Use of Patent Information
(Including J-PlatPat)

Japan Patent Office
Asia - Pacific Industrial Property Center, Japan Institute for Promoting Invention and Innovation

Collaborator: Mr. Atsushi NOZAKI
Senior Director
Landon IP GK

Contents

1. Introduction

According to statistics[1] of the World Intellectual Property Organization, the number of patent applications filed around the world has been increasing every year, totaling 2.57 million worldwide in 2013. Out of these applications, 1.7 million were filed in applicants' home countries, and 870,000 were filed in foreign countries. In 2001, the total number of applications around the world was 1.5 million; and this number has increased by around 40% in just 10 years. This growth was largely due to increased applications in China, the U.S. and South Korea. The growth has been particularly high in China, with the number of applications increasing about tenfold in the last 10 years.

A patent is one of the fruits of research and development conducted by a company or research institute. The purpose of the patent system is to protect the products and services of companies or organizations through patent rights and patent portfolios. Another purpose is to enable companies and organizations to examine patent applications already filed by competitors and others to obtain useful information for their own R&D. In the latter case, examining patent information allows companies to obtain the following insights:

- Trends in technological fields of interest
- Technological fields that are attracting the attention of their industry
  - Problems concerning the technologies they are focusing on
  - Solutions to the problems they are facing

For example, assume that a company is conducting research and development on the opening and closing mechanism of doors. By searching and analyzing patent applications on this topic that have been laid open to the public, the company can learn about the problems found in such mechanisms, as well as what other companies have done to solve such problems. By researching patents in advance, a company may find a problem that others have not considered, or find a new way to solve a problem that others have not used. By looking at applicants, right holders or inventors, moreover, the following insights can be gained:

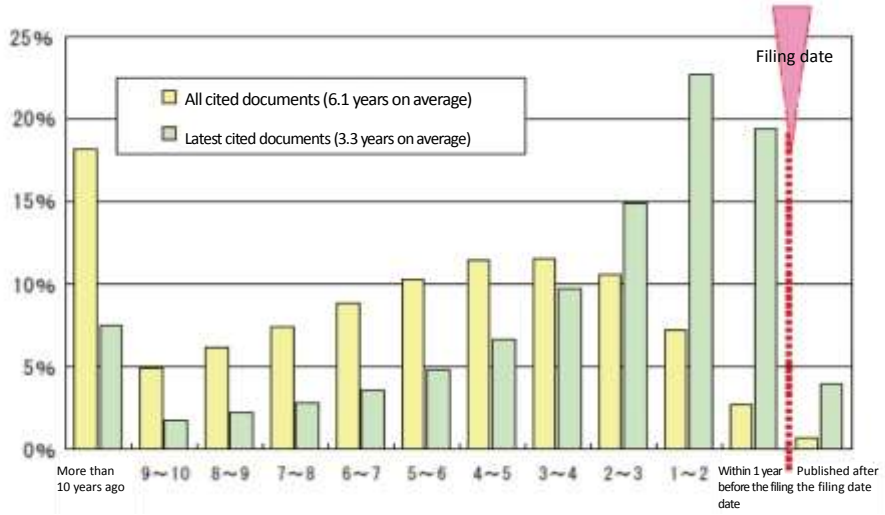
- Which is the leading company in the technological field of interest?
- Which companies or organizations are conducting joint research?
- Who are the key persons in the target technological field?
- How large are the development projects (scale of human resources) of competitors in the target technological field?

[1] WIPO IP statistics data center http://www.wipo.int/ipstats/en/

Such data constitutes market information within a given technological field, rather than technical information. By studying patent information, a company may also be able to find a prospective licensee for a technology that it has developed; or find a prospective partner for a business alliance.

As discussed above, examining published patent information is useful when a company is seeking to develop a business strategy, or new product or service. Now, let's look at the data in the Japan Patent Office Annual Report to see how effectively companies used published patent information when they filed patent applications and sought patent rights to protect their products or services. As shown in Fig. 1 below, when the JPO examined and refused patent applications in 2009, the newest patent gazettes (published inventions) cited in the reason for refusal had been published an average of 3.3 years before the refused applications were filed. This graph also shows the surprising fact that all cited documents included in the reason for refusal had been published an average of 6.1 years before the filing of the refused applications.

Distribution of Published Patent Applications Cited in the Reason for Refusal in 2009



(Note) • Analyzed publications of Japanese patent applications that were cited in the reason for refusal for applications refused in 2009.
• "Published after the filing date" means that publications were cited in the reason for refusal in accordance with Article 29-2 or Article 39 of the Patent Act.

(Source) Japan Patent Office

Fig. 1 Distribution of Published Patent Applications Cited in the Reason for Refusal in 2009[2]

[2] Japan Patent Office Annual Report FY2011
https://www.jpo.go.jp/shiryou/toushin/nenji/nenpou2011/honpen/1-2.pdf (* Link to a Japanese page)

There is also other interesting data within old statistics from 2005, including the fact that about 370,000 patent applications were filed, among which requests for examinations were made for about 200,000. Patent rights were granted to only about 100,000 of these applications, however, while the remaining 100,000 were refused following the examination. Moreover, the decision of refusal was finalized for about half of these 100,000 applications (50,000) without appeals being filed by the applicants. These applicants shouldered IP-related expenses for the refused applications (such as the costs of filing the application and requesting an examination), as well as R&D expenses for the inventions. Although not all of the costs were wasted, these applicants might have been able to reduce wasted expenses and use these R&D and IP-related expenses more effectively if they had conducted prior art searches before choosing their R&D subjects and filing applications.

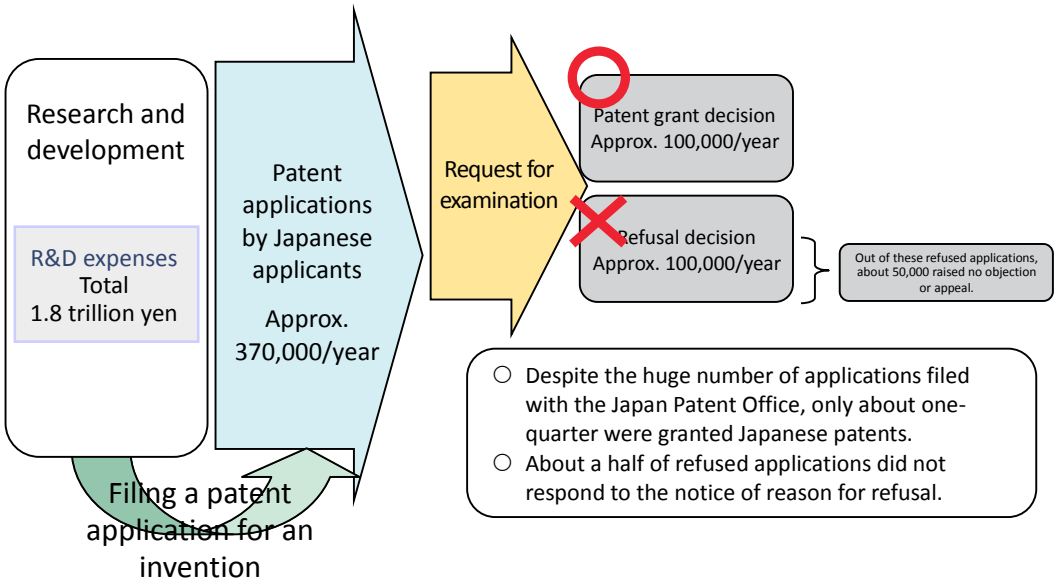


Fig. 2 Processes for Japanese Patent Applicants Through the Final Decision by JPO (FY2005)[3]

The chart above also indicates important points regarding filing patent applications and acquiring patent rights in other countries. For example, if a company wants to acquire patent rights for its invention in the U.S. or China, it must file a patent application with the patent office in that country and go through the examination of the local patent office. When conducting the prior art search, examiners in foreign patent offices tend to focus on patent documents prepared in their own language and in English rather than those prepared in Japanese. Accordingly, applicants must also carefully examine patent documents in other countries, not only in Japan.

[3] Japan Patent Office Annual Report FY2007
http://www.jpo.go.jp/shiryou/toushin/nenji/nenpou2007/honpen/2-1.pdf (* Link to a Japanese page)

2. Basics of Patent Information

i. Definition of Patent Information

Range of patent information

Patent Information = Publications of patent applications + Information on the progress of the patent examination + patent families

Patent information is described below in accordance with the Japanese Patent Act.

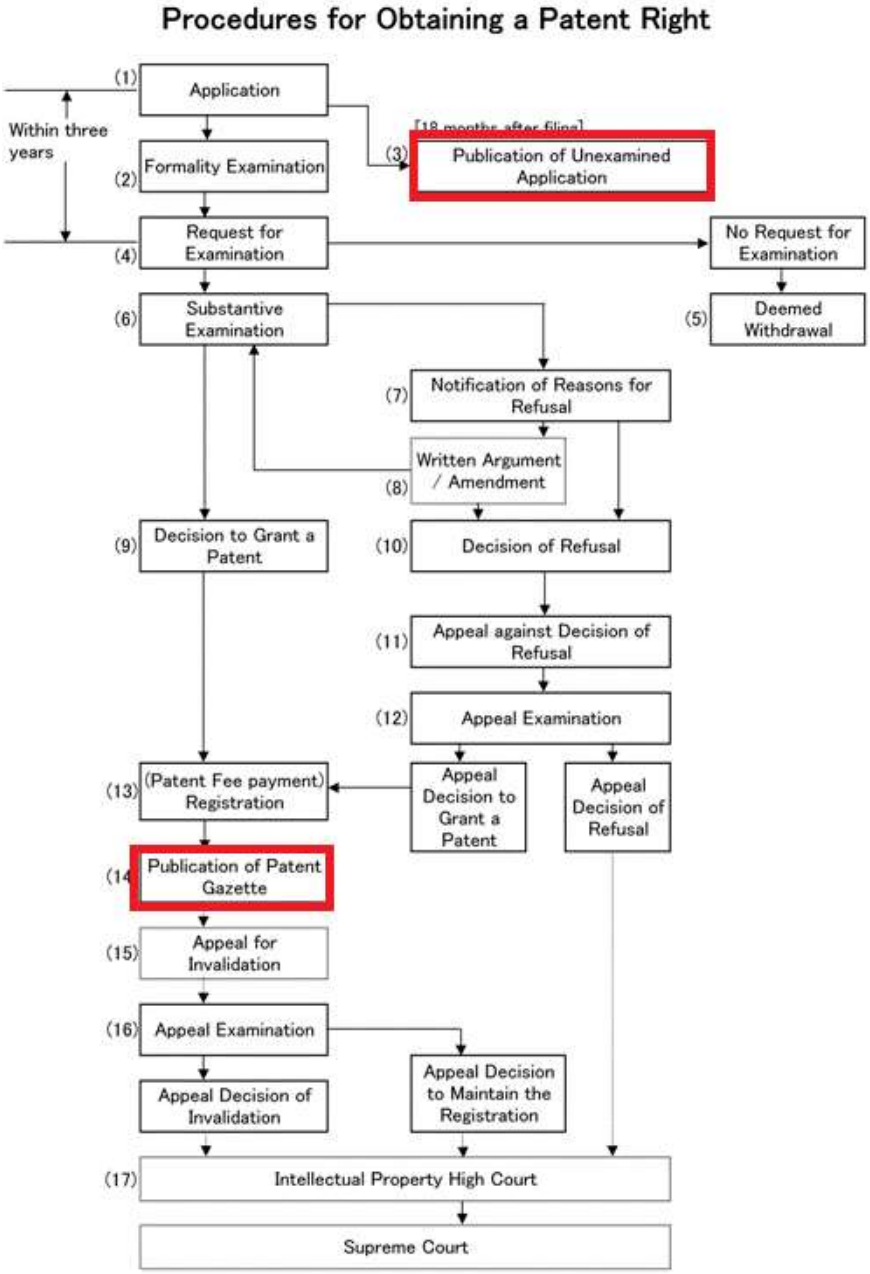


Fig. 3 Processes from Application to Acquisition of Patent Rights and Publications[4]

[4] Procedures for Obtaining a Patent Right: https://www.jpo.go.jp/tetuzuki_e/t_gaiyo_e/pa_right.htm

As shown in Fig. 3, patent information includes publications of unexamined patent applications (including published Japanese translations of PCT international publications for patent applications and re-publication of PCT international publications for patent applications, in addition to publications of Japanese patent applications) which are published 18 months after filing of applications and publications of granted patents. Other types of patent information include that regarding the progress of the patent examination (file wrappers and the status of the patent applications), and regarding patent families.

