feed flow direction of the GRS input gas relative to the one or more plasma heat sources.
17. The facility of claim 12, wherein the gas reformulating system is configured to provide a gas residence time of about 0.5 to about 2.0 seconds.
18. The facility of claim 12, wherein the gas reformulating chamber comprises one or more air jets that promote mixing of gas through the gas reformulating chamber,

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wherein at least one of the jets is optionally operatively associated with one or more sensing and/or response elements.

19. The facility of claim 12, wherein the one or more of the plasma heat sources of the gas reformulation system provide a temperature of about 800° to about 1200°C, wherein at least one of plasma heat sources is optionally operatively associated with one or more sensing and/or response elements.
20. The facility of claim 12, wherein the one or more sources of plasma heat of the gas reformulating system utilize a gas selected from the group comprising air, O<sub>2</sub>, N<sub>2</sub>, Ar, CH<sub>4</sub>, C<sub>2</sub>H<sub>2</sub> and C<sub>3</sub>H<sub>6</sub>.
21. The facility of claim 12, wherein at least one of the plasma heat sources of the gas reformulation system is a non-transferred arc A.C. plasma torch optionally operatively associated with one or more sensing and/or response elements.
22. The facility of claim 12, wherein at least one of the plasma heat sources of the gas reformulation system is a non-transferred arc D.C. plasma torch optionally operatively associated with one or more sensing and/or response elements.
23. The facility of claim 12, wherein at least one of the plasma heat sources of the gas reformulation system is a non-transferred, reverse polarity D.C. plasma torch optionally operatively associated with one or more sensing and/or response elements.
24. The facility of claim 12, wherein at least one of the plasma heat sources of the gas reformulation system is a water cooled, copper electrode NTAT DC plasma torch optionally operatively associated with one or more sensing and/or response elements.
25. The facility of claim 12, wherein the gas reformulating system comprises one or more secondary heat sources to assist in heating the gas reformulating chamber, wherein the at least one of the secondary heat sources is optionally operatively associated with

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one or more sensing and/or response elements.

26. The facility of claim 12, wherein at least one of the gas reformulating systems comprises a substantially vertically oriented gas reformulating chamber.
27. The facility of claim 12, wherein at least one of the gas reformulating systems comprises a substantially horizontally oriented gas reformulating chamber.
28. The facility of claim 12, wherein the gas reformulating chamber is configured to allow for access to intermediate sections of the chamber.
29. The facility of claim 12, wherein the gas reformulating chamber comprises sections that can be separated to allow for access to intermediate sections of the chamber.
30. The facility of claim 12, 26 or 27, wherein the length-to-diameter ratio of the gas reformulating chamber is from about 2:1 to 6:1.
31. The facility of claim 12, wherein the gas reformulating system is configured to provide for heat recovery and cooling of the plasma reformulated gas.
32. The facility of claim 12, wherein the gas reformulating system comprises one or more of a gas reformulating chamber comprising a water jacket, a gas reformulating chamber comprising multiple walls, and/or a gas reformulating chamber operatively associated with one or more heat exchangers, wherein the system is configured for heat recovery and cooling of the plasma reformulated gas.
33. The facility of claim 12, wherein one or more of the plasma heat sources of the gas reformulation system are mounted on a sliding mounting mechanism.
34. The facility of claim 12, wherein at least one of the GRS input gas inlets comprises a controller to control the flow of GRS input gas into the gas reformulating chamber,

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wherein the controller is optionally operatively associated with one or more sensing and/or response elements.

35. The facility of claim 12, wherein one or more of the GRS input gas inlets comprise an injector to inject the GRS input gas into the gas reformulating chamber, wherein at least one injector is optionally operatively associated with one or more sensing and/or response elements.
36. The facility of claim 12, wherein at least one of the GRS input gas inlets of the gas reformulating chamber is positioned in the wall of the gas reformulating chamber proximal to an upstream end.
37. The facility of claim 12, wherein at least one of the reformulated gas outlets is positioned at or near a downstream end of the gas reformulating chamber, and wherein at least one of the reformulated gas outlets is optionally operatively associated with one or more sensing and/or response elements.
38. The facility of claim 12, wherein the gas reformulation system comprises one or more process additive inlets for introducing one or more process additives into the system, wherein at least one of the process additive inlets is optionally operatively associated with one or more sensing and/or response elements.
39. The facility of claim 38, wherein the process additive inlets comprise heat resistant atomizing nozzles or jets.
40. The facility of claim 12, wherein the gas reformulating system comprises means to promote mixing of the GRS input gas.
41. The facility of claim 40, wherein the means to gas promote mixing comprises baffles located at various locations in the gas reformulation chamber to promote back mixing and turbulence of the GRS input gas.

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42. The facility of claim 12, wherein the gas reformulating system comprises one or more air jets at or near the one or more GRS input gas inlets configured to promote a swirling motion and/or turbulence in the GRS input gas stream, wherein at least one of the air jets is optionally operatively associated with one or more sensing and/or response elements.
43. The facility of claim 40, wherein the means to promote gas mixing comprises ports for oxygen sources and/or ports for plasma torches cooperatively configured to promote mixing of the GRS input gas, wherein at least one of the ports is optionally operatively associated with one or more sensing and/or response elements.
44. The facility of claim 12, wherein the gas reformulating system comprises a collector for solid particulate matter.
45. The facility of claim 12, wherein the gas reformulating system comprises means for collecting and feeding solid particulate matter into one or more systems within the facility for further processing.
46. The facility of claim 12, wherein the gas reformulating chamber comprises one or more sealable inlets, the sealable inlets comprising plugs, covers, valves, sealing glands and/or gates, and wherein at least one of the sealable inlets is optionally operatively associated with one or more sensors and/or response elements.
47. The facility of claim 12, wherein the facility comprises one or more induction blowers in gaseous communication with the gas reformulating chamber, wherein at least one of the induction blowers is optionally operatively associated with one or more sensors and/or one or more response elements.
48. A gas reformulating system suitable for use in a gasification facility,  
the gas reformulating system configured for operative association with a control

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system for managing processes within the gas reformulating system comprising conversion of a gas reformulating system input gas (GRS input gas) comprising raw offgas and/or syngas having a first chemical composition into a plasma reformulated gas having a second chemical composition,

the gas reformulating system comprising:

(a) one or more gas reformulating chambers wherein at least one of the gas reformulating chambers is a refractory-lined chamber comprising one or more inputs for receiving the GRS input gas positioned at or near the upstream end of the chamber; one or more outputs for releasing the plasma reformulated gas positioned at or near the downstream end of the chamber; and optionally one or more process additive inputs; and

(b) one or more plasma heat sources operatively associated with each of the one or more gas reformulating chambers, the plasma heat sources configured to provide heat to promote the dissociation of molecules in the GRS input gas within the gas reformulating chamber, which then recombine as a plasma reformulated gas;

wherein the gas reformulating system is configured to promote concurrent, countercurrent, radial, tangential, or other feed flow direction of the GRS input gas relative to the one or more plasma heat sources.

49. A process for converting a gas reformulating system input gas (GRS input gas) comprising raw offgas and/or syngas of a first chemical composition into a plasma reformulated gas of a second chemical composition, the process comprising the steps of:

(a) applying plasma heat to the GRS input gas at a temperature sufficient to dissociate at least a portion of the molecules in the GRS input gas;

(b) allowing the dissociated molecules to recombine to provide a plasma reformulated gas;

(c) optionally imparting turbulence, countercurrent, radial, tangential, or other flow direction to the GRS input gas during steps (a) and/or (b), and

(d) effecting adjustments in one or more steps of the process as necessary to produce the plasma reformulated gas of a second chemical composition.

