



# PATENTSCOPE

Search features and exercise

**June 2, 2021**

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Program Officer, Technology and Innovation Support Division

# Patent documents

- 120+ million patent documents published to date
- 2+ million new patent applications published yearly





# Patent databases

- Highly standardized format
  - Unique source of information
  - Easy access and retrieval



# PATENTSCOPE figures

Patent documents	95 million
Patent collections	72
- National	68
- Regional	3
- International (PCT)	1
Cost	None!

Detailed data coverage:

[https://patentscope.wipo.int/search/en/help/data\\_coverage.jsf](https://patentscope.wipo.int/search/en/help/data_coverage.jsf)

# Is my invention new? What technologies already exist, e.g. solar cells?

**SOLAR**  
drying solid material by **SOLAR** radiation F26B 3/28  
**SOLAR** heat collectors F24S  
**SOLAR** panel of photoelectric cells H01L 31/042  
using **SOLAR** energy F03G 6/00  
using **SOLAR** heat F24S

**H01L 31/042** • • PV modules or arrays of single PV cells (supporting structures for PV modules H02S 20/00) [2014.01]

IPC: <https://www.wipo.int/classifications/ipc/ipcpub>

The screenshot shows the WIPO IP PORTAL PATENTSCOPE search results page. The search query 'IC:H01L 31/042' is entered in the search bar. The results show 65,057 results. The first result is '20210159845 CASCADED SOLAR CELL STRING' with a filing date of 27.05.2021. The abstract of this patent is visible, describing a photovoltaic roof tile with a plurality of photovoltaic structures.

WIPO IP PORTAL MENU PATENTSCOPE HELP ENGLISH LOGIN

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IC:H01L 31/042

65,057 results Offices all Languages en Stemming false Single Family Member true Include NPL false

Sort: Pub date best Per page: 10 View: All 1 / 6,506 Machine translation

1. [20210159845](#) CASCADED SOLAR CELL STRING US - 27.05.2021

Int.Class [H02S 20/25](#) Appl.No 17184507 Applicant Tesis, Inc. Inventor Bhevananda R. NADIMPALLY

One embodiment can provide a photovoltaic roof tile. The photovoltaic roof tile can include a front cover, a back cover, and a plurality of photovoltaic structures positioned between the front and back covers. A respective photovoltaic structure can include a first edge busbar positioned near an edge of a first surface and a second edge busbar positioned near an opposite edge of a second surface. The plurality of photovoltaic structures can be arranged in such a way that the first edge busbar of a first photovoltaic structure overlaps the second edge busbar of an adjacent photovoltaic structure with a layer of adhesive conductive film sandwiched between the first and second edge busbars, thereby resulting in the plurality of photovoltaic structures forming a serially coupled string.

# Why PATENTSCOPE?

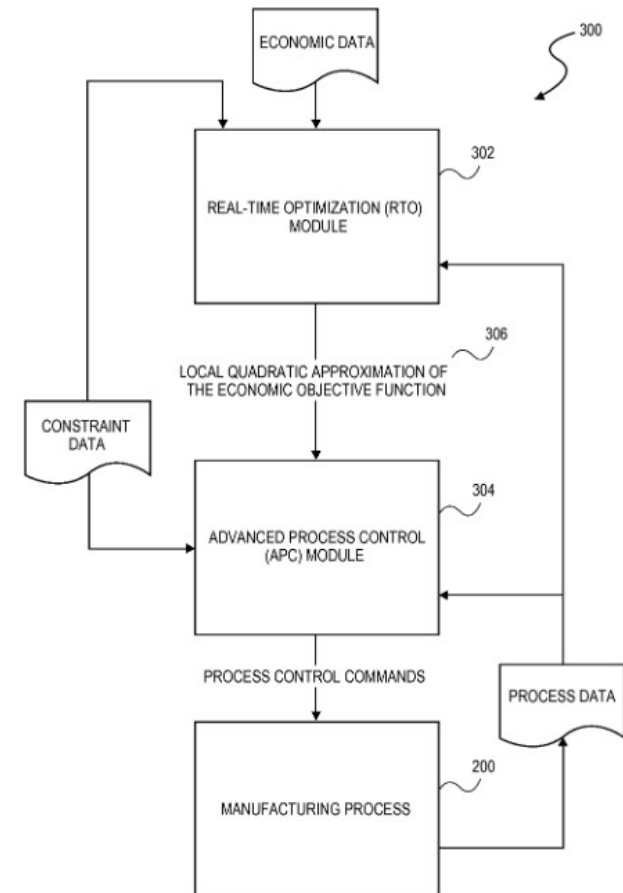
- Flexible interfaces
  - Simple and advanced search interfaces
- Powerful translation tools
  - WIPO Translate: AI-powered tool to search and translate patent documents in up to 14 languages
  - Cross-lingual Expansion: looks for synonyms and translates terms and variations in up to 14 languages
- Graphical analysis of search results
- Save and export search results\*
- Chemical compound search\*

\* requires to register with a free account



# Scenario

- A researcher at a systems development laboratory is considering a direction for her research into adaptive control systems.



# Scenario

- The researcher wants to know:
  - which technologies already exist in this area
  - which organizations or individuals are particularly active in this area

# Task breakdown

- **Access the PATENTSCOPE search service**
- Retrieve patent documents based on
  - keywords
  - classification
  - keywords and classification
- Analyze the whole set of results according to applicants and inventors
- Examine a specific patent document and its related documents within the results
- Keep up-to-date on new patent documents

# WIPO homepage

The image shows a screenshot of the WIPO homepage. At the top left is the WIPO logo: "WIPO WORLD INTELLECTUAL PROPERTY ORGANIZATION". Below the logo is a dark blue navigation bar with the following links: "IP Services", "Policy", "Cooperation", "Resources" (highlighted with a red box), "About IP", and "About WIPO". To the right of the navigation bar is a search box labeled "Search WIPO" with a magnifying glass icon.

Below the navigation bar is a large, colorful illustration. It features a central blue globe, a person's profile holding a camera, a person's profile holding a document with a red ribbon, a person's profile holding a megaphone, a person's profile holding a computer monitor displaying binary code, and various icons like a padlock, a key, a speech bubble, and musical notes. The text "THAN CALUA" is written vertically on the left side of the illustration.

Below the illustration is a grey banner with the text: "World IP Day, April 26: Helping Smaller Businesses Thrive".

To the right of the illustration is a list of news articles:


- World IP Day, April 26: Helping Smaller Businesses Thrive
- WIPO Report Finds Significant Growth in Assistive Technologies
- International Patent Filings Via WIPO Grew in 2020 Despite COVID-19 Pandemic
- Cambodia's Kampot Pepper: First Geographical Indication via Lisbon Agreement's Geneva Act
- New ABC Application Gets Accessible Books Directly to Print-Disabled People

<http://www.wipo.int>

# WIPO homepage

**WIPO**  
WORLD  
INTELLECTUAL PROPERTY  
ORGANIZATION

IP Services   Policy   Cooperation   Resources   About IP   About WIPO

## IP Databases

**PATENTSCOPE**

Global Brand Database

Madrid Monitor

Global Design Database

Hague Express

Lisbon Express

Article 6ter

## Legal Resources

WIPO Lex

WIPO Administered Treaties

## Artificial Intelligence Tools

Machine translation

Image search

Speech-to-text

Automatic classification

## Technical Resources

International Classifications

Standards (WIPO Handbook)

Terminology (WIPO Pearl)

## Insight and Analysis

WIPO Technology Trends

Global Innovation Index

World Intellectual Property Report

## Information Resources

Documents

Statistics

Publications

Country Profiles

Case Studies

Library

# WIPO homepage: PATENTSCOPE



The screenshot shows the WIPO homepage for PATENTSCOPE. At the top, the WIPO logo and name are displayed. Navigation links for Media, Meetings, Contact Us, My Account, and English are in the top right. A secondary navigation bar includes IP Services, Policy, Cooperation, Knowledge, About IP, and About WIPO, along with a search bar labeled 'Search WIPO'. The breadcrumb trail reads 'Home > Knowledge > PATENTSCOPE'. The main heading is 'PATENTSCOPE', followed by a paragraph describing the database's access to international PCT applications and national/regional patent documents. A video thumbnail titled 'Video: What is PATENTSCOPE and why use it?' is shown on the right. A prominent red-bordered button at the bottom left says 'Access the PATENTSCOPE database'. The WIPO logo is repeated in the bottom right corner.

WIPO  
WORLD INTELLECTUAL PROPERTY ORGANIZATION

Media | Meetings | Contact Us | My Account | English ▾

IP Services | Policy | Cooperation | Knowledge | About IP | About WIPO

Search WIPO

Home > Knowledge > PATENTSCOPE

## PATENTSCOPE

The PATENTSCOPE database provides access to international Patent Cooperation Treaty (PCT) applications in full text format on the day of publication, as well as to patent documents of participating national and regional patent offices.

The information may be searched by entering keywords, names of applicants, international patent classification and many other search criteria in multiple languages.


[Access the PATENTSCOPE database](#)

Video: What is PATENTSCOPE and why use it?

WIPO  
WORLD INTELLECTUAL PROPERTY ORGANIZATION



# WIPO PATENTSCOPE

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## SIMPLE SEARCH

Using PATENTSCOPE you can search 96 million patent documents including 4.1 million published international patent applications (PCT). [Detailed coverage information](#)

PCT publication 21/2021 [27.05.2021] is now available [here](#). The next PCT publication 22/2021 is scheduled for 03.06.2021. [More](#)

Check out the [new PATENTSCOPE features](#): CPC, NPL, Families ...

[Search Facility to Support COVID-19 Innovation Efforts](#)

Field Front Page	▼	<input type="text" value="Search terms..."/>	
			<a href="#">Query Examples</a>

# Task breakdown

- Access the PATENTSCOPE search service
- **Retrieve patent documents based on**
  - **keywords**
  - classification
  - keywords and classification
- Analyze the whole set of results according to applicants and inventors
- Examine a specific patent document and its related documents within the results
- Keep the scientist up-to-date on new patent documents

# CLIR: Synonyms and variants

- Original language

adaptive control system → adaptive regulating system, ...

- Other languages

adaptive control system → système de régulation adaptatif, ...

→ Chinese, English, French, German, Japanese, Korean, Portuguese, Russian, Spanish, Dutch, Italian, Swedish

# Search interface: Cross Lingual Expansion (CLIR)

The screenshot displays the PATENTSCOPE search interface. At the top, a dark navigation bar contains 'MENU', 'PATENTSCOPE', 'HELP', 'ENGLISH', and 'LOGIN'. Below this, a secondary navigation bar includes 'Feedback', 'Search', 'Browse', 'Tools', and 'Settings'. The 'Search' dropdown menu is open, listing options: 'Simple', 'Advanced Search', 'Field Combination', 'Cross Lingual Expansion', and 'Chemical compounds'. The 'Cross Lingual Expansion' option is highlighted with a red box. The main content area features a 'SIMPLE SEARCH' heading, a search description, a search field with a dropdown menu set to 'Front Page' and a search button, and a 'Query Examples' link at the bottom right.

