

Patent Searching Using Free Search Tools



2017

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Purpose of this document....

This article is a tutorial on several free patent search tools to help anyone who needs to locate patent information.

This document will act as a rapid introduction to each tool emphasizing its key features and where those features can be found. Since individual needs vary, it is our hope that you will be able to rapidly choose a tool with the functions that fit your needs.

The best patent searches are iterative using different search tools since each tool works slightly differently. The same search was performed in each tool using the same key words and you will notice that the number of results is quite different. This is most commonly due to the countries covered and the way family members are grouped.

Ideally, you would want to perform a search using at least two search tools. Each tool has different strengths, therefore, by searching with different tools you can take advantage of their unique search features, such as WIPO's translation query builder, or Google's synonyms.

Featured tools:

Many existing open source databases have been integrated into freely available search tools. We have chosen to present four tools based on their ease of use, reliability of results and useful key features.

- Espacenet
- Google Patents
- PATENTSCOPE
- The Lens

Presentation of each tool:

The section for each tool will include the following topics and the same search will be used for demonstration.

1. Overview and Coverage
2. Searching Capabilities / Key Features
3. Results Manipulation Capabilities
4. Privacy and Security
5. Additional Information - Help

Best Practices For Protecting Your Patent Search Information

When using free search tools on the Internet, consider the following tips:

1. Only search on encrypted (HTTPS) sites (protects against eavesdroppers on WiFi networks)
2. Delete your browser history after you have finished, or search in an "incognito window" (prevents information access in the event of computer theft)
3. Store your search notes on your computer's encrypted hard drive, or in the Cloud (prevents information access in the event of computer theft)

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Primer on Information Security:

Protecting confidentiality is a common source of misinformation regarding free search tools. Users should be aware that no tool (paid or free) is without risk. However, by following a few tips and understanding the "threat model", you can confidently search for patents while taking reasonable, best-practice security steps to protect the confidentiality of the invention.

Security and privacy are both important to protecting confidentiality.

There are multiple areas to secure while searching. First, consider local security (software updates, hard drive encryption, physical security) and the security of the provider (company reputation, security engineers).

Second, you need to know the ways in which your search strings can be seen as you type them and what are the associated "*threats*".

- Your keyboard (*hardware keyloggers*)
- Your browser (*extensions that can access your pages*)
- Your computer (*software keyloggers, viruses*)
- The internet (*eavesdroppers on non-HTTPS sites*)
- The search tool (*weaknesses of security systems*)

Last, you need to know what can save your search strings.

- Your browser history
- The search tool

Privacy covers the last piece: what does the search tool do with my search strings? Each company has a privacy policy that details how your search strings are processed, who has access to them and under what circumstances, for how long they are stored, and what identifying information they are stored with.

Today's patent search tools are a powerful means of obtaining key information when used with a knowledge of security, privacy, and best practices for protecting your search information.

Smart search

Advanced search
Classification search

Espacenet: free access to the database of over 90 million patents

Smart search: ⓘ Siemens EP 2007

Clear Search

Maintenance news

Espacenet outages

Regular maintenance outages:
scheduled between 05.00 and
05.15 hrs CET, Monday to
Saturday. → [read more...](#)

News flashes

Latest updates

Related links

Access to Global Dossier and links to the European Patent Register and national registers

The Espacenet interface displays Global Dossier icons and links to registers for certain authorities providing access to the Global Dossier and to register information, respectively. In order to avoid any ambiguity, access to Global Dossier and links to the registers have been separated. When you click on a Global Dossier icon, the behaviour is the same as in the European Patent Register. For links to a national register, the respective national (or EP) register window will open where links/pages are available. For authorities/documents where no link to a register is available, no link will be displayed. The Global Dossier link, when available, is displayed in the content area of the bibliographic view and in the INPADOC family view.

The Global Dossier service has now been extended to encompass further authorities participating in the WIPO CASE initiative. In addition to patent application dossiers, ("file wrappers") from the world's five largest patent offices, it now also includes public dossiers from the Canadian Patent Office as well as PCT applications. The bibliographic and full text-coverage tables have been improved to indicate changes in coverage. Result list sorting by publication date is now available.

For more details, please see the [release notes](#)

Online products – need some answers?

Use the [discussion forum](#) and get all the latest news and views about our online products. Read the regular postings from the forum team, post your questions – and answer those of other users.

<https://worldwide.espacenet.com/>

Overview and Coverage

Espacenet is a patent database that allows you to do full-text searches in English, French, or German. You can select the database in your preferred language and in addition to viewing your results online, you can export them to a CSV/XLS formatted file.

The worldwide database allows you to search for published patent applications from over 95 patent-granting authorities. Like all search tools, the EPO relies on the patent-granting authorities for its data, it cannot be guaranteed that the data in Espacenet is completely up-to-date. For example when seeking information on patent status, the user should go to the national register to obtain the most up-to-date information.

Espacenet includes data on more than 95 million patent documents world-wide.

Latest updates to the database

You will find up-to-date information on the EPO website under "Latest bibliographic coverage" and "Latest full-text coverage". Both lists are updated daily. Latest Full-text coverage information can be found at <http://www.epo.org/searching-for-patents/technical/full-text-additions.html>

Updates to the database

The Espacenet database is updated daily. Data is added to the database as soon as possible after it is received from the national patent granting authorities, in some cases on the day of publication.

Availability of searchable data in the database

Documents in the database have the following searchable fields: application number, priority number, publication number, publication date, inventor, applicant, International Patent Classification (IPC), Cooperative Patent Classification (CPC), title, abstract, description, claims and citations.

The CPC assigned by EPO examiners to non-European patent documents is usually available a few months after the publication date. This should be considered if you are targeting recently published documents.