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50. The process of claim 49, comprising the step of adding one or more process additives to the GRS input gas.
51. The process of claim 50, wherein the one or more process additives are selected from an oxygen source, steam, carbon dioxide and hydrocarbons.
52. The process of claim 51, wherein the oxygen source is oxygen, oxygen-enriched air, air, oxidizing medium, steam or a combination thereof.
53. The process of claim 50, comprising the step of adjusting the amount of process additives added to the GRS input gas such that release of heat during reformulation is maximized.
54. The process of claim 49, comprising the step of capturing excess heat from the reformulation process for transfer or recycling.
55. The facility of claim 12, wherein at least one of the gasifier systems comprises a horizontally-oriented gasification chamber, wherein the gasifier system is configured for progressive conversion of reactant material generated at least in part from a carbonaceous feedstock to generate a raw off-gas and/or syngas and a residue, the gasification chamber comprising:
- a) two or more laterally distributed processing zones;
  - b) one or more feedstock inputs, optionally operatively associated with one or more sensing and/or response elements;
  - c) one or more gas outputs, optionally operatively associated with one or more sensing and/or response elements;
  - d) one or more residue outputs, optionally operatively associated with one or more sensing and/or response elements;
  - e) one or more lateral transfer units for moving reactant material through the gasification chamber during processing, wherein each of the one or more lateral

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transfer units is optionally operatively associated with one or more sensing and/or response elements; and

f) optionally, one or more process additive inputs, optionally operatively associated with one or more sensing and/or response elements;

wherein the gasification chamber is operatively associated with heating means for delivering heat to the laterally distributed processing zones.

56. The facility of claim 55, wherein the gasification chamber is operatively associated with one or more level switches to measure pile depth.

57. The facility of claim 55, wherein the facility comprises feeding means to feed carbonaceous feedstock into the one or more gasifier systems, wherein the feeding means is optionally operatively associated with one or more sensing and/or response elements.

58. The facility of claim 57, wherein the feeding means is configured to receive one or more carbon-rich feedstock additives and to feed the one or more carbon-rich feedstock additives into the one or more gasifier systems.

59. The facility of claim 55, wherein at least one of the process additive inputs in the gasification chamber is a carbon-rich feedstock additive input, wherein the carbon-rich feedstock additive input is optionally operatively associated with one or more sensing and/or response elements.

60. The facility of claim 55, wherein the heating means comprises heat recovered from one or more locations within the facility, one or more plasma heat sources or hot air generated using recycled heat, wherein at least one of the heating means is optionally operatively associated with one or more sensing and/or response elements.

61. The facility of claim 55, wherein at least one of the gas outputs is directly coupled to the gas reformulating system.

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62. The facility of claim 55, wherein the gasifier system comprises one or more of a thermocouple, material height detector, pressure sensor, closed-circuit monitor and/or gas analyzer.
63. The facility of claim 55, wherein each of the laterally distributed processing zones in the gasification chamber is configured to promote a stage of the successive conversion of reactant material generated from carbonaceous feedstock to generate a raw off-gas and/or syngas, the stage comprising primarily drying, volatilization or carbon conversion.
64. The facility of claim 55, wherein each of the laterally distributed processing zones in the gasification chamber is configured to maintain a different temperature and wherein the one or more lateral transfer units are configured to move the reactant material through each zone.
65. The facility of claim 55, wherein each lateral transfer unit comprises a shelf, platform, ram, plow, screw, carrier ram, conveyor, belt or combination thereof.
66. The facility of claim 55, wherein gasification chamber is configured such that the one or more process additive inputs are positioned relative to each processing zone for inputting one or more process additives in the processing zone to promote a stage of the successive conversion of reactant material generated from carbonaceous feedstock to generate a raw off-gas and/or syngas, the stage comprising primarily drying, volatilization or carbon conversion.
67. The facility of claim 55, wherein the gasifier system comprises a controllable residue removal means optionally operatively associated with one or more sensing and/or response elements.
68. The facility of claim 55, wherein the gasifier system comprises means for breaking

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up agglomerates in the residue, wherein the means for breaking up agglomerates is optionally operatively associated with one or more sensing and/or response elements.

69. The facility of claim 55, wherein the gasifier system comprises an ash extractor optionally operatively associated with one or more sensing and/or response elements.

70. A horizontally-oriented progressive processing gasifier system suitable for use in a gasification facility, the gasifier system configured for operative association with a control system for managing processes within the gasifier system comprising generation of raw off-gas and/or syngas from a carbonaceous feedstock, the gasifier system comprising:

- a) a substantially horizontally-oriented gasification chamber configured for progressive conversion of reactant material generated at least in part from the carbonaceous feedstock to generate a raw off-gas and/or syngas and a residue, the gasification chamber comprising:
  - i. two or more laterally distributed processing zones;
  - ii. one or more feedstock inputs;
  - iii. one or more gas outputs;
  - iv. one or more residue outputs;
  - v. one or more lateral transfer units for moving reactant material through the gasification chamber during processing, and
  - vi. optionally, one or more process additive inputs; and
- b) heating means operatively associated with the gasification chamber for delivering heat to the laterally distributed processing zones.

71. A process of generating raw offgas and/or syngas from a carbonaceous feedstock comprising the steps of:

- a) passing carbonaceous feedstock into a first gasification processing zone of two or more laterally distributed processing zones of a gasifier system to provide a reactant material;

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- b) progressively passing the reactant material laterally through the two or more gasification zones;
- c) optimizing conditions in each of the zones to promote the successive stages of drying, volatilization and/or carbon conversion to provide a raw offgas and/or syngas and a residue; and
- d) optionally inputting process additives into one or more of the gasification processing zones.

72. A lateral transfer system suitable for use in a horizontally-oriented progressive gasifier to move reactant material through the gasifier, the lateral transfer system comprising:

- one or more lateral transfer units configurable for coordinated movement or independent movement, and
- a control system operatively associated with the one or more lateral transfer units for controlling the movement thereof,

wherein the lateral transfer system is configured to move the reactant material through the gasifier in order to promote specific stages of a gasification process comprising drying, volatilization and carbon conversion.

73. The lateral transfer system of claim 72, wherein the control system is configured to control the movement speed of each lateral transfer unit, the distance each lateral transfer unit moves and/or the sequence of movement of the lateral transfer units in relation to each other, such that movement of the reactant material through the gasifier can be varied depending on process requirements.

74. The facility of claim 12, comprising one or more residue conditioning systems, wherein at least one residue conditioning system is configurable to convert a residue generated from processes carried out within the facility into molten slag and a residue gas, each residue conditioning system comprising one or more plasma heat sources and a refractory-lined residue conditioning chamber comprising:

- a) one or more residue inlets adapted to receive the residue;

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- b) one or more residue gas outlets, optionally operatively associated with one or more sensing and/or response elements;
- c) one or more molten slag outlets, optionally operatively associated with one or more sensing and/or response elements; and
- d) optionally, one or more process additive inputs, optionally operatively associated with one or more sensing and/or response elements,

wherein the residue conditioning chamber is configured to provide a reservoir to collect at least a portion of the molten slag and is operatively associated with the one or more plasma heat sources, and

wherein the residue conditioning system is optionally operatively associated with means to capture heat from the residue conditioning process and/or products produced thereby.

75. The facility of claim 74, wherein the residue conditioning chamber is operatively associated with one or more of a gasifier system, a gas reformulating system, a residue storage hopper, a gas conditioning system, a catalyst system, a particulate matter collection system, and/or a solid phase separation system, to receive residue therefrom.

76. The facility of claim 74, wherein the residue conditioning chamber is configured to receive residue from a plurality of sources and wherein each source is operatively associated with a separate residue inlet.

77. The facility of claim 74, wherein the facility is configured to combine residue from a plurality of sources prior to entry into the residue conditioning chamber.

78. The facility of claim 74, wherein one or more of the residue inlets are operatively associated with an active input means for actively inputting residue into the conditioning chamber, wherein the active input means is optionally operatively associated with one or more sensing and/or response elements.

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79. The facility of claim 74, wherein the one or more plasma heat sources are AC transferred arc torches, DC transferred arc torches, AC non-transferred arc torches, DC non-transferred arc torches and/or inductively coupled plasma torches, wherein at least one of the plasma heat sources is optionally operatively associated with one or more sensing and/or response elements.
80. The facility according to claim 74, wherein the residue conditioning system comprises one or more process additive inlets configured for introducing process additives into the system, wherein at least one of the process additive inlets is optionally operatively associated with one or more sensing and/or response elements..
81. The facility according to claim 74, wherein the residue conditioning chamber comprises one or more process additive inlets configured to input air, steam and/or other oxygen containing additives into the residue conditioning chamber.
82. The facility of claim 74, wherein the residue conditioning system is configured for addition of one or more process additives directly to the residue.
83. The facility of claim 74, wherein the residue conditioning system comprises means for adding at least one process additive to the residue prior to the residue entering the residue conditioning chamber, wherein the means is optionally operatively associated with one or more sensing and/or response elements.
84. The facility of claim 74, wherein the residue conditioning system is operatively associated with one or more heat exchangers optionally operatively associated with one or more sensing and/or response elements.
85. The facility of claim 74, wherein the residue conditioning system is operatively associated with means to recycle heat to a gasifier system within the facility, wherein the means is optionally operatively associated with one or more sensing

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and/or response elements.