MENU PATENTSCOPE HELP ENGLISH LOGIN

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## SIMPLE SEARCH

Using PATENTSCOPE you can search 77 million patent documents including 3.7 million published international patent applications (PCT). [Detailed coverage information](#)  
PCT Publication 45/2019 [07.11.2019] is now available. The next publication date is scheduled as follows: Gazette number 46/2019 [14.11.2019]. [More](#)

Field Front Page Search terms...

Query Examples

# CLIR

MENU PATENTSCOPE HELP  ENGLISH LOGIN

Feedback Search ▾ Browse ▾ Tools ▾ Settings

## CROSS LINGUAL EXPANSION ▾

Search terms... \*

Query Language" English ▾	Expansion Mode: <input checked="" type="radio"/> Automatic <input type="radio"/> Supervised	Precision level High ▾
The language of your query	Use the <b>Supervised</b> mode to select the technical domains, the relevant variants, the languages to translate your query to and the fields to search by	Influences the precision of the suggested variants. <b>Highest</b> level considers only the most relevant ones [less suggested variants] <b>Lowest</b> level considers the less relevant as well [more suggested variants]

Search

# CLIR Search

MENU PATENTSCOPE HELP ENGLISH LOGIN

Feedback Search ▾ Browse ▾ Tools ▾ Settings

## CROSS LINGUAL EXPANSION ▾

Search terms... \*  
adaptive control system

Query Language\*  
English  
The language of your query

Expansion Mode:  
 Automatic  
 Supervised  
Use the **Supervised** mode to select the technical domains, the relevant variants, the languages to translate your query to and the fields to search by

Precision level  
High  
Influences the precision of the suggested variants.  
**Highest** level considers only the most relevant ones [less suggested variants]  
**Lowest** level considers the less relevant as well [more suggested variants]

Search

→ Query language is the language in which your query is entered



# CLIR: Query and results

WIPO IP PORTAL MENU PATENTSCOPE HELP ENGLISH LOGIN WIPO

Feedback Search Browse Tools Settings

EN\_AB:("adaptive control system" OR "adaptive regulating system" OR "adaptive actuating device"~21 OR "adaptive drive de

20,180 results Offices all Languages en Stemming true Single Family Member false Include NPL false

Sort: Relevance Per page: 10 View: All 1 / 2,018 Machine translation

1. **106877774** SERVO SELF-ADAPTIVE CONTROL SYSTEM AND METHOD FOR SUPERSONIC WAVE MOTOR IN INPUT SATURATION CONDITIONS CN - 20.06.2017

Int.Class [H02P 23/04](#) Appl.No 102017000268740 Applicant MINJIANG UNIVERSITY Inventor FU PING

The invention relates to a servo self-adaptive control system and method for a supersonic wave motor in input saturation conditions. The system comprises a pedestal and a supersonic wave motor fixing rack used for fixing the supersonic wave motor, wherein the supersonic wave motor fixing rack is arranged on the pedestal, an output shaft on one side of the supersonic wave motor is connected with a photoelectric encoder, an output shaft on the other side is connected with a flywheel inertia load, the output shaft of the flywheel inertia load is connected with a force moment sensor via a shaft coupling device, and a signal output end of the photoelectric encoder and a signal output part of the force moment sensor are respectively connected to a control system. The control system consists of a backstepping controller and a motor, a whole controller system is built based on backstepping calculation, and therefore good control effects can be obtained. The servo self-adaptive control system and method for the supersonic wave motor in the input saturation conditions put forward in the invention is high in control accuracy, simple and compact in structure and good in using effects.

2. **111844043** ROBOT COUNTERSINKING SELF-ADAPTIVE CONTROL SYSTEM AND CONTROL METHOD CN - 30.10.2020

Int.Class [B25J 9/16](#) Appl.No 202010756218.5 Applicant NORTHWESTERN POLYTECHNICAL UNIVERSITY Inventor CHENG HUI

The invention relates to a robot countersinking self-adaptive control system and control method. Pressing foot pressure, a cutter rotating speed and a cutter feeding speed are obtained in real time through an upper computer, so that real-time working pressing force in a robot countersinking process can be obtained; after the real-time working pressing force is compared with a preset working pressing force threshold value, whether the current working pressing force can ensure that a wall plate is in a stable state or not can be known, and when the wall plate is in an unstable state, the pressing foot pressure, the cutter rotating speed and the cutter feeding speed are adjusted in real time in a self-adaptive mode, so that the wall plate is kept in a stable state in the countersinking process. According to the robot countersinking self-adaptive control system and control method, robot countersinking operation can be

# CLIR: Full query

EN\_AB:("adaptive control system" OR "adaptive regulating system" OR "adaptive actuating device"~21 OR "adaptive drive de

20,180 results Offices all Languages en Stemming true Single Family Member false Include NPL false

## FULL QUERY

Close Edit

EN\_AB:("adaptive control system" OR "adaptive regulating system" OR "adaptive actuating device"~21 OR "adaptive drive device"~21) OR  
FR\_AB:("système de commande adaptative" OR "système de contrôle adaptif" OR "système de protection adaptable" OR "système régulateur  
d'adaptation" OR "dispositif de commande adaptive" OR "système adaptable de régulation" OR "système de régulation adaptatif") OR DE\_AB:  
("Adaptivsteuerung" OR "adaptives Steuerungssystem" OR "Adaptives Steuerungssystem" OR "Adaptivsteuerungssystem" OR  
"Anpassungsfähiges Steuersystem" OR "adaptives Steuersystem" OR "Selbststeuerndes System" OR "selbststeuerndes System" OR  
"anpassungsfähiges Regelsystem") OR ES\_AB:("control adaptable") OR PT\_AB:("sistema controle adaptador"~22) OR JA\_AB:("適応制御" OR  
"適応型制御システム") OR RU\_AB:("адаптивная система управления" OR "система адаптивного управления" OR "адаптивная система  
регулирования") OR ZH\_AB:("自适应控制" OR "自适应控制系统及") OR KO\_AB:("시스템 적응 제어"~22 OR "장치 적응 제어"~22) OR IT\_AB:  
("sistema di controllo adattabile") OR SV\_AB:("adaptiv reglersystem"~22 OR "adaptiv regleranordning"~22 OR "adaptivt reglersystem"~22 OR  
"adaptiv styrningssystem"~22 OR "adaptiv ventilmanovreringsanordning"~22 OR "adaptiv påverkningsanordning"~22 OR "adaptiv  
reglerapparat"~22 OR "adaptivt regleranordning"~22 OR "adapter reglersystem"~22) OR NL\_AB:("regelstelsel" OR "adaptieve besturing  
system"~22 OR "adaptieve besturing stelsel"~22 OR "adaptieve besturing inrichting"~22) OR PL\_AB:("based układ sterowania"~22 OR  
"based system sterowania"~22 OR "based oraz układ sterowania"~22 OR "adapter do dozownika układ sterowania"~22 OR "adapter układ  
sterowania"~22 OR "based układ regulacji"~22 OR "based urządzenie napędowe"~22 OR "based sterowania modelem"~22 OR "adaptacyjny  
układ sterowania"~22) OR DA\_AB:("adaptiv styresystem"~22 OR "adaptiv styreindretning"~22 OR "adapteren styresystem"~22 OR "adapterbar  
styresystem"~22 OR "adaptiv kontrolsystem"~22 OR "adapteren styreindretning"~22 OR "adaptiv drivindretning"~22 OR "adapterbar  
styreindretning"~22 OR "omstilleligt styresystem"~22)

# Machine translation

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Feedback Search Browse Tools Settings

EN\_AB:("adaptive control system" OR "adaptive regulating system" OR "adaptive actuating device"~21 OR "adaptive drive de

20,180 results Offices all Languages en Stemming true Single Family Member false Include NPL false

Sort: Relevance Per page: 10 View: All 1 / 2,018

Machine translation

1. **10697774** SERVO SELF-ADAPTIVE CONTROL SYSTEM AND METHOD FOR SUPERSONIC WAVE MOTOR IN INPUT SATURATION CONDITIONS CN - 20.06.2017

Int.Class [H02P 23/04](#) ? Appl.No 102017000268740 Applicant MINJIANG UNIVERSITY Inventor FU PING

The invention relates to a servo self-adaptive control system and method for a supersonic wave motor in input saturation conditions. The system comprises a pedestal and a supersonic wave motor fixing rack used for fixing the supersonic wave motor, wherein the supersonic wave motor fixing rack is arranged on the pedestal, an output shaft on one side of the supersonic wave motor is connected with a photoelectric encoder, an output shaft on the other side is connected with a flywheel inertia load, the output shaft of the flywheel inertia load is connected with a force moment sensor via a shaft coupling device, and a signal output end of the photoelectric encoder and a signal output part of the force moment sensor are respectively connected to a control system. The control system consists of a backstepping controller and a motor, a whole controller system is built based on backstepping calculation, and therefore good control effects can be obtained. The servo self-adaptive control system and method for the supersonic wave motor in the input saturation conditions put forward in the invention is high in control accuracy, simple and compact in structure and good in using effects.

2. **111844043** ROBOT COUNTERSINKING SELF-ADAPTIVE CONTROL SYSTEM AND CONTROL METHOD CN - 30.10.2020

Int.Class [B25J 9/16](#) ? Appl.No 202010756218.5 Applicant NORTHWESTERN POLYTECHNICAL UNIVERSITY Inventor CHENG HUI

The invention relates to a robot countersinking self-adaptive control system and control method. Pressing foot pressure, a cutter rotating speed and a cutter feeding speed are obtained in real time through an upper computer, so that real-time working pressing force in a robot countersinking process can be obtained; after the real-time working pressing force is compared with a preset working pressing force threshold value, whether the current working pressing force can ensure that a wall plate is in a stable state or not can be known, and when the wall plate is in an unstable state, the pressing foot pressure, the cutter rotating speed and the cutter feeding speed are adjusted in real time in a self-adaptive mode, so that the wall plate is kept in a stable state in the countersinking process. According to the robot countersinking self-adaptive control system and control method, robot countersinking operation can be



# Machine translation

MENU PATENTSCOPE HELP ENGLISH LOGIN

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EN\_AB:("adaptive control system" OR "adaptive regulating system" OR "adaptive actuating device"~21 OR "adaptive drive device"~21) OR

20,180 results Offices all Languages en Stemming true Single Family Member false Include NPL false

Sort: Relevance Per page: 10 View: All 1/2,018 Machine translation

**WIPO Translate**

- English
- French
- German
- Spanish
- Russian
- Korean
- Japanese
- Chinese
- Arabic**
- Portuguese
- Italian

**1. 106877774 SERVO SELF-ADAPTIVE CONTROL SYSTEM AND METHOD FOR SUPERSONIC WAVE MOTOR IN INPUT SATURATION CONDITIONS**  
Int.Class H02P 23/04 Appl.No 102017000268740 Applicant MINJIANG UNIVERSITY Inventor FU PING  
The invention relates to a servo self-adaptive control system and method for a supersonic wave motor in input saturation conditions. The system comprises a supersonic wave motor fixing rack used for fixing the supersonic wave motor, wherein the supersonic wave motor fixing rack is arranged on the pedestal. One side of the supersonic wave motor is connected with a photoelectric encoder, an output shaft on the other side is connected with a flywheel inertia load of the flywheel inertia load is connected with a force moment sensor via a shaft coupling device, and a signal output end of the photoelectric encoder and a part of the force moment sensor are respectively connected to a control system. The control system consists of a backstepping controller and a motor control system is built based on backstepping calculation, and therefore good control effects can be obtained. The servo self-adaptive control system and method for a supersonic wave motor in the input saturation conditions put forward in the invention is high in control accuracy, simple and compact in structure and good in control effect.

