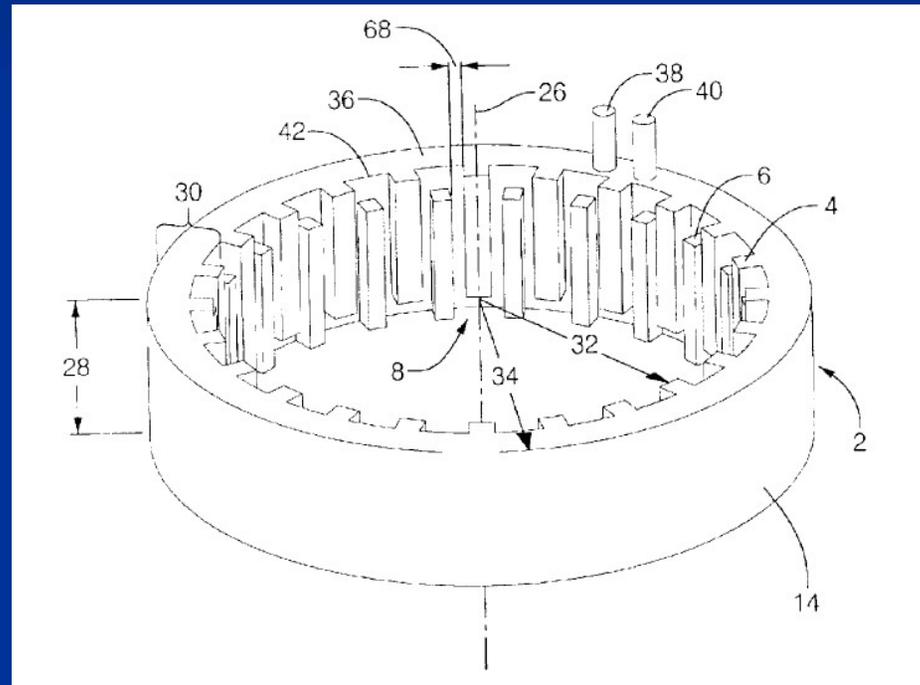


# Inteligencia de campo, procedimientos para la búsqueda de patentes y marcas registradas



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# Técnicas de Inteligencia de Campo

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- **Técnicas de Inteligencia de Campo: Tipos de Información**
- **Primaria:** Si se obtiene por interacción directa con el generador de la información (o el cliente) por medio de encuestas, entrevistas y registro de opiniones.
- **Secundaria:** Si se obtiene por medios indirectos relacionados con el mercado del producto o servicio que se desea analizar (censos de población, registros industriales, instituciones académicas y/o gubernamentales, etc.

# Técnicas de Inteligencia de Campo

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- Técnicas de Inteligencia de Campo

Siempre es conveniente empezar a recolectar la información **secundaria** primero debido a que es más fácil y barata de obtener, siempre y cuando se acuda a las fuentes adecuadas. Ejemplos: Reportes comerciales, catálogos editados por cámaras industriales, estudios bancarios, cámaras de comercio, censos de población, archivos de patentes, revistas y periódicos especializados, etc.

# Técnicas de Inteligencia de Campo

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## ■ Técnicas de Inteligencia de Campo

la información **secundaria** siempre es importante  
considerar 3 características:

- a) **Imparcialidad:** Es la objetividad de la fuente que proporciona la información, no debe haber ninguna opinión o sesgo social/político.
- b) **Validez:** Es importante la información para lo que estoy estudiando?
- c) **Confiabilidad:** Representa esta muestra el universo de información que quiero estudiar?

# Técnicas de Inteligencia de Campo

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- Técnicas de Inteligencia de Campo

La información primaria requiere de una logística y recursos especiales. Para seleccionar la técnica de recolección primaria más adecuada se debe considerar lo siguiente: tiempo disponible, presupuesto, nivel de confianza deseada, habilidad del analista; facilidad de acceder a los clientes, competidores, distribuidores, compradores, etc.

# Técnicas de Inteligencia de Campo

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## ■ Técnicas de Inteligencia de Campo

La búsqueda de información primaria puede realizarse mediante:

- -Cuestionarios por correo.
- -Entrevistas personales.
- -Entrevistas telefónicas.
- -Encuestas de opinión por medios remotos (Internet).
- Su uso depende del mercado a donde se dirija:
- Industria → Entrevista.
- Consumidor → Combinación de todas.

# Técnicas de Inteligencia de Campo

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## ■ Técnicas de Inteligencia de Campo

Búsqueda de información secundaria utilizando Google©

Este motor de búsqueda fue diseñado para listar las paginas mas consultadas en Internet. Sin embargo, muchas veces nos da demasiados resultados y no encontramos lo que buscamos, para reducir este problema utilizamos los operadores de búsqueda.

Allintitle: Nos regresa solamente aquellas paginas que contengan todas las palabras que seleccionemos.

Ejemplo: comparar microalgae biofuel VS

allintitle: microalgae biofuel

# Técnicas de Inteligencia de Campo

+You Search Images Maps Play YouTube News Gmail Documents Calendar More ▾

Google

microalgae biofuel



Sign

Search

About 139,000 results (0.31 seconds)



Web

[Algae fuel - Wikipedia, the free encyclopedia](#) ✓

[en.wikipedia.org/wiki/Algae\\_fuel](http://en.wikipedia.org/wiki/Algae_fuel)

Jump to [Biodiesel](#): The U.S. Department of Energy's Aquatic Species Program, 1978-1996, focused on **biodiesel** from **microalgae**. The final report ...

[Factors](#) ✓ - [Fuels](#) ✓ - [Algae cultivation](#) ✓ - [Specific research](#) ✓

Images

Maps

Videos

News

Shopping

More

[PDF] [Biofuels from Microalgae](#) ✓

[faculty.washington.edu/stevehar/Biofuels%20from%20Microalgae.pdf](http://faculty.washington.edu/stevehar/Biofuels%20from%20Microalgae.pdf)

File Format: PDF/Adobe Acrobat - Quick View

by B from Microalgae - 2008 - Cited by 6 - Related articles

Mar 12, 2008 – further enhance the costeffectiveness of the **biofuel** from **microalgae** strategy. ... **microalgae** for **biofuel** production is the low biomass concen- ...

Boston, MA

Change location

[Top 11 Algae Biofuel and Biochemical Trends From 2011-2020 ...](#) ✓

[www.renewableenergyworld.com/.../top-11-algae-biofuel-and-bioch...](http://www.renewableenergyworld.com/.../top-11-algae-biofuel-and-bioch...)

Mar 29, 2011 – The following article is an excerpt from a technology, investment, and market study titled **Algae 2020**, Vol 2 (2011 update) from market research ...

Show search tools

[PDF] [Microalgae as a Feedstock for Biofuel Production](#) ✓

[pubs.ext.vt.edu/442/442-886/442-886\\_pdf.pdf](http://pubs.ext.vt.edu/442/442-886/442-886_pdf.pdf)

Ads - Why these ads?

[Algae Oil Supplements](#) ✓

[www.algaecal.com/](http://www.algaecal.com/)

AlgaeCal - natural organic mineral supplement from Marine **Algae**

[Biofuels manufacturing](#) ✓

[www.siemens.com/biofuels-production](http://www.siemens.com/biofuels-production)

Inform yourself about innovative **biofuel** technologies from Siemens!

[AttoGene](#) ?

[www.attogene.com/](http://www.attogene.com/)

The **Biofuel** company  
**Algae** growth supplies

[Algae Consulting -Biofuel](#) ?

[www.algaeanalytics.com/](http://www.algaeanalytics.com/)

Consulting Services and Planning  
**Algae** Growth Media

# Técnicas de Inteligencia de Campo

+You Search Images Maps Play YouTube News Gmail Documents Calendar More ▾

Google

**Search** About 3,210 results (0.24 seconds)

**Web** [National \*\*microalgae biofuel\*\* production potential and resource - AGU](#) ✓  
[www.agu.org/pubs/crossref/2011/2010WR009966.shtml](http://www.agu.org/pubs/crossref/2011/2010WR009966.shtml)  
by MS Wigmosta - 2011 - Cited by 11 - Related articles  
Mark S. Wigmosta. Pacific Northwest National Laboratory, Richland, Washington, USA.  
André M. Coleman. Pacific Northwest National Laboratory, Richland, ...

**Images**

**Maps**

**Videos**

**News** [\[PDF\] \*\*Microalgae\*\* as a Feedstock for \*\*Biofuel\*\* Production](#) ✓  
[pubs.ext.vt.edu/442/442-886/442-886\\_pdf.pdf](http://pubs.ext.vt.edu/442/442-886/442-886_pdf.pdf)  
File Format: PDF/Adobe Acrobat - Quick View  
www.ext.vt.edu. Produced by Communications and Marketing, College of Agriculture and Life Sciences, Virginia Polytechnic Institute and State University, 2009 ...

**Shopping**

**More**

**Boston, MA**  
Change location

Show search tools

[Making \*\*Biofuel\*\* from \*\*Microalgae\*\* » American Scientist](#) ✓  
[www.americanscientist.org](http://www.americanscientist.org) › ... › November-December 2011  
by PT Pienkos - Related articles  
... Advertise - Sigma Xi - HOME > PAST ISSUE > November-December 2011 > Article Detail. printer friendly fontSize smallA midA largeA. FEATURE ARTICLE ...

[Conception Bay, Newfoundland Students' Work on \*\*Microalgae\*\* ...](#) ?  
[sanofibiogeneiuschallenge.ca/.../conception-bay-newfoundland-stude...](http://sanofibiogeneiuschallenge.ca/.../conception-bay-newfoundland-stude...)  
May 1, 2012 – Atlantic Sanofi BioGENEius Challenge 2012 Ground-breaking research by

Ads - Why these ads?