86. The facility of claim 74, wherein the residue conditioning system comprises means to direct the residue gas to a gas conditioning system, wherein the means is optionally operatively associated with one or more sensing and/or response elements.
87. The facility of claim 74, wherein the residue conditioning chamber comprises one or more sources of plasma heat operatively associated with one or more sensing and/or response elements and one or more induction heaters operatively associated with one or more sensing and/or response elements.
88. The facility of claim 74, wherein the residue conditioning chamber comprises one or more sources of plasma heat operatively associated with one or more sensing and/or response elements and one or more induction heaters operatively associated with one or more sensing and/or response elements and means for adding at least one process additive to the conditioning chamber, wherein the means is optionally operatively associated with one or more sensing and/or response elements.
89. The facility of claim 74, wherein the residue conditioning system comprises one or more induction heaters configured to control the temperature in a region of the residue conditioning chamber including a molten slag outlet, wherein at least one of the induction heaters is optionally operatively associated with one or more sensing and/or response elements.
90. A residue conditioning system suitable for use in a gasification facility, the residue conditioning system configured for operative association with a control system for managing processes within the residue conditioning system comprising converting a residue generated from processes carried out within the facility into molten slag and a residue gas,  
the residue conditioning system comprising:

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- a) one or more plasma heat sources; and
  - b) a refractory-lined residue conditioning chamber operatively associated with the one or more plasma heat sources and comprising one or more residue inlets adapted to receive the residue; one or more residue gas outlets; one or more molten slag outlets and optionally, one or more process additive inputs; wherein the residue conditioning chamber is configured to provide a reservoir to collect at least a portion of the molten slag,
- wherein the residue conditioning system is optionally operatively associated with means to capture heat from the residue conditioning process and/or products produced thereby.
91. A process for converting a residue generated within a gasification facility to molten slag and a residue gas, the process comprising:
- a) applying plasma heat to the residue at a temperature sufficient to melt solid material in the residue to provide molten slag and to volatilize any carbon remaining in the residue to provide a residue gas;
  - b) optionally adding one or more process additives to the residue;
  - c) separating the molten slag from the residue gas, and
  - d) optionally submitting the residue gas to further processing.
92. The facility of claim 12, comprising one or more heat recycling systems, wherein at least one of the heat recycling systems is configured to recover heat from gas within the facility and deliver the heat to one or more locations, wherein the heat recycling system comprises:
- a) one or more gas-to-fluid heat exchangers configured to transfer heat from a hot gas to a fluid to produce a heated fluid, each of the gas-to-fluid heat exchangers comprising one or more hot gas inlets and one or more heated fluid outlets, wherein at least one of the hot gas inlets and at least one of the heated fluid outlets is optionally operatively associated with one or more sensing and/or one or more response element;
  - b) one or more hot gas conduits configured to provide fluid communication

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between one or more hot gas outlets positioned at one or more locations within the facility and the one or more hot gas inlets, wherein at least one of the hot gas outlets is optionally operatively associated with one or more sensing and/or response elements; and

- c) one or more fluid conduits configured to provide fluid communication between the one or more heated fluid outlets and one or more heated fluid inlets positioned at the one or more locations, wherein at least one heated fluid inlet is optionally operatively associated with one or more sensing and/or response elements;

wherein the control system is configured to adjust the operating conditions within the heat recycling system, and thereby regulate the transfer of heat to one or more locations.

93. The facility of claim 92, wherein the heat recycling systems is configured to deliver heat to one or more locations within the facility.

94. The facility of claim 92, wherein the heat recycling systems is configured to deliver heat to one or more locations for transfer to a site outside of the facility.

95. The facility of claim 92, wherein the one or more hot gas outlets are operatively associated with one or more of the gasifier system, the gas reformulation system, the gas conditioning system, a gas cooling system, the residue conditioning system, the gas homogenization system, a conduit connecting these systems, and/or an engine.

96. The facility of claim 92, wherein the hot gas comprises raw offgas and/or syngas, reformulated gas, conditioned reformulated gas, and/or gas produced during residue conditioning.

97. The facility of claim 92, wherein the fluid is air, water, oil, or a gas.

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98. The facility of claim 92, wherein the fluid is air, and the gas-to-fluid heat exchanger is a gas-to-air heat exchanger.
99. The facility of claim 92, wherein the fluid is water, and the gas-to-fluid heat exchanger is a heat recovery steam generator.
100. The facility of claim 92, wherein the heat recycling system is configured to deliver heat to the gasifier system.
101. The facility of claim 92, wherein the hot gas comprises a plasma reformulated gas.
102. The facility of claim 92, wherein the hot gas comprises a plasma reformulated gas and the heat recycling system is configured to deliver heat to the gasifier system.
103. The facility of claim 92, wherein the hot gas is a gas comprising a plasma reformulated gas and the heat recycling system comprises:  
means to transfer the hot gas to a gas-to-air heat exchanger, wherein the heat from the hot gas is transferred to air to produce a heated exchange-air and a cooled gas comprising a plasma reformulated gas, and  
means to transfer the heated exchange-air to an exchange-air inlet in the gasifier system.
104. The facility of claim 103, wherein the heated exchange-air provides at least a portion of the heat for preheating the carbonaceous feedstock and/or removing moisture from the carbonaceous feedstock.
105. The facility of claim 103, further comprising one or more heat recovery steam generators to generate steam using residual heat from the cooled gas comprising a plasma reformulated gas.

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106. The facility of claim 105, wherein the one or more heat recovery steam generators are operatively associated with a steam turbine such that the generated steam drives the turbine.
107. The facility of claim 105, wherein the steam generated in the one or more steam generators is for use as a process additive in the gasification process.
108. The facility of claim 92, wherein the heat recycling system comprises one or more individual temperature transmitters located at a hot gas inlet and/or at a hot gas outlet, wherein at least one temperature transmitter is optionally operatively associated with one or more sensing and/or response elements.
109. The facility of claim 92, wherein the heated fluid inlets comprise perforations located in the walls of the gasification chamber.
110. The facility of claim 92, wherein one or more of the hot gas and/or fluid conduits are operatively associated with a flow management system comprising one or more of a flow regulating device, flow meter and/or blower to control the flow rate of the hot gas or heated fluid, wherein the flow management system is optionally operatively associated with one or more sensing and/or response elements.
111. A heat recycling system suitable for use in a gasification facility, the heat recycling system configured for operative association with a control system for managing processes within the heat recycling system comprising recovering heat from a hot gas and transferring the heat to a gasifier within the gasification facility, the heat recycling system comprising:
- a) one or more gas-to-fluid heat exchangers configured to transfer heat from a hot gas to a fluid to produce a heated fluid, each of the gas-to-fluid heat exchangers comprising one or more hot gas inlets and one or more heated fluid outlets;
  - b) one or more hot gas conduits configured to provide fluid communication

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- between the one or more hot gas inlets and a source of hot gas; and
- c) one or more fluid conduits configured to provide fluid communication between the one or more heated fluid outlets and the gasifier.
112. A process for recovering heat generated within a gasification facility, the process comprising the steps of:
- a) passing hot gas from one or more locations within the gasification facility through a gas-to-fluid heat exchanger to provide a heated fluid, and
  - b) transferring the heated fluid to a gasifier and optionally one or more other locations within the facility.
113. The facility of claim 12, comprising one or more gas conditioning systems, wherein at least one gas conditioning system is a two-stage system configurable to condition gas conditioning system input gas (GCS input gas) wherein the GCS input gas comprises a plasma reformulated gas, the one gas conditioning system comprising:
- a) one or more Stage One gas conditioning units configured for performing stage one processes comprising dry phase separation wherein a substantial proportion of particulate matter and a substantial proportion of heavy metal contaminants are removed from the GCS input gas to provide a partially conditioned gas, wherein each Stage One unit is optionally operatively associated with one or more sensing and/or response elements; and
  - b) one or more Stage Two gas conditioning units located downstream from the one or more Stage One gas conditioning units configured for performing stage two processes comprising removal of a substantial portion of acid gases and other contaminants remaining in the partially conditioned gas, wherein each Stage Two unit is optionally operatively associated with one or more sensing and/or response elements.
114. The facility of claim 113, wherein the two-stage process gas conditioning system comprises one or more gas cooling systems optionally operatively associated with

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one or more sensing and/or response elements, and/or one or more humidity controllers optionally operatively associated with one or more sensing and/or response elements, wherein at least one gas cooling system and/or humidity controller is positioned upstream of the one or more stage one particle removal units to cool the GCS input gas.

