

IPR4SC

Developing Skills in Intellectual Property Rights Open Data for Sustainability and Circularity

Test report on Free Patents Online



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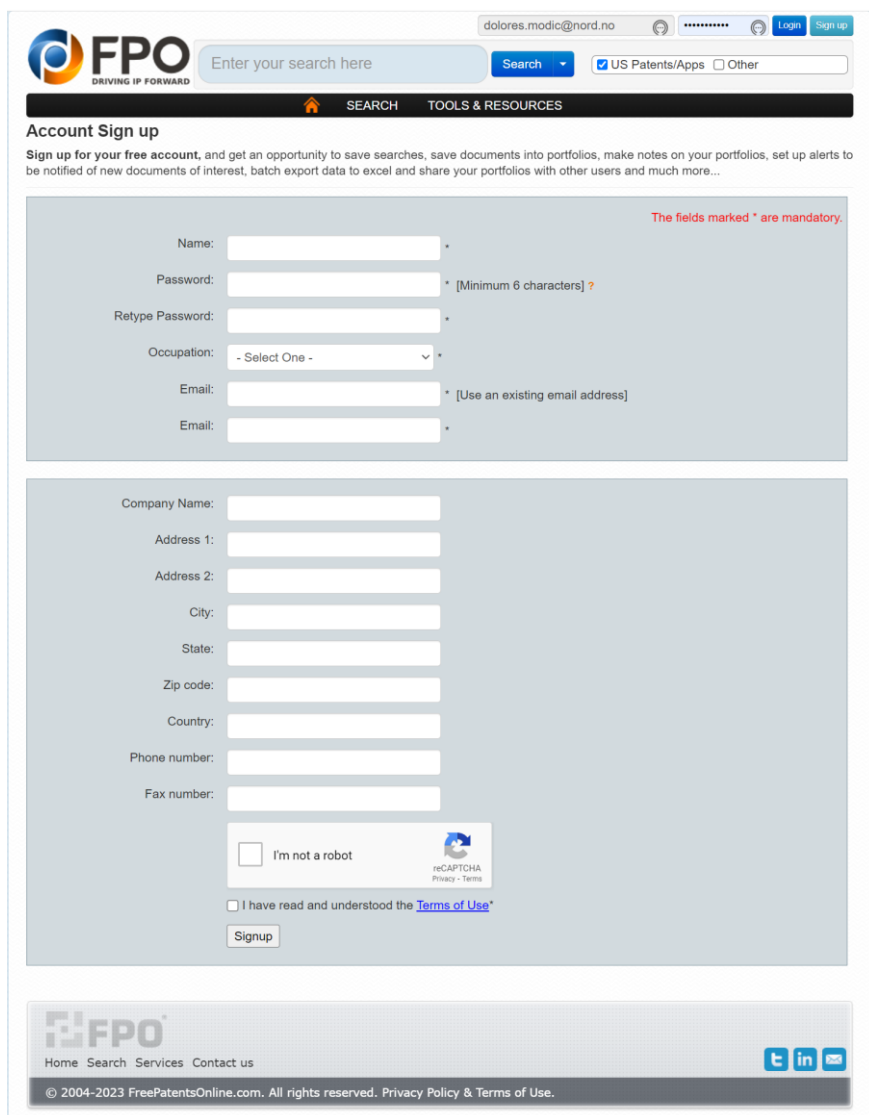
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1. Introduction

The present document gives a brief description of the major functionalities of Free Patents Online (FPO), a free open access patent analytics tool.