**2. 111844043 ROBOT COUNTERSINKING SELF-ADAPTIVE CONTROL SYSTEM AND CONTROL METHOD**  
Int.Class B25J 9/16 Appl.No 202010758218.5 Applicant NORTHWESTERN POLYTECHNICAL UNIVERSITY Inventor CHENG HUI  
The invention relates to a robot countersinking self-adaptive control system and control method. Pressing foot pressure, a cutter rotating speed and a cutter feeding speed are obtained in real time through an upper computer, so that real-time working pressing force in a robot countersinking process can be obtained; after the working pressing force is compared with a preset working pressing force threshold value, whether the current working pressing force can ensure that a wall plate is not damaged can be known, and when the wall plate is in an unstable state, the pressing foot pressure, the cutter rotating speed and the cutter feeding speed are adjusted in a self-adaptive mode, so that the wall plate is kept in a stable state in the countersinking process. According to the robot countersinking self-adaptive control method, robot countersinking operation can be accurately controlled, the stable state of the wall plate in the countersinking process is maintained, and the precision, uniformity and automation efficiency are improved, and therefore the fatigue strength of a wall plate connecting structure is improved.

**3. 210238746 SELF-ADAPTIVE CONTROL SYSTEM AND INTEGRATED PREFABRICATED PUMP STATION**  
Int.Class E03F 5/22 Appl.No 201920802928.X Applicant SHANGHAI SANXING WATER SUPPLY AND DRAINAGE DEVICE CO., LTD. Inventor LIU XIAO  
The utility model discloses a self-adaptive control system and an integrated prefabricated pump station, and belongs to the field of sewage treatment. The self-adaptive control system includes a control system and a pump station. The control system is used for controlling the pump station to operate in a self-adaptive mode, so that the pump station can operate in a self-adaptive mode, and the pump station can operate in a self-adaptive mode.

# Machine translation

MENU PATENTSCOPE HELP ENGLISH LOGIN

Wipo Translate [powered by M] [Continue translation] ... 38%

Feedback Search ▾ Brows ...

EN\_AB:("adaptive control system" OR "adaptive regulating system" OR "adaptive actuating device"~21 OR "adaptive drive device"~21) OR

20,180 results Offices all Languages en Stemming true Single Family Member false Include NPL false

Sort: Relevance ▾ Per page: 10 ▾ View: All ▾ 1 / 2,018 >

Translated b Back to ori

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**1. 106877774** نظام تحكم تكيفي ذاتي موازن وطريقة لمحرك الموجة الصوتية في ظروف تشيع الدخل CN - 20.06.2017  
Int.Class H02P 23/04 Appl.No 102017000268740 Applicant MINJIANG UNIVERSITY Inventor FU PING

يتعلق الاختراع بنظام تحكم تكيفي ذاتي موازن وطريقة لمحرك موجة فوق صوتية في ظروف تشيع الدخل. يشمل النظام على وسيلة تثبيت لمحرك الموجة الصوتية المستمرة المستخدمة لتثبيت محرك الموجة الصوتية، حيث يتم تركيب جهاز ، يتصل عمودتثبيت محرك الموجة فوق الصوتية على جانب المشاء، ويتم توصيل عمود الخرج على جانب واحد من محرك الموجة فوق الصوتية بمشفر كهربي صوتي، ويتم توصيل عمود الخرج على الجانب الآخر بحمولة القصور الذاتي الخرج لحمل القصور الذاتي مع مجس عزم القوة عن طريق جهاز إقران العمود، وطرف خرج إشارة المشفر الكهربائي الصوتي وجزء خرج الإشارة من حساس عزم القوة على التوالي متصل بنظام تحكم. يتكون نظام التحكم من جهاز تحكم نظام التحكم التكيفي ذاتي الموازن وطريقة لمحرك الموجة الصوتية في ظروف تشيع الدخل للتحكم العكسي ومحرك، يتم بناء نظام تحكم كامل على أساس حساب الفلز العكسي، وبالتالي يمكن الحصول على تأثيرات تحكم جيدة. المعروضة في الاختراع يكون مرتفعا في دقة التحكم والبسيط والمدمج في البناء والجيد في استخدام التأثيرات.

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**2. 111844043** نظام التحكم الذاتي التكيفي ذاتيا وطريقة التحكم CN - 30.10.2020  
Int.Class B25J 9/16 Appl.No 202010756218.5 Applicant NORTHWESTERN POLYTECHNICAL UNIVERSITY Inventor CHENG HUI

الملخص: يتعلق الاختراع بنظام للتحكم الذاتي التكيفي ذاتيا وطريقة التحكم. يتم الحصول على ضغط القدم الكبيس، سرعة دوران القاطع وسرعة التغذية القاطع في الوقت الفعلي من خلال كمبيوتر علوي، بحيث يمكن الحصول على قوة ضغط وما إذا كانت قوة ضغط العمل الحالية يمكن أن تضمن أن لوح الجدار في حالة مستقرة أو العمل في الوقت الفعلي في عملية الأحمال المضادة للروبوت؛ بعد مقارنة قوة ضغط العمل في الوقت الفعلي مع قيمة عتبة قوة ضغط التشغيل المبرمجة مسبقا لا يمكن أن يكون معروفا، وعندما يكون لوح الجدار في حالة غير مستقرة، فإن ضغط القدم الكبيس، سرعة دوران القاطع وسرعة التغذية القاطع يتم ضبطها في الوقت الفعلي في وضع متكيف ذاتيا، بحيث يظل لوح الجدار في حالة مستقرة في ووفقا لنظام التحكم الذاتي الآلي والتحكم في طريقة التحكم، يمكن التحكم بدقة في التشغيل المضاد للروبوت، والحالة المستقرة للوح الجداري في العملية المضادة للتصاق، وتحسين دقة الأعمال، والانتظام وفعالية العملية التعويضية. الأتمتة، وبالتالي تتحسن قوة الإجهاد لهيكل توصيل لوح جداري.

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**3. 210238746** نظام تحكم ذاتي التكيفي والمحطة المضخمة السابقة الصنع CN - 03.04.2020  
Int.Class E03F 5/22 Appl.No 201920802928.X Applicant SHANGHAI SANXING WATER SUPPLY AND DRAINAGE DEVICE CO., LTD. Inventor LIU XIAOYUAN

يكشف نموذج المنفعة عن نظام تحكم ذاتي التكيفي ومحطة ضخ مسبقة الصنع، وينتمي إلى مجال معالجة الصرف الصحي. يشتمل نظام التحكم التكيفي الذاتي المستخدم بواسطة محطة الضخ المسبق المتكاملة على وحدة تحكم رئيسية، ووحدة تحكم حيث أن وحدة التحكم من بعد والوحدة النمطية للتحكم الذاتي متصلة كهربائيا مع وحدة التحكم الرئيسية؛ تشتمل وحدة التحكم التكيفي ذاتي ووحدة إرسال عن بعد تستخدم لاكتساب معلومات حالة العمل لمنظمة معالجة الصرف الصحي؛ الذاتي على وحدة تصحيح ووحدة تشغيل؛ تستخدم وحدة التصحيح لمقارنة وتصحيح معلومات حالة العمل لمنظمة معالجة الصرف الصحي ومحتوى الأداء الخاص بمضخة المياه؛ تستخدم وحدة التشغيل لضبط حالة التشغيل للمنظمة المائية ووحدة التشغيل متصلة كهربائيا مع وحدة التصحيح. ووفقا للنظام، يمكن ضبط المضخة القابلة للتحكم إلى حالة تشغيل مثلى، بحيث يكون تشغيل مضخة الماء مبررا ذاتيا، ويمكن تحقيق صرف التصريف في الوقت الفعلي وعلى الصرف حسب الطلب، ويمكن تقليل مخاطر التلوث الزائد وفقدان الطاقة في محطة معالجة الصرف.

# Task breakdown

- Access the PATENTSCOPE search service
- **Retrieve patent documents based on**
  - keywords
  - **classification**
  - keywords and classification
- Analyze the whole set of results according to applicants and inventors
- Examine a specific patent document and its related documents within the results
- Keep the researcher up-to-date on new patent documents



# Results: Analysis

(FN\_AB:("adaptive control system" OR "drive system adaptable" OR "adaptive drive system" OR "adaptive regulating system") OR FR\_AB:("système de commande adaptatif" OR "système de contrôle adaptif" OR "système de protection adaptable" OR "sys

7,045 results Offices all Languages en Stemming true Single Family Member false Include NPL false

## ANALYSIS

Filters Charts Timeseries

Countries	Applicants	Inventors	IPC code	Publication Dates
China	SAMSUNG ELECTRONICS CO LTD	CHEN QIANG	G05B	2002
Republic of Korea	MATSUSHITA ELECTRIC IND CO LTD	OHIRA TAKASHI	H04B	2003
Japan	STATE GRID CO OF CHINA	ICHIKAWA HIROYUKI	G06F	2004
Brazil	ZHEJIANG UNIVERSITY OF TECH	FEI JUNTAO	H02J	2005
PCT	SOUTHEAST UNIVERSITY	HU YI	H04L	2006
United States of America	ZHEJIANG UNIVERSITY	WU CHUN	G05D	2007
European Patent Office	NEC CO	ZHANG WEI	H04N	2008
Spain	NANJING UNIVERSITY OF AERONAUTICS AND ASTRONAUTICS	CHEN KALJIE	H05B	2009
Russian Federation	TOKAI RUBBER IND LTD	LI WEI	H04W	2010
Russian Federation(USSR data)	KYOCERA CO	THE INVENTOR HAS WAIVED THE RIGHT TO BE MENTIONED	H02M	2011
Mexico	LG ELECTRONICS INC	GOTO KATSUHIRO	H02P	2012
Canada	NANJING UNIVERSITY OF SCIENCE AND TECH	WANG WEI	G06K	2013
Australia	QUALCOMM INC	XU BIN	G08G	2014
United Kingdom	ZTE CO	YANG JUN	G06T	2015
France	BEIHANG UNIVERSITY	ZHANG LEI	F16F	2016
Argentina	HITACHI LTD	ZHAO QIANG	G06N	2017
Colombia	NORTHWESTERN POLYTECHNICAL UNIVERSITY	LI LONG	F16H	2018
Kazakhstan	HARBIN ENGINEERING UNIVERSITY	ZHANG YAN	B25J	2019
Portugal	FUJITSU LTD	HAN YUNXIANG	H03H	2020
Slovakia	HEFEI UNIVERSITY OF TECH	LIU YONG	H04J	2021

# International Patent Classification

The screenshot shows the WIPO IP Portal interface for the IPC Publication page. The page is titled "IPC Publication" and includes a navigation menu on the left and a search bar at the top right. The main content area displays a list of classification codes and their descriptions. The entry for G05B 13/00 is highlighted with a red box.