115. The facility of claim 113, wherein the gas conditioning system comprises one or more humidity controllers selected from a chiller, or a chiller in combination with a gas/liquid separator, wherein at least one of the humidity controllers is optionally operatively associated with one or more sensing and/or response elements.
116. The facility of claim 113, wherein the gas conditioning system is operatively associated with a residue conditioning system configured to receive and melt particulate matter and heavy metal contaminants removed from the GCS input gas in the gas conditioning system.
117. The facility of claim 113, wherein the one or more Stage One gas conditioning units comprise one or more of dry injection systems, particle removal units, activated carbon filtration components, and/or components configured to allow contact of the GCS input gas with a specialized sorbent.
118. The facility of claim 113, wherein at least one of the Stage One gas conditioning units comprises a particle removal unit selected from a cyclone separator, a cyclone filter, a high temperature ceramic filter, a moving bed granular filter, a baghouse filter, and an electrostatic precipitator, wherein the particle removal unit is optionally operatively associated with one or more sensing and/or response elements.
119. The facility of claim 113, wherein at least one of the Stage One gas conditioning units comprises a baghouse filter, wherein the baghouse filter is optionally operatively associated with one or more sensing and/or response elements.

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120. The facility of claim 113, wherein the gas conditioning system is configured to produce hazardous waste less than about 5% of the weight of carbonaceous feedstock used to generate the GCS input gas.
121. The facility of claim 113, wherein the gas conditioning system is configured to remove at least about 70% of the particulate matter present in the GCS input gas in the stage one processes.
122. The facility of claim 113, wherein the one or more Stage Two gas conditioning units comprise dry scrubbers and/or wet scrubbers for acid gas removal, wherein at least one of the scrubbers is optionally operatively associated with one or more sensing and/or response elements.
123. The facility of claim 113, wherein at least one of the Stage Two gas conditioning units comprises activated carbon, alumina, alkali earth carbonates, alkali earth oxides, alkaline earth carbonates, alkaline earth oxides, chloride guards, a flue gas sorbents, and/or high temperature sorbents for removal of HCl vapour from the, partially conditioned gas.
124. The facility of claim 113, wherein at least one of the Stage Two gas conditioning units comprises a high temperature sorbent for removal of HCl vapour from the partially conditioned gas, the high temperature sorbent selected from alkali earth compounds, alkaline earth compounds, shortite ( $\text{Na}_2\text{CO}_3 \cdot 2\text{CaCO}_3$ ), trona ( $\text{Na}_2\text{CO}_3 \cdot \text{NaHCO}_3 \cdot 2\text{H}_2\text{O}$ ), eutectic melts of  $\text{Li}_2\text{CO}_3$ , eutectic melts of  $\text{Na}_2\text{CO}_3$ , and alkalized alumina, or a combination thereof.
125. The facility of claim 113, wherein the one or more Stage Two gas conditioning units comprise an HCl scrubber, wherein the HCl scrubber is optionally operatively associated with one or more sensing and/or response elements.

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126. The facility of claim 113, wherein at least one of the Stage Two gas conditioning units comprises a H<sub>2</sub>S removal system, wherein the H<sub>2</sub>S removal system is optionally operatively associated with one or more sensing and/or response elements
127. The facility of claim 113, wherein at least one of the Stage Two gas conditioning units comprise one or more particle removal units, wherein at least one particle removal unit is optionally operatively associated with one or more sensing and/or response elements.
128. The facility of claim 113, wherein at least one of the Stage Two gas conditioning units comprise one or more activated carbon mercury polishers, wherein at least one of the activated carbon mercury polishers is optionally operatively associated with one or more sensing and/or response elements.
129. The facility of claim 113, wherein at least one of the one or more Stage Two gas conditioning units are configured for removal of dioxin, furan, carbon dioxide, or ammonia from the partially conditioned gas.
130. The facility of claim 113, wherein the gas conditioning system comprises one or more cooling units operatively associated with one or more Stage Two gas conditioning units, the cooling units selected from evaporative cooling towers, gas coolers, chillers, recuperators, heat exchangers, indirect air to gas heat exchangers, and/or heat recovery steam generators, wherein at least one of the cooling units is optionally operatively associated with one or more sensing and/or response elements.
131. The facility of claim 113, wherein the gas conditioning system comprises one or more humidity controllers operatively associated with one or more Stage Two gas conditioning units, the humidity controllers selected from demisters, reheaters,

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and/or chillers, wherein at least one of the humidity controllers is optionally operatively associated with one or more sensing and/or response elements.

132. The facility of claim 113, wherein the gas conditioning system comprises one or more compressors operatively associated with one or more Stage Two gas conditioning units for compressing the partially conditioned or conditioned gas to a desired pressure, wherein at least one of the compressors is optionally operatively associated with one or more sensing and/or response elements.

133. The facility of claim 113, wherein the gas conditioning system comprises one or more gas moving units operatively associated with one or more Stage Two gas conditioning units for moving gas through the gas conditioning system, wherein at least one of the gas moving units is optionally operatively associated with one or more sensing and/or response elements.

134. The facility of claim 133, wherein the one or more Stage Two gas conditioning units comprise one or more particle removal units, wherein at least one particle removal unit is optionally operatively configured as a process device operatively associated with one or more sensing and/or response elements and wherein at least one of the gas moving units is located upstream of the one or more particle removal units.

135. A gas conditioning system suitable for use in a gasification facility, the gas conditioning system configured for operative association with a control system for managing processes within the gas conditioning system comprising removing contaminants from a gas conditioning system input gas (GCS input gas) to provide a conditioned gas,

the gas conditioning system comprising:

- a) one or more Stage One gas conditioning units configured for performing stage one processes comprising dry phase separation wherein a substantial proportion of particulate matter and a substantial proportion of heavy metal

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contaminants are removed from the GCS input gas to provide a partially conditioned gas, wherein each Stage One unit is optionally operatively associated with one or more sensing and/or response elements; and

b) one or more Stage Two gas conditioning units located downstream from the one or more Stage One gas conditioning units configured for performing stage two processes comprising removal of a substantial portion of acid gases and other contaminants remaining in the partially conditioned gas, wherein each Stage Two unit is optionally operatively associated with one or more sensing and/or response elements, and

c) a residue conditioner operatively associated with the Stage One gas conditioning units and/or Stage Two gas conditioning units and configured to receive and melt residue therefrom.

136. A process for conditioning a gas generated within a gasification facility, the process comprising the steps of:

a) removing from the gas at least a portion of any particulate matter and at least a portion of any heavy metal contaminants present in the gas to provide a partially conditioned gas;

b) removing from the partially conditioned gas at least a portion of any acid gas present in the partially conditioned gas thereby providing a conditioned gas, and

c) optionally applying plasma heat to particulate matter and/or heavy metal contaminants removed from the gas to melt the removed particulate matter and/or heavy metal contaminants and volatilize any carbon present therein.

137. The facility of claim 12, comprising one or more gas homogenization systems, wherein at least one gas homogenization system is configured to receive a gas homogenization system input gas (GHS input gas) for homogenizing and regulating gas parameters to provide a regulated gas having substantially consistent characteristics, the gas homogenization system comprising:

a homogenization chamber comprising one or more GHS input gas inlets optionally operatively associated with one or more sensing and/or response

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elements and one or more regulated gas outlets optionally operatively associated with one or more sensing and/or response elements, wherein the gas homogenization system is designed to accommodate a gas residence time sufficient for regulation of the one or more gas characteristics.