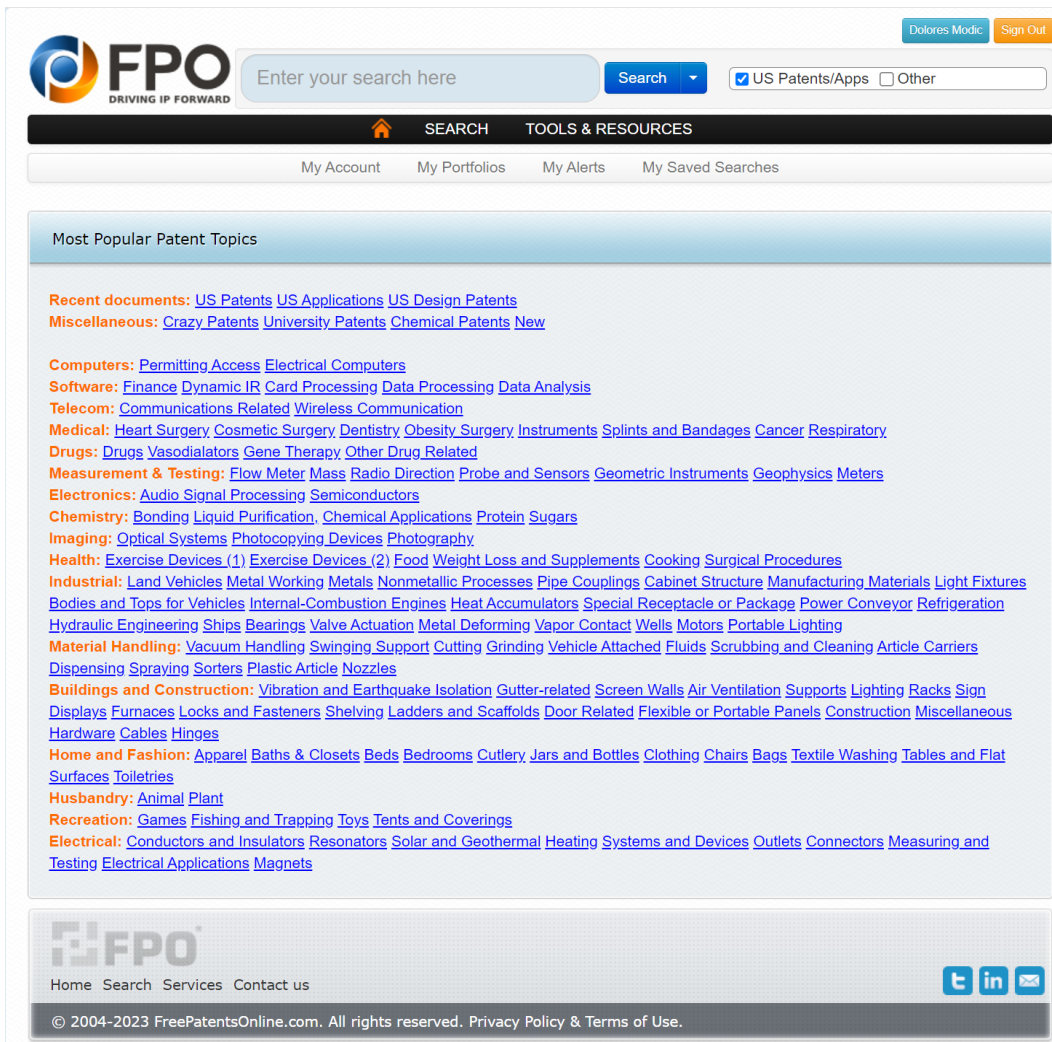
FPO only requires minimal organizational credentials and contact information from users to be granted immediate access. The tool does not provide any analytics, nor does it go beyond patent data. Searching with a semantic query is not possible. Since this is a free open access tool, users might experience some commercials popping up, but they do not detract much from the user **experience**.



The screenshot shows the 'Account Sign up' page of Free Patents Online (FPO). The page includes a search bar at the top with the text 'Enter your search here' and a 'Search' button. Below the search bar is a navigation menu with 'SEARCH' and 'TOOLS & RESOURCES'. The main heading is 'Account Sign up', followed by a brief description: 'Sign up for your free account, and get an opportunity to save searches, save documents into portfolios, make notes on your portfolios, set up alerts to be notified of new documents of interest, batch export data to excel and share your portfolios with other users and much more...'. The form contains several fields: 'Name', 'Password' (with a note '* [Minimum 6 characters] ?'), 'Retype Password', 'Occupation' (a dropdown menu), 'Email' (with a note '* [Use an existing email address]'), and another 'Email' field. A red note states 'The fields marked * are mandatory.' Below these fields are 'Company Name', 'Address 1', 'Address 2', 'City', 'State', 'Zip code', 'Country', 'Phone number', and 'Fax number'. At the bottom of the form, there is a reCAPTCHA widget with the text 'I'm not a robot', a checkbox for 'I have read and understood the Terms of Use', and a 'Signup' button. The footer of the page includes the FPO logo, navigation links for 'Home', 'Search', 'Services', and 'Contact us', social media icons for Twitter, LinkedIn, and Facebook, and a copyright notice: '© 2004-2023 FreePatentsOnline.com. All rights reserved. Privacy Policy & Terms of Use.'