English abstracts are normally loaded approximately one month after the publication date, depending on availability and delivery from the national offices and patent-granting authorities.

If the abstract is published in a language other than English, the original abstract is usually translated into English, unless

there are English abstracts already available for patent family members. Otherwise, the abstract is requested and subsequently loaded into the database.

Espacenet gives you access to:

- more than 95 million patent documents – most of them patent applications – from around the world, journal articles, and before new products reach the market. Patent applications normally represent the first publication of a new idea, appearing ahead of journal articles
- patent family information, telling you if similar patents have been filed in other countries
- legal status information, helping you find out whether, and in what countries, a patent is in force
- deep links to some national registers
- references to other kinds of technical literature (non-patent literature)
- citations – other documents cited by or citing the document you are looking at
- links to the European Patent Register for European and Euro-PCT documents and to selected national patent registers
- Global Dossier links to the file wrapper for US, Canada, WIPO, Chinese, Japanese and Korean patent applications.
- export to CSV/XLS
- searching by keyword in title abstract and full text (description and claims) and CPC
- CPC browser with CPC's assigned to EP docs after a delay. (Other docs are assigned CPCs as they are loaded into the database.)

Global Dossier

The link to Global Dossier offers access to patent or application "file wrappers", free of charge and with automatic machine translations to English. The file wrapper contains a historical listing of public documents including search reports, office actions, correspondence between the applicant and the patent office, and often the current legal status (status should be verified with the national office).

Common Citation Document

Clicking on the CCD link allows users to search for and view all documents cited by more than 35 patent offices in the search process for applications for the same invention.

Online customer support, helpdesk and training

Espacenet has many resources for anyone needing help in searching or using this powerful search tool.

Discussion Forums

Forums allow you to post your opinions, ask questions and share information on Espacenet. Current topics include: Search tips, Technical issues and Meet the experts.

Smart search
 Advanced search
 Classification search
 Maintenance news

Espacenet: free access to the database of over 90 million patents
 Smart search:

Key Features

Landing page

- On the landing page there are three search options: Smart search, Advanced search and Classification search.
- The Smart search takes a free-form search statement and will search in title and/or abstract with keywords. It will display a corresponding CQL search statement. You can also construct a CQL command-line search statement using field identifiers, Boolean and proximity operators. You can search full text in abstract or description or claims using the appropriate field identifiers. (See "Help" and "operators")

Search results list

- The number of results is found at the top of the list
- Arrow for the next page of results
- Sort functions: publication date, priority date, inventor, applicant and CPC
- Sort order
- Check box for selecting documents
- Select all check box
- Compact list view
- Functions of export or download covers
- Click on star to add the document to My Patents List

Our search example is 'solar portable usb charger'. Using **Smart Search**, a list of approximately 74 results is obtained. "Approximately" indicates a large number of results and the list contains multiple family members. (See results below.) If the list is less than 500, you can manipulate the list by sorting it, in which case the list is de-duplicated, "Approximately..." disappears, and the new list contains only one hit per family. The advanced search can also be used for specific field searching. The Advanced search, in Worldwide EN for full text, gives "Approximately 3,744 results"

Advanced search
 Select the collection you want to search in
 Enter your search terms - CTRL-ENTER expands the field you are in
 Enter keywords
 Keyword(s) in title, abstract and full text:
 Enter numbers with or without country code
 Publication number:
 Application number:
 Priority number:

Numerous fields for advanced searching

Search
 Result list
 My patents list (0)
 Query history
 Settings
 Help

Refine search → Results page 1

Smart search
 Advanced search
 Classification search

Result list
☐ Select all (0/25)

Quick help

Approximately 74 results found in the Worldwide database for:
 ((txt = solar and txt = portable) and txt = usb) and txt = charger using Smart search

Can I subscribe to an RSS feed of the result list?
 What does the RSS reader do with the result list?
 Can I export my result list?
 What happens if I click on "Download covers"?
 Why is the number of results sometimes only approximate?
 Why is the list limited to 500 results?
 Can I deactivate the highlighting?
 Why is it that certain documents are sometimes not displayed in the result list?
 Can I sort the result list?
 What happens if I click on the star icon?
 What are XP documents?

Sort by Sort order

☐ 1. Portable . solar . charger	Inventor: DONG HUANPING TIAN WEIGUO	Applicant: XI'AN ZIZHU ELECTRONIC SCIENCE & TECH CO LTD	CPC:	IPC: H02S40/38	Publication info: CN105703707 (A) 2016-06-22	Priority date: 2014-11-29
☐ 2. Portable . solar . charge pal	Inventor: LYU GUOFENG LIU JIANBIN (+2)	Applicant: HONGLI LIGHTING GROUP CO LTD	CPC:	IPC: H02J7/35 H02S30/20	Publication info: CN105356584 (A) 2016-02-24	Priority date: 2015-11-27
☐ 3. Multifunctional portable power source						

Patent Document View

- Indicator of document being reviewed
- Menu for parts of the document
- Previous and Next in result list
- Highlighted keywords
- Bibliographic information
- Classification codes CPC, IPC
- Link to Global Dossier on the document view page
- Translation options
- INPADOC patent family
- Link to Common Citation Document on the family list page
- Link to Global Dossier on the family list page

[Search](#)
[Result list](#)
[★ My patents list \(4\)](#)
[Query history](#)
[Settings](#)
[Help](#)

[Refine search](#) → [Results page 1](#) → [US2016285138 \(A1\)](#)

US2016285138 (A1)