Scheme	RCL	Compilation	Catchwords	Search
		G05B 11/30	••• using pulse-frequency modulation [2006.01]	
		G05B 11/32	•• with inputs from more than one sensing element; with outputs to more than one correcting element [2006.01]	
	-	G05B 11/36	•• with provision for obtaining particular characteristics, e.g. proportional, integral, differential [2006.01]	
		G05B 11/38	••• for obtaining a proportional characteristic [2006.01]	
		G05B 11/40	••• for obtaining an integral characteristic [2006.01]	
		G05B 11/42	••• for obtaining a characteristic which is both proportional and time-dependent, e.g. P. I., P. I. D. [2006.01]	
	-	G05B 11/44	• pneumatic only [2006.01]	
		G05B 11/46	•• without auxiliary power [2006.01]	
	-	G05B 11/48	•• with auxiliary power [2006.01]	
		G05B 11/50	••• in which the output signal represents a continuous function of the deviation from the desired value, i.e. continuous controllers [2006.01]	
	-	G05B 11/52	••• in which the output signal represents a discontinuous function of the deviation from the desired value, i.e. discontinuous controllers [2006.01]	
		G05B 11/54	•••• Two-step controllers, e.g. with on/off action [2006.01]	
		G05B 11/56	•••• Multi-step controllers [2006.01]	
		G05B 11/58	•• with inputs from more than one sensing element; with outputs to more than one correcting element [2006.01]	
	-	<b>G05B 13/00</b>	<b>Adaptive control systems, i.e. systems automatically adjusting themselves to have a performance which is optimum according to some preassigned criterion</b> (G05B 19/00 takes precedence; machine [2006.01])	
	-	G05B 13/02	• electric [2006.01]	
		G05B 13/04	•• involving the use of models or simulators [2006.01]	
	-	<b>G05B 15/00</b>	<b>Systems controlled by a computer</b> (G05B 13/00, G05B 19/00 take precedence; automatic controllers with particular characteristics G05B 11/00; computers per se G06) [2006.01]	
		G05B 15/02	• electric [2006.01]	
	-	<b>G05B 17/00</b>	<b>Systems involving the use of models or simulators of said systems</b> (G05B 13/00, G05B 15/00, G05B 19/00 take precedence; analogue computers for specific processes, systems or devices, e.g. simulators, [2006.01])	
		G05B 17/02	• electric [2006.01]	

# Interfaces: Simple search

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Field ▾ Search terms...

- Front Page
- Any Field
- Full Text
- Int. Classification(IPC)**
- Names
- Publication Date

Query Examples


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Field Int. Classification[IPC]	▼	Search terms... "G05B 13/00"	
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[Query Examples](#)

# Simple search: Query and results

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Feedback Search Browse Tools Settings

IC:("G05B 13/00")

39,084 results Offices all Languages en Stemming true Single Family Member false

Sort: Pub Date Desc Per page: 10 View: All 1 / 3,909 Machine translation

- 1. [WO/2020/026196](#) MINIMUM QUANTITY LUBRICATION SYSTEM AND METHOD** WO - 06.02.2020  
Int.Class [B23Q 11/10](#) Appl.No PCT/JP2019/056583 Applicant UNIST, INC. Inventor BOELKINS, Charles W.  
A minimum quantity lubrication (MQL) system includes a controller, a lubricant module coupled to a tool spindle of a machining apparatus, and a pneumatic module coupled to the spindle. The lubricant module is configured to supply lubricant at pressure to the tool, as controlled by the controller. Likewise, the pneumatic module is configured to supply pressurized air to the tool, as controlled by the controller. The controller is configured to direct the lubricant module to supply lubricant prior to the controller receiving a START signal from a machine tool controller. Optionally, the lubricant pressure level is predetermined based on known characteristics of the tool that is coupled to the spindle. Optionally, the START signal is anticipated by referring to a signature/profile of the operational steps of a machining process where a timeline or time table of lubrication request intervals are identified.
- 2. [WO/2020/026474](#) METHOD AND SYSTEM FOR CONTROLLING OPERATION OF MACHINE, AND STORAGE MEDIUM** WO - 06.02.2020  
Int.Class [G05B 13/04](#) Appl.No PCT/JP2019/005175 Applicant MITSUBISHI ELECTRIC CORPORATION Inventor DANIELSON, Claus  
A method for controlling an operation of a machine exhibiting symmetries in dynamics of the machine, a cost of the operation of the machine, and constraints on the operation of the machine performs iteratively a control optimization until a termination condition is met to produce an optimal control input and controls the machine according to the optimal control input. An iteration includes transforming control inputs to the machine, a state of the machine, an output of the machine, and dual variables from an original domain to a symmetric domain using a symmetric transformation, solving an optimal control problem of the control inputs and the state for fixed values of the output and the dual variables in the symmetric domain, transforming the control inputs and the state from the symmetric domain into the original domain using an inverse of the symmetric transformation; projecting the outputs corresponding to the control inputs and the state in the original domain onto the constraints, and updating the dual variable based on the projected outputs.
- 3. [WO/2020/027352](#) HYBRID TUBE AND MANUFACTURING METHOD THEREFOR** WO - 06.02.2020  
Int.Class [G05B 13/04](#) Appl.No PCT/KR2018/008780 Applicant SHPAC CO., LTD Inventor LEE, Yun Ju  
The objective of the present invention is to provide a method for manufacturing a hybrid tube comprising the step of deriving an optimal ratio between a metal tube and a composite layer when manufacturing the hybrid tube in which the composite layer is formed on an outer circumferential surface of the metal tube, in order to reduce the weight of an existing metal tube such as a cylinder tube of a hydraulic cylinder. In manufacturing a hybrid tube, it is possible to derive an optimal ratio between different materials that can achieve weight reduction while satisfying a target buckling load, thereby making it possible to reduce the weight of tubes made of a metal material and an apparatus related to such tubes.



# Scenario: A twist

- The researcher now wants to focus the research on adaptive control systems adapted for the oil industry

# Classification: G05B 13/00

→	—	<b>G05B 13/00</b>	<b>Adaptive control systems</b> , i.e. systems automatically adjusting themselves to have a performance which is optimum according to some preassigned criterion (G05B 19/00 takes precedence; details of the computer G06F 15/18) [2006.01]
→	—	G05B 13/02	• electric [2006.01]
→		G05B 13/04	• • involving the use of models or simulators [2006.01]

→ No classification available for “Adaptive control systems ... oil industry”

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- Keep the researcher up-to-date on new patent documents

# Simple search: Field combination

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IC:("G05B 13/00")

30,842 results Offices All Languages En Stemming False

Analysis Sort: Pub Date Desc Per page: 10 Page 1 / 3,085

Field Combination

1. [20190335913](#) SLEEP PHASE DEPENDENT TEMPERATURE CONTROL AND LEARNING METHODS TO OPTIMIZE SLEEP QUALITY US - 07.11.2019  
Int.Class A47C 21/04 Appl.No 16401108 Applicant Ely Tsern Inventor Ely Tsern  
A bed includes components to control temperature of a sleep surface, for example based on time and historical usage patterns by a user. In some embodiments the temperature of the sleep surface is controlled based on information indicating a sleep state of the user. In some embodiments the temperature is dynamically adjusted so to achieve particular sleep states and/or sleep patterns for the user. In some embodiments the temperature and timing of temperature adjustments is iteratively adjusted over multiple sleep sessions so to achieve improvements in sleep states and/or sleep quality for the user.



2. [20190339684](#) METHODS AND SYSTEMS FOR DATA COLLECTION, LEARNING, AND STREAMING OF MACHINE SIGNALS FOR ANALYTICS AND MAINTENANCE USING THE INDUSTRIAL INTERNET OF THINGS US - 07.11.2019  
Int.Class G05B 23/02 Appl.No 16369063 Applicant Strong Force IOT Portfolio 2016, LLC Inventor Charles Howard Cella  
A system for predicting a service event from vibration data generally includes an industrial machine comprising at least one vibration sensor disposed to capture vibration of a portion of the industrial machine; a vibration analysis circuit in communication with the at least one vibration sensor; a multi-segment vibration frequency spectra structure that facilitates mapping the captured vibration to one vibration frequency segment of a multi-segment vibration frequency; a severity unit algorithm that receives the frequency of the captured vibration and the corresponding vibration frequency segment and produces a severity value which is then mapped to one of a plurality of severity units defined for the corresponding vibration frequency segment; and a signal generating circuit that receives the one of the plurality of severity units, and based thereon, signals a predictive maintenance server to execute a corresponding maintenance action on the portion of the industrial machine.

3. [20190340525](#) ITERATIVE GENERATION OF TOP QUALITY PLANS IN AUTOMATED PLAN GENERATION FOR ARTIFICIAL INTELLIGENCE APPLICATIONS AND THE LIKE US - 07.11.2019  
Int.Class G06N 5/04 Appl.No 15971911 Applicant International Business Machines Corporation Inventor Michael KATZ  
A method for improving performance of at least one hardware processor solving a top-k planning problem includes obtaining, in a memory coupled to the at least one processor, a specification of the planning problem in a planning language; obtaining, in a first iteration carried out by the at least one processor, at least one solution to the planning problem; and modifying the planning problem, in the first iteration carried out by the at least one processor, to forbid the at least one solution. The method further includes repeating, by the at least one processor, the obtaining of the at least one solution and the modifying to forbid the at least one solution, for a plurality of additional iterations, after the first iteration, until a desired number, k, of solutions to the planning problem are found or until no further solutions exist, whichever comes first.