2. Home page

Once the user has registered, the tool displays the home page (shown in the next figure). FPO suggests a list of 'Most Popular Patent Topics' from which the user can choose.

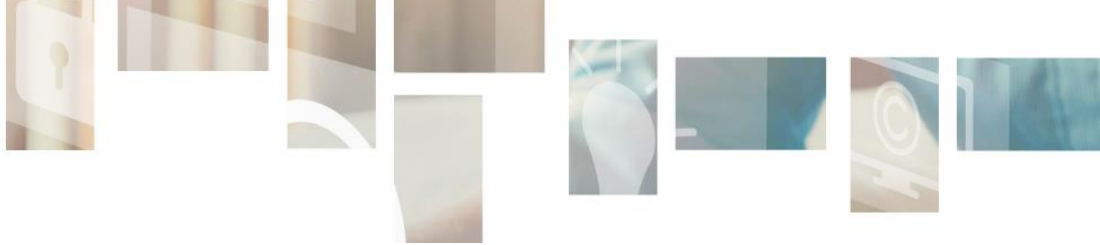


A search bar finds place in the center of the screen. Here the user can select among different search modalities: keyword-based, by publication number, by application number, by accession number, and semantic search. Users interested in chemical compounds can exploit the 'Chemical' option. There is also the possibility to build searches with a guided procedure by clicking on the 'Use Search Builder' button.

3. Patent search

The tool allows for a **quick search function** as well as an **expert search**. Both are briefly described in the next paragraphs.

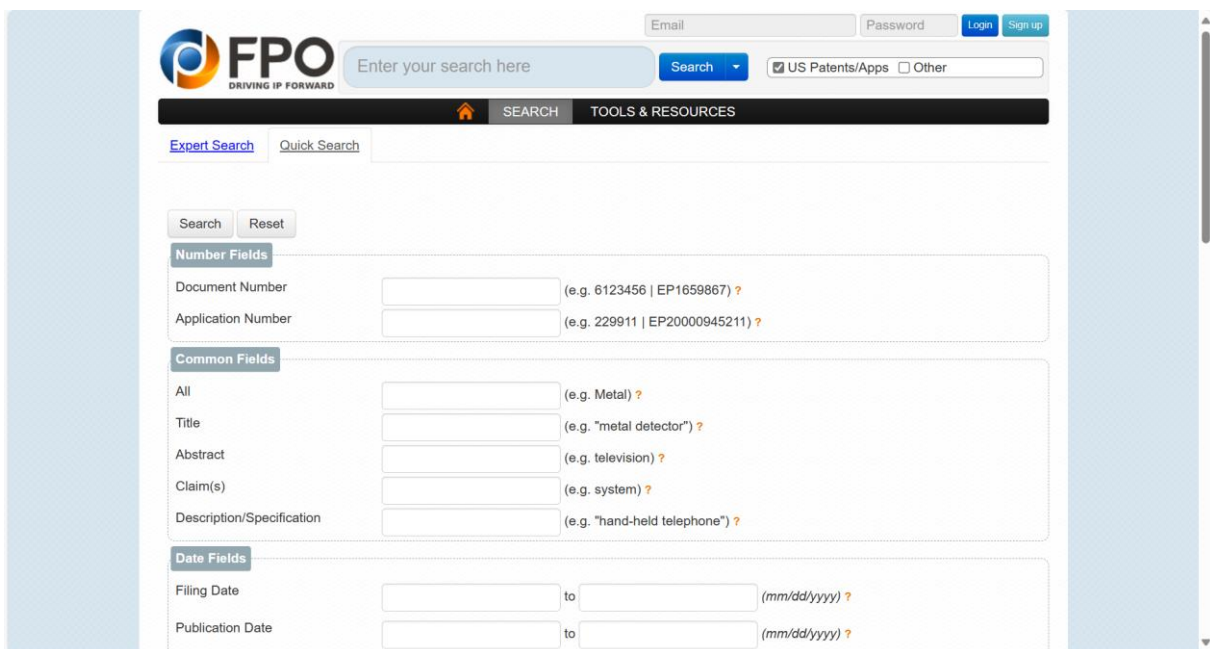
There are different reasons for doing a patent search. In practice each different type of search requires a slightly different approach, however the initial steps would typically be identical, so we do not make



a distinction at this point. Same is true when we are using the IP tools for e.g. for state-of-the-art searches (what solutions do we know for my technical problem) or e.g. novelty/patentability searches (can I obtain a patent for my invention), other than in specific cases if the tool would allow for some specific filtering or similar (e.g. to only patents with so-called Y-tags with which some waste related patents are marked) - these we point out in particular below.