Bibliographic data

Description

Claims

Mosaics

Original document

Cited documents

Citing documents

INPADOC legal status

INPADOC patent family

Quick help

→ What is meant by high quality text as facsimile?
→ What does A1, A2, A3 and B stand for after a European publication number?
→ What happens if I click on "In my patents list"?
→ What happens if I click on the "Register" button?
→ Why are some sidebar options deactivated for certain documents?
→ How can I bookmark this page?
→ Why does a list of documents with the heading "Also published as" sometimes

★ In my patents list

Previous

9 / 500

Next

Report data error

Print

4

3

PORTABLE ENERGY-STORAGE DEVICE WITH UNIVERSAL INPUT/OUTPUT POWER INTERFACE

Page bookmark

US2016285138 (A1) - PORTABLE ENERGY-STORAGE DEVICE WITH UNIVERSAL INPUT/OUTPUT POWER INTERFACE

Inventor(s):

LIU CHIH-PENG [TW]; HSIEN HSUN-MING [TW]; FANG FU-MIN [TW] ±

Applicant(s):

NAT CHUNG SHAN INST OF SCIENCE AND TECH [TW] ±

Classification:

- international: [H01M10/46](#); [H02J7/00](#); [H02J7/35](#)
- cooperative: [H01M10/46](#); [H01M10/465](#); [H02J7/0021](#); [H02J7/0026](#); [H02J7/355](#)

Application number:

US201514822990 20150811

Global Dossier

Priority number(s):

[TW20150109894](#) 20150327

Abstract of US2016285138 (A1)

Translate this text into

Select language

patenttranslate

powered by EPO and Google

A **portable** energy-storage device includes a battery module unit for storing and outputting electrical power; a power switch unit connected to the battery module unit to enable or disable the operations of the **portable** energy-storage device; a universal I/O power interface unit connected to the power switch unit to store and output electrical power; a power level monitoring unit connected to the power switch unit to monitor a power level of the battery module unit; a power level display unit for displaying a power level status of the battery module unit; and a protection switch control unit connected to the battery module unit and the power level monitoring unit. The power level monitoring unit signals the protection switch control unit to disable the operations of

[Search](#)
[Result list](#)
[★ My patents list \(4\)](#)
[Query history](#)
[Settings](#)
[Help](#)

[Refine search](#) → [Results page 1](#) → [US2016285138 \(A1\)](#) → Family

US2016285138 (A1)

Bibliographic data

Description

Claims

Mosaics

Original document

Cited documents

Citing documents

INPADOC legal status

INPADOC patent family

Quick help

→ Can I export this list?

Family list: US2016285138 (A1) — 2016-09-29

☐ Select all (0/1)
☐ Compact
Export (CSV | XLS)
Download covers
CCD
Print

1 application(s) for: **US2016285138 (A1)**

☐ 1. **PORTABLE ENERGY-STORAGE DEVICE WITH UNIVERSAL INPUT/OUTPUT POWER INTERFACE**

★ Inventor:

LIU CHIH-PENG [TW]; HSIEN HSUN-MING [TW] (+1)

Applicant:

NAT CHUNG SHAN INST OF SCIENCE AND TECH [TW]

CPC:

[H01M10/46](#)
[H01M10/465](#)
[H02J7/0021](#)
(+2)

IPC:

[H01M10/46](#)
[H02J7/00](#)
[H02J7/35](#)

Publication info:

US2016285138 (A1) 2016-09-29

Global Dossier

Priority date:

2015-03-27

Results Manipulation

- Translation
- My patents list
- Downloads
- Export
- Query history

My patents list

☐ Select all (0/4)
 ☐ Compact

4 items in my patents list

Sort by:
 Sort order:

☐	1. PORTABLE ENERGY-STORAGE DEVICE WITH UNIVERSAL INPUT/OUTPUT POWER INTERFACE				
	Inventor: LIU CHIH-PENG [TW] HSIEN HSUN-MING [TW] (+1)	Applicant: NAT CHUNG SHAN INST OF SCIENCE AND TECH [TW]	CPC: H01M10/46 H01M10/485 H02J7/0021 (+2)	IPC: H01M10/46 H02J7/00 H02J7/35	Publication info: US2016285138 (A1) 2016-09-29
☐	2. Wireless Multimode Charging Center				

Query history

☐ Select all
 ☐ Compact

5 items in query history list

☐	1. solar and portable and usb and charger
	solar and portable and usb and charger in the title, abstract or full text

Approximately 3451 results found in the WORLDWIDE EN database on Sun, 16 Oct 2016 10:39

Settings

☒ 1. **Enable query history**

Tick the box to enable the query history

Number of query history entries to save:

☒ 2. **Enable classification popups**

The pop-up is available on search results list, bibliographic view and classification search

☒ 3. **Enable highlighting**

Tick the box to activate the highlighting of search terms

Additional Information

- [Smart search](#)
- [Smart search - entering queries](#)
- [Smart search - field identifiers](#)
- [Smart search - operators](#)
- [Advanced Search](#)
- [Classification Search](#)
- [Espacenet Assistant](#)

A guided tour through Espacenet, crash courses (24 courses in 1-3 minutes), and Help index.

- T1 Getting Started
- T2 The Results List
- T3 Searching & Criteria
- T4 Classification
- T5 Search Strategies
- T6 Patent Documents
- T7 Tips & Tricks

My patents list is maintained one year unless updated.

The **query history** is maintained permanently unless deleted or overwritten. (Maximum of 50 query history entries.)

Check **settings** before using Espacenet for the first time. These functions are not automatically enabled.

Privacy and Security

Secure access to Espacenet is now available. This means that you can search in Espacenet within a verified secure domain. It also verifies that all communications between your browser and the website are encrypted.

Espacenet does not monitor individual searches. For more information, see [EPO and Espacenet Terms and Conditions](#).