# Interface: Field combination

## FIELD COMBINATION ▾

		Field Front Page	▼	Value	?
Operator AND	▼	Field WIPO Publication Number	▼	Value	?
Operator AND	▼	Field Application Number	▼	Value	?
Operator AND	▼	Field Publication Date	▼	Value	?
Operator AND	▼	Field English Title	▼	Value	?
Operator AND	▼	Field Abstract	▼	Is Empty: N/A	▼
Operator AND	▼	Field Licensing availability	▼	<input type="checkbox"/>	

 Add another search field  Reset search fields

Offices All	▼
Languages English	▼
<input type="checkbox"/> Stemming	
<input type="checkbox"/> Single Family Member	
<input type="checkbox"/> Include NPL	

# Interface: Field combination

**FIELD COMBINATION** ▾

	Field	Value	
	Front Page		?
Operator AND	WIPO Publication Number		?
Operator AND	International Class	"G05B 13/00"	?
Operator AND	Publication Date		?
Operator AND	English Title	oil	?
Operator AND	Abstract	Is Empty: N/A	▾
Operator AND	Licensing availability	<input type="checkbox"/>	

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# Concepts and synonyms

- oil: petroleum  
→oil **OR** petroleum

# Interface: Advanced search

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IC:("G05B 13/00") AND EN\_Tl:(oil)

66 results Offices All Languages En Stemming True

Analysis Sort: Relevance Per page: 10 Page 1/7

Simple  
Advanced Search  
Field Combination  
Cross Lingual Expansion  
Chemical compounds

1. **WO/2014/015096** PERFORMANCE MONITORING IN A GAS OIL SEPARATION PLANT WO - 23.01.2014  
Int.Class G05B 13/00 Appl.No PCT/US2013/050996 Applicant SAUDI ARABIAN OIL COMPANY Inventor AMMINUDIN, Kamarul, A.  
The invention provides a facility monitoring system and method of using the system that allows for prioritization of performance parameters to be improved based on deviations from target performance parameters. Improvement incentives are provided to users on a user interface such that the user appreciates the value of the improvement to be conducted.

2. **101556457** DYNAMIC OPTIMIZING CONTROL METHOD FOR EFFICIENCY OF HIGH CAPACITY OIL TRANSFER PUMP CN - 14.10.2009  
Int.Class G05B 13/00 Appl.No 200910022550.2 Applicant Xi'an University Of Technology Inventor Liu Jun  
The invention discloses a dynamic optimizing control method for the efficiency of a high capacity oil transfer pump, comprising the following steps: firstly, the setting value of an oil transfer pump system is assured, the actual output value of the oil transfer pump system is measured, a deviation value signal is inputted into a network controller, wherein, the deviation value is equal to the setting value deducts the actual output value; secondly, an output value is transmitted to the oil transfer pump system after being counted by the network controller, the change of a centrifugal pump parameter is realized, meanwhile the output value and the actual output value of the oil transfer pump system are jointly inputted into an identification network by the network controller, and the identification network is modified by a deviation value between the identification output value of the identification network and the actual output value, therefore, the identification output value is close to the actual output value; and finally, according to the deviation situation between the setting value and the identification output value and the relationship between efficiency and the actual output value, the parameter of the network controller is modified by a system optimization purpose process so as to realize dynamic optimizing control and cooperative control for the efficiency of the oil transfer pump system.

3. **1218135** AUTOMATIC CONTROLLING INSTRUMENT FOR MECHANICAL OIL WELL CN - 02.06.1999  
Int.Class G05B 13/00 Appl.No 97108699.0 Applicant Ouyang Hu Inventor Ouyang Hu  
A full-automatic control instrument for mechanical oil well is composed of power supply, timer, intermittence controller, display controller and speech prompt circuit. Said intermittence controller includes pressure protecting circuit which can control load circuit to work when well pressure is too high or too low, and the system runs safety. The timing signals of intermittence is provided by timer composed of crystal oscillator and signals of timer includes hour, minute and second, which can be chosen by system according to different requirements.

# Interface: Advanced search

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## ADVANCED SEARCH ▾

Search terms...


Query Assistant Query Examples

Expand with related terms

Offices All	▾
Languages English	▾
<input type="checkbox"/> Stemming	
<input type="checkbox"/> Single Family Member	
<input type="checkbox"/> Include NPL	

Reset Search

# Advanced search interface: Field codes

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## ADVANCED SEARCH


Search terms...

- Advanced Search Instant Help
- Query Syntax
- Fields Definition**
- User Guide PATENTSCOPE

Query Assistant  Query Examples

 Expand with related terms

Offices  
All 

Languages  
English 

Stemming

# Advanced search interface: Field codes


- International classification → IC:(...)
- English title → EN\_TI:(...)
- English abstract → EN\_AB:(...)
- English claims → EN\_CL:(...)

# Query

→ IC:("G05B 13/00") AND (EN\_TI:(oil OR petroleum) OR EN\_AB:(oil OR petroleum) OR EN\_CL:(oil OR petroleum))



# Advanced search: Query

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## ADVANCED SEARCH ▼

`IC:("G05B 13/00") AND (EN_TI:(oil OR petroleum) OR EN_AB:(oil OR petroleum) OR EN_CL:(oil OR petroleum))`

Query Assistant [Query Examples](#)






⊕ Expand with related terms

Offices All	▼
Languages English	▼
<input checked="" type="checkbox"/> Stemming	
<input checked="" type="checkbox"/> Single Family Member	



# Advanced search: Query and results

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IC:("G05B 13/00") AND (EN\_TI:(oil OR petroleum) OR EN\_AB:(oil OR petroleum) OR EN\_CL:(oil OR petroleum))

 389 results offices all Languages en Stemming true Single Family Member true Include NPL false    


Sort: Relevance ▾ Per page: 10 ▾ View: All ▾ < 1 / 39 > Machine translation ▾





- 6236894** **PETROLEUM** PRODUCTION OPTIMIZATION UTILIZING ADAPTIVE NETWORK AND GENETIC ALGORITHM TECHNIQUES US - 22.05.2001  
Int.Class G05B 13/02  Appl.No 08994975 Applicant Atlantic Richfield Company Inventor Stoitsits, Richard F.  
A computer system and method of operating the same to optimize the operating conditions of a **petroleum** production field, in which a plurality of wells are arranged according to drill sites, and connected to one or more central processing facilities, is disclosed. In this disclosed embodiment, gas compression capacity is a significant constraint on the operation of the complex production field, and surface line hydraulic effects of well production are to be considered in the optimization. A genetic algorithm is used to generate, and iteratively evaluate solution vectors, which are combinations of field operating parameters such as incremental gas-**oil** ratio cutoff and formation gas-**oil** ratio cutoff values. The evaluation includes the operation of an adaptive network to determine production header pressures, followed by modification of well output estimates to account for changes in the production header pressure. Convergence of the genetic algorithm identifies one of the solution vectors as containing an optimal combination of field operating parameters that may be used by production personnel to set the operating conditions of the field.
- 20100230324** CONTROL OF FLUID CATALYTIC CRACKING PROCESS FOR MINIMIZING ADDITIVE USAGE IN THE DESULFURIZATION OF **PETROLEUM** FEEDSTOCKS US - 18.09.2010  
Int.Class C10G 11/18  Appl.No 12785847 Applicant Saeed Saad Al-Alloush Inventor Saeed Saad Al-Alloush  
A method and apparatus for the cracking of a **petroleum oil** feedstock to produce a desulfurized full-range gasoline product. The **petroleum oil** feedstock is contacted with a base cracking catalyst and an FCC additive in an FCC unit, wherein the catalyst includes a stable Y-type zeolite and a rare-earth metal oxide and the additive includes a shape selective zeolite. The catalyst, additive and **petroleum oil** feedstock can be contacted in a down-flow or riser fluid catalytic cracking unit, that can also include a regeneration zone, a separation zone, and a stripping zone. The FCC unit includes an integrated control and monitoring system that monitors at least one parameter selected from FCC operating parameters, feed rate, feedstock properties, and product stream properties, and adjusts at least one parameter in response to the measured parameter to increase production of desulfurized products.

# Task breakdown


- Access the PATENTSCOPE search service
- Retrieve patent documents based on
  - keywords
  - classification
  - keywords and classification
- **Analyze the whole set of results according to applicants and inventors**
- Examine a specific patent document and its related documents within the results
- Keep up-to-date on new patent documents


# Results


IC:("G05B 13/00") AND EN\_TI:(oil) 

 2 results Offices all Languages en Stemming true Single Family Member true Include NPL false   

Sort: Relevance ▾ Per page: 10 ▾ View: All ▾ < 1/9 ▾ > Machine translation ▾

1. [WO/2014/015096](#) PERFORMANCE MONITORING IN A GAS **OIL** SEPARATION PLANT WO - 23.01.2014  
Int.Class [G05B 13/00](#)  Appl.No PCT/US2013/050998 Applicant SAUDI ARABIAN **OIL** COMPANY Inventor AMMINUDIN, Kamarul, A.  
The invention provides a facility monitoring system and method of using the system that allows for prioritization of performance parameters to be improved based on deviations from target performance parameters. Improvement incentives are provided to users on a user interface such that the user appreciates the value of the improvement to be conducted.

2. [101556457](#) DYNAMIC OPTIMIZING CONTROL METHOD FOR EFFICIENCY OF HIGH CAPACITY **OIL** TRANSFER PUMP CN - 14.10.2009  
Int.Class [G05B 13/00](#)  Appl.No 200910022550.2 Applicant Xi'an University of Technology Inventor Liu Jun  
The invention discloses a dynamic optimizing control method for the efficiency of a high capacity oil transfer pump, comprising the following steps: firstly, the setting value of an oil transfer pump system is assured, the actual output value of the oil transfer pump system is measured, a deviation value signal is inputted into a network controller, wherein, the deviation value is equal to the setting value deducts the actual output value; secondly, an output value is transmitted to the oil transfer pump system after being counted by the network controller, the change of a centrifugal pump parameter is realized, meanwhile the output value and the actual output value of the oil transfer pump system are jointly inputted into an identification network by the network controller, and the identification network is modified by a deviation value between the identification output value of the identification network and the actual output value, therefore, the identification output value is close to the actual output value; and finally, according to the deviation situation between the setting value and the identification output value and the relationship between efficiency and the actual output value, the parameter of the network controller is modified by a system optimization purpose process so as to realize dynamic optimizing control and cooperative control for the efficiency of the oil transfer pump system.

3. [1218135](#) AUTOMATIC CONTROLLING INSTRUMENT FOR MECHANICAL **OIL** WELL CN - 02.08.1999  
Int.Class [G05B 13/00](#)  Appl.No 97108899.0 Applicant Ouyang Hu Inventor Ouyang Hu  
A full-automatic control instrument for mechanical oil well is composed of power supply, timer, intermittence controller, display controller and speech prompt circuit. Said intermittence controller includes pressure protecting circuit which can control load circuit to work when well pressure is too high or too low, and the system runs safety. The timing signals of intermittence is provided by timer composed of crystal oscillator and signals of timer includes hour, minute and second, which can be chosen by system according to different requirements.