3.1. Quick search

The **quick search** allows for a number of field searches, such as those connected to document number searches (if you already know a particular patent you would like to check), then searching with keywords in various parts of the document (e.g. throughout, title, abstract, etc.), several date fields, as well as information on the actors (inventors, assignees, examiners, or attorneys/agents).



3.2. Expert search

In the **expert search** interface, the user can build a query which will usually have several elements: search keywords, and logical operators (e.g., AND, OR, NOT), as well as further limitations to where the search query should run (e.g., only through abstracts). The tool will give you also suggestions on how to deal with permutations (e.g., using electronic* waste, which would allow for searching for “electronic waste”, “electronical waste” or “electronics waste”).

Click here for [field abbreviations](#) and [character map](#)

US Patents
 US Patent Applications
 EP documents
 Abstracts of Japan
 WIPO (PCT)
 German Patents (Beta)

Date Range* All years Last 20 years

Word Stemming On Off

Sort Order Chronological Relevancy

* Entering date parameters in the box will override the 'date range' buttons.

Note that most fields support Phrase (ABST/"cardboard box"), Proximity (ABST/"cardboard box"~5), Wildcard (ABST/card*), and Leading Wildcard (ABST*ectomy) queries. Some fields support range queries and math operations. Only basic examples are provided below.

Field Abbr.	Field Name	Type	Syntax Example and Comments
AADR	Assignee Address (complete string)	Text	AADR/California AADR/"Route 66"
ABST	Abstract	Text	ABST/widget ABST/"titanium steel"

To build a query, **first observe limitations**. Is there a limitation on the number of keywords, is there limitations or extra options in terms of the search (wildcards, near-to, ...) for the tool etc. Note that for FPO most fields support Phrase (ABST/"cardboard box"), Proximity (ABST/"cardboard box"~5), Wildcards (ABST/card*), and Leading Wildcards (ABST/*ectomy) queries. However, it is not possible to do wildcard within exact phrases (e.g. "electronic* waste").

It is worth noting that the user will have to always (re-)tick the datasets to derive the results from (same would also apply to the quick search).

Click here for [field abbreviations](#) and [character map](#)

US Patents
 US Patent Applications
 EP documents
 Abstracts of Japan
 WIPO (PCT)
 German Patents (Beta)

Date Range* All years Last 20 years

Word Stemming On Off

Sort Order Chronological Relevancy



* Entering date parameters in the box will override the 'date range' buttons.

To test this tool we used the following keyword query option. We constructed the following query based on our example:

(remanufacturing machine OR remanufacturing device OR sorting machine OR sorting device OR circular economy OR sustainable manufacturing OR repair OR material recovery OR disassembly OR dismantling OR deconstruction OR reassembly) AND (electronic waste OR e-waste OR electronic* component scrap OR electronic scrap) AND (separation sensor system OR sensor-based sorting OR advanced sensors OR electronic device component identification OR imaging sensor* OR thermal sensor* OR spectroscopic sensor* OR sensor array)*

Save Search:
 Search name Click here to save this search

Matches 1 - 50 out of 227724 [1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [8](#) [9](#) [10](#) [11](#) [12](#) [13](#) [14](#) [15](#) >