Provider's Note

Key features and important points include: data coverage, CPC browser, links to Global Dossier, links to national registers, Common Citation Document, online customer support, forums, and expert helpdesk.

Espacenet is a great place to search, get information about patent families and obtain rapid access to national registers.

☐ Include non-patent literature (Google Scholar)

Search and read the full text of patents from around the world.

New! boolean search, graphs, thumbnail grids and downloads

[About](#) [Send Feedback](#) [Advanced Search](#) [Terms](#) [Privacy Policy](#)

<https://patents.google.com>

Overview and Coverage

Google Patents includes over 87 million patent publications from 17 patent offices around the world, as well as many more technical documents and books indexed in Google Scholar and Google Books.

It currently indexes full-text documents from the following patent offices:

United States	Europe
Japan	China
South Korea	WIPO
Russia	Germany
The United Kingdom	Canada
France	Spain
Belgium	Denmark
Finland	Luxembourg
The Netherlands	

You can see the real-time number of documents that are included from each patent office by clicking on "around the world" on <https://patents.google.com>. These totals include all patents and published applications in the index, but complete coverage cannot be guaranteed.



Many documents have full-text description and claims available. The "Since ..." dates listed on the statistics graph show when full-text is available, but additional abstract-only documents are often available for earlier dates.

Optical character recognition (OCR) has been performed on the US patents to 1790 to make them searchable, and Google Translate has been used on all non-English patents to make the English translations searchable.

Patents with only non-English text have been machine-translated to English and indexed, so you can search patent publications using only English keywords.

Non-patent literature

New ideas are often published either in patent applications or academic journals. If you are searching for prior art to a patent application, it is critical in many fields to also search for non-patent literature to get a complete view of the state of the art.

To make prior art searching easier, Google Patents includes a copy of the technical documents and books indexed in Google Scholar and Google Books. These documents have been machine-classified using the Cooperative Patent Classification scheme commonly used in patent searching to make finding documents easier.

You can browse the citation metrics for the top publications in [Google Scholar Metrics](#) to get an overview of the types and sources of papers included, and see Google Scholar help for [details on what papers are included](#).

Searching

From the homepage, you can begin your search in a few ways:

- **Enter a patent publication or application number**, such as [US9014905B1], [9014905], or [US 14/166,502]
- **Enter freeform text**, such as [autonomous vehicle camera]
- You can also enter ["exact phrases"] and metadata restricts [assignee:"Google Inc"], [inventor:page], and [before:2001]. Note: inventor and assignee names must be entered using the prefixes.
- If you are looking for **prior art**, check the "Include non-patent literature" box to include results from Google Scholar.
- Paste a large block of text, such as a paragraph, to run the **Prior Art Finder keyword extractor** to suggest search terms.

Any good search begins by developing a clear description of the subject of the search.

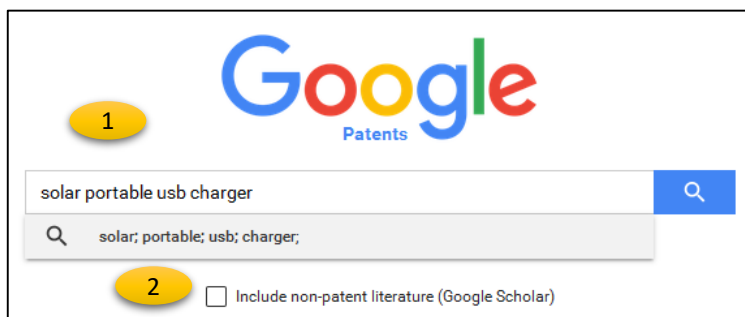
Key elements should be identified and any synonyms for those elements should be noted. (USB = universal serial bus)

Keywords can be tested by using Google and looking at "Images" to determine which words give the best results.

Those words can then be used in the Google Patents initial search box or in any other search tool.

https://support.google.com/faqs/answer/7049585?hl=en&ref_topic=6390989

Our search example is 'solar portable usb charger'. Non-patent literature may be included by checking the box, but for our example search we have chosen to only search patents.



New! boolean search, graphs, thumbnail grids and downloads

Key Features

Landing page

1. Initial syntax search
2. Checkbox to include non-patent literature

Search results list

The initial search terms are placed in boxes containing the search terms and additional open fields on the left. Documents are listed on the right. Click on the title to view document details in the patent document view screen.

3. "Boolean" like search with "or" between synonyms and each box being equivalent to "and"
4. Total results number at the top of the results list
5. Results can be ordered by relevance, newest or oldest
6. Results can be grouped by classification or ungrouped
7. Download results
8. Narrow or broaden searches by adding terms in boxes
9. Proposes CPC codes for words in the search terms box
10. Searches can be narrowed by dates, assignee, inventor, patent office, language, status, citing patent and CPC
11. Graphs of top assignees, inventors and CPCs
12. Expanded Thumbnail images
13. Link to PDF document
14. New search magnifying glass

SEARCH TERMS

solar x +Synonym

portable x +Synonym

usb x +Synonym

charger x +Synonym

+ Search term or

SEARCH FIELDS

Before priority YYYY-MM-DD

+ Assignee

MORE

After filing YYYY-MM-DD

+ Inventor

+ Patent office

+ Language

+ Filing status

+ Patent type

+ Citing

+ CPC

About 6,033 results

Download (CSV)

ordered by relevance

grouped by classification

10 results / page

H02J7/0042?

Circuit arrangements for charging or depolarising batteries or for supplying loads from batteries characterised by the mechanical construction

Portable phone holder and solar charger

Application US20100317413A1 • Qing Song Tan • Qing Song Tan

Priority 2009-06-15 • Filing 2010-04-05 • Publication 2010-12-16

A portable phone holder and solar charger for holding and charging a portable electronic device. The portable phone holder and charger includes a cradle portion which cradles a portable electronic device, a plug or electrical contacts that ...