[Algae Oil Supplements](#) ✓  
[www.algaecal.com/](http://www.algaecal.com/)  
AlgaeCal - natural organic mineral supplement from Marine Algae

[Algae Consulting - \*\*Biofuel\*\*](#) ?  
[www.algaeanalytics.com/](http://www.algaeanalytics.com/)  
Consulting Services and Planning Algae Growth Media

[Bio-Diesel from Algae](#) ✓  
[www.glenmills.com/](http://www.glenmills.com/)  
1 (888) 549 7414 ✓  
CELL breakage to release lipids in a single pass through Dyno®-Mill.

[AttoGene](#) ?  
[www.attogene.com/](http://www.attogene.com/)  
The **Biofuel** company  
Algae growth media

# Técnicas de Inteligencia de Campo

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- Técnicas de Inteligencia de Campo

¿Aun son muchos?

¿Que les parece si usamos mas operadores?

allinurl: Nos da resultados para un dominio en especifico

Por ejemplo, allinurl: gov microalgae , o mejor aun:

allinurl: nrel microalgae

# Técnicas de Inteligencia de Campo

The screenshot shows a Google search interface with the following elements:

- Navigation bar: +You Search Images Maps Play YouTube News Gmail Documents Calendar Mo
- Search bar: allinurl: gov microalgae
- Search results: About 883 results (0.20 seconds)
- Left sidebar: Web, Images, Maps, Videos, News, Shopping, More, Boston, MA, Change location, Show search tools
- Search results list:
  - microalgae culture collection - Science.gov** ✓  
[www.science.gov/topicpages/m/microalgae+culture+collection.html](http://www.science.gov/topicpages/m/microalgae+culture+collection.html)  
Science.gov is a gateway to government science information provided by U.S. Government science agencies, including research and development results.
  - microalgae production systems - Science.gov** ✓  
[www.science.gov/topicpages/m/microalgae+production+systems.html](http://www.science.gov/topicpages/m/microalgae+production+systems.html)  
The scalability of microalgae growth systems is a primary research topic in anticipation of the commercialization of microalgae-based biofuels. To date, there is ...
  - NCCOS News and Announcements – Interactions among nutrients ...** ✓  
[coastalscience.noaa.gov/.../interactions-among-nutrients-microalgae-a...](http://coastalscience.noaa.gov/.../interactions-among-nutrients-microalgae-a...)  
Feb 15, 2012 – An ecosystem model newly developed by NCCOS and NMFS scientists reveals the complex ecosystem interactions and environmental factors ...
  - Generating Hydrocarbons from Microalgae | eetd-seminars.lbl.gov** ✓  
[eetd-seminars.lbl.gov/seminar/generating-hydrocarbons-microalgae](http://eetd-seminars.lbl.gov/seminar/generating-hydrocarbons-microalgae)  
Jun 7, 2005 – Based on the need for the development of photosynthetic organisms for renewable energy production, carbon sequestration and high-value ...

# Técnicas de Inteligencia de Campo

The screenshot shows a Google search interface with the following elements:

- Navigation bar: +You Search Images Maps Play YouTube News Gmail Documents Calendar More ▾
- Search bar: Google logo, search input field containing "allinurl: nrel microalgae", and a search button.
- Search results summary: Search About 23 results (0.07 seconds)
- Left sidebar: Web, Images, Maps, Videos, News, Shopping, More, Boston, MA, Change location, Show search tools
- Search results list:
  - Index PIX** ✓  
[www.nrel.gov/.../searchpix.php?...](http://www.nrel.gov/.../searchpix.php?...)  
National Renewable Energy Laboratory (NREL) - Photographic Information eXchange.  
There are 26 PIX images remaining to be viewed of 26 total matched ...
  - Resource Evaluation and Site Selection for Microalgae Production** ✓  
[nrelpubs.nrel.gov/.../Record?...Microalgae...](http://nrelpubs.nrel.gov/.../Record?...Microalgae...)  
Skip header navigation to main content. NREL - National Renewable Energy Laboratory - NREL Publications - Return to Search - Return to Document List ...
  - Brittany Murphy: Microalgae at NREL** ?  
[brittanymurphymo1.blogspot.com/2011/01/microalgae-at-nrel.html](http://brittanymurphymo1.blogspot.com/2011/01/microalgae-at-nrel.html)  
Jan 14, 2011 - Prospecting for elusive fast-growing, oily microalgae is a soggy, muddy, rewarding job for NREL researcher Lee Elliott. Not only do algae grow ...
  - Microalgae at NREL - Venicia foreman's blog** ✓  
[veniciaforeman.typepad.com/blog/2011/01/microalgae-at-nrel.html](http://veniciaforeman.typepad.com/blog/2011/01/microalgae-at-nrel.html)  
Jan 14, 2011 - Prospecting for elusive fast-growing, oily microalgae is a soggy, muddy, rewarding job for NREL researcher Lee Elliott. Not only do algae grow ...

Slide # 12

# Técnicas de Inteligencia de Campo

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- Técnicas de Inteligencia de Campo

¿Quieren ser todavía mas específicos?

Usen el operador filetype, así es como se hace:

Microalgae biofuel ramon sanchez filetype:pdf

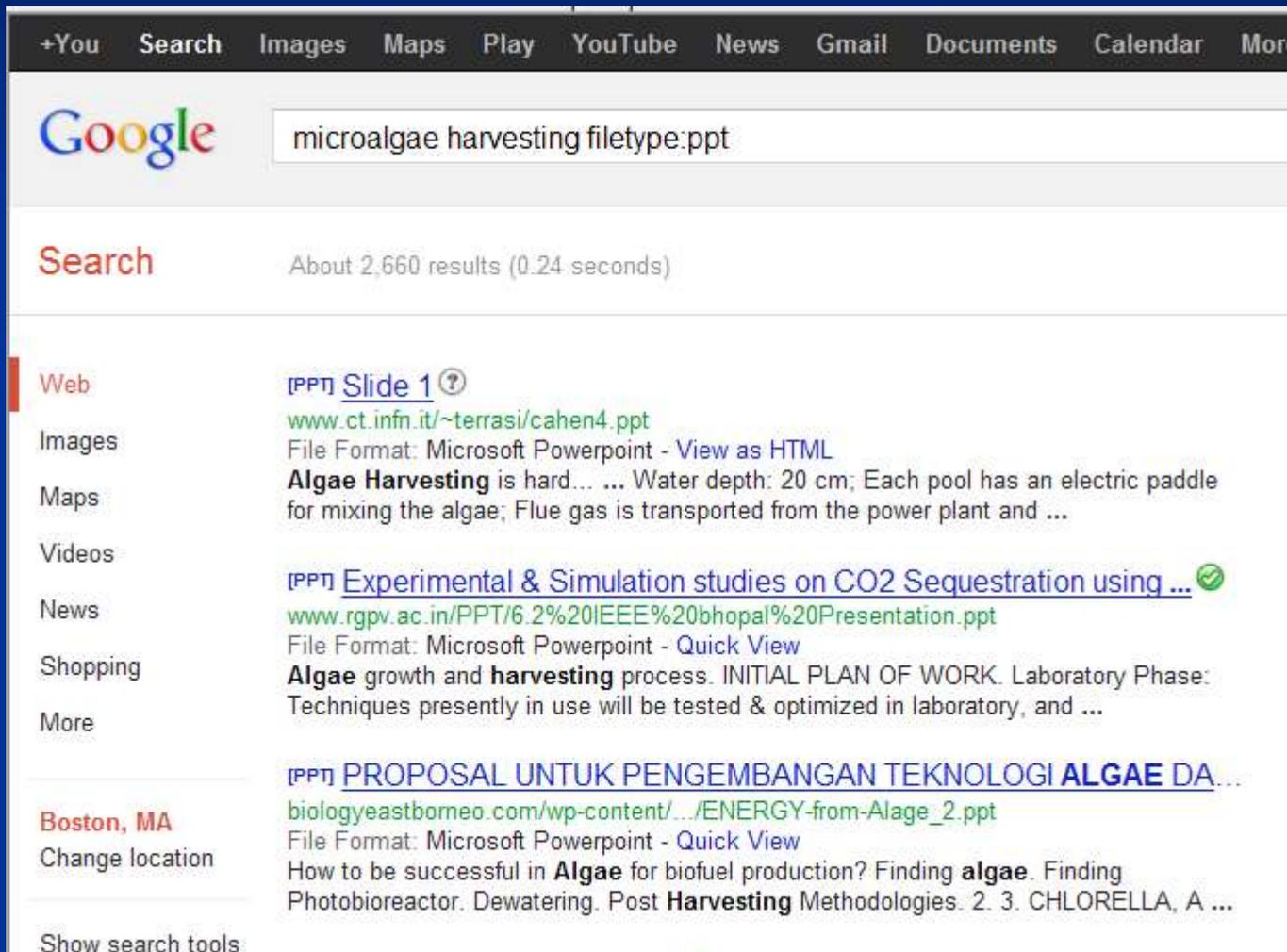
Microalgae harvesting filetype:ppt

# Técnicas de Inteligencia de Campo

The image shows a Google search interface with the following elements:

- Navigation bar: +You Search Images Maps Play YouTube News Gmail Documents Calendar More ▾
- Search bar: microalgae biofuel ramon sanchez filetype:pdf
- Search results: About 2,880 results (0.34 seconds)
- Left sidebar: Web, Images, Maps, Videos, News, Shopping, More, Boston, MA, Change location, Show search tools
- Search results list:
  - [PDF] Introduction Justification for Micro Justification for Micro-algae farm...**  
[isites.harvard.edu/fs/docs/icb.../algae\\_culture01\\_sanchez\\_Mar28.pdf](https://isites.harvard.edu/fs/docs/icb.../algae_culture01_sanchez_Mar28.pdf)  
File Format: PDF/Adobe Acrobat - Quick View  
New Developments in **Microalgae** Farming for Food and **Biofuels** / **Ramon Sanchez**. 3/28/2012. Harvard University ENVR E-110. 1. New developments in ...
  - [PDF] Environmental Health** ✓  
[www.hsph.harvard.edu/news/hphr/files/winter11sanchez.pdf](http://www.hsph.harvard.edu/news/hphr/files/winter11sanchez.pdf)  
File Format: PDF/Adobe Acrobat - Quick View  
**Ramon Sanchez**, SD '11, holds a flask filled with **algae**—a potential source of **biofuel**. **Microalgae** produce six times more ethanol than corn and 40 times ...
  - [PDF] Outline Environmental and Economic Impacts of Manufacturing ...** ✓  
[isites.harvard.edu/.../Sustainable\\_Manufacturing\\_and\\_Industrial\\_Eco...](https://isites.harvard.edu/.../Sustainable_Manufacturing_and_Industrial_Eco...)  
File Format: PDF/Adobe Acrobat - Quick View  
Sustainable Manufacturing and Industrial Ecology / Sanchez. 4/18/2012. Harvard University ENVR ..... regular diesel and **biodiesel** from **algae**. **Ramon Sanchez** ...
  - [PDF] How Healthy is Our Planet?** ✓  
[isites.harvard.edu/fs/docs/.../how\\_healthy\\_is\\_our\\_planet\\_spengler.pd...](https://isites.harvard.edu/fs/docs/.../how_healthy_is_our_planet_spengler.pd...)  
File Format: PDF/Adobe Acrobat - Quick View

# Técnicas de Inteligencia de Campo



+You Search Images Maps Play YouTube News Gmail Documents Calendar More

Google microalgae harvesting filetype:ppt

Search About 2,660 results (0.24 seconds)

Web [PPT] Slide 1 [?] [www.ct.infn.it/~terrasi/cahen4.ppt](http://www.ct.infn.it/~terrasi/cahen4.ppt)  
File Format: Microsoft Powerpoint - View as HTML  
**Algae Harvesting** is hard... .. Water depth: 20 cm; Each pool has an electric paddle for mixing the algae; Flue gas is transported from the power plant and ...

Images

Maps

Videos

News [PPT] Experimental & Simulation studies on CO2 Sequestration using ... [✓] [www.rgpv.ac.in/PPT/6.2%20IEEE%20bhopal%20Presentation.ppt](http://www.rgpv.ac.in/PPT/6.2%20IEEE%20bhopal%20Presentation.ppt)  
File Format: Microsoft Powerpoint - Quick View  
**Algae** growth and **harvesting** process. INITIAL PLAN OF WORK. Laboratory Phase: Techniques presently in use will be tested & optimized in laboratory, and ...

Shopping

More [PPT] PROPOSAL UNTUK PENGEMBANGAN TEKNOLOGI ALGAE DA... [biologyeastborneo.com/wp-content/.../ENERGY-from-Alage\\_2.ppt](http://biologyeastborneo.com/wp-content/.../ENERGY-from-Alage_2.ppt)  
File Format: Microsoft Powerpoint - Quick View  
How to be successful in **Algae** for biofuel production? Finding **algae**. Finding Photobioreactor. Dewatering. Post **Harvesting** Methodologies. 2. 3. CHLORELLA, A ...

Boston, MA Change location

Show search tools

# Técnicas de Inteligencia de Campo

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- Técnicas de Inteligencia de Campo

Otros operadores útiles

“Phonebook” nos busca los teléfonos o datos de contacto de una persona en específico, por ejemplo

Phonebook: Ramon Sánchez Harvard

“Link” nos indica que paginas refieren a una dirección en Internet en específico, por ejemplo

Link: [www.itesm.mx](http://www.itesm.mx)

# Técnicas de Inteligencia de Campo

+You Search Images Maps Play YouTube News Gmail Documents Calendar More ▾

Google

**Search** About 240,000 results (0.26 seconds)

**Web**

- [Ramon Sanchez | LinkedIn](https://www.linkedin.com/pub/ramon-sanchez/8/203/106) ✓  
[www.linkedin.com/pub/ramon-sanchez/8/203/106](https://www.linkedin.com/pub/ramon-sanchez/8/203/106)  
Greater Boston Area - Assistant Director, Sustainability and Environmental Management Program, Harvard University  
**Ramon Sanchez**, Assistant Director, Sustainability and Environmental Management Program, **Harvard** University. Location: Greater Boston Area; Industry ...
- [Ramon Sanchez - Harvard Extension School - Harvard University](https://www.extension.harvard.edu/about-us/faculty.../ramon-sanchez) ✓  
[www.extension.harvard.edu/about-us/faculty.../ramon-sanchez](https://www.extension.harvard.edu/about-us/faculty.../ramon-sanchez)  
**Ramon Sanchez**, Assistant Director of the Sustainability and Environmental Management Program, **Harvard** Extension School ...
- [From Pond to Pump - January 06, 2011 - Winter 2011 - Harvard ...](https://www.hsph.harvard.edu.../Harvard-Public-Health-Review-Winter-2011) ✓  
[www.hsph.harvard.edu > ... > Harvard Public Health Review > Winter 2011](https://www.hsph.harvard.edu.../Harvard-Public-Health-Review-Winter-2011)  
Jan 6, 2011 – **Harvard** School of Public Health doctoral student **Ramon Sanchez**, who will graduate in 2011 with a degree in environmental health, sees hope ...
- [Ramon Sanchez Pina - Harvard School of Public Health - Harvard ...](https://www.hsph.harvard.edu.../Research) ✓  
[www.hsph.harvard.edu > Research](https://www.hsph.harvard.edu.../Research)

**Boston, MA**  
Change location

Show search tools

# Técnicas de Inteligencia de Campo

The screenshot shows a Google search interface with the following elements:

- Navigation bar: +You Search Images Maps Play YouTube News Gmail Documents Calendar More ▾
- Search bar: link: www.itesm.mx
- Search results: About 623,000 results (0.12 seconds)
- Left sidebar: Web, Images, Maps, Videos, News, Shopping, More, Boston, MA, Change location, Show search tools
- Search results list:
  - Web**: [International Exchange student - Campus Ciudad de México ...](#) ✓  
[www.ccm.itesm.mx/internacional/apply1.html](http://www.ccm.itesm.mx/internacional/apply1.html)  
... of reviewing your application documents, you need to fill in as well your information in the following **link**: [http://www.itesm.mx/va/internacionalizacion/2\\_2.htm](http://www.itesm.mx/va/internacionalizacion/2_2.htm) ...
  - Calendar - Tecnológico de Monterrey** ✓  
[www.ccm.itesm.mx/internacional/calendar.html](http://www.ccm.itesm.mx/internacional/calendar.html)  
20+ items – Academic Calendar. Fall Semester August-December 2011.  
Application Deadline June 30th, 2011  
Mandatory Orientation Session August 1st-5th, 2011
  - Internship - Tecnológico de Monterrey** ✓  
[www.ccm.itesm.mx/internacional/build.html](http://www.ccm.itesm.mx/internacional/build.html)  
Engineering and Arquitecture: <http://www.ccm.itesm.mx/dia2007/>; Humanities ... For more information about undergraduate studies, consult the following **link**: ...
  - [PPT] Bioinformatics Dr. Víctor Treviño vtrevino@itesm.mx Pabellón Tec ...** ✓

# Técnicas de Inteligencia de Campo

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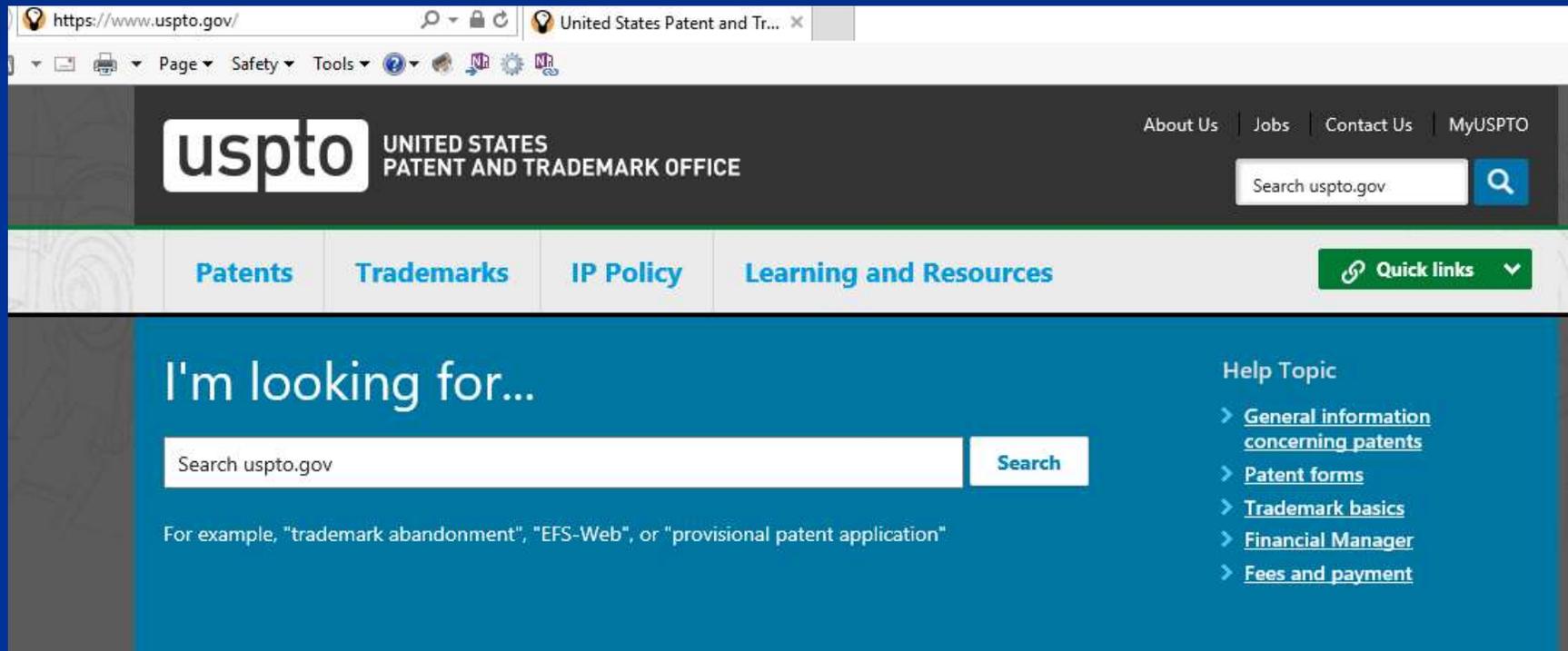
- Técnicas de Inteligencia de Campo