File wrappers are a package of documents related to a patent application, including the patent application and a request for examination submitted by the applicant to the patent office, a notice of reason for refusal issued by the Commissioner of the Patent Office or patent examiner, a written argument and/or correction in response to the notice of reason for refusal, and the decision to grant a patent.

The status of the patent applications indicates the current phase of the application for the right. By verifying the status of an application, it is possible to learn, for example, that the publication of an unexamined patent application was issued, but a request for examination has not yet been made (of course, you cannot access the information before the publication of unexamined patent application); that the request for examination was made, and the application is being examined; that a publication of a granted patent was issued, but the patent right has expired and has not been renewed because the annual maintenance fee was not paid; etc.

As explained above, the patent information also includes information on the progress of the patent examination and patent family (not only the information included in the publications of unexamined patent applications and publications of granted patents).

ii. **Characteristics of Patent Information**

In addition to patent information, you can obtain technological information from academic literature, academic convention minutes, technological magazines, catalogs, product manuals and the like.

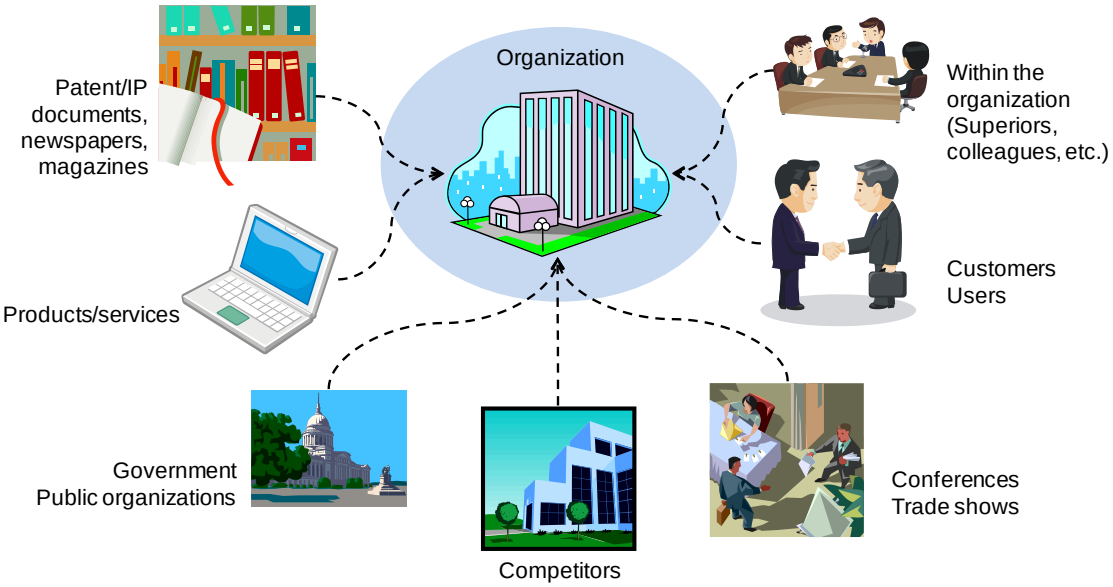


Fig. 4 Technological Information Sources for Companies and Organizations

Among many technological information sources, patent information has the following characteristics:

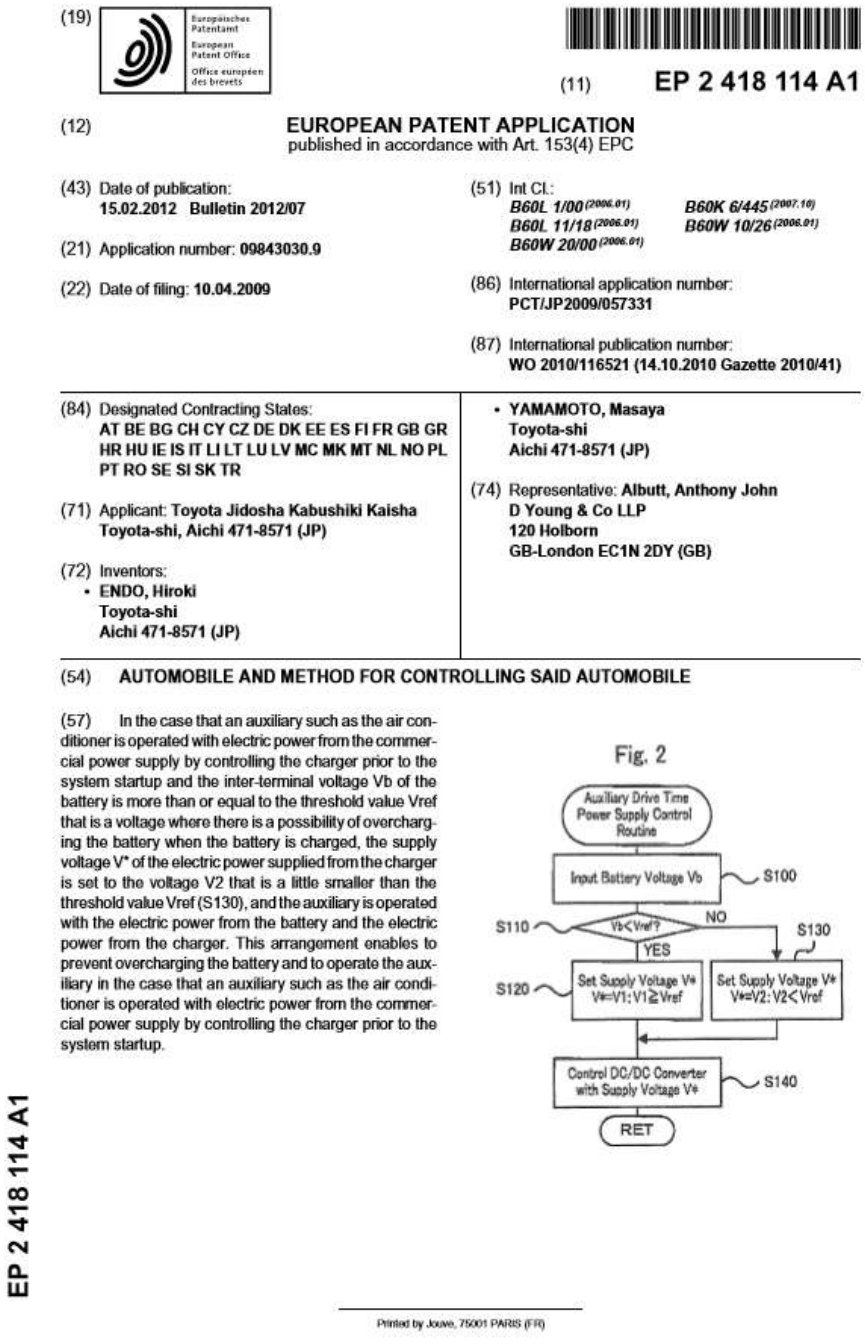
(1) It is relatively easy to obtain patent information from free or paid databases.
(2) All patents issued around the world are classified in accordance with the International Patent Classification (IPC), the international standard for classifying technology.
(3) Bibliographic data that must be included in official patent gazettes anywhere around the world are specified by INID Codes[5] of the WIPO.
(4) All technological fields are comprehensively covered, without bias to specific areas.
(5) Official patent gazettes describe disclosed inventions in detail.

As explained above, patent information has excellent characteristics as data to be examined and analyzed. One of the greatest benefits is that the data are categorized by the global standard classification.

[5] http://www.wipo.int/export/sites/www/standards/en/pdf/03-09-01.pdf

iii. **Structure and Types of Official Patent Gazettes**

Figure 5 is an example of a patent application publication.



(19) Europäisches Patentamt / European Patent Office / Office européen des brevets

(11) **EP 2 418 114 A1**

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
15.02.2012 Bulletin 2012/07

(21) Application number: **09843030.9**

(22) Date of filing: **10.04.2009**

(51) Int Cl.:
B60L 1/00 *(2006.01)* ***B60K 6/445*** *(2007.10)*
B60L 11/18 *(2006.01)* ***B60W 10/26*** *(2006.01)*
B60W 20/00 *(2006.01)*

(86) International application number:
PCT/JP2009/057331

(87) International publication number:
WO 2010/116521 (14.10.2010 Gazette 2010/41)

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR

(71) Applicant: **Toyota Jidosha Kabushiki Kaisha**
Toyota-shi, Aichi 471-8571 (JP)

(72) Inventors:
- **ENDO, Hiroki**
  Toyota-shi
  Aichi 471-8571 (JP)
- **YAMAMOTO, Masaya**
  Toyota-shi
  Aichi 471-8571 (JP)

(74) Representative: **Albutt, Anthony John**
D Young & Co LLP
120 Holborn
GB-London EC1N 2DY (GB)

(54) **AUTOMOBILE AND METHOD FOR CONTROLLING SAID AUTOMOBILE**

(57) In the case that an auxiliary such as the air conditioner is operated with electric power from the commercial power supply by controlling the charger prior to the system startup and the inter-terminal voltage Vb of the battery is more than or equal to the threshold value Vref that is a voltage where there is a possibility of overcharging the battery when the battery is charged, the supply voltage V* of the electric power supplied from the charger is set to the voltage V2 that is a little smaller than the threshold value Vref (S130), and the auxiliary is operated with the electric power from the battery and the electric power from the charger. This arrangement enables to prevent overcharging the battery and to operate the auxiliary in the case that an auxiliary such as the air conditioner is operated with electric power from the commercial power supply by controlling the charger prior to the system startup.

Fig. 2

EP 2 418 114 A1

Printed by Jouve, 75001 PARIS (FR)

Fig. 5 Example of Publication of Patent Application (EP2418114A1)

Typically, the first (front) page of an official patent gazette includes various information items called "bibliographic data." The front page contains important useful information for searching and examining patent applications and granted patents. Titles of inventions, abstracts and other keywords are necessary for searching patent information on the basis of technological aspects. The International Patent Classification (IPC) and other patent classification information are important for gathering comprehensive patent information from aspects other than keywords. By looking at the applicant and the right holder information, moreover, you can identify which companies or research institutes filed those applications. From the inventor information, you can identify key persons and changes in the R&D activities of the inventors over time.

As shown in the example above, information items in a patent gazette are prefixed with numbers in parentheses such as (43). This (43) is a universal code indicating the issuance date of the patent gazette, i.e., the date the invention was published. This is called an INID code. The following are other major INID codes:

(21) Application number
(22) Application date
(43) The date when an unexamined patent document was made available to the public in the form of a printed material or other similar means (date of publication)
(51) International patent classification
(71) Name of the applicant
(72) Name of the inventor
(73) Name of the right holder

The second and subsequent pages contain the scope of patent claim, detailed description of the invention, drawings and other information, although specifics may vary depending on the country. Such data is also important information for patent searches and research. The progress of the patent examination and the patent family information are not contained in patent gazettes; they must be obtained from the databases which will be discussed later in this textbook.

Patent gazettes can be divided into two main types: publications of patent applications and publications of granted patents. Each patent gazette is assigned a type code. By looking at the type code, you can see which type of patent gazette it is. The WIPO Standard ST. 16 (standard codes for identifying patent documents)[6] defines type codes as follows:

[6] http://www.wipo.int/export/sites/www/standards/en/pdf/03-16-01.pdf

Table 1 Major Type Codes of Patent Gazettes

Group	Document	Type Code/Publication Level
Group 1	Patent documents	A: First publication level B: Second publication level C: Third publication level
Group 2	Utility model right documents	U: First publication level Y: Second publication level Z: Third publication level
Group 3	Patent documents in special classifications	M: Drug patent documents (e.g. in France) P: Plant patent documents (e.g. in U.S.) S: Design patent documents (e.g. in U.S.)

The first publication level of patent documents is publication of patent applications in most countries where the patent publication system is used. Therefore, if the type code "A" is attached, the document is a publication of a patent application. If the type code is B or C, the document is a publication of a granted patent. The following are type codes used in the patent systems in Japan, the U.S. and Europe.