138. The facility of claim 137, wherein the gas homogenization system comprises one or more draft induction devices operatively associated with the gas homogenization chamber for providing uniform input gas flow thereto, wherein at least one of the draft induction devices is optionally operatively associated with one or more sensing and/or response elements.
139. The facility of claim 137, wherein the gas homogenization system comprises one or more chillers operatively associated with the gas homogenization chamber for adjusting the temperature of the GHS input gas, wherein at least one of the chillers is optionally operatively associated with one or more sensing and/or response elements
140. The facility of claim 137, wherein the gas homogenization system comprises one or more gas/liquid separators operatively associated with the gas homogenization chamber for adjusting the humidity of the GHS input gas, wherein at least one of the gas/liquid separators is optionally operatively associated with one or more sensing and/or response elements
141. The facility of claim 137, wherein the gas homogenization system comprises one or more gas conditioning skids operatively associated with the gas homogenization chamber for adjusting the temperature and humidity of the regulated gas, wherein at least one gas conditioning skid is optionally operatively associated with one or more sensing and/or response elements.
142. The facility of claim 137, wherein the gas homogenization system comprises one or more filters operatively associated with the gas homogenization chamber for

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removing impurities from the regulated gas, wherein at least one of the filters is optionally operatively associated with one or more sensing and/or response elements.

143. The facility of claim 137, wherein gas homogenization system is configured to regulate one or more gas parameters to result in: (i) a pressure variance limit less than about 0.145 psi/second, (ii) a regulated gas composition lower heating value having a maximum % change of about 1% change in about 30 seconds, (iii) a regulated gas with higher heating value of about 50BTU/scf with a minimum of about 12% Hydrogen, to result in a gas having a Wobbe Index (defined as  $T(\text{degrees R})/\text{sq.rt}(\text{specific gravity})$ )  $\pm$  4% of the value required for use with turbine engines, (iv) gas with a minimum lower heating value of about 300 Btu/scf and a minimum pressure of about 475 psig or (v) a gas with gas temperature greater than or equal to the dew point temperature plus about 20°F where relative humidity is at a maximum of about 80%.
144. The facility of claim 137, wherein the gas homogenization system is configured to provide a gas residence time of between less than about one minute to about 20 minutes.
145. The facility of claim 137, wherein the gas homogenization system is configured: (i) so that the variable gas volume ranges from 0-30,000 m<sup>3</sup>, (ii) to have a mechanical design pressure of about 5.0 psig, (iii) to provide regulated gas to a gas engine requiring a gas pressure of about 1.2-3.0 psig, (iv) to provide regulated gas to a gas turbine requiring a gas pressure of about 250-600 psig or (v) to have a mechanical design temperature tolerance in a range between about -40°C to about 300°C.
146. The facility of claim 137, wherein the homogenization chamber is a gasometer, a gas holder, a variable volume tank or a fixed volume tank.

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147. The facility of claim 137, wherein the gas homogenization system comprises a compressor operatively associated with the gas homogenization chamber for compressing the GHS input gas, wherein the compressor is optionally operatively associated with one or more sensing and/or response elements.
148. The facility of claim 137, wherein the gas homogenization chamber is defined by an inner membrane and an outer membrane, and wherein the gas homogenization system comprises one or more blowers operatively associated with the outer membrane to provide inflation to the region between the membranes when the regulated gas exits the gas homogenization chamber and one or more regulators operatively associated with outer membrane to adjust the pressure of the inflated region when GHS input gas enters the gas homogenization chamber, and wherein at least one of the blowers and at least one of the regulators are optionally operatively associated with one or more sensing and/or response elements.
149. The facility of claim 137, wherein the gas homogenization chamber is an absorption-type gas holder having a constant volume.
150. The facility of claim 137, wherein the gas homogenization chamber is configured for positioning above ground, underground or with a portion thereof underground.
151. The facility of claim 137, wherein the gas homogenization system comprises sensing elements and/or response elements to monitor and/or regulate one or more of gas composition, gas flow rate, gas temperature and/or gas pressure.
152. The facility of claim 137, wherein the gas homogenization chamber comprises multiple sensing elements configured to sample gas at different locations within the gas homogenization chamber.
153. The facility of claim 137, wherein the gas homogenization system comprises a flow control means operatively associated with a GHS input gas inlet for

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controlling the flow rate of the GHS input gas into the gas homogenization chamber, wherein the flow control means is optionally operatively associated with one or more sensing and/or response elements.

154. The facility of claim 137, wherein the gas homogenization system comprises one or more sensing elements for evaluating gas characteristics of the GHS input gas and one or more response elements configured to direct compliant gas to the gas homogenization chamber and non-compliant gas to one or more other systems in the facility.

155. The facility of claim 137, wherein the gas homogenization system comprises a flow control means operatively associated with a regulated gas outlet for controlling the flow rate of the regulated gas from the homogenization chamber to a downstream application or a pressure regulating valve device operatively associated with a regulated gas outlet for controlling the pressure of the regulated gas prior to delivery to a downstream application.

156. The facility of claim 137, wherein the gas homogenization system comprises a gas/liquid separator operatively associated with a regulated gas outlet optionally configured to remove any water formed due to the condensation of the regulated gas.

157. The facility of claim 137, wherein the gas homogenization system is configured:  
(i) such that the maximum fluctuation in the lower heating value of the regulated gas is about 10%, (ii) for operation at a pressure of 2.2 to 3.0 psig or (iii) for a maximum pressure of 5 psig.

158. A gas homogenization system suitable for use in a gasification facility, the gas homogenization system configured for operative association with a control system for managing processes within the gas homogenization system comprising regulating gas characteristics of a gas homogenization system input gas (GHS input

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gas) to provide a regulated gas,  
the gas homogenization system comprising a homogenization chamber  
comprising one or more GHS input gas inlets optionally operatively associated  
with one or more sensing and/or response elements and one or more regulated gas  
outlets optionally operatively associated with one or more sensing and/or response  
elements,  
wherein the gas homogenization system is designed to accommodate a gas  
residence time sufficient for regulation of the one or more gas characteristics.

159. A process for providing a regulated gas from a gas generated within a  
gasification facility, the regulated gas having substantially consistent characteristics  
suitable for a selected downstream application, the process comprising the steps of:
- a) passing the gas into a homogenization chamber, and
  - b) retaining and optionally mixing the gas in the homogenization chamber for a  
time sufficient to provide a regulated gas having substantially consistent  
characteristics.
160. The facility of claim 12, wherein the control system is operative to:
- (a) determine a current operating condition of one or more processes within the  
facility, the current operating condition based at least in part on one or more input  
signals received from one or more sensing elements; and
  - (b) determine one or more control signals for at least one response element to adjust  
the one or more processes to obtain or adjust towards a target operating  
condition, said one or more control signals based at least in part on a comparison  
of the current operating condition and the target operating condition;
  - (c) provide the one or more control signals to the at least one response element.
161. The facility of claim 12, wherein the control system is operative to:
- a) determine a target operating condition of one or more processes within the  
facility;

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- b) determine one or more control signals for at least one response element to adjust the one or more processes to obtain the target operating condition; and
- c) provide the one or more control signals to the at least one response element.

162. The facility of claim 12, wherein the control system is operative to:

- a) represent a sensed characteristic by a characteristic value, said sensed characteristic indicative of one or more of the input signals;
- b) compute one or more process control parameters based in part on a comparison of:
  - one or more characteristic values wherein the characteristic value is a value or a derived value, with
  - one or more target values or ranges thereof wherein the target value is a value or a derived value,
 wherein the process control parameters set conditions for operation of one or more response elements; and
- c) provide control signals reflective of the one or more process control parameters to at least one response element to maintain or adjust a process characteristic of one or more processes within the facility.

163. The facility of claim 162, wherein the control system is configured to generate

one or more process control parameters at least in part using an approximately linear relationship defined between one characteristic value and another characteristic value, according to the equation:  $[X] = [a][Y]$ ; wherein  $[a]$  is an empirical constant that depends on facility design and one or more desired output characteristics of the facility, wherein one or more other characteristic values are held constant.

164. The facility of claim 162, wherein the control system is configured to determine a

target value by calculating an equation according to  $[X]_{tv} = a[Y]_{tv}$ , wherein temperature and pressure are held constant, and wherein

either  $[X]_{tv}$  or  $[Y]_{tv}$  represents a known target value;

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the control system also configured to determine a characteristic value by calculating an equation according to  $[X]_{cv} = a[Y]_{cv}$ , wherein temperature and pressure are held constant, and wherein

either  $[X]_{cv}$  or  $[Y]_{cv}$  represents a known characteristic value;

wherein  $[a]$  is an empirical constant that depends on facility design and one or more desired output characteristics of the facility; and

wherein the control system is configured to generate one or more control parameters based in part on a comparison of one or more target values with corresponding one or more characteristic values.