¿Qué pasa si utilizamos los operadores con palabras en otro idioma? Nada, los operadores funcionan perfectamente con cualquier palabra

Ejercicio: Buscar información en Internet en formatos pdf y ppt para las 3 soluciones conceptuales que generaron en cada equipo (30 minutos). Usar la guía “Google Search Operators” en su material de clase. Leer la información y compartirla con la clase (30 minutos).

# Propiedad Intelectual

- Ir a <http://www.uspto.gov>



The screenshot shows the USPTO website homepage. At the top, there is a navigation bar with the USPTO logo and the text "UNITED STATES PATENT AND TRADEMARK OFFICE". To the right of the logo are links for "About Us", "Jobs", "Contact Us", and "MyUSPTO". Below the navigation bar is a search bar with the text "Search uspto.gov" and a magnifying glass icon. Below the search bar is a horizontal menu with four items: "Patents", "Trademarks", "IP Policy", and "Learning and Resources". To the right of this menu is a "Quick links" button with a dropdown arrow. Below the menu is a large blue section with the text "I'm looking for..." and a search bar with the text "Search uspto.gov" and a "Search" button. Below the search bar is the text "For example, 'trademark abandonment', 'EFS-Web', or 'provisional patent application'". To the right of the search bar is a "Help Topic" section with a list of links: "General information concerning patents", "Patent forms", "Trademark basics", "Financial Manager", and "Fees and payment".

## Learn about the process

### Patents

#### ? General information concerning patents

Find out if a utility, design, or plant patent is right for you

### Trademarks

#### TM Trademark basics

Learn about trademarks and find out if it's right for you to apply for registration

## Fees and payment

### Fees and payment

Pay fees and learn more about filing fees and other payments.

# Propiedad Intelectual

- Ir a <http://www.uspto.gov>

The screenshot shows the USPTO website homepage. At the top left is the 'uspto' logo and 'UNITED STATES PATENT AND TRADEMARK OFFICE'. On the top right are links for 'About Us', 'Jobs', 'Contact Us', and 'MyUSPTO', along with a search bar. Below the header is a navigation bar with 'Patents', 'Trademarks', 'IP Policy', and 'Learning and Resources' tabs, and a 'Quick links' dropdown. The main content area is divided into four columns: 'Getting started', 'Application process' (highlighted with a red box), 'Maintaining a patent', and 'Tools & links'. The 'Application process' column contains links like 'Search for patents', 'Learn about patent classification', 'Filing online', 'Checking application status', 'Responding to Office actions', 'Patent Trial and Appeal Board', and 'Petitions'. Below the main content are three sections: 'Patents' with a question mark icon and 'General information concerning patents', 'Trademarks' with a TM icon and 'Trademark basics', and 'Fees and payment'.

**uspto** UNITED STATES PATENT AND TRADEMARK OFFICE

About Us | Jobs | Contact Us | MyUSPTO

Search uspto.gov

**Patents** Trademarks IP Policy Learning and Resources Quick links

**Getting started**

- › Patent basics
- › Process overview
- › Using legal services
- › Inventor resources
- › International cooperation
- › Patent FAQs

**Application process**

- › [Search for patents](#)
- › Learn about patent classification
- › Filing online
- › Checking application status
- › Responding to Office actions
- › Patent Trial and Appeal Board
- › Petitions

**Maintaining a patent**

- › Maintenance fees
- › Correcting your patent
- › Transferring ownership
- › Ordering certified documents
- › Patent litigation

**Tools & links**

- About EFS-Web**  
File a patent application online with EFS-web
- Fees and payment**  
Pay maintenance fees and learn more about filing fees and other payments
- Global Dossier**  
View international patent filings
- Check application status**  
Check patent application status with public PAIR and private PAIR.
- Patent Trial & Appeal Board**  
Resolve disputes regarding patents with PTAB

**More tools & links**

**Patents**

**?** **General information concerning patents**  
Find out if a utility, design, or plant patent is right for you

**Trademarks**

**TM** **Trademark basics**  
Learn about trademarks and find out if it's right for you to apply for registration

**Fees and payment**  
Pay fees and learn more about filing fees and other payments.

# Propiedad Intelectual

- Ir a <http://www.uspto.gov>

Patents Trademarks IP Policy Learning and Resources Quick links

Home / Patents: Application Process / Search for patents Share Print

Application process

Search for patents

Accessing Published Applications

Authority Files

Filing Year by Application Serial Number

Understanding Patent Classifications

Withdrawn Patent Numbers

Learn about patent classification

Filing online

Checking application status

## Search for patents

**New to Patent Searching?** See this important information about searching for patents:

[How to Conduct a Preliminary U.S. Patent Search: A Step by Step Strategy](#) - Web Based Tutorial (38 minutes)

- [The Seven Step Strategy](#) - Outlines a suggested procedure for patent searching
- A [detailed handout](#) of the Seven Step Strategy with examples and screen shots.

Patents may be searched using the following resources:

- [USPTO Patent Full-Text and Image Database \(PatFT\)](#)
- [USPTO Patent Application Full-Text and Image Database \(AppFT\)](#)
- [Global Dossier](#)
- [Patent Application Information Retrieval \(PAIR\)](#)
- [Public Search Facility](#)
- [Patent and Trademark Resource Centers \(PTRCs\)](#)
- [Patent Official Gazette](#)
- [Common Citation Document \(CCD\)](#)
- [Search International Patent Offices](#)
- [Search Published Sequences](#)

# Propiedad Intelectual

- Ir a <http://www.uspto.gov>

Patent Trial and Appeal Board

Petitions

## USPTO Patent Full-Text and Image Database (PatFT)

Inventors are encouraged to search the USPTO's patent database to see if a patent has already been filed or granted that is similar to your patent. Patents may be searched in the USPTO Patent Full-Text and Image Database (PatFT). The USPTO houses full text for patents issued from 1976 to the present and PDF images for all patents from 1790 to the present.

### Searching Full Text Patents (Since 1976)

Customize a search on all or a selected group of elements (fields) of a patent.

- [Quick Search](#)
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**United States Patent** **6,803,775**  
**Sanchez, et al.** **October 12, 2004**

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Fuel quality sensor assembly and method of use

**Abstract**

A sensing element (2) for sensing a fluid (50) composition and a method of using the sensing element (2) are provided. The sensing element (2) includes an electrode base (36) having a first electrode (4) and a second electrode (6) disposed on the electrode base (36); the first electrode (4) and a second electrode (6) being electrically isolated one another except through an external circuitry (64); the first electrode (4) and the second electrode (6) defining a gap (42) between one another such that electrical conduction through a fluid (50) within the gap (42) is proportional to the composition of the fluid.

---

Inventors: **Sanchez; Ramon A** (Juarez, MX), **Burrola; Santos** (Juarez, MX)  
Assignee: **Delphi Technologies, Inc.** (Troy, MI)  
Appl. No.: **10/254,347**  
Filed: **September 25, 2002**

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US006803775B2

(12) **United States Patent**  
**Sanchez et al.**

(10) **Patent No.:** US 6,803,775 B2  
(45) **Date of Patent:** Oct. 12, 2004

(54) **FUEL QUALITY SENSOR ASSEMBLY AND METHOD OF USE**

(75) Inventors: **Ramon A Sanchez, Juarez (MX); Santos Burrola, Juarez (MX)**

(73) Assignee: **Delphi Technologies, Inc., Troy, MI (US)**

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 40 days.

(21) Appl. No.: **10/254,347**

(22) Filed: **Sep. 25, 2002**

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Primary Examiner—Anjan K. Deb

(74) Attorney Agent or Firm—Jimmy J. Funke

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US006803775B2

(12) **United States Patent**  
Sanchez et al.

(10) **Patent No.:** US 6,803,775 B2  
(45) **Date of Patent:** Oct. 12, 2004

(54) **FUEL QUALITY SENSOR ASSEMBLY AND METHOD OF USE**

(75) Inventors: **Ramon A Sanchez, Juarez (MX); Santos Burrola, Juarez (MX)**

(73) Assignee: **Delphi Technologies, Inc., Troy, MI (US)**

(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 40 days.