Table 2 Current Major Type Codes of Patent Gazettes in Japan, U.S., and Europe

Group	Type Code	Description
Japan	A	Publication of unexamined patent application, or published Japanese translation of PCT international publication for patent application
	A1	Domestic re-publication of PCT international publication for patent application
	B1	Publication of examined patent application or granted patent (without publication of patent application)
	B2	Publication of examined patent application or granted patent
	U	Publication of unexamined utility model application or registered utility model
	U1	Publication of full text of unexamined utility model application
	Y	Publication of examined utility model application or utility model registration

U.S.	A	Issued patent (before the adoption of the publication of patent application system)
	A1	Published applications
	B1	Issued patent (after the adoption of the publication of patent application system, without publication of the application)
	B2	Issued patent (after the adoption of the publication of patent application system)
	E	Reissue patent
	S	Design patent
Europe (EP)	A1	Publication of patent application (with search report)
	A2	Publication of patent application (without search report)
	A3	Search report only
	B1	Granted patent
	B2	Granted patent (amended due to opposition)
International application (WO)	A1	Publication of patent application (with search report)
	A2	Publication of patent application (without search report)
	A3	Search report only

The following are important points to note when examining patent gazettes of these countries. In Japan, Code A is attached to the publication of an unexamined patent application, and Code B2 is attached to the publication of a granted patent. Sometimes, publication of a granted patent may be issued in less than 18 months, which is the normal time frame from the patent application to publication of the unexamined application, as a result of an accelerated examination or other reason. In such a case, Code B1 is attached to the publication of that granted patent. As for utility models, the system has become more complicated since it was revised. "Registered utility models" are utility models for which applications were filed in and after 1994 and registered without examination, for which publications were issued after 6 months from the time of application (Numbers: 3000001 -). On the other hand, "utility model registrations" are utility models registered after examination, after the system of publication of applications was abolished in 1996. (Numbers: 2500001 -)

There was initially no system of publishing patent application in the U.S. Therefore, the first publication level was that of granted patents. Accordingly, Code A indicated a granted patent. Subsequently, following revision of the patent law in 1999, patent applications filed on and after November 29, 2000 in the U.S. have been published 18 months from their application dates (earliest priority dates) and these publications were assigned Code A1. However, an application may be kept secret if certain requirements are satisfied.

EP and WO use similar code structures for publications of patent applications, i.e.

A1 = A2 + A3

Search reports will be discussed later. Code A1 is publication of a patent application with a search report, and Code A2 is publication of a patent application without a search report. Therefore, the A3 publication is generally published after the A2 publication has been issued.

iv. **Patent Classification (IPC, FI, F-term, CPC, USPC)**

Each patent gazette is assigned a patent classification according to the technological contents of that publication. If you search patent documents only by keywords, the desired results may be missed. To minimize this risk of omission, it is recommended to perform the search by using patent classifications in combination with keywords. There are three major patent classifications:

1. Patent classification used internationally;
2. Patent classifications used locally in individual countries; and
3. Patent classifications used in specific databases.

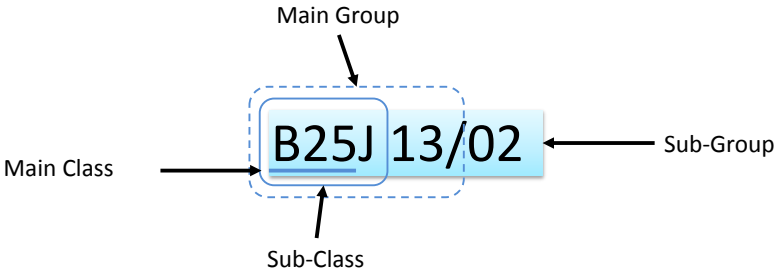
The first one, the internationally used patent classification, is that of the International Patent Classification, or IPC. The second ones, those used in individual countries, include FI (File Index) and F-term used only in Japan, and CPC used in the U.S. and Europe. The last ones, those used in specific databases, are Derwent Class Codes and Manual Codes that can be used in DWPI and Thomson Innovation. Patent classifications referred to in 1. and 2. above are explained below.

The International Patent Classification has the format shown below, consisting of Section A to Section H encompassing all technological fields, including daily goods, information and communications, information technology and other advanced technologies.

(Section)

A Human necessities
B Performing operations; Transporting
C Chemistry; Metallurgy
D Textiles; Paper
E Fixed Constructions
F Mechanical Engineering; Lighting; Heating; Weapons; Blasting
G Physics
H Electricity

The International Patent Classification has a hierarchical structure consisting of sections on the top, followed by main classes (or simply referred to as “classes”), sub-classes, main groups and sub-groups at the bottom. The lower the hierarchy becomes, the more specifically a technology is classified. FI and CPC, which will be explained later, also have almost identical formats.



Hierarchy	Item	Description
B	Section	PERFORMING OPERATIONS; TRANSPORTING
B25	Main Class	HAND TOOLS; PORTABLE POWER-DRIVEN TOOLS; MANIPULATORS
B25J	Sub-Class	MANIPULATORS; CHAMBERS PROVIDED WITH MANIPULATION DEVICES
B25J13/	Main Group	Controls for manipulators
B25J13/02	Sub-Group	Hand grip control means

(Example 1 of IPC)

B	Performing operations; Transporting
B60	Vehicles in general
B60W	Conjoint control of vehicle sub-units of different type or different function; Control systems specially adapted for hybrid vehicles; Road vehicle drive control systems for purposes not related to the control of a particular sub-unit
B60W10/00	Conjoint control of vehicle sub-units of different type or different function
B60W10/24	・including control of energy storage means
B60W10/26	・・storing electric energy, e.g. batteries, capacitors

(Example 2 of IPC)

C	Chemistry, Metallurgy
C01	Inorganic chemistry
C01B	Non-metallic elements; and their compounds
C01B31/00	Carbon; Compounds thereof
C01B31/02	・Preparation of carbon
C01B31/04	・・Graphite

In addition to IPC, individual countries have established their own classifications. In Japan, FI (File Index) and F-term are unique patent classifications. Because the segmentation of IPC is not narrow enough, the Japan Patent Office uses FI to divide classification groups into smaller groups. As shown below, FI suffixes a file discriminating code (an alphabetic letter) and extension numbers (three digits) to an IPC code. The structure of the FI code is similar to that used in the Cooperative Patent Classification (CPC), a patent classification system jointly developed by EPO and USPTO. CPC will be discussed later.

(Example of FI)

C	Chemistry, Metallurgy
C01	Inorganic chemistry
C01B	Non-metallic elements; and their compounds
C01B31/00	Carbon; Compounds thereof
C01B31/02:	・Preparation of carbon
C01B31/04	・・Graphite
C01B31/04,101	***・・・Preparation of graphite***
C01B31/04,101@A	***・・・Compact***
C01B31/04,101@B	***・・・Powder***
C01B31/04,101@Z	***・・・Others***
C01B31/04,102	***・・・Pyrolytic graphite***

F-term (File Forming Term) is designed mainly to facilitate prior art searches by patent examiners in the JPO. Accordingly, unlike IPC and FI that define classes from the technological viewpoint, F-term adopts more segmented classification from multiple viewpoints (purpose of the invention, purpose of use, materials, control, control volume, etc.) as shown in Fig. 6.

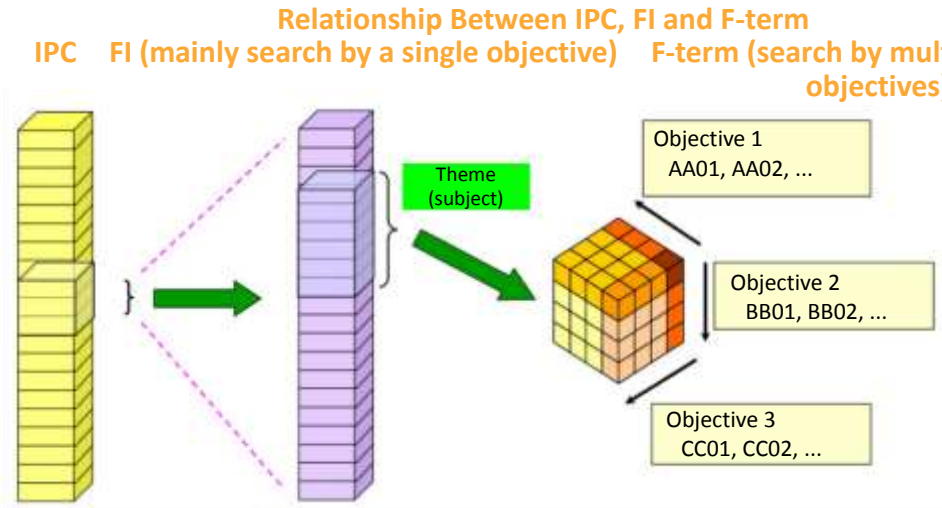


Fig. 6 Relationship of IPC, FI and F-term[7]

As shown in Fig. 7, IPC and FI do not use classifications such as the purpose of the invention or the purpose of use, while F-term has additional classifications such as problem/purpose, and type/mode.

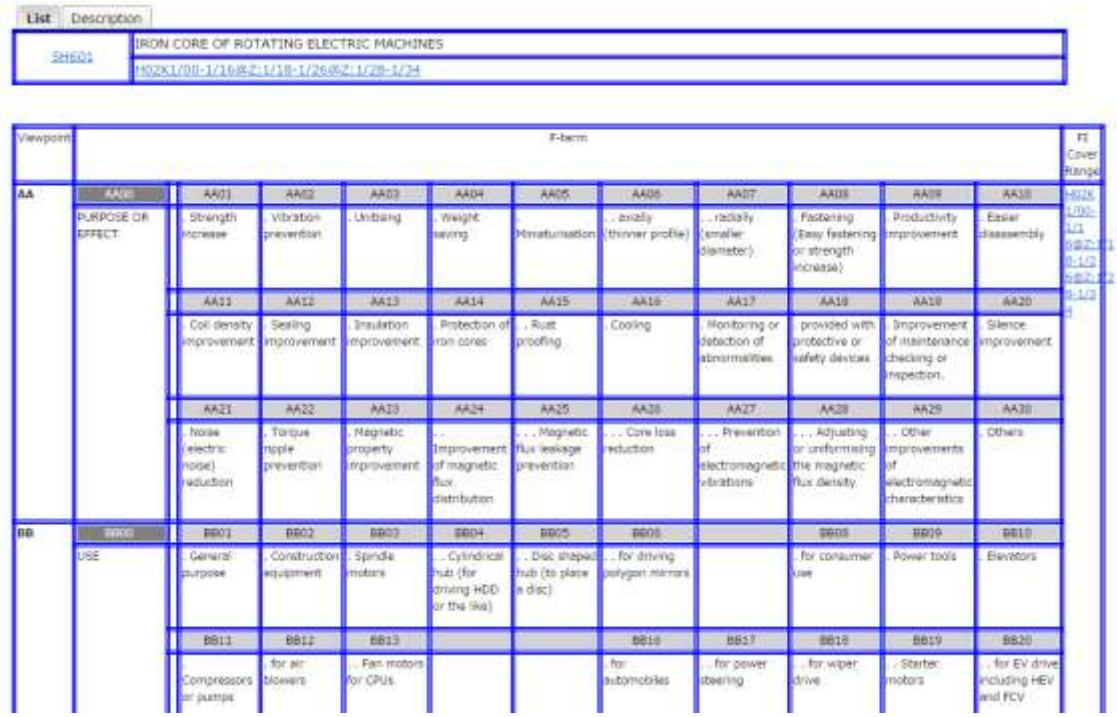


Fig. 7 Example of F-term (5H601)

[7] Source: National Center for Industrial Property Information and Training, "Overview of IPC, FI and F-term and Their Use in Prior Art Searches (2015)" http://www.inpit.go.jp/jinzai/kensyu/kyozai/outlink00057.html (* Link to a Japanese page)

As shown in the table below, F-term consists of a 5-digit theme code, followed by a 2-digit objective code and a 2-digit number.

Table 3 Examples of F-term

Meaning of a F-term	Theme Code	Objective	Number
5H601AA05 Iron core of a rotating electrical machine designed for downsizing	5H601 Iron core of a rotating electrical machine	AA Purpose/Effect	05 ・Downsizing
5B057AA18 Image processing designed for textile and apparel	5B057 Image processing	AA Use	18 ・Textile and apparel
5K067KK13 Mobile wire communication system having a CPU as a constituent element	5K067 Mobile wire communication system	KK Constituent element	13 ・CPU
4G140DB01 A process/device for hydrogen, water, or hydride related to regeneration or activation of catalyst	4G140 Hydrogen, water, or hydride	DB Characteristic of a process/device	01 ・Related to regeneration or activation of catalyst

The U.S. Patent and Trademark Office (USPTO) has used the U.S. Patent Classification (USPC) and the European Patent Office (EPO) has used the European Classification (ECLA) and In Computer Only (ICO) codes. From January 2013, the USPTO and the EPO started to use a common patent classification (CPC).