Portable and universal hybrid-charging apparatus for portable electronic devices

Application US20090284216A1 • Jerry S. Bessa • Ipowerup, Inc.

Priority 2008-05-09 • Filing 2009-05-11 • Publication 2009-11-19

The teachings relate to a power supply that can be used to carry, charge, and power a portable electronic device, as well as be operable by a user while mobile, between or during uses of the portable electronic device. The power supply ...

Portable charging device capable of outputting voltage

Application US20080061739A1 • Sheng-Fu Lu • Sheng-Fu Lu

Priority 2006-09-11 • Filing 2006-09-11 • Publication 2008-03-13

A portable charging device capable of outputting voltage comprises a charger base, a power supply and a solar panel. The power supply and the solar panel are insertable into the charger base for inputting voltage to the charger base. The ...

→ Search within classification H02J7/0042 (3,820 results)

H01M10/465?

Accumulators structurally combined with charging apparatus with solar battery as charging system

Results by date

Relative count of top 5 values

Assignees	Inventors	CPCs
Osterhout Group, Inc.		3.2%
G02B2027/0178 G02B27/017 G02B27/01 G06Q30/02		
Mojo Mobility, Inc.		1.5%
H01F38/00 H01F38/14 H01F H01F1		
Teeng-Lu Chien		1.2%
F21V33/00 F21Y2101/00 F21Y2101 F21Y		
Recker Michael V		0.7%
H05B37/0245 H05B37/02 H05B37/0209 H05B37/00		
Wireless Environment, Llc		0.7%
H05B37/0272 H05B37/0245 H05B37/02 H05B37/0209		

Expand

Boolean syntax: Google Patents includes boolean syntax (USPTO or EPO format).

Proximity: You can use proximity operators to boost the score of documents if they contain expressions near each other.

Searching in title, abstract, claims, CPC: Use TI=(safety belt) to search in the title, AB= for the abstract and CL= for the claims. For CPCs, CPC=B60R22 will match documents with exactly this CPC, CPC=B60R22/low matches documents with this CPC or a child classification of this CPC.

Wildcards, truncation: See the "?" next to Search Terms for additional information

Graphs allow rapid access to other documents by the assignee, inventors or CPCs. The top five are viewed by default but the "Expand" link enlarges the list.

Patent document view

By clicking on the title, the document in the document review screen.

1. Key words are highlighted
2. Abstract, images and description are in the left-hand column

3. Bibliographic information and claims are on the right
4. Arrows to view the next document in the list
5. Classifications are between the images and the description
6. Additional fields to narrow the search
7. Button to return to the results list view

Google Patents

SEARCH TERMS

solar X + Synonym

portable X + Synonym

usb X or universal serial bus X + Synonym

charger X + Synonym

+ Search term or CPC

SEARCH FIELDS

Before priority: YYYY-MM-DD

+ Assignee

MORE 6

BACK TO 6.2K RESULTS

7

Portable and universal hybrid-charging apparatus for portable electronic devices

Abstract

The teachings relate to a power supply that can be used to carry, charge, and power a portable electronic device, as well as be operable by a user while mobile, between or during uses of the portable electronic device. The power supply comprises a modular hybrid-charger assembly operably connected to a device holder. The modular hybrid-charger assembly comprises a rechargeable internal battery connected to a port operable to function as a tetherless connection to a portable electronic device, a power management engine embodied in a computer readable medium, and an untethered solar energy source. The device holder comprises a framework operable to receive, hold, and release the portable electronic device; and an alignment mechanism that facilitates a mating of the portable electronic device with the hybrid-charger assembly. The modular hybrid-charger assembly can comprise a form factor that is interchangeable and operable with each of several different device holder form factors.

Images (8)

Classifications

H02J7/0044 Circuit arrangements for charging or depolarising batteries or for supplying loads from batteries characterised by the mechanical construction specially adapted for holding portable devices containing batteries

View 3 more classifications

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application No. 61/052,065, filed May 9, 2008, which is hereby incorporated herein by reference in its entirety.

BACKGROUND

[0002] 1. Field of the Invention

[0003] The teachings generally relate to a wearable, portable docking station having a charging mechanism for a portable electronic device.

[0004] 2. Description of the Related Art

[0005] A longstanding painpoint of the mobile electronic device industry is inadequate battery life. Battery technology has not kept pace with the power-hungry applications being added to smartphones, for example. The 3G cellular market is growing at a high rate and will reach 1 billion units by 2012. There are, however, over 3.5 billion cell phone customers worldwide, and it is expected that the

Claims (58)

1. A portable and universal hybrid-charging apparatus for a portable electronic device comprising a modular hybrid-charger assembly operably connected to a device holder, wherein, the modular hybrid-charger assembly comprises: a rechargeable internal battery connected to a port operable to function as a tetherless connection to a portable electronic device; a power management engine embodied in a computer readable medium and operable to identify power input to the hybrid-charger assembly, set an input current limit to the charger assembly, detect the status of the internal battery, provide charge where required, or a combination thereof; and an untethered solar energy source; and,

US20090284216A1

US Application

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Legal status: Granted

Application number: US12454108

Other versions: US8080975B2 (Grant)

Inventor: Jerry S. Bessa, Martin D. Cox, Donald K. Moore

Current Assignee: iPowerUp Inc

Original Assignee: iPowerUp Inc

Priority date: 2008-05-09

Filing date: 2009-05-11

Publication date: 2009-11-19

Info: Patent citations (31), Cited by (68), Also published as (5), Legal events, Similar documents