(21) Appl. No.: **10/254,347**

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(65) **Prior Publication Data**

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(51) **Int. Cl.**<sup>7</sup> ..... **G01R 27/08; G01R 31/08; G01F 1/58**

(52) **U.S. Cl.** ..... **324/698; 324/724; 324/515; 73/861.15**

(58) **Field of Search** ..... **324/698, 722, 324/515, 695, 664, 693, 691, 724; 123/494, 511; 73/861.15, 53.05**

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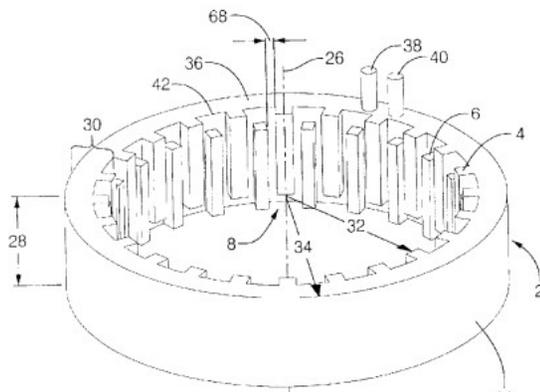
*Primary Examiner*—Anjan K. Deb

(74) *Attorney, Agent, or Firm*—Jimmy L. Funke

(57) **ABSTRACT**

A sensing element (2) for sensing a fluid (50) composition and a method of using the sensing element (2) are provided. The sensing element (2) includes an electrode base (36) having a first electrode (4) and a second electrode (6) disposed on the electrode base (36); the first electrode (4) and a second electrode (6) being electrically isolated one another except through an external circuitry (64); the first electrode (4) and the second electrode (6) defining a gap (42) between one another such that electrical conduction through a fluid (50) within the gap (42) is proportional to the composition of the fluid.

**29 Claims, 2 Drawing Sheets**



U.S. Patent Oct. 12, 2004 Sheet 2 of 2 US 6,803,775 B2

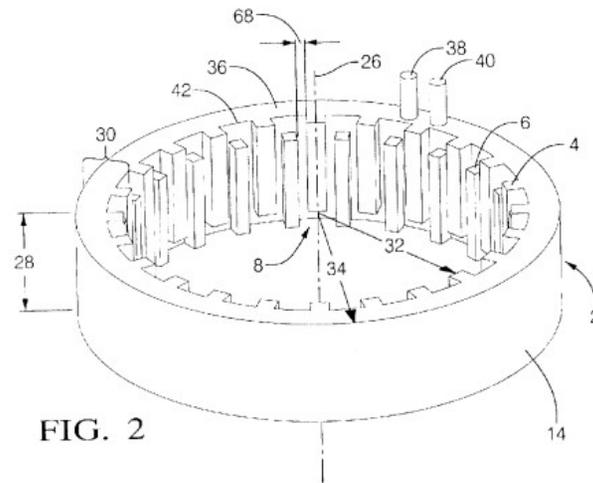


FIG. 2

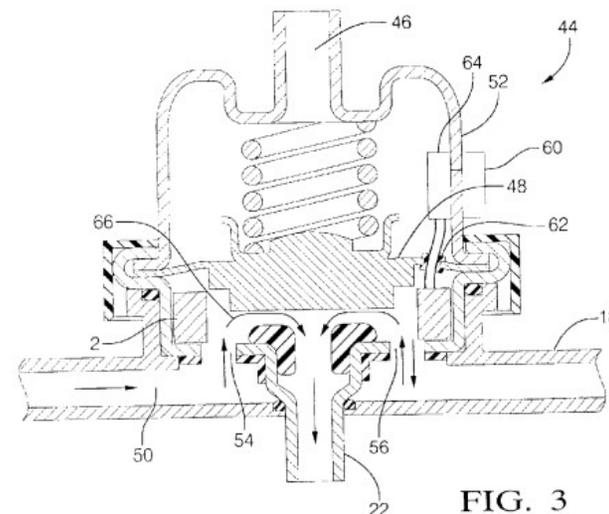


FIG. 3

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## FUEL QUALITY SENSOR ASSEMBLY AND METHOD OF USE

### BACKGROUND

Fuel used in internal combustion engines is typically contained in a tank or reservoir as a mixture. Depending on the source of the fuel, it may comprise one or more different fuel components in an unknown ratio. Automobile fuel, for example may be gasoline, including any of its variant blends of aliphatic, olefinic, and/or aromatic hydrocarbons. It may further include various alcohols such as methanol, ethanol, propanol, butanol, pentanol, octanol, and the like. Other components that may be present include octane improvers such as methyl tertiary butyl ether (MTBE) and the like.

Each of these fuel components requires different parameters for optimal combustion. These parameters include specific air to fuel ratios, spark plug timing, injector volume, and the like. When the precise composition of the fuel is unknown, or is ever-changing, accurate determination of the optimal combustion parameters depends on being able to quickly and accurately sense fuel mixture composition and other parameters indicative of optimal end use parameters. One approach to optimal engine operation requires the ability to sense characteristics of the fuel, and adjust the operational conditions of the engine accordingly.

Systems have been designed to sense the characteristics of various blends of fuels, such as gasoline and methanol. U.S. Pat. No. 4,438,749 to Schwippert is directed to an optical sensor that uses the overall refractive index of the fuel as an indication of composition. Aromatic content of the fuel and clouding of the optical sensor elements over time can result in variations of refractive index that lead to inaccuracy in the sensor output.

Microwave fuel composition sensors utilize the fuels overall dielectric constant through microwave attenuation. Besides adding significant cost, these sensors operate at extremely high frequencies (e.g., 1-30 Giga Hertz) and generate amounts of electromagnetic noise that can interfere with other electronic components.

Sensors, which utilize the fuel mixture as a dielectric in a capacitive cell, are also capable of correlating the dielectric constant of a fuel mixture to its composition. These sensors have the benefit of being rugged and can be designed for use in environments in which other sensors would be unacceptable. Unfortunately, the conductivity of various fuel mixtures varies in a non-linear relationship depending on component concentrations. This phenomena is made worse by impurities, especially water. These sensors also need to be made relatively large as compared to other sensors to achieve the level of sensitivity required to sense fuel in an efficient manner. Space and size limitations imposed by design, and the need to minimize void volume in fuel delivery systems, among other factors, have limited the usefulness of capacitive fuel sensors in automotive fuel delivery system applications. A rugged, compact sensor having a sensitivity capable of discriminating between a wide range of fuel blends would be beneficial to optimal combustion of fuel, especially in an internal combustion engine.

### SUMMARY

Described herein is a sensing element for measuring a fluid composition comprising: an electrode base having a first electrode and a second electrode disposed thereon; the first electrode and said second electrode being electrically

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isolated from one another; said first electrode and said second electrode being configured, dimensioned, and positioned to define a gap therebetween such that electrical conduction through the fluid within said gap is proportional to the composition of said fluid.

Also disclosed is a method of sensing a fluid composition comprising: contacting said fluid composition with a sensing element in communication with a circuitry, said sensing element comprising: an electrode base having a first electrode and a second electrode disposed thereon; said first electrode and said second electrode being electrically isolated from one another, except through said circuitry; said first electrode and said second electrode being configured, dimensioned, and positioned to define a gap therebetween such that electrical conduction through a fluid within said gap is proportional to the composition of said fluid; a first electrical connector to provide electrical communication between said first electrode and said circuitry; and a second electrical connector to provide electrical communication between said second electrode and said circuitry; determining said electrical conduction of said fluid; and correlating said electrical conduction to said fluid composition.

Further disclosed herein is a combined fluid pressure regulator and assembly for sensing a fluid composition, comprising: a sensing element disposed within a fluid flow path located within a fluid pressure regulator housing; said sensing element comprising: an electrode base having a first electrode and a second electrode disposed thereon; said first electrode and said second electrode being electrically isolated from one another except through an external circuitry; said electrode base having an inner surface and an outer surface separated by a thickness; said outer surface being continuously disposed around a central axis to form an essentially cylindrical shape; said electrode base defining a flow path parallel to said central axis having a flow path length; said first electrode being a plurality of first electrode teeth disposed on said inner surface depending away from said outer surface towards said central axis; said second electrode being a plurality of second electrode teeth on said inner surface depending away from said outer surface towards said central axis; said first electrode teeth and said second electrode teeth being configured, dimensioned, and positioned in a substantially alternating pattern to define a plurality of gaps therebetween such that electrical conduction through a fluid within said plurality of gaps is proportional to a composition of said fluid; said fluid pressure regulator housing comprising a first fluid conduit and a second fluid conduit which allows said fluid to travel through said fluid flow path located within said fluid pressure regulator housing; a regulator valve mounted therein responsive to a fluid demand and disposed in sealing communication between said first conduit and a bypass conduit; a first electrical connector being channeled through a sealing member disposed in said regulator valve to provide electrical communication between said first electrode and said external circuitry; and a second electrical connector being channeled through a sealing member disposed in said regulator valve to provide electrical communication between said second electrode and said external circuitry.

The above described and other features are exemplified by the following figures and detailed description.

### DRAWINGS

Referring now to the figures wherein like elements are numbered alike:

FIG. 1 shows a combustion engine having a fuel composition sensor;

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another to form a single first electrode. Also, the structures that form the second electrode teeth 6 are all preferably in electrical contact with one another to form a single second electrode. First and second electrical connectors 38 and 40 provide electrical conductivity between the electrodes and external circuitry. Both of which are in electrical contact with their respective electrodes 4 and 6, but are electrically isolated from each other. The multiple teeth or other such structures serve to increase the available surface area available for sensing given the total size of the sensing element. This is important because the overall sensitivity of the sensing element increases as the available surface area increases.