(Example 1 of CPC)

C	CHEMISTRY; METALLURGY
C01	INORGANIC CHEMISTRY
C01B	NON-METALLIC ELEMENTS; COMPOUNDS THEREOF
C01B31/00	Carbon; Compounds thereof
C01B31/02	・Preparation of carbon; Purification; After-treatment
C01B31/04	・・Graphite, including modified graphite e.g. graphitic oxides, intercalated graphite, expanded graphite or graphene
C01B31/0407	***・・・Purification; Recovery or purification of graphite formed in iron making, e.g. kish graphite***

C01B31/0415	***・・・Intercalation***
C01B31/0423	***・・・Expanded or exfoliated graphite***
C01B31/043	***・・・Graphitic oxides, graphitic acids or salts thereof***
C01B31/0438	***・・・Graphene***
C01B31/0446	***・・・・Preparation***
C01B31/0453	***・・・・・by CVD***
C01B31/0461	***・・・・・by epitaxial growth***
C01B31/0469	***・・・・・by exfoliation***
C01B31/0476	***・・・・・・starting from graphitic oxide***
C01B31/0484	***・・・・After-treatments***
C01B31/0492	***・・・・・Purification***

An outline of the CPC is available on the official CPC website[8]. In addition to the U.S. and Europe, China and Korea also decided to adopt the CPC. We must pay attention to this movement to ensure effective and efficient global patent search and patent information research.

The USPC, the original patent classification used in the U.S. having a different structure from IPC, FI and CPC, was practically abolished as of December 31, 2014, although the design patent and the plant patent continue to be classified by the USPC.

The USPC coding consists of prefix numbers followed by a slash and numbers.

(Example of USPC)
Class Schedule
Class 701 DATA PROCESSING: VEHICLES, NAVIGATION, AND RELATIVE LOCATION

1	VEHICLE CONTROL, GUIDANCE, OPERATION, OR INDICATION
2	. Remote control system
3	. Aeronautical vehicle
4	. . Altitude or attitude control or indication
5	. . . Rate of change (e.g., ascent, descent)
6	. . . . Angle of attack
7	. . . Air speed or velocity measurement
8	. . . Threshold or reference value
9	. . . . Warning signal or alarm
10	. . . Compensation for environmental conditions

[8] http://www.cooperativepatentclassification.org/index.html

v. **Patent Family**

A group of patents for which applications are filed for the same invention in two or more countries (such as the U.S. and Germany) and organizations (such as EPO and the Eurasian Patent Convention (EAPC)), by using an international application route in accordance with the Paris Convention or the Patent Cooperation Treaty (PCT), is called a patent family. There are two major benefits in searching patent families.

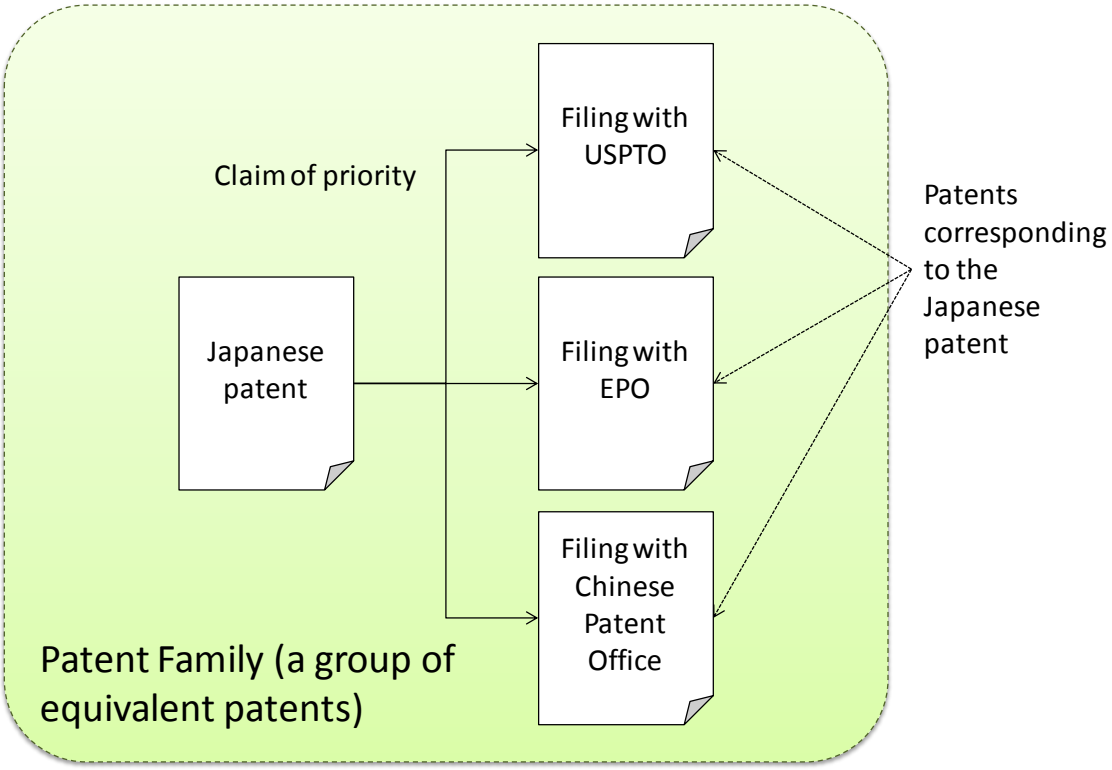


Fig. 8 Patent Family

The first benefit is that a company can check whether a Japanese patent in which it is interested has had applications filed in other countries. If a company faces severe competition not only in Japan but also in other countries, it should aim to understand its competitors' moves by continuously checking whether they have filed patent applications outside Japan, and then use this information to develop its own patent application strategy.

The second benefit is a practical one. If you find an interesting or conflicting patent for your company while searching for patents, but the documents are in a foreign language (such as English, German, or Chinese), you may look at the patent family to find relevant patent documents published by the Japan Patent Office to learn the outline of the patent.

For example, assume you received a warning letter from a foreign company together with a patent specification written in a foreign language. To understand the content of the patent, you must read that patent specification in the foreign language, but this may be time-consuming. Instead, you can look at the relevant patent family to check if an equivalent patent has been granted in Japan. If a

patent gazette is published in Japan for the equivalent patent, you can understand the contents of the patent more quickly.

3. Types of Patent Research

Patent research includes the following types according to the phases of the IP Cycle (Creation of an invention → Protection of the invention → Use of the invention) and the R&D cycle (Basic research/applied research → Development/design → Production/commercialization → Sales/marketing).

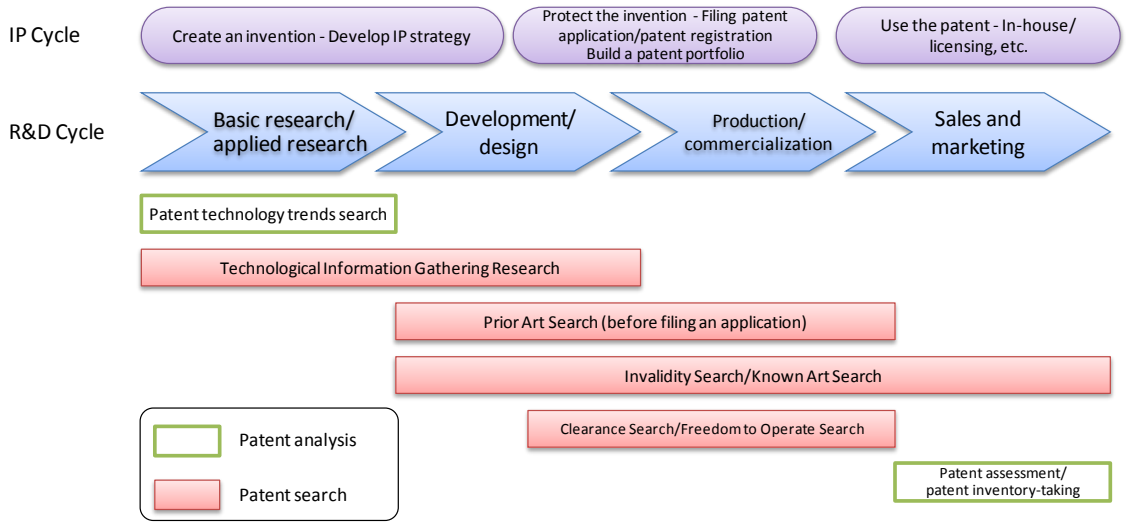


Fig. 9 Types of Patent Research According to the IP Cycle and the R&D Cycle

Each research type is explained in detail below.

i. Prior Art Search (before filing an application)

In the stage before a patent application is filed, namely, the stage when a researcher/engineer has conceived of an idea and is preparing an idea sheet to summarize it, prior art searches should be conducted to investigate whether any application has already been filed for a similar invention. Filing a patent application with the Japan Patent Office costs several hundred thousand yen (and filing a patent application with a foreign patent office incurs additional costs such as for translation and local attorneys). If a person files a patent application without knowing whether there was any previous patent application similar to the conceived idea, the application may be rejected, thus wasting these costs. If a company finds a prior patent application for an invention similar to its idea during the prior art search, it may use the information in the prior application to improve its own idea.

ii. **Invalidity Search/Known Art Search**

If its product or service infringes upon any other person's intellectual property right (such as patent right, utility model right and design right), a company may conduct invalidity searches or known art searches to find prior documents that prove the invalidity of the registered IP right. In patent right infringement cases such as those between Apple and Samsung Electronics, both the plaintiff and the defendant conducted thorough searches to argue the invalidity of the other's granted patent. In invalidity searches and known art searches, non-patent documents (such as academic papers, catalogs and magazines) are usually examined in addition to patent documents to ensure extensive coverage.

iii. **Clearance Search/Freedom to Operate Search**

Before a company introduces a new product or service into the market, it should conduct clearance searches or freedom-to-operate (FTO) searches to confirm that the product or service does not infringe the IP rights of others (such as patent right, utility model right and design right). Searches must be conducted in each country where the company plans to introduce the new product or service, usually covering patented inventions, registered utility models and registered designs currently in effect, as well as patent applications that are likely to be registered. If a company conducts such a search and finds a patent that would hinder its business, it must conduct invalidity searches to prepare for arguing the invalidity of such patent. If it is difficult to argue the invalidity, the company must then consider modifying the specifications of the relevant products or services such that they do not fall under the scope of that patent.

iv. **Technology Trends Research/Technological Information Gathering Research**

A company must research technology trends to comprehensively analyze the trend in a specific technological field in order to develop its R&D strategy and to choose an R&D subject. Such research usually covers more than 1,000 patents, and may have to cover more than 10,000 patents in some technological fields. Some examples of research documents made publicly available include the Report of Patent Application Technological Trend Research[9], an annual report published by the Japan Patent Office, and the WIPO Patent Landscape Reports (PLRs)[10] published by the World Intellectual Property Organization. Once the research subject is determined, technological information research is conducted to gather and sort information on past technologies that are similar to the chosen subject.

[9] http://www.jpo.go.jp/shiryou/gidou-houkoku.htm (* Link to the Japanese page)
[10] http://www.wipo.int/patentscope/en/programs/patent_landscapes/

v. **Other Research**

Other research includes status searches and patent family searches. Status searches are conducted to confirm the current status of a patent (in effect or expired) or a patent application (still in the application publication stage, or being examined, etc.). For example, if a company finds a patent or patent application that would impede its business, it must conduct a status search to confirm the stage reached by the patent examination of the application, or whether the patent is registered in effect or expired.

Patent family searches are conducted to investigate specific patent families. Patent rights in each country are independent from those in other countries. To do business in Japan, the U.S. and China, a company must file a patent application in each of these countries. A group of patent applications with identical content filed in different countries is called a "patent family" (strictly speaking, the scope of the patent right may vary in the end because, in the course of the examination by each local patent office, the scope of the claims or the content, which defines the scope of the patent right, may be modified). Data on patent families are available, free of charge, from Espacenet, a database provided by the European Patent Office (EPO).

4. Steps of Patent Searches

The steps shown in Fig. 10 should be followed when conducting searches. To accomplish the purpose of a patent information search, it is necessary to form a right parent population. Accordingly, the major challenge is how to structure the search formula.