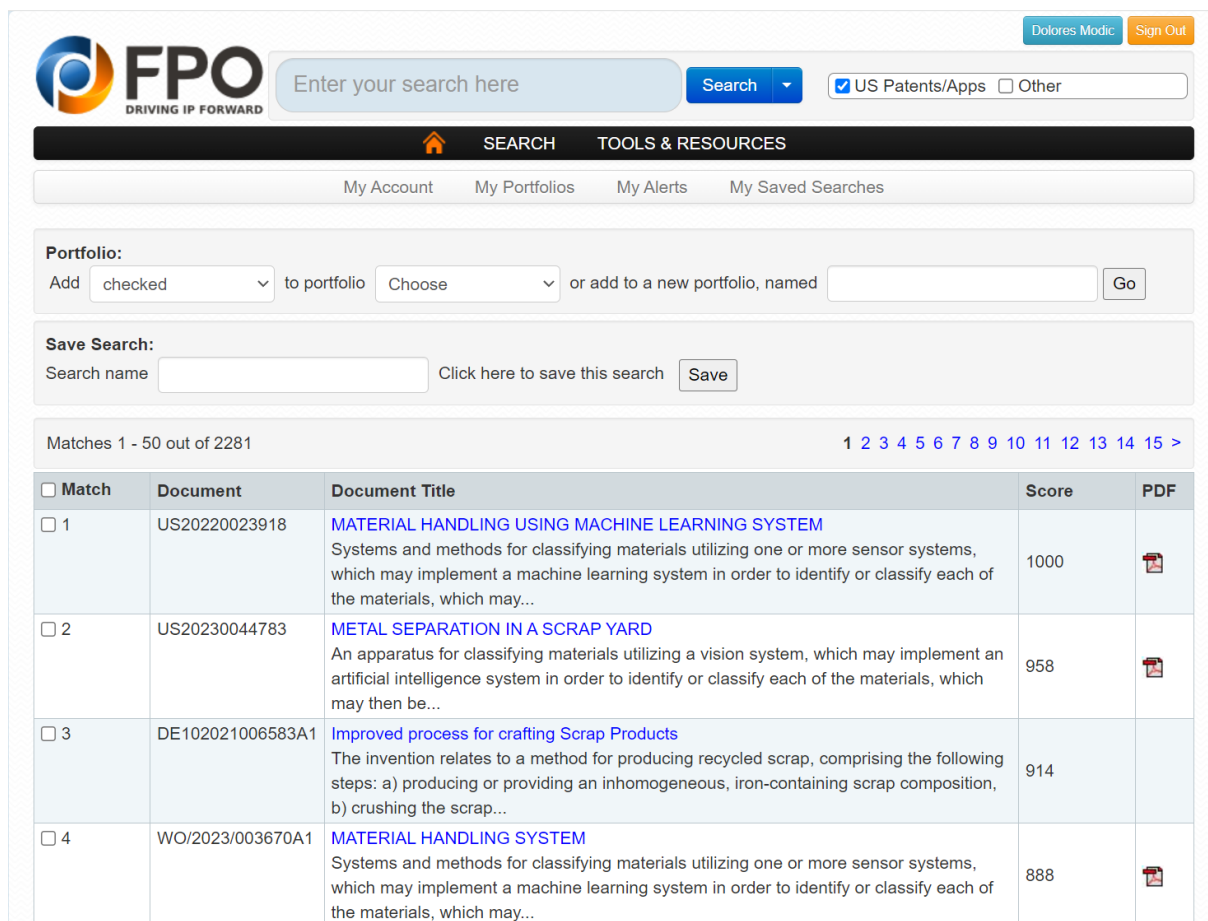
<input type="checkbox"/> Match	Document	Document Title	Score	PDF
<input type="checkbox"/> 1	WO/2022/102176A1	SORTING METHOD FOR ELECTRONIC COMPONENT SCRAPS AND PROCESSING METHOD FOR ELECTRONIC COMPONENT SCRAPS Provided are: an electronic component scrap sorting method with which it is possible to appropriately determine a scrap mixture including multiple types of components; and an electronic component...	1000	
<input type="checkbox"/> 2	10898928	Vision and analog sensing scrap sorting system and method A system and a method of sorting scrap particles is provided. A moving conveyor containing scrap particles is imaged using a vision system to create a vision image corresponding to a timed...	905	
<input type="checkbox"/> 3	JP2021159881A	COMPOSITION ANALYSIS METHOD FOR ELECTRONIC/ELECTRICAL EQUIPMENT COMPONENT SCRAP, DISPOSAL METHOD FOR ELECTRONIC/ELECTRICAL EQUIPMENT COMPONENT SCRAP, ANALYSIS DEVICE FOR ELECTRONIC/ELECTRICAL EQUIPMENT COMPONENT SCRAP, AND PROCESSING DEVICE FOR ELECTRONIC/ELECTRICAL EQUIPMENT COMPONENT SCRAP To provide a composition analysis method for electronic/electrical equipment component scrap, a disposal method for electronic/electrical equipment component scrap, an analysis device for...	878	
<input type="checkbox"/> 4	JP2022078835A	CLASSIFICATION METHOD FOR ELECTRONIC COMPONENT SCRAP AND PROCESSING METHOD FOR ELECTRONIC COMPONENT SCRAP		