The value of the outer dimension 34, the inner dimension 32, and the fluid passage length 28 depend on the characteristics required of the sensor element 2. Each of these two electrodes also has an associated total surface area. By defining the total surface area of the electrodes as being the underlying geometric surface area (e.g., for a rectangle, base multiplied by height), the total surface area of the first electrode, when the sensor is used, for example, in a fuel delivery system, is greater than or equal to about 50 square millimeters (mm<sup>2</sup>). Preferably within this range, the total surface area of the first electrode is greater than or equal to about 90, more preferably greater than or equal to about 300 mm<sup>2</sup> as represented by the underlying geometric area.

Also, by defining the total surface area of the first electrode as being equal to unity (i.e., equal to one), the proportion of the total surface area of the first electrode to the total surface area of the second electrode determined in the same way is a ratio of about 1 to 0.01, to a ratio of about 1 to 100. Preferably within this range, the proportion of total surface areas of the first electrode to the total surface area of the second electrode is a ratio of greater than or equal to about 1 to 0.1, more preferably greater than or equal to about 1 to 0.5. Also within this range, the proportion of total surface areas of the first electrode to the total surface area of the second electrode is a ratio of less than or equal to about 1 to 10, more preferably less than or equal to about 1 to 2, with a ratio of 1:1 being most preferred.

The sensing element is preferably located within a housing to form a sensing assembly 20. The sensing element 2 is disposed within the housing and arranged such that the fluid of interest is able to occupy the gaps 42 between the electrodes and thus be in contact with the sensing element. Preferably, the housing is closed except for a fluid inlet conduit and a fluid outlet conduit. The housing provides a conduit or flow path between the inlet and outlet conduits, and in communication with the sensing element. Preferably, the fluid is able to enter the housing, contact the sensing element along the fluid passage length 28, and then exit the housing.

When used to determine the composition of fuel for an internal combustion engine, for example, the sensing assembly is preferably located in close proximity to the point at which the fuel is combusted and also preferably has a total volume that does not interfere with optimal combustion of the fuel.

To prevent extraneous effects between the housing and the sensing element, the shape of the housing is preferably complementary to the shape of the outer surface of the sensing element. As used herein the term complementary is defined as the two being essentially the same. For example, when the outer surface of the sensing element is essentially cylindrical, the housing is thus preferably essentially cylindrical and the housing also has an inner diameter in excess of the outer diameter of the sensing element to allow fuel to freely flow within the housing.

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In the embodiment shown in FIG. 3, the sensing element 2 is disposed within a fuel pressure regulator 44. Within the fuel pressure regulator-housing 52 is a regulator valve 48 disposed in sealing communication between a fluid rail conduit 18, and a bypass conduit 22. Preferably, the regulator valve 48 is responsive to fluid demand via pneumatic communication with an air intake manifold through manifold conduit 46. In this arrangement, the sensor element 2 is concentrically disposed within, and bounded by the fuel pressure regulator housing 52 and by the regulator valve 48. A fluid conduit or flow path 66 between the fuel rail inlet 54 and the fuel rail outlet 56 is provided by the regulator housing 52 such that the sensing element 2 is located within this flow path 66.

Electrical connection between the sensing element 2 and an external electronic system is preferably provided by directing the electrical connectors 38 and 40 through a sealing member 62 located within the regulator valve assembly 44, and preferably to an external electrical connector 60. Also, a portion of and/or all of the necessary electronics may be located as on electronics package 64 within a portion of the housing 52, depending on space limitations and design needs.

The sensor is in communication with, and preferably electrically connected to an electronic circuitry capable of providing information as to the composition of the fluid the sensor comes in contact with. The electronic circuitry may include a computer or computers capable of using the information derived from the sensor to adjust the combustion parameters of the engine to an optimal value for the fuel mixture flowing through sensor. For this purpose, the computer or computers can include a standard read only memory (ROM) containing a multiple dimensioned lookup table containing compensation factors to be repeatedly looked up with a combination of capacitance and other factors including ambient and engine temperature, exhaust gas composition, ambient air analysis and the like. These compensation factors can be used directly, or can be associated with additional inputs and lookup tables.

While preferred embodiments have been shown and described, various modifications and substitutions may be made thereto without departing from the spirit and scope of the invention. Accordingly, it is to be understood that the apparatus and method have been described by way of illustration only, and such illustrations and embodiments as have been disclosed herein are not to be construed as limiting to the claims.

We claim:

1. A sensing element for measuring a fluid composition comprising:

an electrode base being disposed about an axis, said electrode base having an inner surface defining an aperture extending through the electrode base for allowing a fluid to flow therethrough; and

a first electrode and a second electrode coupled to said electrode base and electrically isolated from one another, said first electrode having a first plurality of electrode teeth extending radially inwardly from said inner surface of the electrode base into said aperture, and said second electrode having a second plurality of electrode teeth extending radially inwardly from said inner surface into said aperture, said first plurality of electrode teeth being electrically connected together, and said second plurality of electrode teeth being electrically connected together, wherein said second plurality of electrode teeth are arranged in a substan-

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APN	<a href="#">Application Serial Number</a>	ACN	<a href="#">Assignee Country</a>
APD	<a href="#">Application Date</a>	EXP	<a href="#">Primary Examiner</a>

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3 <a href="#">8,047,007</a>	<a href="#">Methods for generating electricity from carbonaceous material with substantially no carbon dioxide emissions</a>
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9 <a href="#">7,786,327</a>	<a href="#">Method for co-producing electric power and urea from carbonaceous material</a>
10 <a href="#">7,767,097</a>	<a href="#">Ozonated capacitive deionization process &amp; product water</a>

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## USPTO PATENT FULL-TEXT AND IMAGE DATABASE



( 2 of 150 )

United States Patent  
Keiser , et al.

8,110,163  
February 7, 2012

Complexation and removal of heavy metals from flue gas desulfurization systems

### Abstract

A method for the reduction of the emission of mercury into the environment from the burning of fossil fuels with the use of polydithiocarbamic compounds. The polydithiocarbamic compounds are used for the capture of mercury from the resulting flue gases using a flue gas desulfurization systems or scrubbers. The method uses polydithiocarbamic compounds in conjunction with a scrubber to capture mercury and reduce its emission and/or re-emission with stack gases. The method is a unique process of reducing the toxic levels of mercury, which allows for the use of *coal as a clean* and environmentally friendlier fuel source.

Inventors: **Keiser; Bruce A** (Naperville, IL), **Shah; Jitendra** (Naperville, IL), **Sommese; Anthony G.** (Aurora, IL), **Capener; Lars E.** (Aurora, IL), **TenEyck; Peter** (Wexford, PA), **Wysk; Ralf** (Dorsten, DE)  
Assignee: **Nalco Company** (Naperville, IL)  
Appl. No.: **11/952,637**  
Filed: **December 7, 2007**

Slide # 33

# Propiedad Intelectual

(12) **United States Patent**  
**Keiser et al.**

(10) **Patent No.:** US 8,110,163 B2  
(45) **Date of Patent:** Feb. 7, 2012

(54) **COMPLEXATION AND REMOVAL OF HEAVY METALS FROM FLUE GAS DESULFURIZATION SYSTEMS**

(75) **Inventors:** Bruce A Keiser, Naperville, IL (US); Jitendra Shah, Naperville, IL (US); Anthony G. Sommese, Aurora, IL (US); Lars E. Capener, Aurora, IL (US); Peter TenEyck, Wexford, PA (US); Ralf Wysk, Dorsten (DE)

(73) **Assignee:** Nalco Company, Naperville, IL (US)

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

(21) **Appl. No.:** 11/952,637

(22) **Filed:** Dec. 7, 2007

(65) **Prior Publication Data**  
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(51) **Int. Cl.**  
**B01D 53/64** (2006.01)  
(52) **U.S. Cl.** ..... 423/210; 210/729; 210/735; 210/914  
(58) **Field of Classification Search** ..... 423/210; 210/729, 735, 914  
See application file for complete search history.

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**Primary Examiner** — Timothy Vanoy  
(74) **Attorney, Agent, or Firm** — Edward O. Yontner; Michael B. Martin

(57) **ABSTRACT**  
A method for the reduction of the emission of mercury into the environment from the burning of fossil fuels with the use of polydithiocarbamic compounds. The polydithiocarbamic compounds are used for the capture of mercury from the resulting flue gases using a flue gas desulfurization systems or scrubbers. The method uses polydithiocarbamic compounds in conjunction with a scrubber to capture mercury and reduce its emission and/or re-emission with stack gases. The method is a unique process of reducing the toxic levels of mercury, which allows for the use of coal as a clean and environmentally friendlier fuel source.

**25 Claims, No Drawings**

US 8,110,163 B2

**1**  
**COMPLEXATION AND REMOVAL OF HEAVY METALS FROM FLUE GAS DESULFURIZATION SYSTEMS**

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**TECHNICAL FIELD**

This invention relates to the reduction of the emission of mercury into the environment from the burning of coal and/or other carbon-based fuels. The invention relates to the method of the capture of mercury from flue gases by flue gas desulfurization systems or scrubbers. The invention demonstrates the method of reducing the toxic levels of mercury, which allows for the use of coal as a clean and environmentally friendlier fuel source.

**BACKGROUND**

The demand for electricity continues to grow globally. In order to keep stride with the growing demand, coal is being looked to as a source for its generation. At present, burning coal produces some 50% of the electricity generated in the United States. The burning of coal in power generation plants results in the release of energy, as well as the production of solid waste such as bottom and fly ash, and flue gas emissions into the environment. Emissions Standards, as articulated in The Clean Air Act Amendments of 1990 as established by the U.S. Environmental Protection Agency (EPA), requires the assessment of hazardous air pollutants from utility power plants.