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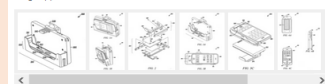
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Portable and universal hybrid-charging apparatus for portable electronic devices

Abstract

The teachings relate to a power supply that can be used to carry, charge, and power a portable electronic device, as well as be operable by a user while mobile, between or during uses of the portable electronic device. The power supply comprises a modular hybrid-charger assembly operably connected to a device holder. The modular hybrid-charger assembly comprises a rechargeable internal battery connected to a port operable to function as a tetherless connection to a portable electronic device, a power management engine embodied in a computer readable medium, and an untethered solar energy source. The device holder comprises a framework operable to receive, hold, and release the portable electronic device; and an alignment mechanism that facilitates a mating of the portable electronic device with the hybrid-charger assembly. The modular hybrid-charger assembly can comprise a form factor that is interchangeable and operable with each of several different device holder form factors.

Images (8)



Classifications

H02J7/0044 Circuit arrangements for charging or depolarising batteries or for supplying loads from batteries characterised by the mechanical construction specially adapted for holding portable devices containing batteries

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Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application No. 61/052,065, filed May 9, 2008, which is hereby incorporated herein by reference in its entirety.

BACKGROUND

Claims (58)

1. A portable and universal hybrid-charging apparatus for a portable electronic device comprising a modular hybrid-charger assembly operably connected to a device holder, wherein, the modular hybrid-charger assembly comprises:

US20090284216A1

US Application

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Legal status: Granted

Application number: US12454108

Other versions: US8080975B2 (Grant)

Inventor: Jerry S. Bessa, Martin D. Cox, Donald K. Moore

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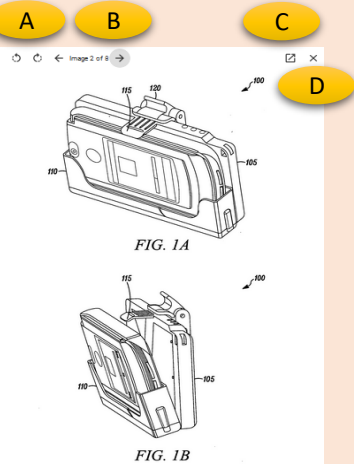
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Inventor: [Jerry S. Bessa](#), [Martin D. Cox](#), [Donald K. Moore](#)

Current Assignee: [iPowerUp Inc](#)

Original Assignee: [iPowerUp Inc](#)

Priority date: 2008-05-09

Filing date: 2009-05-11

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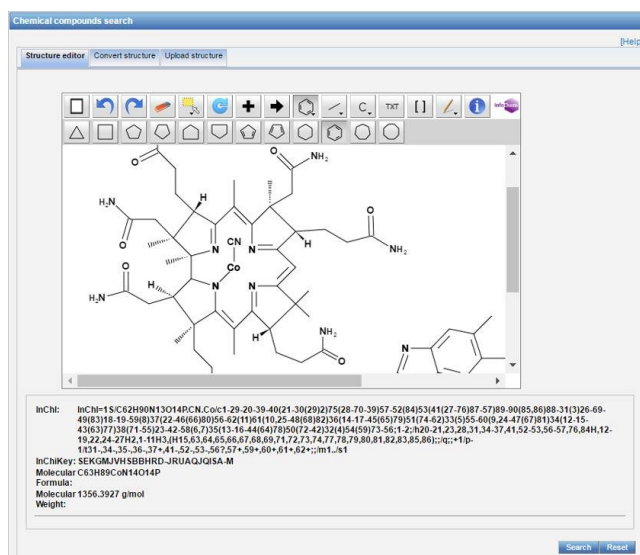
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Analysis

Sort by: Relevance View: All List Length: 50 Machine translation

Int.Class	Appl.No	Title	Applicant	Inventor	PubDate
H02J 7/00	13684269	Portable solar power supply	Hugee Technology Co., Ltd.	Hung Pin Shen	30.05.2013

15. Link to individual record
 16. Bibliographic information
 17. Abstract
 18. Image (click to enlarge)

A portable solar power supply includes a solar-powered charger including a solar cell; a circuit board including a power management unit, a buck-boost converter unit, a charging control unit, a data management unit, an on/off switch, a set of indicators, a power inlet, a power outlet, a first connector, a wireless communications member, a line transmission member, a data storage member, an RFID member, an SD card member, a USB port, a Micro USB port, and a solar charging member; and holes; and a rechargeable battery including at least one electrochemical cell each shaped to partially contain the solar-powered charger and including a second connector, a third connector, snapping members, and slots. The second connector is capable of connecting to the first connector or the third connector, and the snapping members are capable of being retained in the holes or the slots.

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1. (US20080084177) Portable devices having multiple power interfaces

National Biblio. Data Description Claims Drawings Documents

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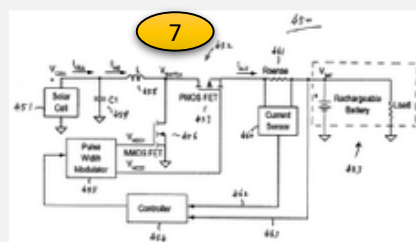
Application Number: 11544108 Application Date: 06.10.2006
 Publication Number: 20080084177 Publication Date: 10.04.2008
 Grant Number: 7514900 Grant Date: 07.04.2009
 Publication Kind : B2