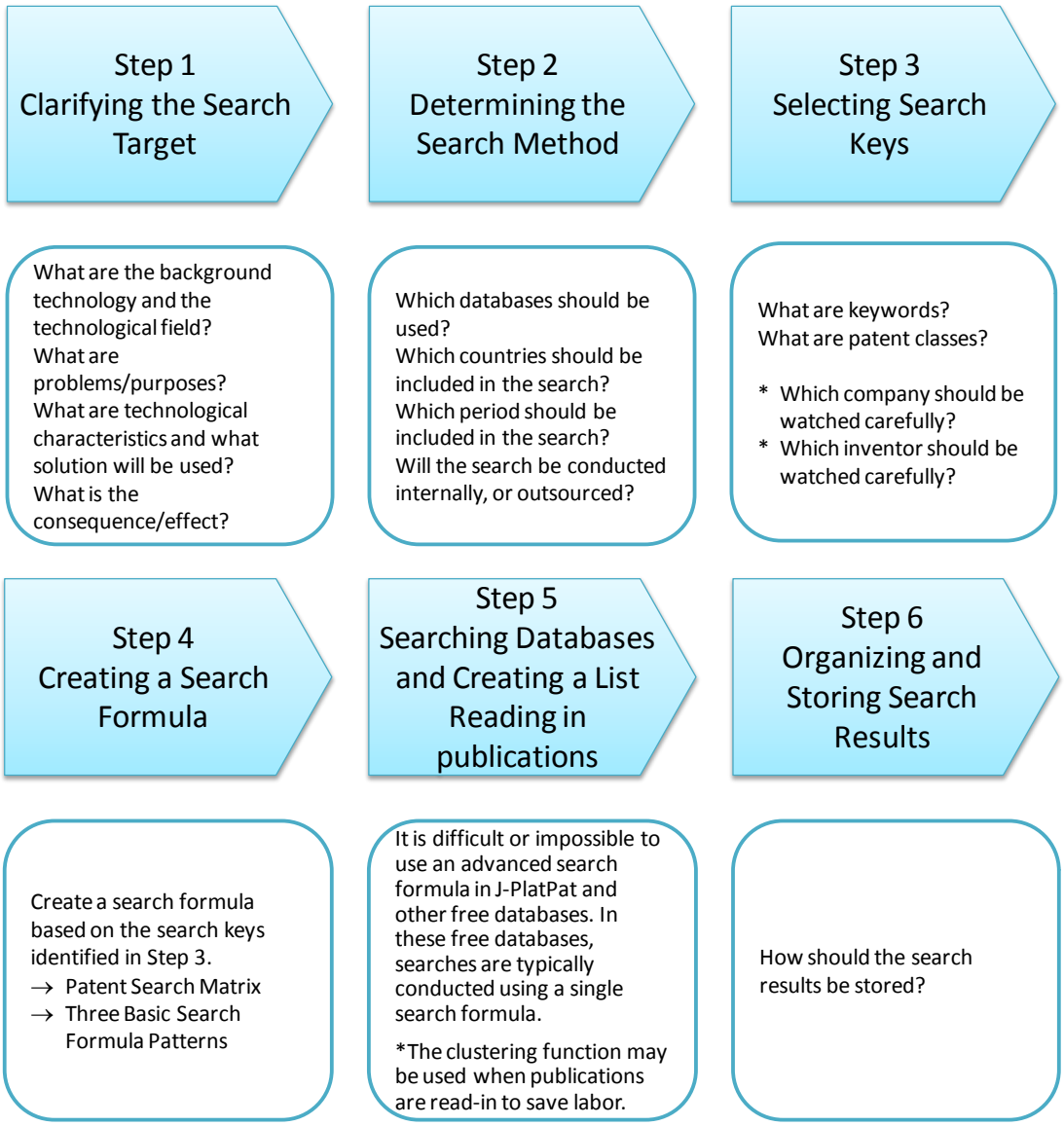


Fig. 10 Steps of Patent Searches

i. **Step 1: Clarifying the target technologies to be searched**

The first step is to clarify which technology should be searched. What are the background technologies and the technological field? What is the problem or purpose of the technology to be searched? What solution will be used to solve the problem? What is the consequence or effect of the solution? It is important to clarify these points before starting the search.

ii. **Step 2: Determining the search approaches (country, period, database, etc.)**

After clarifying the target technology, the second step is determining the search approaches. It should be determined how the search will be conducted, including the target countries, databases and periods (how many years should be tracked back), excluding the characteristics of the technology.

In determining which countries' patents should be searched, you may consult statistics published by the WIPO and the JPO to see which countries are strong in which technological fields (i.e. in which countries many patent applications were filed for a specific technological field). In the software or telecommunications field, for example, more patent applications have been filed in the U.S. than Japan. To know the technological trend in these fields, it is recommended to include the U.S. in the search in addition to Japan. In the Clearance Search/Freedom to Operate Search explained above, a company conducts searches in those countries where it does business. If a company does not plan to expand into other countries, the search range may be restricted to Japan.

iii. **Step 3: Selecting keywords and patent classes**

Search keys such as keywords and patent classes are used when structuring a search formula. To search patent documents in which the target technology is disclosed, relevant patents should be identified by using keywords, patent classes and other search keys.

Equivalent terms, synonymous words and different expressions may also need to be included when choosing keywords. For example, you may want to search printer-related patents, but other applicants may use terms such as "image forming device," "imaging device," "image output device" or other synonyms instead of "printer". When you conduct a search, these synonymous terms should also be included.

As explained previously, individual countries and regions adopt their own classifications besides the International Patent Classification (IPC), such as FI and F-term in Japan, and the Cooperative Patent Classification (CPC) used in the U.S. and Europe. If a company searches patent information in Japan only, FI and

F-term should be used primarily. If a global search is needed, CPC should also be used in addition to IPC.

The most orthodox method for choosing keywords and patent classes is called a preliminary search or preliminary research. As the first step, only the most relevant keywords are used to find 10 to 20 patent gazettes that exactly match those keywords in order to identify relevant patent classes. Then, based on the identified patent classes (patent classes that are highly relevant to the target technology to be searched), 10 to 20 patent gazettes are chosen to retrieve other relevant keywords (equivalent terms, synonymous words and broader or narrower definitions).

Online thesauruses,[11, 12] English-English dictionaries[13] and other online dictionaries are also effective tools to extract keywords. To extract patent classes, you may use online tools such as the IPC/FI Ranking of "Kantan Tokkyo Kensaku" (Quick Patent Research)[14] and the patent class keyword search in the J-PlatPat Patent Map Guidance.

The Japan Patent Office operates the Patent Search Portal site[15] which publishes patent-related information (in Japanese only) to assist prior art searches. It provides a tool to check the correspondence relationship between the FI classes and the CPC classes, as well as a subject-specific search guidance that illustrates examples of subject-specific searches and other search approaches.

Keywords and patent classes are mainly used to search and extract patents based on technological characteristics. In addition, the applicant name (company or research institute) and the inventor name contained in the bibliographic data are also important search keys to identify a specific technology of a specific company.

iv. **Step 4: Creating a search formula**

A search formula should be created by using search keys and "AND", "OR" and "NOT" operators. Figure 11 outlines the concept of AND and OR.

---

[11] Weblio: http://thesaurus.weblio.jp/
[12] Thesaurus.com: http://www.thesaurus.com/
[13] Longman English Dictionary Online: http://www.ldoceonline.com/
[14] "Kantan Tokkyo Kensaku" (Quick Patent Research): http://kantan.nexp.jp/ (* Link to a Japanese page)
[15] Patent Search Portal Site: https://www.jpo.go.jp/torikumi/searchportal/htdocs/search-portal/top.html (* Link to a Japanese page)

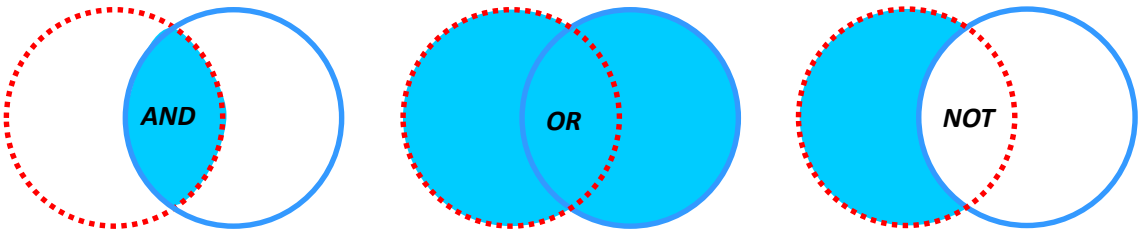


Fig. 11 Operators AND and OR

Although they are fundamental elements, AND and OR are often used incorrectly. Examples of search formulas using AND and OR for the following keywords are shown below.

ランニング、靴、赤、クツ、ウォーキング、くつ、徒歩、ジョギング、シューズ、レッド、紅

(i.e. running, shoes, red, shoes, walking, shoes, walk, jogging, shoes, red, red) (note: “靴”, “クツ”, and “くつ” and “shoes” all refer to the same concept; and “赤”, “red” and “紅” all refer to the same concept; but the characters used to express the meaning (kanji, hiragana, katakana, roman characters) are different)

(1) Search Formula Pattern A
（ランニング OR ウォーキング OR 徒歩 OR ジョギング） AND （靴 OR クツ OR くつ OR シューズ） AND （赤 OR レッド OR 紅）

(2) Search Formula Pattern B
S1 （ランニング OR ウォーキング OR 徒歩 OR ジョギング）
S2 （靴 OR クツ OR くつ OR シューズ）
S3 （赤 OR レッド OR 紅）
S4 S1 AND S2 AND S3

A search formula can be created by putting keywords referring to the same concept (such as a keyword indicating a color) into a group by using the OR operator, and then binding these different concept groups of keywords by using the AND operator. The creation of search formulas will be discussed in more detail in the next chapter.

In Pattern A, the search formula is written in one single row. In Pattern B, a group of keywords referring to the same concept is created in each row, and all of these groups are coupled by using the AND operator in the final row. Pattern B or other similar advanced search formulas may not be available in most of the free patent search databases.

v. **Step 5: Conducting database search and publication read-in**

It is not practical to create a complete search formula before starting database searches. Typically, you create search formulas and then read in publications while you are conducting a database search. You may use free databases provided by the JPO and other patent offices in foreign countries and paid databases with advanced functions provided by vendors. J-PlatPat, the free patent data platform in Japan, and free databases available in other countries are discussed in Chapter 7.

vi. **Step 6: Organizing and storing search results**

The search results should be compiled into a report by using word-processing or spreadsheet software. When creating a report, at least the following items must be included:

- Description of the search (target technology and extract criteria);
- Search method (target countries, target period, target databases, etc.);
- Search results (conclusions, extracted patents' identification numbers); and
- Name of the person who conducted the search

It is important to describe the search, but it is even more important to know who conducted the search and to what extent. Patent search databases are updated every week. It should be clarified, for example, whether the search covers data up to October 31, 2015 or up to December 31, 2015. Otherwise, when another update search is subsequently conducted, the searcher cannot know how far back the search should go.

5. Example of Patent Search Using Patent Search Matrix

This section discusses some examples of actual searches for Step 1 to Step 5 of the patent information search explained in the previous chapter.

Example:

On rainy days, manhole covers catch rainwater and become slippery, which is dangerous for pedestrians. The subject to be searched is that of manhole covers with concave-convex patterns to prevent slipping on rainy days.

i. Using the Patent Search Matrix

The patent search matrix may be used as a tool to effectively organize search keys and create a search formula.

	Background technology	Objective 1 Problem/purpose (consequence/effect) or technological characteristics/solutions	Objective 2 Problem/purpose (consequence/effect) or technological characteristics/solutions
Search key			
Keywords/equivalent terms (in Japanese)			
Keywords/equivalent terms (in English)			
IPC			
FI			
F-term			
CPC			

←Clarifying the Search Target

Selecting Search Keys

Fig. 12 Patent Search Matrix

Figure 12 shows the patent search matrix, which is a tool that is mainly used to organize search keys (keywords, patent classes, applicants/right holders, dates, etc.). Based on the search keys organized by this matrix, a search formula should be created following the three search formula patterns described later. The main purpose is to centrally manage information necessary for patent information searches by organizing search keys in this matrix. Creating the matrix in MS Excel or other spreadsheet software makes it easy to share information and knowledge necessary for searching. In addition, by applying three basic patterns to the matrix (i.e. operation only by keywords, by patent classes, or by both), anyone can create a mother population with some accuracy (low noise).

ii. Clarifying the Search Target

The search target should be clarified in the first step. Background technologies and objectives (problems, purposes or technological characteristics) should then be entered in the highlighted sections for each constituent element. In this example,

> **On rainy days, manhole covers catch rainwater and become slippery, which is dangerous for pedestrians. Manhole covers with concave-convex patterns to prevent slipping on rainy days.**

A manhole (cover) is the background technology, prevention of slipping is the problem, and concave-convex patterns on the surface of manhole covers are the technological characteristics.