The primary gas emissions are criteria pollutants (e.g. sulfur dioxide, nitrogen dioxides, particulate material, and carbon monoxide). About two thirds of all sulfur dioxide and a quarter of the nitrogen dioxide in the atmosphere is attributable to electric power generation achieved by burning coal and other fuels.

Secondary emissions depend on the type of coal or fuel being combusted but include as examples mercury, selenium, arsenic, and boron. Coal-fired utility boilers are known to be a major source of anthropogenic mercury emissions in the United States. In December of 2000, the EPA announced their intention to regulate mercury emissions from coal-fired utility boilers despite the fact that a proven best available technology (BAT) did not exist to capture or control the levels of mercury released by the combustion of coal. This has been further complicated by the lack of quick, reliable, continuous monitoring methods for mercury.

The fact remains that mercury is found in coals at concentrations ranging from 0.02 to 1 ppm. The mercury is present as sulfides, or associated with organic matter. Upon combustion the mercury is released and emitted into the flue gas as gaseous elemental mercury and other mercury compounds. The mercury appears in the flue gas in both the solid and gas phases (particulate-bound mercury and vapor-phase mercury, respectively). The so-called solid phase mercury is really vapor-phase mercury adsorbed onto the surface of ash and/or carbon particles. The solid-phase mercury can be captured by existing particle control devices (PCDs) such as electrostatic

**2**  
precipitators (ESPs) and fabric filters (FF), the latter is sometimes referred to as baghouses.

A review of data collected by the EPA in 1999 under the Mercury Information Collection Request (ICR) showed that PCDs alone could capture from 20 to 42% of the total mercury in the fuel. Of course, the efficiency of this strategy depends on the fuel composition, the operating temperature and design of the PCD. Indeed, it has been found that fabric filters tend to exhibit better particulate laden mercury removal, compared to cold-side ESPs, as a result of the formation of filter cake within the filter. The filter cake contains constituents that absorb and/or adsorb mercury such as unreacted carbon, activated carbon, iron, and fly ash. As such the filter cake can act as a site to facilitate gas-solid reactions between the vapor-phase mercury and the trapped solid particulate. The data suggests FFs can currently achieve as much as 82% mercury capture.

The volatility of mercury and many of its compounds results in a significant portion of the total mercury existing as vapor-phase mercury in the flue gases. Vapor-phase mercury is composed of elemental mercury and oxidized mercury, the relative amounts of these forms being dependent on the amount of chloride in the coal, iron oxide levels in the coal and other constituents in the fly ash as examples. Speciation, which refers to the form of vapor-phase mercury, is a key parameter in development and design of capture strategies for mercury emissions. Generally there are two forms of mercury that constitute vapor-phase mercury. The forms are oxidized (Hg<sup>2+</sup> as an example) and elemental (Hg<sup>0</sup>) mercury.

Several control strategies have been developed for the control of mercury emissions from coal-fired boilers. Some of these methods include injection of activated carbon, modified activated carbon, various chemical catalysts, and inorganic sorbents. Unfortunately, none of these strategies removes all the mercury from the flue gas. The efficiencies range from as low as 30% to as high as 80% based on the amount of mercury entering the system with the coal. In addition, these technologies either produce unwanted effects on by-products such as impacting the quality of fly ash, or generate additional waste streams for the power plant. Both lead to higher operational costs for the power plant. One promising strategy is to take advantage of existing air pollution control devices or APCDs to augment or to serve as the primary means to remove vapor-phase mercury. Two examples of APCDs are semi-dry and wet scrubbers or Flue Gas Desulfurizer (FGD). Semi-dry FGDs are also known as Spray Dryer Absorbers or SDAs.

Sulfur oxides (SO<sub>x</sub>) regulatory compliance mandates the use of at least one of several control strategies. Three such strategies that are used in the US are sorbent injection into the boiler during coal burning and wet or dry Flue Gas Desulfurizers. At present about 3% of the coal-fired power plants are using sorbent injection. FGD scrubbing accounts for 85% using wet and 12% using dry scrubber technologies. Wet scrubbers achieve greater than 90% SO<sub>2</sub> removal efficiency compared to 80% by dry scrubbing. In wet scrubbers, the flue gas is brought into contact with slurry containing an alkaline calcium mineral, such as lime or limestone. The SO<sub>2</sub> is adsorbed into the water and reacts to form calcium sulfite. It has been demonstrated that simultaneous to SO<sub>2</sub> capture, wet FGDs can be used to capture vapor-phase mercury from the flue gas.

Elemental mercury is water insoluble and is not removed by a wet FGD. In contrast, oxidized mercury in the flue gas is water-soluble and is removed. The ICR mercury data demonstrated that ionic mercury is removed effectively approaching 90% by wet FGDs. Hence, one strategy for mercury capture is to oxidize all the mercury during the burning of the

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US 20100105129A1

(19) **United States**  
 (12) **Patent Application Publication** (10) **Pub. No.:** US 2010/0105129 A1  
 Sanchez-Pina et al. (43) **Pub. Date:** Apr. 29, 2010

(54) **BIOMASS PRODUCTION SYSTEM**

**Publication Classification**

(76) Inventors: **Jose L. Sanchez-Pina**, Los Mochis (MX); **Ramon Sanchez-Pina**, Los Mochis (MX)

(51) **Int. Cl.**  
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*C12M 3/00* (2006.01)  
 (52) **U.S. Cl.** ..... 435/286.5; 435/292.1

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**ABSTRACT**

A system preferably for light irradiation, wherein the system includes a support structure, wherein the support structure is able to accommodate an array of vessels capable of receiving light; the system includes a buoyancy support system and a feeding harvesting system, wherein the buoyancy support system is in fluid and data communication with the array of vessels to regulate the amount of light introduced into the vessels within a fluid medium.

(21) Appl. No.: **12/290,044**  
 (22) Filed: **Oct. 27, 2008**

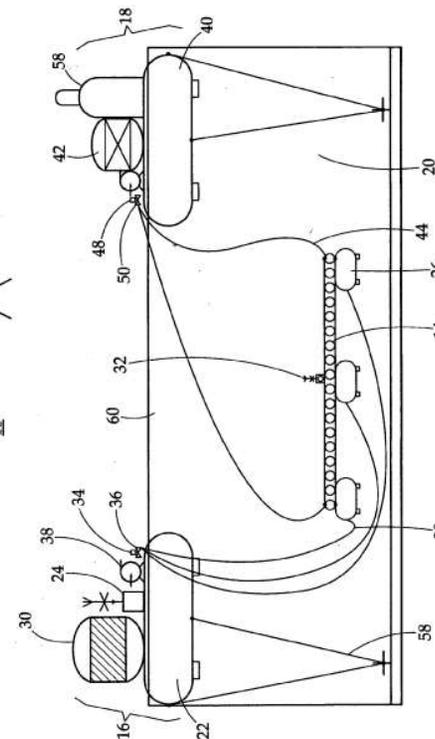
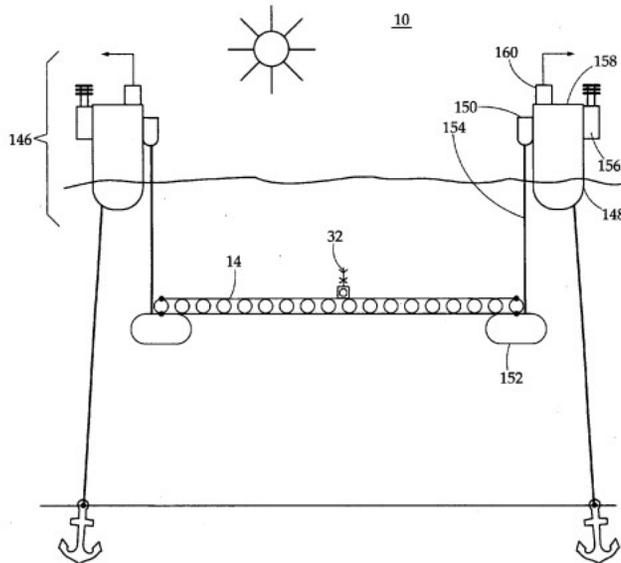


FIG. 1C

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★ Inventor:	Applicant:	CPC:	IPC:	Publication info:	Priority date:
BONDAR OLEKSANDR IVANOVYCH [UA] KRAVETS VALENTYN VASYLIOVYCH [UA] (+4)	STATE ECOLOGICAL ACADEMY OF POST GRADUATE EDUCATION AND MAN OF THE MINISTRY OF ENVIRONMENTAL PROT OF [UA]		C12N1/12 A01H13/00 C12P23/00	UA97024 (C2) 2011-12-26	2010-05-18

**2. METHOD FOR PRODUCTION OF BIOGAS FROM ALGAE**

★ Inventor:	Applicant:	CPC:	IPC:	Publication info:	Priority date:
ADAMENKO IVAN OLEKSIIOVYCH [UA] ADAMENKO OLEKSII IVANOVYCH [UA]	ADAMENKO IVAN OLEKSIIOVYCH [UA]		C02F11/04 C12M1/107 C12P5/00	UA94956 (C2) 2011-06-25	2009-02-09