165. The facility of claim 162, wherein one or more characteristic values are indicative of a gas composition and wherein one or more control parameters are indicative of an additive input rate to the gasification process, wherein said additive input rate is adjusted at least in part as a function of the gas composition.

166. The facility of claim 162, wherein one or more characteristic values are indicative of a gas composition and said one or more characteristic values are used at least in part to define a heating value of the gas, wherein one or more control parameters are indicative of an air additive input rate and wherein said air additive input rate is adjusted at least in part as a function of the heating value.

167. The facility of claim 166, wherein the computing system is configured to adjust the air additive input rate as a linear function of the heating value of the gas.

168. The facility of claim 162, wherein one or more characteristic values are indicative of a gas composition, the gas composition including a sensed CO content and sensed H<sub>2</sub> content of the gas, wherein one or more control parameters are indicative of an additive input rate to the gasification process, wherein said additive input rate is adjusted at least in part as a function of the sensed CO content and the sensed H<sub>2</sub> content.

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169. The facility of claim 162, wherein the control system is configured to compute one or more control parameters including parameters for controlling the amount of Air fed into the gasifier as a process additive as a function of the Heating Value (HV) of the product gas, the parameters computed based on a linear relationship defined between the HV of the product gas and the amount of Air fed into the gasifier according to:  $[HV] = [a][Air]$ ;  
wherein [a] is an empirical constant that depends on facility design and one or more desired output characteristics of the facility and wherein one or more other characteristic values are held constant.
170. The facility of claim 162, wherein the control system is configured to compute one or more control parameters including parameters for controlling the amount of Air fed into the gasifier as a process additive as a function of the Low Heating Value (LHV) of the product gas, the parameters computed based on a linear relationship defined between the LHV of the product gas and the amount of Air fed into the gasifier according to:  $[LHV] = [a][Air]$ ;  
wherein [a] is an empirical constant that depends on facility design and one or more desired output characteristics of the facility and wherein at least temperature and pressure are held constant.
171. The facility of claim 162, wherein the control system is configured to compute one or more control parameters including parameters for controlling the amount of Air fed into the gasifier as a process additive as a function of High Heating Value (HHV) of the product gas, the parameters computed based on a linear relationship defined between the HHV of the product gas and the amount of Air fed into the gasifier wherein at least temperature and pressure are set as constants.
172. The facility of claim 162, comprising a converter solids level detection module operatively associated with the control system, wherein at least a portion of output from the converter solids level detection module is cooperatively used for

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generation of one or more process control parameters for control of motion of one or more lateral transfer units, Carbonaceous Feedstock (CF) feed rate and High Carbon Feedstock (HCF) feed rate.

173. The facility of claim 172, wherein the control system is configured to compute control parameters including parameters for controlling rate of motion of the one or more lateral transfer units and/or CF feed rate, and/or and HCF feed rate and/or height of solids in the gasifier, wherein the parameters are computed based on a linear relationship defined between the rate of motion of the one or more lateral transfer units, the CF feed rate, the HCF feed rate and the height of solids in the gasifier.
174. The facility of claim 162, comprising a product gas carbon content detection module operatively associated with the control system and configured to sense the product gas carbon content, wherein at least a portion of output from the product gas carbon content detection module is cooperatively utilized for generation of one or more process control parameters for control of a Carbonaceous Feedstock (CF) feed rate and a High Carbon Feedstock (HCF) feed rate.
175. The facility of claim 162, comprising a product gas carbon content detection module operatively coupled with a Carbonaceous Feedstock (CF):High Carbon Feedstock (HCF) ratio controller, each operatively associated with the control system and configured to cooperatively control a CF/HCF splitter for controlling a CF feed rate and a HCF feed rate into the gasifier.
176. The facility of claim 162, comprising a product gas fuel value detection module operatively associated with the control system and configured to sense product gas fuel value, wherein at least a portion of output from the product gas fuel value detection module is cooperatively utilized for generation of one or more process control parameters for control a Carbonaceous Feedstock (CF) feed rate and a High Carbon Feedstock (HCF) feed rate.

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177. The facility of claim 162, comprising a product gas fuel value determination module operatively associated with the control system and configured to sense a product gas fuel value, wherein the product gas fuel value determination module is operative to provide one or more control parameters for a Fuel:Air ratio controller configured to control a feed rate of total Carbonaceous Feedstock (CF) and High Carbon Feedstock (HCF) directed to the CF/HCF Splitter, the Fuel:Air ratio controller further configured to provide one or more control parameters to a transfer unit controller for control of motion of one or more lateral transfer units.
178. The facility of claim 162, comprising a product gas H<sub>2</sub> determination module and a product gas CO determination module operatively associated with the control system and configured to sense a product gas H<sub>2</sub> content and product gas CO content, wherein at least a portion of output from the product gas H<sub>2</sub> determination module and the product gas CO determination module is cooperatively utilized for generation of one or more process control parameters for control a Carbonaceous Feedstock (CF) feed rate and a High Carbon Feedstock (HCF) feed rate.
179. The facility of claim 162, comprising a product gas flow detection module operatively associated with the control system and configured to sense the product gas flow, wherein the product gas flow detection module is operative to provide one or more control parameters for control of a feed rate of total Carbonaceous Feedstock (CF) and High Carbon Feedstock (HCF), motion of one or more lateral transfer units and total airflow.
180. The facility of claim 162, comprising one or more process temperature detection modules operatively associated with the control system and configured to sense temperature at one or more points within one or more processes, wherein the process temperature detection module is operative to provide one or more control parameters for control of airflow distribution and plasma heat.

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181. The facility of claim 162, wherein the control system is configured to generate one or more process control parameters to at least in part control input of air and steam into the Gasifier, wherein the one or more process control parameters control system are determined at least in part using a relationship according to:

$$\begin{bmatrix} H_2 \\ CO \end{bmatrix} = \begin{bmatrix} a & b \\ c & d \end{bmatrix} \begin{bmatrix} Air \\ Steam \end{bmatrix}$$

wherein a, b, c and d are empirical constants that depend on facility design and one or more desired output characteristics of the facility and wherein where  $H_2$  and CO are product gas characteristic values.

182. The facility of claim 162, wherein the control system is configured to determine a target value by calculating an equation according to:

$$\begin{bmatrix} H_2 \\ CO \end{bmatrix} = \begin{bmatrix} a & b \\ c & d \end{bmatrix} \begin{bmatrix} Air \\ Steam \end{bmatrix}$$

wherein temperature and pressure are held constant, and wherein

$[H_2]_{iv}$  represents a target value for the product gas  $H_2$  content;

$[CO]_{iv}$  represents a target value for product gas CO content;

$[Air]_{iv}$  represents a target value for amount of Air added as a process additive into the gasifier; and

$[Steam]_{iv}$  represents a target value for amount of Steam added as a process additive into the gasifier;

wherein two of  $[H_2]_{iv}$ ,  $[CO]_{iv}$ ,  $[Air]_{iv}$  and  $[Steam]_{iv}$  represent known target values;

wherein the control system is further configured to determine a characteristic value by calculating an equation according to:

$$\begin{bmatrix} H_2 \\ CO \end{bmatrix} = \begin{bmatrix} a & b \\ c & d \end{bmatrix} \begin{bmatrix} Air \\ Steam \end{bmatrix}$$

wherein temperature and pressure are held constant, and wherein

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$[H_2]_{cv}$  represents a characteristic value for the product gas  $H_2$  content;

$[CO]_{cv}$  represents a characteristic value for product gas CO content;

$[Air]_{cv}$  represents a characteristic value for amount of Air added as a process additive into the gasifier; and

$[Steam]_{cv}$  represents a characteristic value for amount of Steam added as a process additive into the gasifier;

wherein two of  $[H_2]_{cv}$ ,  $[CO]_{cv}$ ,  $[Air]_{cv}$  and  $[Steam]_{cv}$  represent known characteristic values;

wherein a, b, c and d are empirical constants that depends on facility design and one or more desired output characteristics of the facility; and

wherein the control system is configured to generate one or more control parameters based in part on a comparison of one or more target values with corresponding one or more characteristic values.