# Results: Analysis

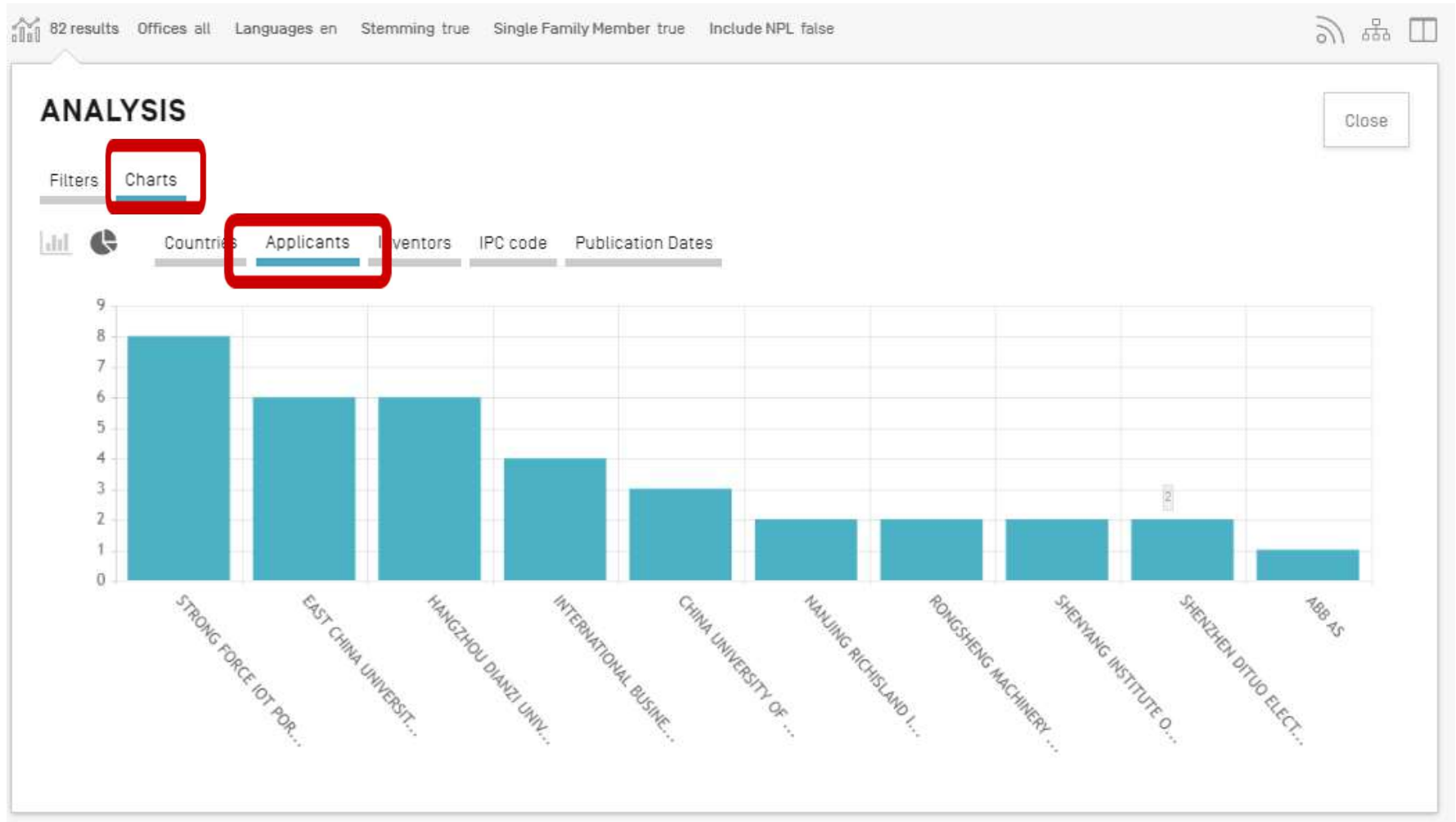
82 results Offices all Languages en Stemming true Single Family Member true Include NPL false

**ANALYSIS** Close

**Filters** Charts

Countries	Applicants	Inventors	IPC code	Publication Dates				
China	45	STRONG FORCE IOT PORTFOLIO 2016 LLC	8	CHARLES HOWARD CELLA 8	G05B	82	2013	2
United States of America	20	EAST CHINA UNIVERSITY OF SCIENCE AND TECH	8	GERALD WILLIAM DUFFY, JR. 8	E21B	18	2014	5
Russian Federation	8	HANGZHOU DIANZI UNIVERSITY	8	JEFFREY P. MCGUCKIN 8	G05D	16	2015	0
PCT	8	INTERNATIONAL BUSINESS MACHINES CO	4	MEHUL DESAI 8	G06N	13	2016	2
Japan	2	CHINA UNIVERSITY OF PETROLEUM (EAST CHINA)	3	ZHANG RIDONG 8	G06K	8	2017	8
Australia	1	NANJING RICHISLAND INFORMATION ENGINEERING CO LTD	2	ANDREW R. CONN 4	H04B	8	2018	20
Bulgaria	1	RONGSHENG MACHINERY MANUFACTURE LTD OF HUABEI OILFIELD	2	LIOR HORESH 4	H04L	8	2019	18
Republic of Korea	1	SHENYANG INSTITUTE OF AUTOMATION CHINESE ACADEMY OF SCIENCES	2	MATTHIAS KORMAKSSON 4	G06F	4	2020	12
		SHENZHEN DITUO ELECTRONIC CO LTD	2	MOSHOOD O. SALIU 4	F04B	3	2021	2
		ABB AS	1	THEODORE G. VAN KESSEL 4	G01N	3		

# Results: Analysis



# Task breakdown

- Access the PATENTSCOPE search service
- Retrieve patent documents based on
  - keywords
  - classification
  - keywords and classification
- Analyze the whole set of results according to applicants and inventors
- **Examine a specific patent document and its related documents within the results**
- Keep up-to-date on new patent documents



# Results

1. [WO/2014/015096](#) PERFORMANCE MONITORING IN A GAS OIL SEPARATION PLANT


WO - 23.01.2014

Int.Class [G05B 13/00](#)  Appl.No PCT/US2013/050998 Applicant SAUDI ARABIAN OIL COMPANY Inventor AMMINUDIN, Kamarul, A.

The invention provides a facility monitoring system and method of using the system that allows for prioritization of performance parameters to be improved based on deviations from target performance parameters. Improvement incentives are provided to users on a user interface such that the user appreciates the value of the improvement to be conducted.

2. [WO/2020/199665](#) MULTI-TARGET ONLINE OPTIMIZATION METHOD FOR CRUDE OIL BLENDING


WO - 08.10.2020

Int.Class [G05B 13/04](#)  Appl.No PCT/CN2019/128928 Applicant EAST CHINA UNIVERSITY OF SCIENCE AND TECHNOLOGY Inventor QIAN, Feng

Disclosed is a multi-target online optimization method for crude oil blending. The method comprises the steps of: initializing parameters of a blending task; configuring an optimization cycle and target function weights, and configuring upper and lower limits of respective attribute indexes of blended crude oil, reserves of respective component oils, the maximum blending and refining-line flow rate of each component oil, and a unit mass cost of each component oil; acquiring, according to the preconfigured optimization cycle, attribute data of respective blending components and a tank bottom oil, and updating a reading on an oil dipstick at the tank bottom, the reserves of the respective component oils, and the remaining blending time of the present batch; and obtaining the optimal formula of each blending component in the current optimization cycle, and sending the same to a blending control system for execution.

3. [WO/2020/199666](#) BLENDING EFFECT PARAMETER CALCULATION METHOD FOR CRUDE OIL BLENDING


WO - 08.10.2020

Int.Class [G05B 13/04](#)  Appl.No PCT/CN2019/128971 Applicant EAST CHINA UNIVERSITY OF SCIENCE AND TECHNOLOGY Inventor QIAN, Feng

A blending effect parameter calculation method for crude oil blending. The method comprises the steps: first, performing operating parameter initialization; next, configuring an operating cycle and target function weighting; then, according to the operating cycle, acquiring a component oil characteristic, a blending formula and a characteristic of crude oil obtained by blending at a blending head; finally, using an adaptive differential evolution smart optimization algorithm to solve a blending effect parameter model.

4. [WO/2014/078830](#) PREDICTING THE OIL TEMPERATURE OF A TRANSFORMER

WO - 22.05.2014

Int.Class [G05B 13/02](#)  Appl.No PCT/US2013/070898 Applicant ABB TECHNOLOGY AG Inventor DAGNINO, Aldo

Method and system for predicting an oil temperature of a transformer for a desired load and/or predicting a load that a transformer can support for a desired time. A machine learning algorithm is developed using historical data of a transformer. After the algorithm is developed, historical data corresponding to the transformer are input into the algorithm to develop a profile of the transformer describing how the temperature of oil within the transformer is expected to change as a function of a desired load. Using the profile, the oil temperature of the transformer is predicted for a desired load. In this way, a prediction is made as to whether and/or for how long a transformer may support a desired load before the oil temperature reaches a specified threshold and/or before the transformer fails due to the load.

# Record

## 1. WO2014078830 - PREDICTING THE OIL TEMPERATURE OF A TRANSFORMER

PCT Biblio. Data

Description

Claims

Drawings

National Phase

Patent Family

Notices

Documents

PermaLink Machine translation ▼

### Publication Number

WO/2014/078830

### Publication Date

22.05.2014

### International Application No.

PCT/US2013/070898

### International Filing Date

19.11.2013

### IPC

G05B 13/02 2008.01 H01F 27/40 2008.01

### CPC

G05B 13/027 H01F 2027/408 H01F 27/12

### Applicants

ABB TECHNOLOGY AG [CH]/[CH]  
Affolternstrasse 44 CH-8050 Zurich, CH  
[AllExceptUS]  
DAGNINO, Aldo [CA]/[US] [US]  
CHEIM, Luiz [BR]/[US] [US]  
LIN, Lan [CN]/[US] [US]  
PATEL, Poorvi [SE]/[US] [US]

### Inventors

DAGNINO, Aldo  
CHEIM, Luiz  
LIN, Lan  
PATEL, Poorvi

### Agents

### Title

[EN] PREDICTING THE OIL TEMPERATURE OF A TRANSFORMER

[FR] TRANSFORMATEUR DE PROFILAGE DE SYSTÈME D'ÉNERGIE

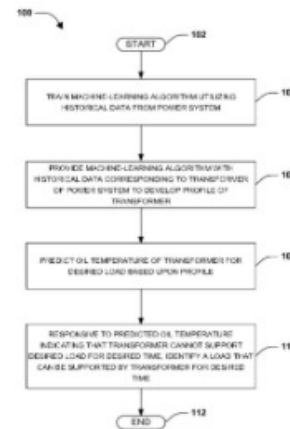


FIG. 1

### Abstract

[EN]

Method and system for predicting an oil temperature of a transformer for a desired load and/or predicting a load that a transformer can support for a desired time. A machine learning algorithm is developed using historical data of a transformer. After the algorithm is developed, historical data corresponding to the transformer are input into the algorithm to develop a profile of the transformer describing how the temperature of oil within the transformer is expected to change as a function of a desired load. Using the profile, the oil temperature of the transformer is predicted for a desired load. In this way, a prediction is made as to whether and/or for how long a transformer may support a desired load before the oil temperature reaches a specified threshold and/or before the transformer fails due to

# Record

## 4. WO2014078830 - PREDICTING THE OIL TEMPERATURE OF A TRANSFORMER



PCT Biblio. Data Description Claims Drawings National Phase Patent Family Notices **Documents**