The search query led to many results (over 200,000 patents), as we still weren't too specific. Wider searches can be beneficial, and for circular and eco-innovations, which are often complex and necessitate different actors, also across industries to be involved, often the invention from one field/industry can be even more so than usual, usable for another new circular solution. However, one also wants to be as specific as possible.




The numbers of results will change in time depending on how fast the data is refreshed - FPO appears to have a very fast refreshment rate - daily. The refreshment rates are important as they allow you to observe the state of the art.

Since the number of results is high, we need strategies to bring it down. If you know additional details regarding the invention at hand you can add a more specific query, for example, use of image recognition to separate electrical components from other metal objects, focusing on copper and a particular consumer durable product type (hence adding the first part of the query, in *italic*):

(image recognition AND copper AND television) AND (remanufacturing machine OR remanufacturing device OR sorting machine OR sorting device OR circular economy OR sustainable manufacturing OR repair OR material recovery OR disassembly OR dismantling OR deconstruction OR reassembly) AND (electronic* waste OR e-waste OR electronic* component scrap OR electronic scrap) AND (separation sensor system OR sensor-based sorting OR advanced sensors OR electronic device component identification OR imaging sensor* OR thermal sensor* OR spectroscopic sensor* OR sensor array)



Matches 1 - 50 out of 2281 [1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [8](#) [9](#) [10](#) [11](#) [12](#) [13](#) [14](#) [15](#) >

<input type="checkbox"/> Match	Document	Document Title	Score	PDF
<input type="checkbox"/> 1	US20220023918	MATERIAL HANDLING USING MACHINE LEARNING SYSTEM Systems and methods for classifying materials utilizing one or more sensor systems, which may implement a machine learning system in order to identify or classify each of the materials, which may...	1000	
<input type="checkbox"/> 2	US20230044783	METAL SEPARATION IN A SCRAP YARD An apparatus for classifying materials utilizing a vision system, which may implement an artificial intelligence system in order to identify or classify each of the materials, which may then be...	958	
<input type="checkbox"/> 3	DE102021006583A1	Improved process for crafting Scrap Products The invention relates to a method for producing recycled scrap, comprising the following steps: a) producing or providing an inhomogeneous, iron-containing scrap composition, b) crushing the scrap...	914	
<input type="checkbox"/> 4	WO/2023/003670A1	MATERIAL HANDLING SYSTEM Systems and methods for classifying materials utilizing one or more sensor systems, which may implement a machine learning system in order to identify or classify each of the materials, which may...	888	

This further specification of the generic invention reduces the number of matches from 227,724 down to 2,281.

3.3. Results view

In terms of the **displayed information**, the most information is displayed for US patents, and less for others, such as EP documents. For some patents also the original *.pdf* file is available. What is interesting in FPO is that for individual patents the user can directly access to the list of other patents citing it, so he/she can track how the technologies evolve and are being cross-pollinated. You can also export a citation - the function is available for generating Endnote and BibText references.

SEARCH TOOLS & RESOURCES

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Add to portfolio Choose or add to a new portfolio, named Go

Sorting materials using a pattern recognition, such as upgrading nickel laterite ores through electromagnetic sensor-based methods

United States Patent 9316537 B2 · Filed: 03/14/2013 · Published: 04/19/2016

[Biblio](#) [Claims](#) [Description](#) [Citations](#) [PDF](#) [Combined](#)

A system and method of sorting mineral streams, for example laterite mineral ores, into appropriately classified valuable and waste streams for maximum recovery of value from the mineral stream, e.g., a stream of minerals includes receiving response data indicating reflected, absorbed or backscattered energy from a mineral sample exposed to a sensor, where the mineral sample is irradiated with electromagnetic energy. The system determines spectral characteristics of the mineral sample by performing spectral analysis on the response data of the mineral sample and identifies a composition of the mineral sample by comparing the spectral characteristics of the mineral sample to previously developed spectral characteristics of samples of known composition. The system then generates a sort decision for the mineral sample based on the comparison, where the sort decision is used in diverting the mineral sample to a desired destination e.g. pyrometallurgical treatment stages, or to a waste stream.