183. A process for converting carbonaceous feedstock into gas comprising plasma reformulated gas of a defined composition suitable for one or more downstream applications, the process comprising the steps of:
- passing carbonaceous feedstock into a first gasification processing zone of two or more laterally distributed gasification processing zones of a gasifier system to provide a reactant material;
  - progressively passing the reactant material through the two or more gasification processing zones;
  - optimizing operating conditions in each of the gasification processing zones to promote the successive stages of drying and/or volatilization and/or carbon conversion of the reactant material to provide a raw offgas and/or syngas and a residue;
  - optionally inputting process additives into one or more of the gasification processing zones;
  - applying plasma heat to the raw offgas and/or syngas at a temperature

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sufficient to dissociate at least a portion of the molecules in the raw offgas and/or syngas gas;

f) allowing the dissociated molecules to recombine to provide a plasma reformulated gas;

g) optionally imparting turbulence, countercurrent, radial, tangential, or other flow direction to the raw offgas and/or syngas gas during step e) and/or f), and

h) optionally submitting the plasma reformulated gas to further processing.

184. The process of claim 183, wherein heat recovering heat generated in one or more of steps a) to g) is recovered by:

- i. passing the raw offgas and/or syngas, or the plasma reformulated gas through a gas-to-fluid heat exchanger to provide a heated fluid, and
- ii. transferring the heated fluid to one or more of the gasification processing zones.

185. The process of claim 183, wherein the residue from step c) is converted to molten slag and a residue gas by a process comprising the steps of:

- i. applying plasma heat to the residue at a temperature sufficient to melt solid material in the residue to provide molten slag and to volatilize any carbon remaining in the residue to provide a residue gas;
- ii. optionally adding one or more process additives to the residue;
- iii. separating the molten slag from the residue gas, and
- iv. optionally submitting the residue gas to further processing.

186. The process of claim 183, wherein step h) comprises the steps of:

- i. removing from the plasma reformulated gas at least a portion of any particulate matter and at least a portion of any heavy metal contaminants present in the plasma reformulated gas to provide a partially conditioned gas;
- ii. removing from the partially conditioned gas at least a portion of any acid gas present in the partially conditioned gas thereby providing a conditioned gas, and

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iii. optionally applying plasma heat to particulate matter and/or heavy metal contaminants removed from the gas to melt the removed particulate matter and/or heavy metal contaminants and volatilize any carbon present therein.

187. The process of claim 186, wherein the conditioned gas is further processed to provide a regulated gas having substantially consistent characteristics suitable for a selected downstream application by:

- i. passing the conditioned gas into a homogenization chamber, and
- ii. retaining and optionally mixing the conditioned gas in the homogenization chamber for a time sufficient to provide a regulated gas having substantially consistent characteristics.

188. A facility configurable to perform processes comprising generating a raw offgas and/or syngas (raw gas) from carbonaceous feedstock and processes for converting a gas reformulating system input gas (GRS input gas) comprising at least in part the raw gas into a homogenized gas, the facility comprising:

- a) a feedstock handling system configured to feed the carbonaceous feedstock into a gasifier system;
- b) a gasifier system configured for progressive conversion of a reactant material at least in part including the carbonaceous feedstock into the raw gas; the gasification system comprising a substantially horizontally oriented, refractory-lined gasification chamber comprising:
  - i) one or more feedstock inputs operatively linked to the feedstock handling system;
  - ii) two or more substantially laterally distributed processing zones, wherein each processing zone is configured to maintain a different temperature and each processing zone is configured to promote a stage of the progressive conversion; the progressive conversion comprising drying, volatilization and carbon conversion;
  - iii) a floor having steps, wherein each processing zones corresponds substantially to a step;

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- iv) one or more gas outputs in gaseous communication with one or more GRS input gas inlets;
  - v) one or more lateral transfer units configured to move the reactant material between processing zones;
  - vi) one or more process additive inputs configured to inject process additives including plastics and steam into the gasification chamber; and
  - vii) a residue output configured with an output means for removal of a residue from the gasification chamber;
- wherein the gasification chamber is operatively associated with heating means configured to deliver heated air to the processing zones to promote the progressive conversion therein;
- c) a gas reformulating system operatively associated with one or more plasma heat sources and operatively coupled to the gasifier system, said one or more plasma heat sources configured to promote dissociation of gaseous molecules in the GRS input gas having a first chemical composition, which then recombine into the plasma reformulated gas having a second chemical composition, said gas reformulating system comprising: a refractory-lined gas reformulating chamber having an upstream end and a downstream end, said gas reformulating chamber comprising:
    - i) one or more GRS input gas inlets positioned at or near the upstream end for receiving the GRS input gas at least in part from the gasifier system;
    - ii) one or more plasma reformulated gas outlets positioned at or near the downstream end for releasing the plasma reformulated gas; and
    - iii) one or more process additive inlets for injection of one or more process additives;

wherein interaction of the GRS input gas with the plasma heat sources is promoted by swirling patterns created at least in part by one or more air jets and relative spatial arrangement of the GRS input gas inlets, process additive inlets, the air jets and the plasma heat sources;
  - d) a residue conditioning system operatively coupled to the gasifier system and operatively associated with one or more secondary plasma heat sources, the

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residue conditioning system configured to convert at least part of the residue from the gasification system and optionally particulate matter and/or contaminants from a two stage gas conditioning system into a molten slag and a residue gas, the residue conditioning system comprising a refractory-lined residue conditioning chamber comprising:

- i) one or more residue inlets adapted to receive the residue and optionally the particulate matter and/or contaminants;
  - ii) one or more process additive inputs;
  - iii) one or more molten slag outlets; and
  - iv) one or more residue gas outlets configured to direct the residue gas to an operatively associated residue gas conditioning system configured to produce an at least partially conditioned residue gas;
- e) a two-stage gas conditioning system operatively coupled to the residue conditioning system, and configured to remove particulate matter and contaminants from a GCS input gas comprising the plasma reformulated gas and the at least partially conditioned residue gas, wherein the gas conditioning system comprises:
- i) one or more Stage One units configured as a dry phase separation system configured to received the GCS input gas and at least in part remove particulate matter from the GCS input gas;
  - ii) one or more Stage Two units configured to receive input gas from the Stage One units and/or the GCS input gas and configured to at least in part remove contaminants therefrom;

wherein the gas conditioning system is optionally configured to transfer the removed particulate matter and contaminates to the residue conditioning system, the two gas conditioning system producing a conditioned GCS input gas;

- f) optionally, a gas homogenization system operatively coupled to the two stage gas conditioning system and configured to receive GHS input gas comprising at least in part the conditioned GCS input gas, the gas homogenization system configured to provide a desired residence time to regulate one or more gas characteristics of the GHS input gas thereby forming a homogenized gas, the gas homogenization

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- system comprising one or more gas homogenization chambers operatively coupled in serial and/or parallel, each gas homogenization chamber comprising one or more gas inlets and one or more gas outlets, said one or more gas outlets configured to provide the homogenized gas to one or more downstream applications;
- g) a heat recycling system configured to capture heat at least in part from one or more of the gasifier system, the gas reformulating system and the residue conditioning system, the heat recycling system configured provide the heat to desired locations of the facility; and
- h) a control system comprising:
- i) a plurality of sensing elements configured to sense one or more characteristics of one or more of the gasifier system, the gas reformulating system, the residue conditioning system, the two-stage gas conditioning system and the gas homogenization system;
  - ii) a plurality of response elements configured to adjust and/or maintain one or more operational characteristics of one or more of the gasifier system, the gas reformulating system, the residue conditioning system, the two-stage gas conditioning system and the gas homogenization system; and
- i) one or more computing platforms communicatively linked to the sensing elements and to the response elements, the one or more computing platforms configured to receive input signals from at least one sensing element and to generate and provide control signals to at least one response element to control operation thereof, thereby controlling functionality of the facility.