	Background technology	Objective 1 Problem/purpose (consequence/effect) or technological characteristics/solutions	Objective 2 Problem/purpose (consequence/effect) or technological characteristics/solutions
Search key	Manhole covers	Anti-slip	Cover surface/concave-convex
Keywords/equivalent terms (in Japanese)			
IPC			
FI			
F-term			

Fig. 13 Patent Search Matrix after Clarifying the Search Target

iii. Selecting Search Keys

The next step is identifying keywords, synonymous words, patent classes (IPC, FI, F-term and CPC) and other search keys, and entering them in the matrix. As discussed above, it is recommended to first conduct a preliminary search by using the most relevant keywords. The screen below is an example of a preliminary search by using the text search of J-PlatPat for patents and utility models.

Fig. 14 Example of Preliminary Search Using J-PlatPat

The purpose of a preliminary search is to identify patent publications that exactly match the most relevant keywords, rather than conducting a comprehensive search, then extract patent classes and other relevant keywords from those publications. In this example, searches are conducted as shown in Fig. 14:

Abstract + Scope of Claim = Manhole
　and
Abstract + Scope of Claim = Slip Prevention
　and
Abstract + Scope of Claim = Slip Prevention

The search extracted 17 matches. From these results, you can easily find a publication of patent application, Tokkai 2001-090097 “Iron cover of manhole or the like applied with anti-slip treatment.” Looking at the patent classes assigned to this publication,

(IPC)

E02D29/14	..covers for manholes or the like; frames for covers

(FI)

E02D29/14E	structures of covers, e.g. layered covers, anti-slip covers

(F-term)

2D047BB00	manhole covers/cover-receiving frames
2D047BB21	. structures of covers
2D047BB22	.. layered covers
2D047BB23	.. anti-slip covers
2D047BB24	.. double covers (with inner cover)

may be selected as relevant patent classes. The definitions of the identified patent classes should be confirmed in the Patent Map Guidance as needed. When identifying relevant patent classes, note that patent classifications have hierarchical structures. Even if the definition of a class in a lower hierarchy matches the target technology, it cannot be used as a search key unless its upper classification also matches the target technology to be searched.

The following screen is an example of using the Quick Patent Search website tool to identify patent classes. In the Top screen, enter “マンホール　滑り止め” (manhole anti-slip) and click the [Search] button. Then, click the [FI Ranking] link to show a ranking table as shown in Fig. 15. In the default setting, the top 20 primary FI classes are listed with their application numbers. This setting can be changed in the pull-down menu as necessary.

Fig. 15 Example of Using Quick Patent Searches to Search Patent Classes

After search keys are selected, the patent search matrix looks like that shown below. with identified keywords and patent classes. Although this is a simple example, you can effectively create a search formula by filling in the patent search matrix.

	Background technology	**Objective 1** Problem/purpose (consequence/effect) or technological characteristics/solutions	**Objective 2** Problem/purpose (consequence/effect) or technological characteristics/solutions
Search key	Manhole covers	Anti-slip	Cover surface/concave-convex
Keywords/equivalent terms (in Japanese)	マンホール 地下構造物用蓋 “マンホール” is a Japanese word for manhole. “地下構造物用蓋” refers to covers for underground structures.	滑止、防滑、すべり、スリップ、撥水 “滑止” and “防滑” both refer to anti-slip. “すべり” and “スリップ” both refer to slip. “撥水” is water repellent.	模様、凹凸、凸部、凹部、突起 “模様” is pattern. “凹凸”, “凸部”, “凹部” and “突起” all refer to concavity, convexity, or protrusion.
IPC	E02D29/14		
FI	E02D29/14E	(E02D29/14E)	
F-term	2D047BB21-BB24		
Corresponding F-term	2D047BB23		

Fig. 16 Patent Search Matrix after Selecting Search Keys

iv. **Three Basic Search Formula Patterns**

Another important point in creating a search formula is using the three basic search formula patterns. Table 4 below shows these three patterns.

Table 4 Three Basic Search Formula Patterns

Pattern	**Use Merit/Demerit**	**Considerations**
Basic Pattern (1) Keywords only	○ / △	・ May result in a huge number of hits unless the keywords are carefully chosen (△). ・ It is useful to run an operation by using two or more keywords to prevent omission (○).
Basic Pattern (2) Patent classes only	◎ / ×	・ Very useful if there is a patent class that matches the search target technology (◎). ・ May result in a huge number of hits if there is no patent class that matches the search target technology (×). Narrowing by using keywords is necessary.
Basic Pattern (3) Combined use of keywords and patent classes	◎	・ Easy to set the mother population for the search to a desired size (fewest hits possible or lowest noise, etc.)

Major search keys are keywords and patent classes. By combining these two types of keys, the three basic patterns can be structured as shown above. There are other methods to narrow the search range based on names of applicants, right holders or inventors, or dates. But these three basic search patterns are the main patterns to narrow the search range based on technological characteristics of patents. It is recommended to combine these patterns as appropriate, considering their merits and demerits.

When using keywords, it is important to decide whether to limit the search range to abstracts and scopes of claims or to search the full text. Typically, it is recommended to limit the search range to abstracts and scopes of claims when searching technological terms, and to conduct full-text searches to find problems, consequences or effects, or proper names.

v. **Creating a Search Formula**

As shown in Fig. 16 (Patent Search Matrix after Selecting Search Keys), you start can creating a search formula after you have finished identifying and organizing the search keys. In this patent search matrix, as shown in Fig. 17, the vertical direction (columns) represents the same concepts, while the horizontal direction (rows) indicates different concepts.

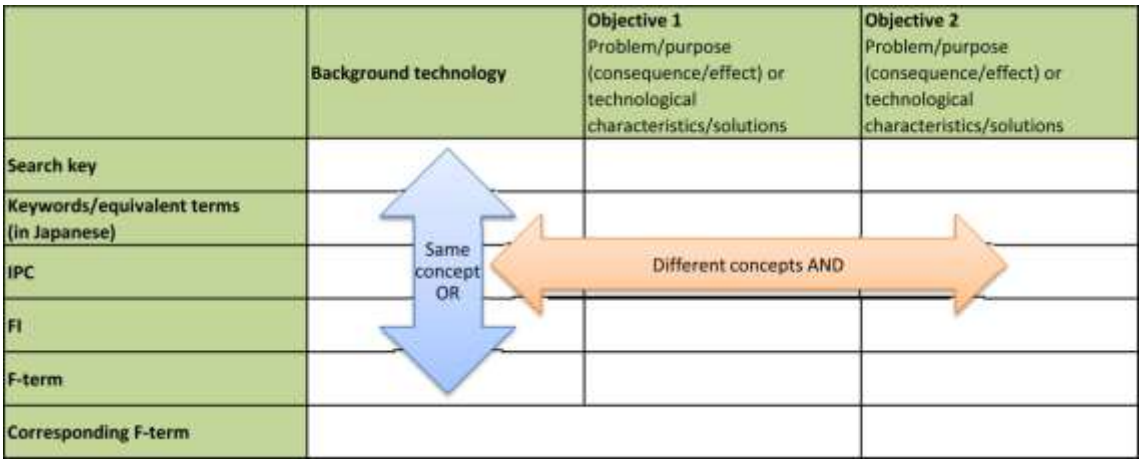


Fig. 17 Concept of Columns and Rows in Patent Search Matrix

As explained regarding the use of operators OR and AND in Fig. 11, if you want to set a comprehensive range for background technology, the following is recommended:

> Keyword＝マンホール OR 地下構造物用蓋) OR IPC=E02D29/14 OR FI=E02D29/14E OR F-term = (2D047BB21 OR 2D047BB22 OR 2D047BB23 OR 2D047BB24) ... Proposed Search Formula 1

If you want to narrow down, you may cross-couple the basic search patterns as shown below.

> IPC = E02D29/14 AND Keyword ＝(蓋 OR ふた OR フタ) AND キーワード ＝ (滑止 OR 防滑 OR すべり OR スリップ OR 撥水) AND Keyword = (模様 OR 凹凸 OR 凸部 OR 凹部 OR 突起) ... Proposed Search Formula 2

> FI = E02D29/14E AND Keyword ＝ (滑止 OR 防滑 OR すべり OR スリップ OR 撥水) AND Keyword = (模様 OR 凹凸 OR 凸部 OR 凹部 OR 突起)...Proposed Search Formula 3

> Keyword ＝ (マンホール OR 地下構造物用蓋) AND Keyword ＝ (滑止 OR 防滑 OR すべり OR スリップ OR 撥水) AND

キーワード=(模様 OR 凹凸 OR 凸部 OR 凹部 OR 突起) ... Proposed Search Formula 4

(In the above formulas, “マンホール” is manholes;
“地下構造物用蓋” is covers for underground structures;
“蓋”, “ふた” and “フタ” all refer to covers, and are pronounced “futa,” but are expressed by different Japanese characters (kanji, hiragana and katakana),
滑止 and 防滑 both refer to anti-slip but in different expressions;
“すべり and スリップ” both refer to slip but in different expressions;
“撥水” is water repellent;
“模様” is patterns;
“凹凸, 凸部 and 凹部” refer to concavities, convexities or protrusions; and “突起” is protrusions.)

Because IPC E02D29/14 (covers for manholes or the like; frames for covers) is used in the Proposed Search Formula 2, more keywords related to covers are coupled. Because FI E02D29/14E (Structures of covers, e.g. Layered covers, anti-slip covers) is used in the Proposed Search Formula 3, keywords related to covers are not coupled. Figure 18 shows the results of a J-PlatPat patent/utility model text search by using the Proposed Search Formula 2 to limit the keyword range to abstracts and scopes.

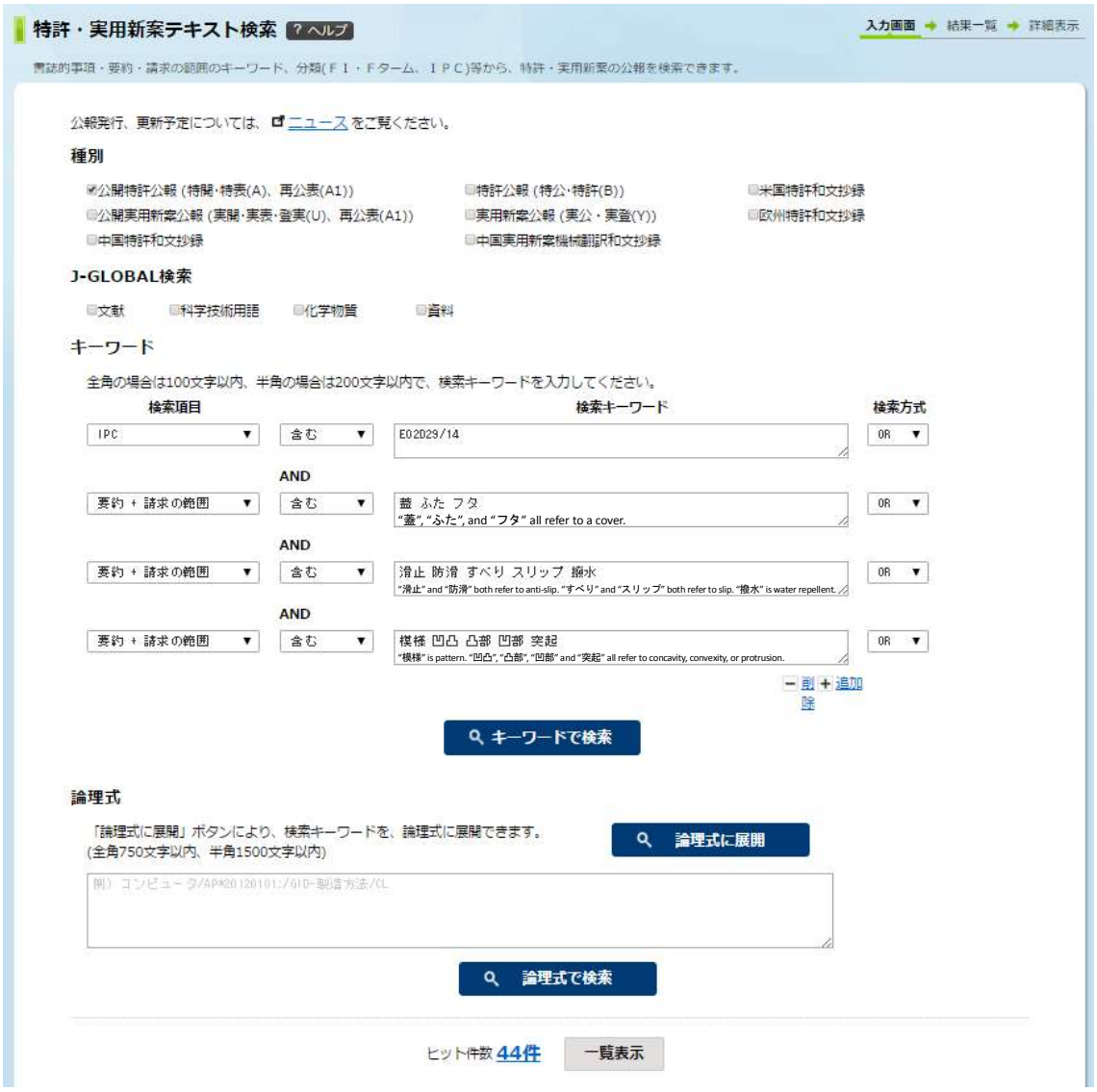


Fig. 18 Screen Showing the Results of Patent Gazette Text Searches by Using the Proposed Search Formula 2