IPC: H01M 10/42 
 H01M 10/44
 H01M 10/46

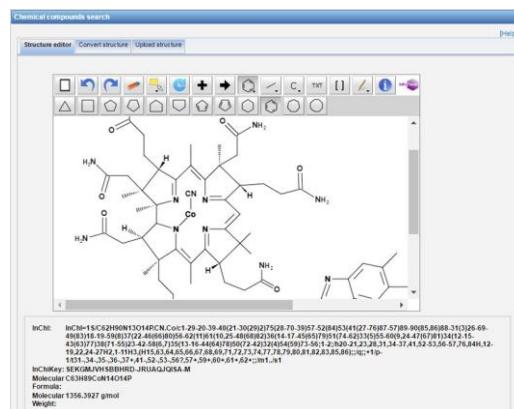
Applicants: Apple Inc.
 Inventors: Sander Wendell B.
 Warren Daniel A.
 Agents: Kramer Levin Naftalis & Frankel LLP

Priority Data:
 Title: (EN) Portable devices having multiple power interfaces
 Abstract: (EN)

Portable devices having multiple power interfaces are described herein. According to one embodiment of the invention, a portable electronic device includes, but is not limited to, a processor, a memory coupled to the processor for storing instructions, when executed from the memory, cause the processor to perform one or more functions, a battery coupled to provide power to the processor and the memory, and a battery charging manager coupled to charge the battery using power derived from a plurality of power sources including a solar power source. Other methods and apparatuses are also described.


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```
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動電子歯ブラシ" OR "これを用いた電動電子歯ブラシ
") OR KO_AB:("전동 칫솔" OR "전동 칫솔용") OR
PT_AB:("escova de dente elétrica") OR
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электрической зубной щетки") OR ZH_AB:("电动牙刷")
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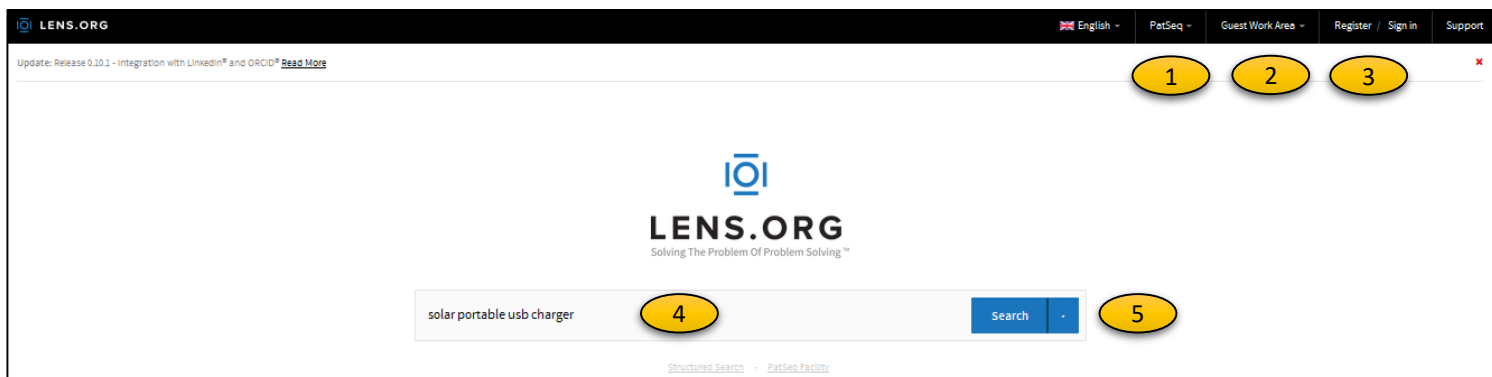
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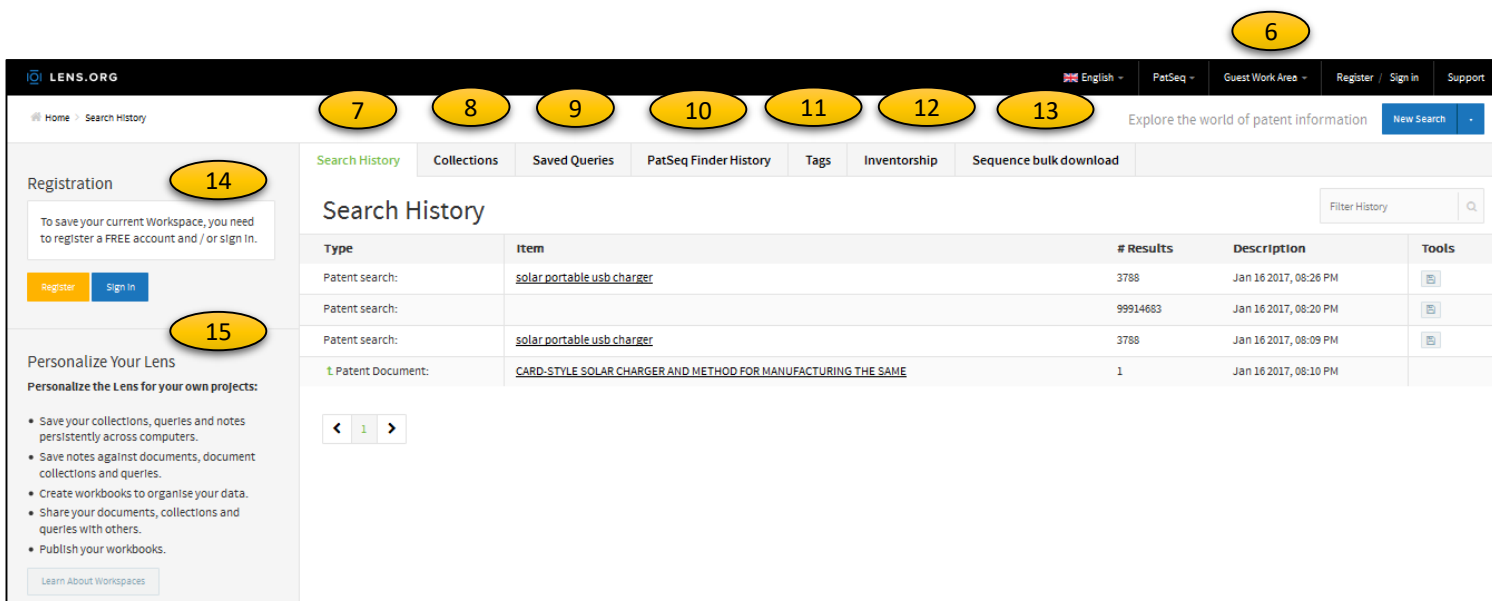
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Patent Document:	CARD-STYLE SOLAR CHARGER AND METHOD FOR MANUFACTURING THE SAME	1	Jan 16 2017, 08:10 PM	