189. A method for generating a homogenized gas by progressive conversion of a reactant material derived at least in part from a carbonaceous feedstock, the method comprising the steps of:
- a) feeding the carbonaceous feedstock for input into a gasifier system, the gasifier system comprising a substantially horizontally oriented, refractory-lined gasification chamber having two or more substantially laterally distributed processing zones;

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- b) delivering heated air to each of said processing zones such that a different temperature is substantially maintained in each processing zone thereby promoting progressive conversion, said progressive conversion of the reactant material into a raw offgas and/or syngas (raw gas), the progressive conversion comprising drying, volatilization and carbon conversion;
- c) optionally, adding one or more process additives to each of said processing zones;
- d) transferring the reactant material, during processing, through each processing zone using one or more lateral transfer units;
- e) transferring said raw gas from the gasifier system to a gas reformulating system comprising a refractory-lined gas reformulating chamber;
- f) configuring one or more plasma heat sources operatively associated with said gas reformulating system to promote conversion of said raw gas into a plasma reformulated gas;
- g) optionally, adding one or more process additives into the gas reformulating chamber through one or more process additive inlets;
- h) optionally, promoting mixing within the gas reformulating chamber using one or more air jets and by relative spatial arrangement of one or more inlets of the gas reformulating system, process additive inlets, air jets and the plasma heat sources;
- i) transferring a residue from the gasifier system to a residue conditioning system comprising a refractory-lined residue conditioning chamber;
- j) optionally transferring particulate matter and/or contaminants from a two stage gas conditioning system to the residue conditioning system;
- k) configuring one or more secondary plasma heat sources operatively associated with said residue conditioning system to convert the residue and particular matter and/or contaminants into a molten slag and a residue gas;
- l) adding one or more process additives to the residue conditioning system;
- m) directing said residue gas to a residue gas conditioning system to produce an at least partially conditioned residue gas;
- n) transferring said at least partially conditioned residue gas to a two-stage gas

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- conditioning system for removing particulate matter and contaminants from the at least partially conditioned residue gas thereby producing a conditioned gas;
- o) transferring said conditioned gas to a gas homogenization system comprising one or more gas homogenization chambers configured in serial and/or parallel, holding the conditioned gas for a desired residence time for regulating one or more gas characteristics thereby producing a homogenized gas;
  - p) directing said homogenized gas from the gas homogenization system to one or more downstream applications.

190. A process for generating syngas from a carbonaceous feedstock, the process comprising:
- a) passing carbonaceous feedstock into a gasification processing zone to provide a reactant material;
  - b) heating the reactant material to a temperature sufficient to promote drying and/or volatilization and/or carbon conversion of the reactant material, thereby generating a syngas and a residue;
  - c) optionally inputting process additives into the gasification processing zone, and
  - d) one or more of:
    - i. applying plasma heat to the syngas to provide a plasma reformulated syngas; and/or
    - ii. applying plasma heat to the residue to generate additional syngas.

191. A gasification facility integrated for flow-through processing of municipal solid waste to electricity via a plurality of processes, the gasification facility comprising:
- a) one or more municipal solid waste handling systems;
  - b) one or more carbon-rich feedstock handling systems;
  - c) one or more gasifier systems;
  - d) one or more gas reformulating systems;
  - e) one or more gas conditioning systems;
  - f) one or more gas engines; and
  - g) a control system, and

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h) optionally, one or more heat recycling systems, and/or  
one or more residue conditioning systems, and/or  
one or more gas homogenization systems,  
wherein the processes are integrated to ensure optimized conversion of waste to  
electricity.

192. A municipal solid waste handling system integrated into a gasification facility, the  
municipal solid waste handling system comprising:

- a) a municipal solid waste storage building;
- b) a loader;
- c) a municipal solid waste shredding system;
- d) optionally, a magnetic separator; and
- e) a conveyor configured to convey shredded municipal solid waste into one  
or more gasifiers within the gasification facility, wherein the conveyor is  
operatively associated with a process controller for controlling the rate thereof to  
meet process demands of the gasification facility.

193. A plastics handling system integrated into a gasification facility, the plastics  
handling system comprising:

- a) a storage facility;
- b) an input hopper;
- c) a shredder operatively associated with the input hopper;
- d) a take away conveyor configured to convey shredded plastics away from  
the shredder; and
- e) a feed conveyor configured to convey shredded plastics into one or more  
gasifiers within the gasification facility, wherein the conveyor is operatively  
associated with a process controller for controlling the rate thereof to meet  
process demands of the gasification facility.

194. A carbonaceous feedstock handling system integrated into a gasification facility,  
the carbonaceous feedstock system comprising:

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- a) one or more storage buildings;
- b) one or more shredding systems;
- c) optionally, a magnetic separator; and
- d) one or more conveyors configured to convey shredded carbonaceous feedstock as a single feedstock or mixed feedstocks into one or more gasifiers within the gasification facility, wherein the conveyor is operatively associated with a process controller for controlling the rate thereof to meet process demands of the gasification facility.

195. The carbonaceous feedstock handling system of claim 194, wherein the carbonaceous feedstock is one or more of: municipal solid waste; high carbon feedstock; coal; plastics; liquid wastes; hazardous wastes; municipal wastes; industrial waste; biomedical wastes; carbonaceous material inappropriate for recycling; non-recyclable plastics; sewage sludge; heavy oils; petroleum coke; heavy refinery residuals; refinery wastes; hydrocarbon contaminated solids; biomass; waste wood; fresh wood; remains from fruit, vegetable and grain processing; paper mill residues; straw; grass; manure and/or agricultural wastes.

196. A facility that generates electricity from the gasification of municipal waste on a substantially continuous basis comprising:

- a) a municipal waste handling system for the supply of processed municipal waste and optionally a carbon-rich feedstock additive;
- b) a gasifier for converting the municipal waste into raw off-gas and/or syngas and a residue, wherein optionally processing heat for the gasifier is provided in part by recycled heat;
- c) a gas reformulator operatively associated with one or more sources of plasma heat for reformulating the raw off-gas and/or gas into a plasma reformulated gas;
- d) a conditioning system for conditioning a gas comprising plasma reformulated gas;

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- e) one or more gas engines for converting a gas comprising plasma reformulated gas into electricity, and
- f) optionally, a homogenization system for homogenizing a gas comprising plasma reformulated gas.
197. A facility that generates electricity from municipal waste and optionally high carbon-rich feedstock, the facility comprising a gasifier system, a gas reformulating system, a heat recycling system, and a control system, wherein the control system is configured to ensure that the amount of municipal waste and high carbon-rich feedstock entering the gasifier system and the conversion of the municipal waste and high carbon-rich feedstock to a gas comprising plasma reformulated gas is sufficient to provide a gas comprising plasma reformulated gas of adequate energy content to run one or more gas engines to generate electricity on a substantially continuous basis.
198. The facility of claim 12 having a modular design, wherein one or more of the systems is provided as a pre-built function block such that a plurality of pre-built function blocks can be assembled on site to form the facility.
199. The facility of claim 12, wherein one or more of the gasifier systems, the gas reformulating systems, the solid residue conditioning systems, the gas conditioning systems and the gas homogenization systems are configured as a component module, each component module configured to be factory built and factory functional.
200. The facility of claim 199, comprising one or more gasification trains, each gasification train formed from one component module or from a series of interconnected component modules and each gasification train configured to perform a desired set of processes.

**REPUBLICA DE COLOMBIA**  
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Folio 688

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Bogotá D.C.,

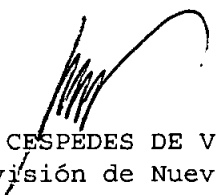
Doctor(a)  
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Apoderado(a) y/o Representante de  
PLASCOENERGY IP HOLDINGS S.L BILBAO SCHAFFHAUSEN BRANCH

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|------------|----------------------------|-------------------|
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|            | Trámite                    | 11                |
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|            | Actuación                  | 416               |
|            | Oficio No.                 | 8963              |
|            | Folios                     | 1                 |

Teniendo en cuenta que la solicitud de privilegio de patente que se tramita bajo el expediente indicado en la referencia, reúne los requisitos de forma establecidos en la Decisión 486 de la Comisión de la Comunidad Andina, el Tratado de Cooperación en Materia de Patentes (PCT), el Reglamento y la Circular Única de la Superintendencia de Industria y Comercio, se envía el extracto de la solicitud a la Oficina de Comunicaciones para efecto de su publicación en la Gaceta de Propiedad Industrial.

Cúmplase  
Dado en Bogotá DC,

14 OCT. 2009

  
ALIX CARMENZA CESPEDES DE VERGEL  
Jefe de la división de Nuevas Creaciones

adpa10