The patent gazette is checked on its default setting of patent application publications (publication of applications filed with the JPO, publication of Japanese translations of PCT international publication for patent applications, and re-publication of PCT international publication for patent applications). The search resulted in 44 hits (as of Dec. 13, 2015). F-term 2D047BB23 related to manhole covers was extracted as a result of a search key identification. Although this F-term does not include reference to anti-slip by patterns or concavities and convexities, it is recommended to use only 2D047BB23 for the search because it is a highly relevant patent class.

In this search example, the following search formula was created as explained above:

Search Formula Pattern 1
Keyword ＝ (マンホール OR 地下構造物用蓋) AND Keyword ＝ (滑止 OR 防滑 OR すべり OR スリップ OR 撥水) AND キーワード=(模様 OR 凹凸 OR 凸部 OR 凹部 OR 突起)

Search Formula Pattern 2
F-term = 2D047BB23

Search Formula Pattern 3
IPC = E02D29/14 AND Keyword＝ (蓋 OR ふた OR フタ) AND キーワード＝(滑止 OR 防滑 OR すべり OR スリップ OR 撥水) AND Keyword = (模様 OR 凹凸 OR 凸部 OR 凹部 OR 突起)

Search Formula Pattern 4
FI = E02D29/14E AND Keyword ＝ (滑止 OR 防滑 OR すべり OR スリップ OR 撥水) AND Keyword = (模様 OR 凹凸 OR 凸部 OR 凹部 OR 突起)

(In the above formulas, “マンホール” is manholes;
“地下構造物用蓋” is covers for underground structures;
“蓋”, “ふた” and “フタ” all refer to covers, and are pronounced “futa,” but are expressed by different Japanese characters (kanji, hiragana and katakana),
滑止 and 防滑 both refer to anti-slip but in different expressions;
“すべり and スリップ” both refer to slip but in different expressions;
“撥水” is water repellent;
“模様” is patterns;
“凹凸, 凸部 and 凹部” refer to concavities, convexities or protrusions; and
“突起” is protrusions.)

Because unions of sets cannot be retrieved by the above-mentioned search formulas, search results obtained by individual search formulas in J-PlatPat may overlap. In commercially available databases, however, you may get a union of sets by each search formula. Because the case of anti-slip manholes above is a very simple example, not many search patterns are created from the patent search matrix. In actual cases, search subjects are more complicated; so it is recommended to use cross coupling using several patterns, instead of a single pattern, by following the basic search formula patterns.

6. Patent Information Databases in Different Countries

In this chapter, J-PlatPat provided by the Japan Patent Office, Espacenet provided by the European Patent Office, Patent Full-Text Database (PatFT/AppFT) provided by the USPTO, Patentscope provided by the World Intellectual Property Organization, and Google Patents provided by Google are explained as examples of patent information databases available in different countries. Patent offices in other countries also provide their own patent databases.

Commercial vendors such as Thomson Reuter, Minesoft, RWS, Questel, and LexisNexis also develop and provide paid patent databases. Paid databases provide many additional functions that are not available in free databases.

i. J-PlatPat Patent Information Platform

This is a database operated by the Japan Patent Office. On March 23, 2015, IPDL, the former digital patent library, was renewed as J-PlatPat, a new patent information platform. (The following explanations are based on the English user interfaces used in J-PlatPat).

URL: https://www.j-platpat.inpit.go.jp/web/all/top/BTmTopEnglishPage

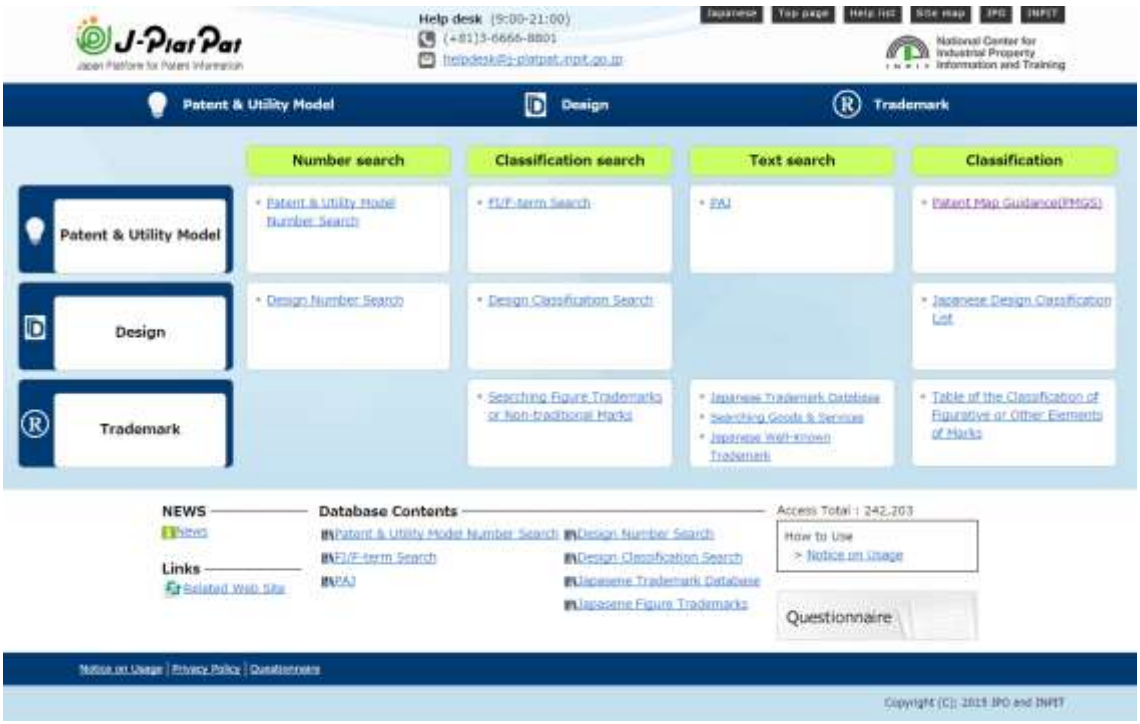


Fig. 19 Top Page of J-PlatPat

Figure 19 shows the top page of J-PlatPat, which features the following search menus:

Patents/Utility Models
- Patent & Utility Model Number Search
- FI/F-term Search
- PAJ
- Patent Map Guidance (PMGS)

Designs
- Design Number Search
- Design Classification Search
- Japanese Design Classification List

Trademarks
- Searching Figure Trademarks or Non-traditional Marks
- Japanese Trademark Database
- Searching Goods & Services
- Japanese Well-Known Trademark
- Table of the Classification of Figurative or Other Elements of Marks

In the Patent/Utility Model Search Menu, the search can be made by FI or F-term, which are both Japanese original patent classifications, as well as by English keywords using Patent Abstracts of Japan (PAJ), which are English excerpts of publications of patent applications. Patent Map Guidance is also provided to help you with FI and F-term searches. Explanations of design and trademark searches are omitted in this textbook. Menus for patent/utility model searches are explained below.

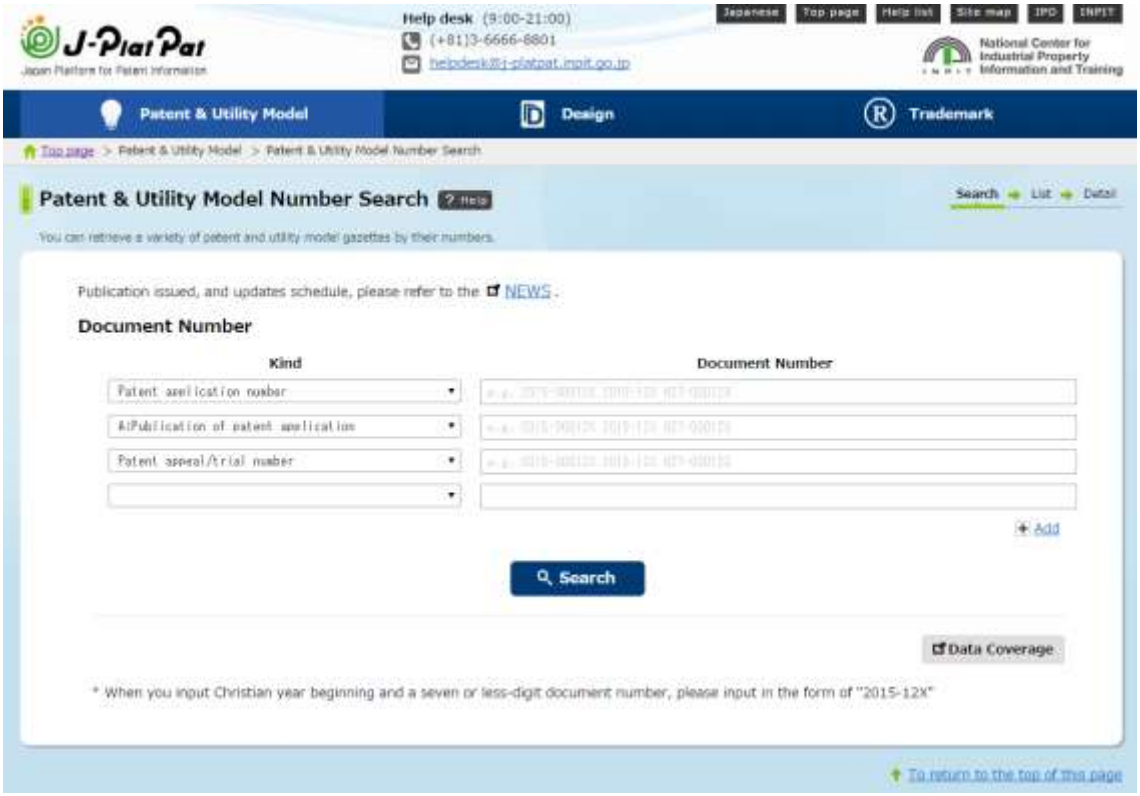


Fig. 20 J-PlatPat Patent & Utility Model Number Search Screen

Figure 20 is a screen of J-PlatPat Patent & Utility Model Number Search. On this screen, you can search publications using application numbers, numbers of publications of patent applications, numbers of examined applications, numbers of granted patents/utility models and other number data. In the entry fields, examples of entry formats are shown in light gray.

Because the Japan Patent Office uses the Japanese Calendar system for document administration, refer to the following relationship between the Japanese Calendar and the Western Calendar if a character like “S” or “H” is included in a Japanese publication number that you searched in Espacenet:

1868-1912 = M1 (M01)-M45	*M refers to the “Meiji” era in the Japanese Calendar.
1912-1926 = T1 (T01)-T15	*T refers to the “Taisho” era.
1926-1989 = S1 (S01)-S64	*S refers to the “Showa” era.
1989-2015 = H1 (H01)-H27	*H refers to the “Heisei” era.

As shown in the example below, publication numbers issued in and before 1999 (Heisei 11) used the Japanese Calendar. Publications issued from 2000 (Heisei 12) use the Western Calendar.