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International Application Status			
Date	Title	View	Download
28.05.2021	International Application Status Report	<a href="#">HTML</a> , <a href="#">PDF</a> , <a href="#">XML</a>	<a href="#">PDF</a> , <a href="#">XML</a>

Published International Application			
Date	Title	View	Download
28.08.2014	Later publication of international search report[ (A3 35/2014)]	<a href="#">PDF (5p.)</a>	<a href="#">PDF (5p.)</a> , <a href="#">ZIP(XML + TIFFs)</a>
22.05.2014	Initial Publication without ISR[ (A2 21/2014)]	<a href="#">PDF (34p.)</a>	<a href="#">PDF (34p.)</a> , <a href="#">ZIP(XML + TIFFs)</a>

Search and Examination-Related Documents			
Date	Title	View	Download
19.05.2015	[ISA/237] Written Opinion of the International Searching Authority	<a href="#">PDF (9p.)</a>	<a href="#">PDF (9p.)</a> , <a href="#">ZIP(XML + TIFFs)</a>
19.05.2015	[IB/373] International Preliminary Report on Patentability Chapter I	<a href="#">PDF (10p.)</a>	<a href="#">PDF (10p.)</a> , <a href="#">ZIP(XML + TIFFs)</a>
14.07.2014	[ISA/210] International Search Report	<a href="#">PDF (5p.)</a>	<a href="#">PDF (5p.)</a> , <a href="#">ZIP(XML + TIFFs)</a>

# Documents: Application, search report

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
22 May 2014 (22.05.2014)

(10) International Publication Number  
**WO 2014/078830 A2**

(51) International Patent Classification:  
G05B 13/02 (2006.01)

(21) International Application Number:  
PCT/US2013/070696

(22) International Filing Date:  
19 November 2013 (19.11.2013)

(25) Filing Language:  
English

(26) Publication Language:  
English

(30) Priority Data:  
61/727,890 19 November 2012 (19.11.2012) US

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LV, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(71) Applicant (for all designated States except US): **ABB TECHNOLOGY AG** [CH/CH]; Aßlerstrasse 44, CH-8050 Zurich (CH).

(72) Inventors; and  
(73) Applicants (for US only): **DAGNINO, Aldo** [CA/US]; 105 Billingshurn Turn Lane, Cary, NC 27519 (US); **CHEIM, Lutz** [BR/US]; 855 Mecantley Way, St Charles, MO 63303 (US); **LIN, Lan** [CN/US]; 25011 Aventura Ferry Rd., Raleigh, NC 27606 (US); **PATEL, Poorvi** [SE/US]; 2572 Hickory Manor Dr., Bullwin, MO 63011 (US).

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

(74) Agent: **FISCHER, Marcus, A.**; Cooper Legal Group, LLC, 6505 Rockside Road, Suite 330, Independence, OH 44131 (US).

Published: — without international search report and to be republished upon receipt of that report (Rule 49.2(ii))

WO 2014/078830 A2

(54) Title: PROFILING TRANSFORMER OF POWER SYSTEM

(57) Abstract: Among other things, one or more techniques and/or systems are provided for predicting an oil temperature of a transformer for a desired load and/or predicting a load that a transformer can support for a desired time. A machine learning algorithm may be developed using historical data of a power system. After the algorithm is developed, historical data corresponding to the transformer may be input into the algorithm to develop a profile of the transformer. Using the profile, an oil temperature of the transformer may be estimated or predicted for a desired load. In this way, a prediction may be made as to whether and/or for how long a transformer may support a desired load before the oil temperature reaches a specified threshold and/or before the transformer fails due to the load.

## INTERNATIONAL SEARCH REPORT

International application No  
**PCT/US2013/070696**

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> INV. G05B13/02 ADD. H01F27/40		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) H01F G05B		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal, WPI Data		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	QING HE ET AL: "Prediction of Top-Oil Temperature for Transformers Using Neural Networks", IEEE TRANSACTIONS ON POWER DELIVERY, IEEE SERVICE CENTER, NEW YORK, NY, US, vol. 15, no. 4, 1 October 2000 (2000-10-01), XP011049941, ISSN: 0885-8977 the whole document -----	1-10, 18-20

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# Record: National phase

## 4. WO2014078830 - PREDICTING THE OIL TEMPERATURE OF A TRANSFORMER



PCT Biblio. Data Description Claims Drawing **National Phase** Patent Family Notices Documents

PermaLink

Available information on National Phase entries [\[more information\]](#)

Office	Entry Date	National Number	National Status
United States of America	19.05.2015	14443818	Granted: 19.08.2018
European Patent Office	19.08.2015	<a href="#">2013802783</a>	Published: 11.11.2015 Granted: 12.09.2018
China	17.07.2015	201380070788.0	Granted: 31.05.2019



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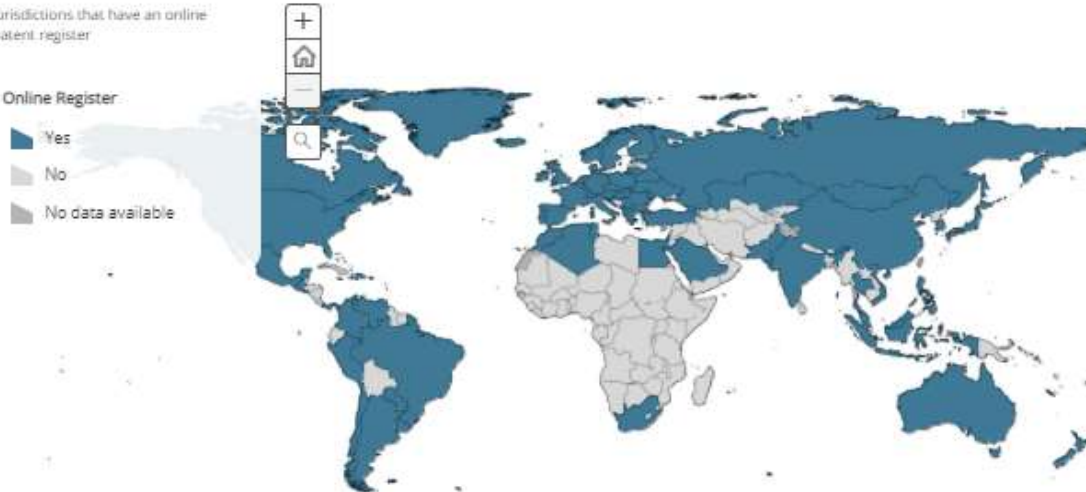

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Online Register

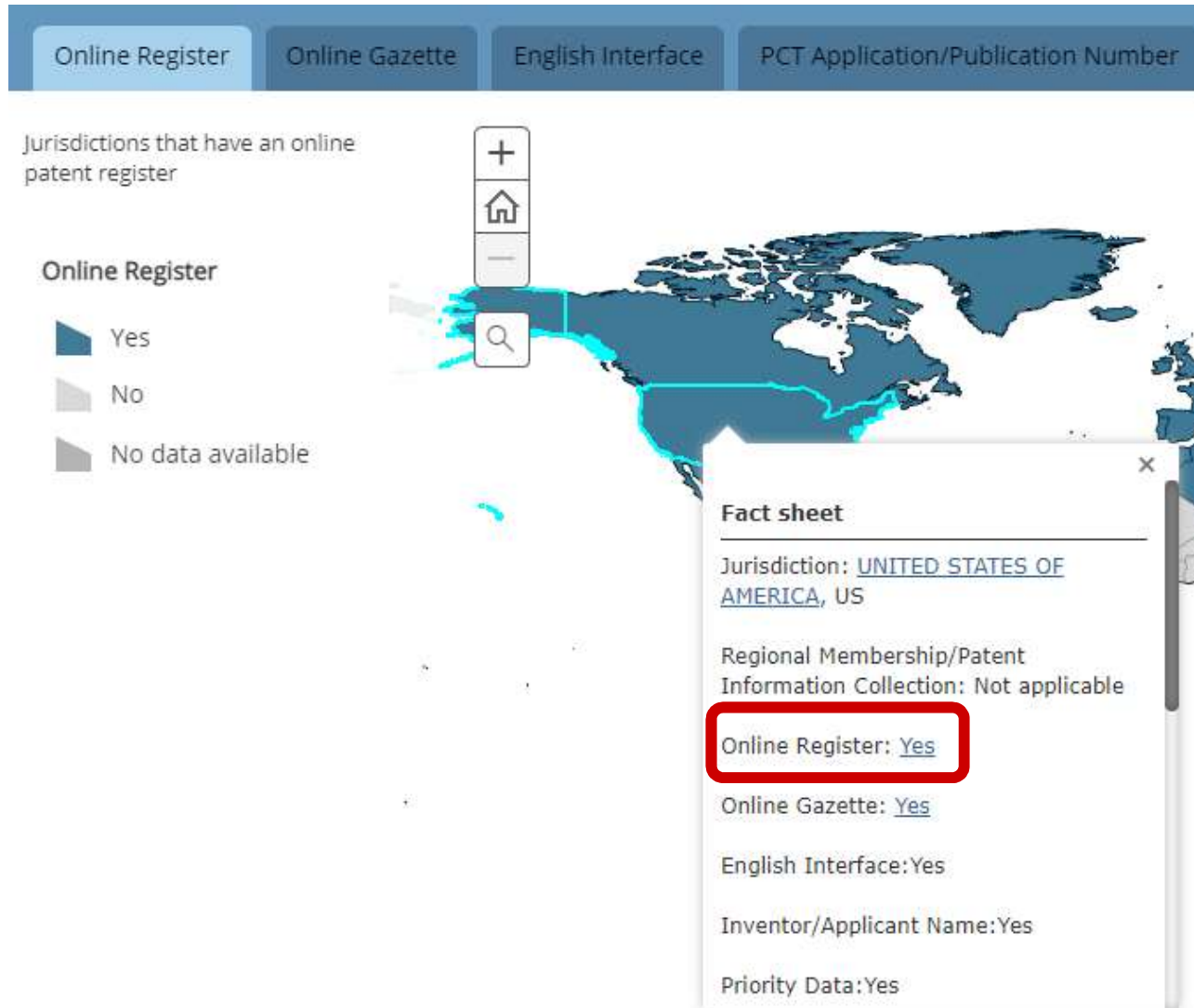
Yes

No

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**14/443,816** **PROFILING TRANSFORMER OF POWER SYSTEM** **US-12050-US-OAG**

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### Bibliographic Data

Application Number:	14/443,816	Correspondence Address Customer Number:	105679
Filing or 371 (c) Date:	05-19-2015	Status:	Patented Case
Application Type:	Utility	Status Date:	05-30-2018
Examiner Name:	HOLMES, MICHAEL B	Location:	ELECTRONIC
Group Art Unit:	2129	Location Date:	-
Confirmation Number:	9035	Earliest Publication No:	US 2016-0005522 A1
Attorney Docket Number:	US-12050-US-OAG	Earliest Publication Date:	01-07-2016
Class / Subclass:	706/012	Patent Number:	10,002,701
First Named Inventor:	Aldo Dagnino , Cary, NC (US) all Inventors	Issue Date of Patent:	06-19-2018
First Named Applicant:	-	International Registration Number (Hague):	-
Entity Status:	Undiscounted	International Registration Publication Date:	-
AIA (First Inventor to File):	No		

Patent Information  
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# Task breakdown

- Access the PATENTSCOPE search service
- Retrieve patent documents based on
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  - classification
  - keywords and classification
- Analyze the whole set of results according to applicants and inventors
- Examine a specific patent document and its related documents within the results
- **Keep up-to-date on new patent documents**


# Results



82 results Offices all Languages en Stemming true Single Family Member true Include NPL false


Sort: Relevance ▼ Per page: 10 ▼ View: All ▼ < 1/9 >    Machine translation ▼

1. [WO/2014/015096](#) PERFORMANCE MONITORING IN A GAS **OIL** SEPARATION PLANT WO - 23.01.2014

Int.Class [G05B 13/00](#)  Appl.No PCT/US2013/050998 Applicant SAUDI ARABIAN **OIL** COMPANY Inventor AMMINUDIN, Kamarul, A.