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6	METHOD AND INSTALLATION FOR MICROALGAE DUNALIELLA SALINA TEOD CULTIVATION	UA97024 (C2)	2011-12-26	BONDAR OLEKSANDR IVANOVYCH [UA] KRAVETS VALENTYN VASYLIOVYCH [UA] KOCHERHA MYKOLA MYKOLAIDOVYCH [UA] NOVOSELSKA LUDMYLA PETRIVNA [UA] RUBTSOV HENNADI SERHIIOVYCH [UA] SHMATKOV HRYHORII HRYHOROVYCH [UA]	STATE ECOLOGICAL ACADEMY OF POST GRADUATE EDUCATION AND ENVIRONMENTAL PROT OF [UA]
7	METHOD FOR PRODUCTION OF BIOGAS FROM ALGAE	UA94956 (C2)	2011-06-25	ADAMENKO IVAN OLEKSIIOVYCH [UA] ADAMENKO OLEKSI IVANOVYCH [UA]	ADAMENKO IVAN OLEKSIIOVYCH [UA]
8	PROCESS FOR PRODUCTION OF PHYCOERYTHRIN FROM RED MICROALGAE	UA93767 (C2)	2011-03-10	GUDVILOVYCH IRYNA MYKOLAIVNA [UA] BOROVKOV ANDRII BORYSOVYCH [UA] TRENKENSU RUDOLF PAVLOVYCH [UA]	KOVALEVSKYI INST OF BIOLOGY OF SOUTH SEAS OF NAT ACADEMY OF
9	METHOD USING IMMOBILIZED ALGAE FOR PRODUCTION AND HARVEST OF ALGAL BIOMASS AND PRODUCTS	KB20140040212 (A)	2014-04-02	PICARD GASTON [CA]	AL G TECHNOLOGIES INC [CA]

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(21) 출원번호 10-2014-7000581	캐나다 퀘벡 퀴비엑스 1417 리미티드 워 드 프 리즈 8540
(22) 출원일자(국제) 2012년06월13일	(72) 발명자
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(87) 국제공개번호 WO 2012/171123	리엔특허법인
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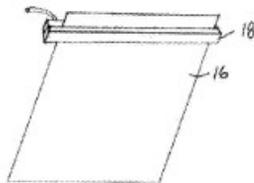
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(54) 발명의 명칭 조류 바이오매스의 생산 및 수거를 위한 고정화 조류의 사용 방법 및 제품

(57) 요약

이산화탄소 및 질의 공급원에 대한 접근을 제공하는 기상 환경 내의 저지체 상에서의 고정화된 조류의 생산, 및 유속 수거 및 바이오매스 가공을 위한 조성물, 용품, 장치, 방법 및 시스템이 제공된다.

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(11) MX 2013012628 A

(12) SOLICITUD de PATENTE

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(21) Número de solicitud:	2013012628	(87) Número de publicación PCT:	WO 2012/140214 (01/11/2012)
(30) Prioridad(es): 29/04/2011 US 13/066,338			
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(74) Representante: José F. HINOJOSA CUÉLLAR Paseo de los Tamarindos 400-A, Piso 3 CUAJIMALPA DE MORELOS Distrito Federal 05120 MX			

(54) Title: OPTIMIZACIÓN DE CIRCULACION DE FLUIDO EN UN ESTANQUE DE CULTIVO DE ALGAS.  
(54) Title: OPTIMIZATION OF CIRCULATION OF FLUID IN AN ALGAE CULTIVATION POND.

(57) Resumen

Estanques de cultivo de algas que tienen la circulación de fluido optimizado para tales factores como consumo de energía reducido, depredadores/competidores reducidos, zonas muertas de flujo reducidas o eliminadas (es decir, regiones estancadas), y la producción de biomasa de algas incrementada, tal como para la producción de biocombustibles y otros productos a base de algas. Una primera parte inferior del estanque puede quedar bajo la zona de expansión. Una pared exterior puede formar un ángulo con la primera parte inferior del estanque de aproximadamente noventa a más de ciento sesenta grados. Una segunda parte inferior del estanque adyacente a la primera parte inferior del estanque puede tener una elevación de terreno aproximadamente consistente, que corresponde aproximadamente a una elevación del terreno más inferior de la primera parte inferior del estanque. Adicionalmente, la segunda parte inferior del estanque puede extenderse hacia afuera de la primera parte inferior del estanque. La aleta en la zona de expansión puede extenderse hasta un punto por arriba de la segunda parte inferior del estanque.

(57) Abstract

Algae cultivation ponds having the circulation of fluid optimized for such factors as decreased energy consumption, decreased predators/competitors, decreased or eliminated flow deadzones (i.e. stagnant regions), and increased algae biomass production, such as for the production of biofuels and other algae-based products. A first pond bottom may underlie the expansion zone. An exterior wall may form an angle with the first pond bottom of approximately ninety to greater than one-hundred-sixty degrees. A second pond bottom adjacent to the first pond bottom may have an approximately consistent ground elevation, approximately matching a lowermost ground elevation of the first pond bottom. Additionally, the second pond bottom may extend outward from the first pond bottom. The vane in the expansion zone may extend to a point above the second pond bottom.



(12) United States Patent  
Schaefer et al.

(16) Patent No.: US 8,642,326 B1  
(45) Date of Patent: Feb. 4, 2014

(54) SYSTEM FOR THE PRODUCTION AND HARVESTING OF ALGAE

(56) References Cited  
U.S. PATENT DOCUMENTS

(76) Inventors: Alan W. Schaefer, Ste. Genevieve, MO (US); Brandon D. Cabot, Ste. Genevieve, MO (US)

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 559 days.

\* cited by examiner

(21) Appl. No.: 12/874,751  
(22) Filed: Sep. 2, 2010

Primary Examiner — Nafan Bowers  
Assistant Examiner — Lydita Edwards  
(74) Attorney, Agent, or Firm — Orce J. Eibel

Related U.S. Application Data  
(57) ABSTRACT

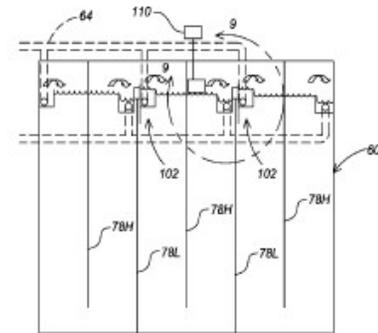
(60) Provisional application No. 61/239,306, filed on Sep. 2, 2010.

(51) Int. Cl. C12M 1/00 (2006.01)  
C12M 3/00 (2006.01)  
C12N 1/12 (2006.01)  
AR1G 7/00 (2006.01)  
AR1H 15/00 (2006.01)

(52) U.S. Cl. USPC ..... 435/292.1; 471:1.4; 435/257.1; 435/283.1; 435/289.1

(58) Field of Classification Search  
USPC ..... 435/257.1; 283.1-309.4; 471:1.4  
See application file for complete search history.

14 Claims, 12 Drawing Sheets



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<b>Word Mark</b>	ALGAEFUEL
<b>Goods and Services</b>	(ABANDONED) IC 004. US 001 006 015. G & S: Renewable fuels. FIRST USE: 20060518. FIRST USE IN COMMERCE: 20060602
<b>Standard Characters Claimed</b>	
<b>Mark Drawing Code</b>	(4) STANDARD CHARACTER MARK
<b>Serial Number</b>	77170710
<b>Filing Date</b>	May 2, 2007
<b>Filing Basis</b>	1A
<b>Original Filing Basis</b>	1A
<b>Owner</b>	(APPLICANT) Brendel, Alex J. INDIVIDUAL UNITED STATES 249 Western Hills Drive Pleasant Hill CALIFORNIA 94523
<b>Type of Mark</b>	TRADEMARK
<b>Register</b>	PRINCIPAL
<b>Live/Dead Indicator</b>	DEAD
<b>Abandonment Date</b>	February 22, 2008

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	Serial Number	Reg. Number	Word Mark	Check Status	Live/Dead
1	85006990		COCA-COLA LIFE	TARR	LIVE
2	85494701		COCA-COLA MOVE TO THE BEAT	TARR	LIVE
3	85068287		COCA-COLA ON	TARR	LIVE
4	85240503	4019547	COCA-COLA	TARR	LIVE
5	78976440	3120811	COCA-COLA SAMPLING SPOT	TARR	LIVE
6	78886966		THE COCA-COLA SIDE	TARR	DEAD
7	78815001		COCA-COLA LIGHT	TARR	DEAD
8	78802562		LIVE ON THE COCA-COLA SIDE OF LIFE	TARR	DEAD
9	78796804		COCA-COLA	TARR	DEAD
10	78779105		COCA-COLA PLUS	TARR	DEAD
11	78772582		THE COCA-COLA SIDE OF LIFE	TARR	DEAD
12	78749617		COCA-COLA LOVEBEING	TARR	DEAD
13	78743757	3320591	COCA-COLA BLAK	TARR	LIVE

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## COCA-COLA ZERO

<b>Word Mark</b>	COCA-COLA ZERO
<b>Goods and Services</b>	IC 032. US 045 046 048. G & S: Beverages, namely soft drinks; syrups and concentrates for the making of the same. FIRST USE: 20050613. FIRST USE IN COMMERCE: 20050613
<b>Standard Characters Claimed</b>	
<b>Mark Drawing Code</b>	(4) STANDARD CHARACTER MARK
<b>Serial Number</b>	78580598
<b>Filing Date</b>	March 4, 2005
<b>Filing Basis</b>	1A
<b>Original Filing Basis</b>	1B
<b>Published for Opposition</b>	April 17, 2007
<b>Owner</b>	(APPLICANT) The Coca-Cola Company CORPORATION DELAWARE One Coca-Cola Plaza Atlanta GEORGIA 30313
<b>Attorney of Record</b>	Paula Guibault
<b>Prior Registrations</b>	0238145;0238146;AND OTHERS
<b>Type of Mark</b>	TRADEMARK
<b>Register</b>	PRINCIPAL-2(F)-IN PART
<b>Live/Dead Indicator</b>	LIVE
<b>Distinctiveness Limitation Statement</b>	As to "ZERO"

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