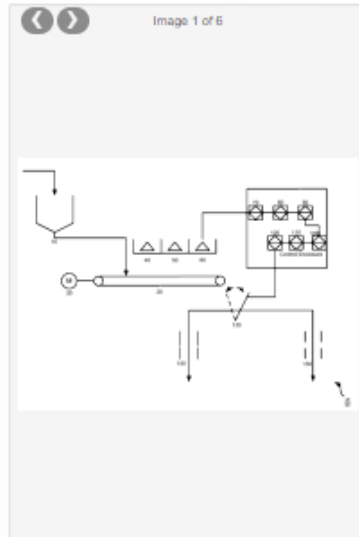
Parent Case Data:

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit under 35 U.S.C. 119(c) of U.S. Provisional Application No. 61/640,749, filed on May 1, 2012, entitled "A Method For Upgrading Nickel Laterite Ores Through Electromagnetic Sensor-Based Methods," which is hereby incorporated by reference for all purposes in its entirety. This application is a continuation-in-part of U.S. application Ser. No. 13/538,931, filed Jun. 29, 2012, entitled "Extracting Mined Ore, Minerals or Other Materials Using Sensor-Based Sorting," which in turn claims the benefit of U.S. Provisional Application No. 61/502,772, filed on Jun. 29, 2011, entitled "Method for the Pre-Concentration of Mineral Ores" and U.S. Provisional Application No. 61/502,760, filed on Jun. 29, 2011, entitled "High Frequency Electromagnetic Spectrometer," all of which are hereby incorporated by reference for all purposes in their entireties.

<p>Assignee: MneSense Technologies Ltd. (Vancouver, CA)</p> <p>Inventors: Bamber, Andrew Sherliker (Vancouver, CA) Barcza, Nicholas (London, GB) Csinger, Andrew (Vancouver, CA)</p> <p>Attorney/Agent: PERKINS COIE LLP - SEA General (SEATTLE, WA, US)</p> <p>App Num: 13/830453</p> <p>Pub Date: 04/19/2016</p> <p>File Date: 03/14/2013</p> <p>Referenced by: View patents that cite this patent</p> <p>Export Citation: Click for automatic bibliography generation</p>	<p>Primary Class: 1/1</p> <p>Int'l. Classes: G06F7/00; B07C5/344; G01J3/00; G01N23/12</p> <p>Field of Search: 700/223</p> <p>Primary Examiner: LOGAN, KYLE D</p>
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[← Previous Patent \(Spatial frequency re...\)](#) | [Next Patent → \(Light measuring devi...\)](#)



Next useful feature is the so-called **“score”**, which is the similarity in relation to your keyword query.

Typically your search results will be sorted according to these similarity score and they can be quite handy to give a first impression, firstly as it can allow you to check against the content and see how relevant they really are, and secondly, for a quick impression of how crowded the area is - which is also very interesting in some areas that might be seen within the circular economy as “new” - yet when comparing the potential technologies, one can discover that there are several technologies and solutions already in the space, although they might not have been using the more CE-oriented vocabulary.