The invention provides a facility monitoring system and method of using the system that allows for prioritization of performance parameters to be improved based on deviations from target performance parameters. Improvement incentives are provided to users on a user interface such that the user appreciates the value of the improvement to be conducted.

2. [101556457](#) DYNAMIC OPTIMIZING CONTROL METHOD FOR EFFICIENCY OF HIGH CAPACITY **OIL** TRANSFER PUMP CN - 14.10.2009

Int.Class [G05B 13/00](#)  Appl.No 200910022550.2 Applicant Xi'an University of Technology Inventor Liu Jun

The invention discloses a dynamic optimizing control method for the efficiency of a high capacity oil transfer pump, comprising the following steps: firstly, the setting value of an oil transfer pump system is assured, the actual output value of the oil transfer pump system is measured, a deviation value signal is inputted into a network controller, wherein, the deviation value is equal to the setting value deducts the actual output value; secondly, an output value is transmitted to the oil transfer pump system after being counted by the network controller, the change of a centrifugal pump parameter is realized, meanwhile the output value and the actual output value of the oil transfer pump system are jointly inputted into an identification network by the network controller, and the identification network is modified by a deviation value between the identification output value of the identification network and the actual output value, therefore, the identification output value is close to the actual output value; and finally, according to the deviation situation between the setting value and the identification output value and the relationship between efficiency and the actual output value, the parameter of the network controller is modified by a system optimization purpose process so as to realize dynamic optimizing control and cooperative control for the efficiency of the oil transfer pump system.

3. [1218135](#) AUTOMATIC CONTROLLING INSTRUMENT FOR MECHANICAL **OIL** WELL CN - 02.08.1999


Int.Class [G05B 13/00](#)  Appl.No 97108899.0 Applicant Ouyang Hu Inventor Ouyang Hu




A full-automatic control instrument for mechanical oil well is composed of power supply, timer, intermittence controller, display controller and speech prompt circuit. Said intermittence controller includes pressure protecting circuit which can control load circuit to work when well pressure is too high or too low, and the system runs safety. The timing signals of intermittence is provided by timer composed of crystal oscillator and signals of timer includes hour, minute and second, which can be chosen by system according to different requirements.

# PATENTSCOPE Accounts


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IC:("G05B 13/00") AND EN\_TI:(oil) 

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1. [WO/2014/015096](#) PERFORMANCE MONITORING IN A GAS OIL SEPARATION PLANT WO - 23.01.2014  
Int.Class [G05B 13/00](#)  Appl.No PCT/US2013/050998 Applicant SAUDI ARABIAN OIL COMPANY Inventor AMMINUDIN, Kamarul, A.  
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# PATENTSCOPE Accounts

- Save queries
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- Export data
- Chemical Compounds Search

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## SETTINGS

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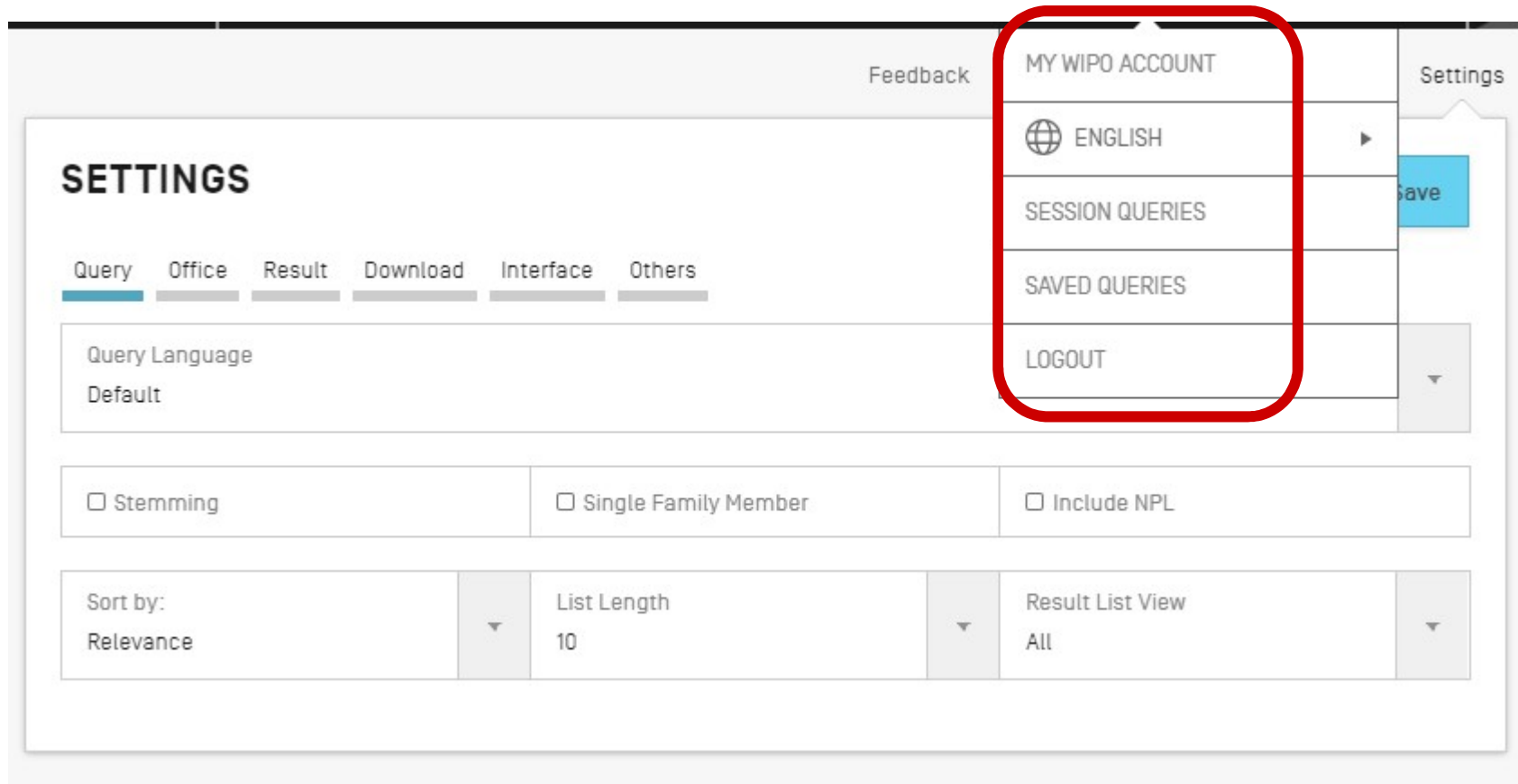
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Stemming  Single Family Member  Include NPL

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**IC:(\"G05B 13/00\") AND EN\_TI:(oil)** 🔍

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The screenshot shows the 'SETTINGS' page of a WIPO account. The page has a top navigation bar with 'Feedback' and 'Settings' links. The main content area is titled 'SETTINGS' and has several tabs: 'Query', 'Office', 'Result', 'Download', 'Interface', and 'Others'. The 'Query' tab is selected. Under the 'Query' tab, there is a 'Query Language' section set to 'Default'. Below this are three checkboxes: 'Stemming', 'Single Family Member', and 'Include NPL'. At the bottom, there are three dropdown menus: 'Sort by:' (set to 'Relevance'), 'List Length' (set to '10'), and 'Result List View' (set to 'All'). On the right side, there is a user menu with a red box highlighting the 'SAVED QUERIES' option. The other options in the menu are 'MY WIPO ACCOUNT', 'ENGLISH', 'SESSION QUERIES', and 'LOGOUT'. A 'Save' button is visible next to the 'SESSION QUERIES' option.



# Export results

IC:("G05B 13/00") AND EN\_TI:(oil)

82 results Offices all Languages en Stemming true Single Family Member true Include NPL false

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100 results

10,000 results

1. [WO/2014/015096](#) PERFORMANCE MONITORING IN A GAS OIL SEPARATION PLANT WO - 23.01.2014

Int.Class [G05B 13/00](#) ? Appl.No PCT/US2013/050998 Applicant SAUDI ARABIAN OIL COMPANY Inve narul, A.

The invention provides a facility monitoring system and method of using the system that allows for prioritization of performance parameters to be improved based on deviations from target performance parameters. Improvement incentives are provided to users on a user interface such that the user appreciates the value of the improvement to be conducted.

# Chemical structure search interface

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IC:("G05B 13/00") AND EN\_Tl:(oil)

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Field Combination  
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Chemical compounds

1. [WO/2014/015096](#) PERFORMANCE MONITORING IN A GAS OIL SEPARATION PLANT WO - 23.01.2014  
Int.Class [G05B 13/00](#) Appl.No PCT/US2013/050998 Applicant SAUDI ARABIAN OIL COMPANY Inventor AMMINUDIN, Kamarul, A.  
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Int.Class [G05B 13/00](#) Appl.No 200910022550.2 Applicant Xi'an University of Technology Inventor Liu Jun  
The invention discloses a dynamic optimizing control method for the efficiency of a high capacity oil transfer pump, comprising the following steps: firstly, the setting value of an oil transfer pump system is assured, the actual output value of the oil transfer pump system is measured, a deviation value signal is inputted into a network controller, wherein, the deviation value is equal to the setting value deducts the actual output value; secondly, an output value is transmitted to the oil transfer pump system after being counted by the network controller, the change of a centrifugal pump parameter is realized, meanwhile the output value and the actual output value of the oil transfer pump system are jointly inputted into an identification network by the network controller, and the identification network is modified by a deviation value between the identification output value of the identification network and the actual output value, therefore, the identification output value is close to the actual output value; and finally, according to the deviation situation between the setting value and the identification output value and the relationship between efficiency and the actual output value, the parameter of the network controller is modified by a system optimization purpose process so as to realize dynamic optimizing control and cooperative control for the efficiency of the oil transfer pump system.

# Chemical structure search interface

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