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Owner: Giga Solar Materials Corp

Solar Usb Charger

Published: Nov 10, 2011 Family: 1 Cited: 12 Info: [Link]

Applicant: Sela Anthony D

Solar-powered Charger With Heat-dissipating Surface

Published: Feb 12, 2009 Family: 4 Cited: 13 Info: [Link]

Owner: Better Energy Systems Inc, Better Energy Systems Ltd

Solar-powered Charger

Published: Apr 23, 2009 Family: 3 Cited: 13 Info: [Link]

Owner: Better Energy Systems Inc, Better Energy Systems Ltd

Portable Solar Power Supply

Published: May 30, 2013 Family: 7 Cited: 5 Info: [Link]

Owner: Huges Technology Co. Ltd

Portable Solar Power Supply

Published: May 28, 2015 Family: 7 Cited: 0 Info: [Link]

Owner: Huges Technology Co. Ltd

Solar-powered Charger

US 2013/0285593 A1

Doc Type: Patent Application

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Doc Type: Patent Application

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US 2009/0039827 A1

Doc Type: Patent Application

ID: lens.org/110-368-128-431-718

US 2009/0102414 A1

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ID: lens.org/125-025-120-619-559

US 2013/0134921 A1

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Card-style Solar Charger And Method For Manufacturing The Same

Published: Oct 31, 2013 Family: 2 Cited: 3 Cites: 62 Non Patent Citations: 3 Info: [Link] [Link] [Link]

Abstract

A card-style solar charger includes a flexible substrate, a solar cell, and a transparent cover membrane which are stacked up in bottom-to-top order and is characterized in that the card-style solar charger has an output end electrically connected to a connector of a transmission cable for supplying electric power. The card-style solar charger comes with different output ends to suit different contacts of a connector. Due to its card-like appearance and its way of generating solar power, the card-style solar charger is portable, lightweight, compact, easy to use, capable of instant charging, and widely applicable.

Claims

01. A card-style solar charger, comprising:
a flexible substrate;
a solar cell disposed on the flexible substrate and having two electrodes; and
a transparent cover membrane disposed on the solar cell,
wherein the card-style solar charger is characterized in that: the card-style solar charger has an output end disposed at an end of the flexible substrate and comprising two output electrodes electrically connected to the electrodes of the solar cell.

02. The card-style solar charger of claim 1, wherein the card-style solar charger is of a thickness of 1.2 mm.

03. The card-style solar charger of claim 2, further comprising a converter electrically connected to the output electrodes.

04. The card-style solar charger of claim 1, wherein the card-style solar charger meets ISO/IEC FDIS 7810 ID-1 requirements and is of dimensions of 85.60 mm by 53.98 mm.

05. The card-style solar charger of claim 1, wherein the output electrodes are of a rectangular shape each such that the output end comprising the output electrodes is electrically connected to a connector as needed.

06. The card-style solar charger of claim 1, wherein two slit-like openings are disposed at a same end of the card-... [Read More](#)

Owners (US)

Giga Solar Materials Corp (Oct 01 2012)

Applicants

Chu Rong-shian

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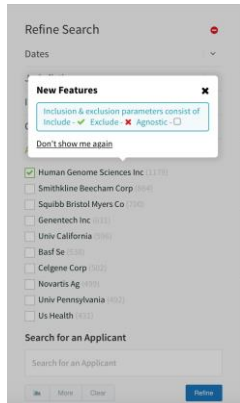
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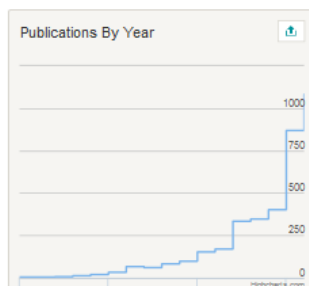
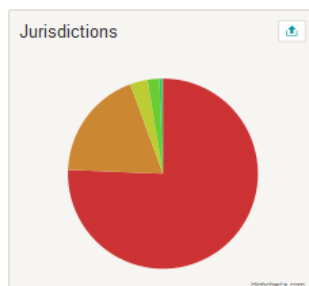
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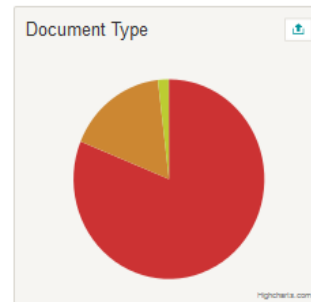
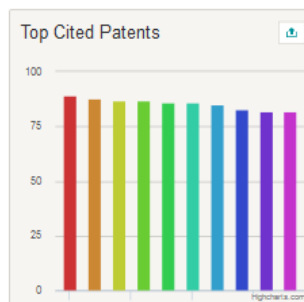
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We thank Lucy Antunes, Michael Chernoff, Nigel Clarke, Osmat Jefferson, Richard Jefferson, Ford Khorsandian and Sandrine Ammann for their assistance with this publication.

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