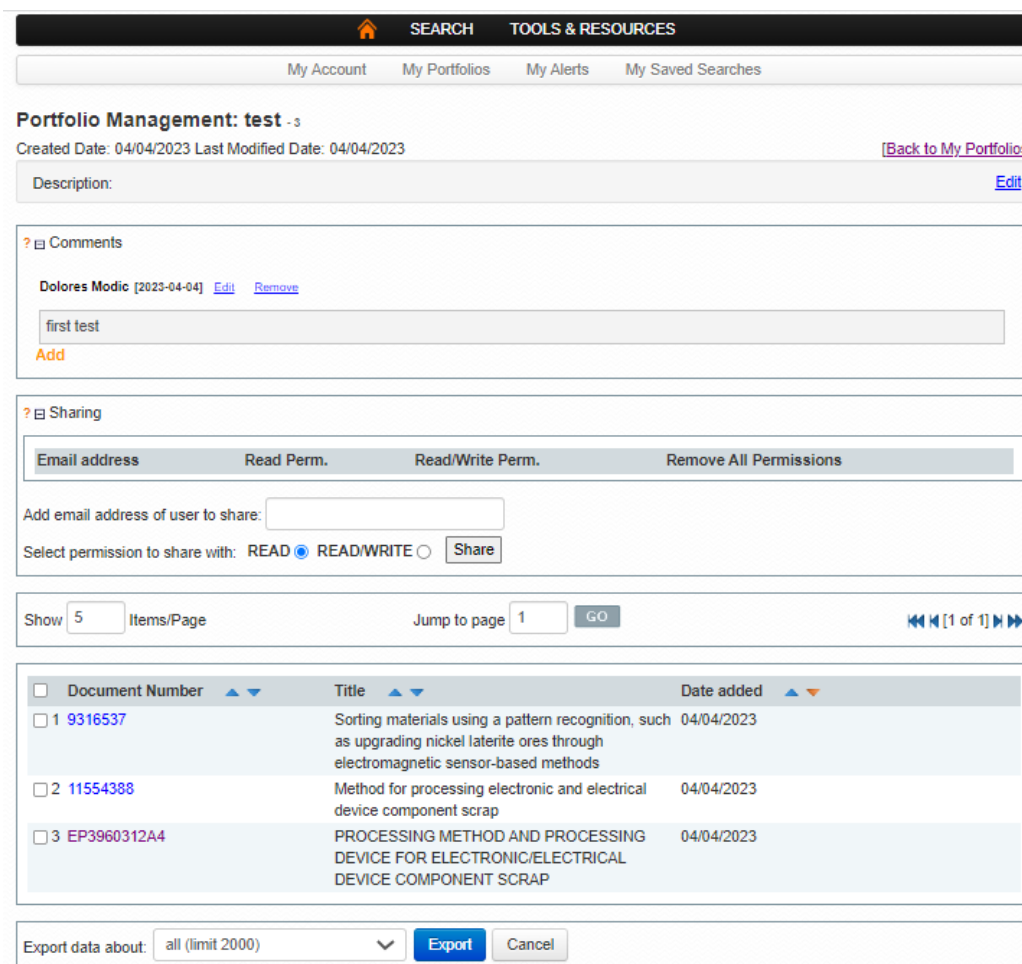
Further for the example used here, reading the abstracts (inside FPO they call it Biblio, where the first part of that is the abstract and the second part is information on the parent patent) even the inventions

with the lower scores appear to be in the right generic 'ball-park' for the query but less specific to optical, copper and television, for example, field-effect-transistor (FET) sensor arrays for detecting and measuring ... , etc.

Once having the results, **no additional filters including those that would be useful for circular, sustainable, or eco-innovations are available** (e.g., having a filter for Y-tags or green inventory tags), similar as in other tools.

3.4. Document management

For this tool, there are several document management rudimentary functionalities. Beside allowing to save the query itself, you can also create portfolios (i.e., folders) with your different searches. You can also add comments to these. These portfolios can also be shared with others - all persons need to complete a simple registration to be able to access it.



The screenshot shows the 'Portfolio Management' interface for a portfolio named 'test'. It includes a navigation bar with 'SEARCH' and 'TOOLS & RESOURCES', and a sub-menu with 'My Account', 'My Portfolios', 'My Alerts', and 'My Saved Searches'. The main content area shows the portfolio details, including a description field, a comments section with a text input and 'Add' button, and a sharing section with a table for permissions and a 'Share' button. At the bottom, there is a table of results with columns for Document Number, Title, and Date added, and an 'Export' button.

Document Number	Title	Date added
1 9316537	Sorting materials using a pattern recognition, such as upgrading nickel laterite ores through electromagnetic sensor-based methods	04/04/2023
2 11554388	Method for processing electronic and electrical device component scrap	04/04/2023
3 EP3960312A4	PROCESSING METHOD AND PROCESSING DEVICE FOR ELECTRONIC/ELECTRICAL DEVICE COMPONENT SCRAP	04/04/2023

Furthermore, you can export the results, with the limitation of export to pdf for up to 2000 results - whereas you can save under a certain portfolio at one time up to 1000 results. The Excel table generated would include information about the patent (document number, application number, type and publication and filing date and patent classifications) and information about the actors (inventor and assignee names - for Is data also with geolocation data).