特開昭 63-123456	* Publication of unexamined patent application
特公昭 58-001145	* Publication of examined patent application
実開昭 57-003215	* Publication of unexamined utility model application
実公昭 57-003215	* Publication of examined utility model application
特開平 05-004567	* Publication of unexamined patent application
特公平 04-000278	* Publication of examined patent application
実開平 08-000164	* Publication of unexamined utility model application

特開 represents a publication of unexamined patent application;
特公 represents an abbreviation of publication of examined patent;
実公 represents an abbreviation of publication of examined utility model application;
実開 represents an abbreviation of publication of unexamined utility model application;
昭 refers to “Showa” era; and
平 refers to “Heisei” era.

The publication of examined application system was discontinued in 1996. From then onward, registration numbers were adopted as shown in the examples below:

特許 2555678	* Granted patent
実登 2555678	* Registered utility model

The table below compares the formats of publication numbers between JPO publications, J-PlatPat and Espacenet.

Table 5 Formats of Japanese Patent Publication Numbers

Publication Number	**J-PlatPat Format (Description in ( ) is a kind (type) of publication)**	**Espacenet Format**
特開昭 63-123456	S63-123456 1988-123456 (A: Publication of patent application (A))	JPS63123456A
特公昭 58-001145	S58-001145 1983-001145 (B: Publication of examined/granted patent)	JPS581145B
特開平 05-004567	H05-004567 1993-004567 (A: Publication of patent application (A))	JPH054567A
特公平 04-000278	H04-000278 1992-00278 (B: Publication of examined/granted patent)	JPH04278B
特開 2000-123456	2000-123456 H12-123456 (A: Publication of patent application (A))	JP2000123456A
特許 2555678	2555678 (B: Publication of examined/granted patent)	JP2555678B

The screen below is an example of searching 特開平 05-004567 (A: Publication of patent application (A), H05-004567). From the pull-down menu of [Kind], select [A: Publication of patent application (A)], enter H05-004567 in [Document Number], and click the [Search] button. Then, the following screen will be displayed.

Fig. 21 Search Result of H05-004567

Click the link of JP, 05-004567, A (1993) to view the Patent Abstracts of Japan (PAJ) containing bibliographic data, an abstract in English and a representative drawing.

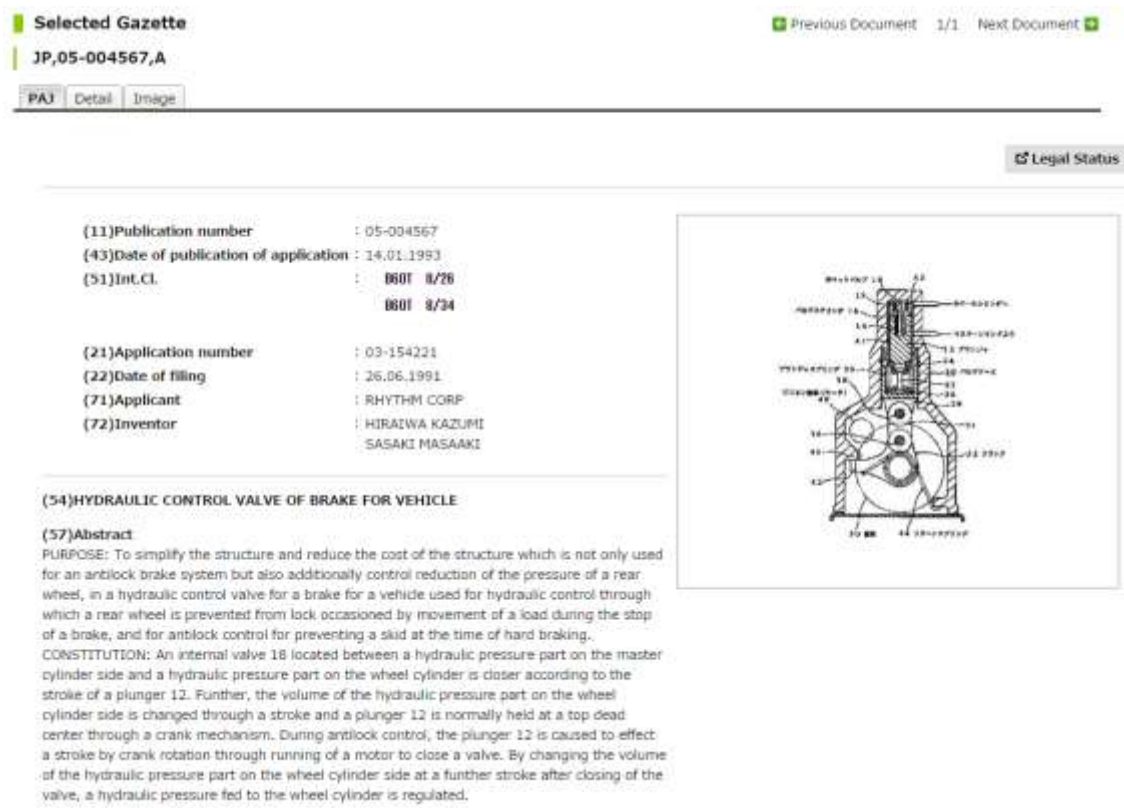


Fig. 22 PAJ Screen for H05-004567

From the [PAJ], [Detail], and [Image] tabs in the upper part of the screen, click the [Detail] tab to view claims and working examples in English. These are created by machine translation, and so are often not very accurate. Click the [Image] tab to view the publication format. However, you cannot retrieve a PDF file of the publication identified by the Patent & Utility Model Number Search of J-PlatPat in English. To retrieve a PDF file, you must use the Japanese interface of J-PlatPat to search for the relevant patent/utility model number or access Espacenet.

Click the [Legal Status] button on the upper-right corner to show the status of the patent right in the pop-up window as shown below.

Fig. 23 Pop-Up Window of Legal Status of H05-004567

The [Date of request for examination] and [Registration info] lines are left blank. The [Detailed info. of application] line shows “Kind of final decision (Deemed to be withdrawn).” From this data, you learn that no request for examination was made for the patent application, so the JPO deemed that the application must has been withdrawn.

Now, let’s look at Fig. 24 showing the FI/F-term search menu.

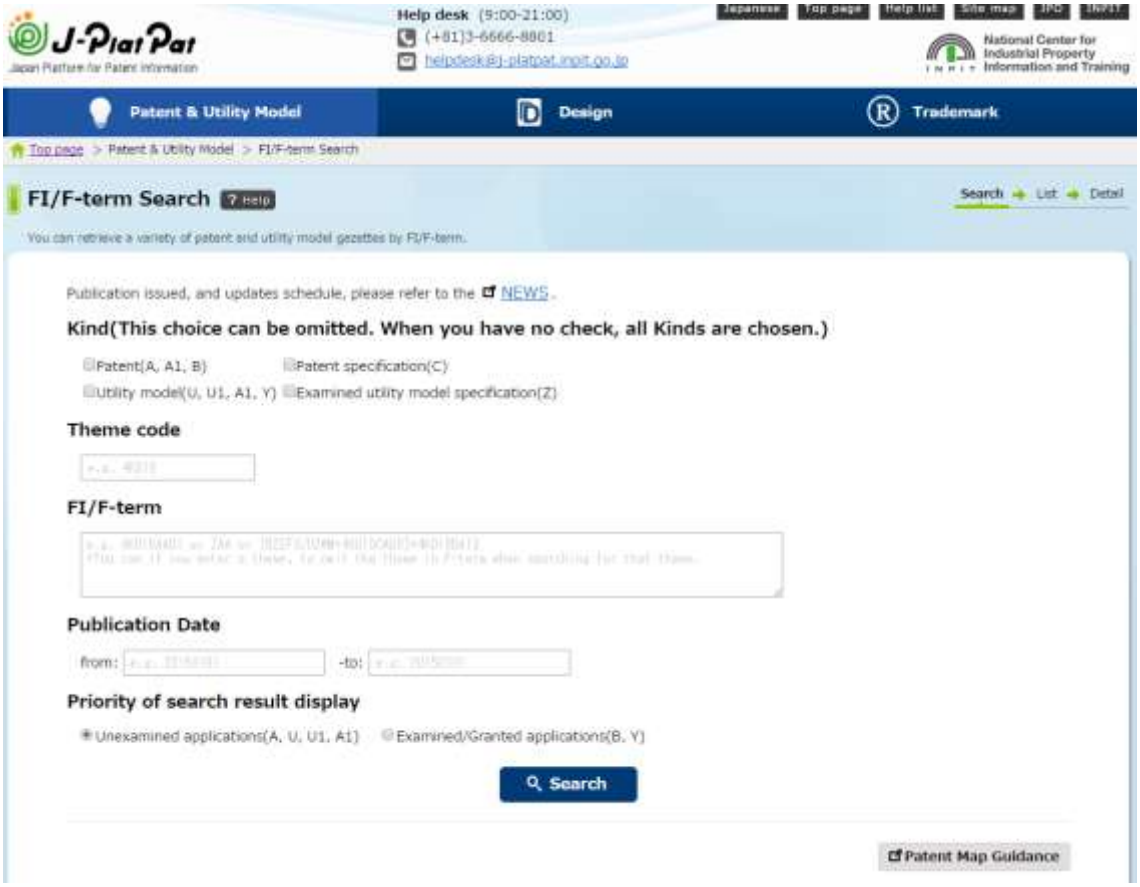


Fig. 24 FI/F-term Search Screen of J-PlatPat

In this menu, you can use FI or F-term, both original patent classifications used by the JPO, for searching patent publications. FI and F-term can be searched by using the Patent Map Guidance as shown below.

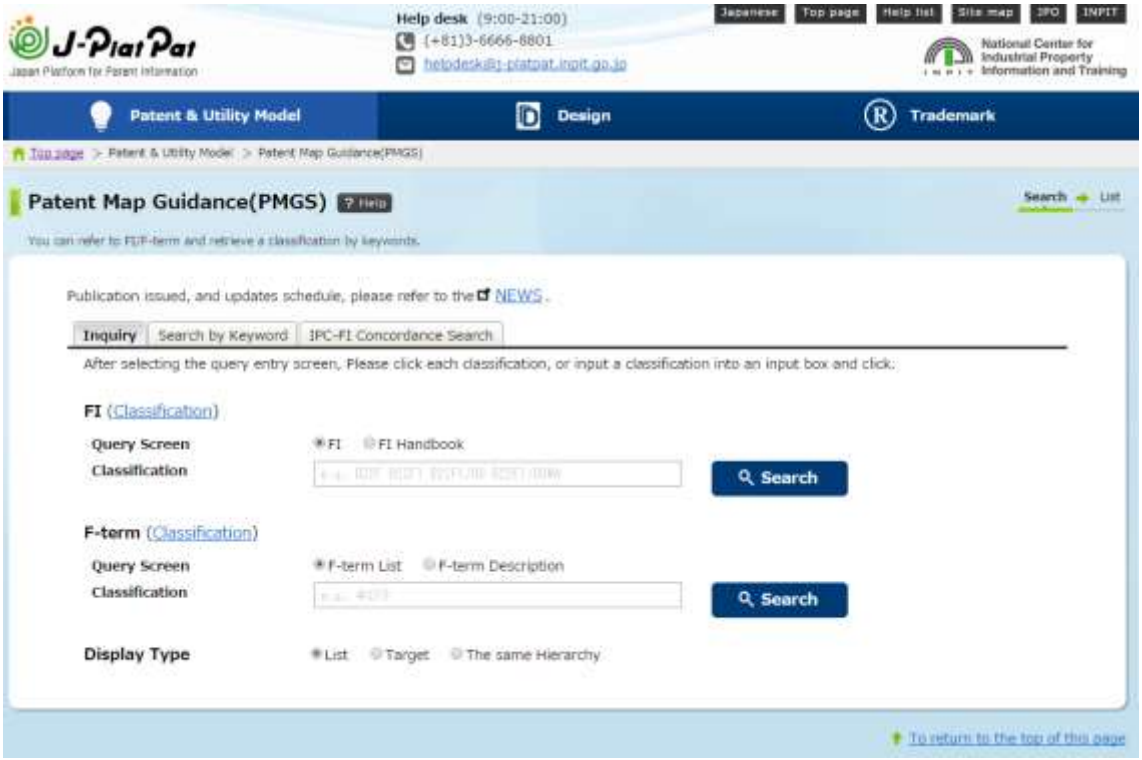
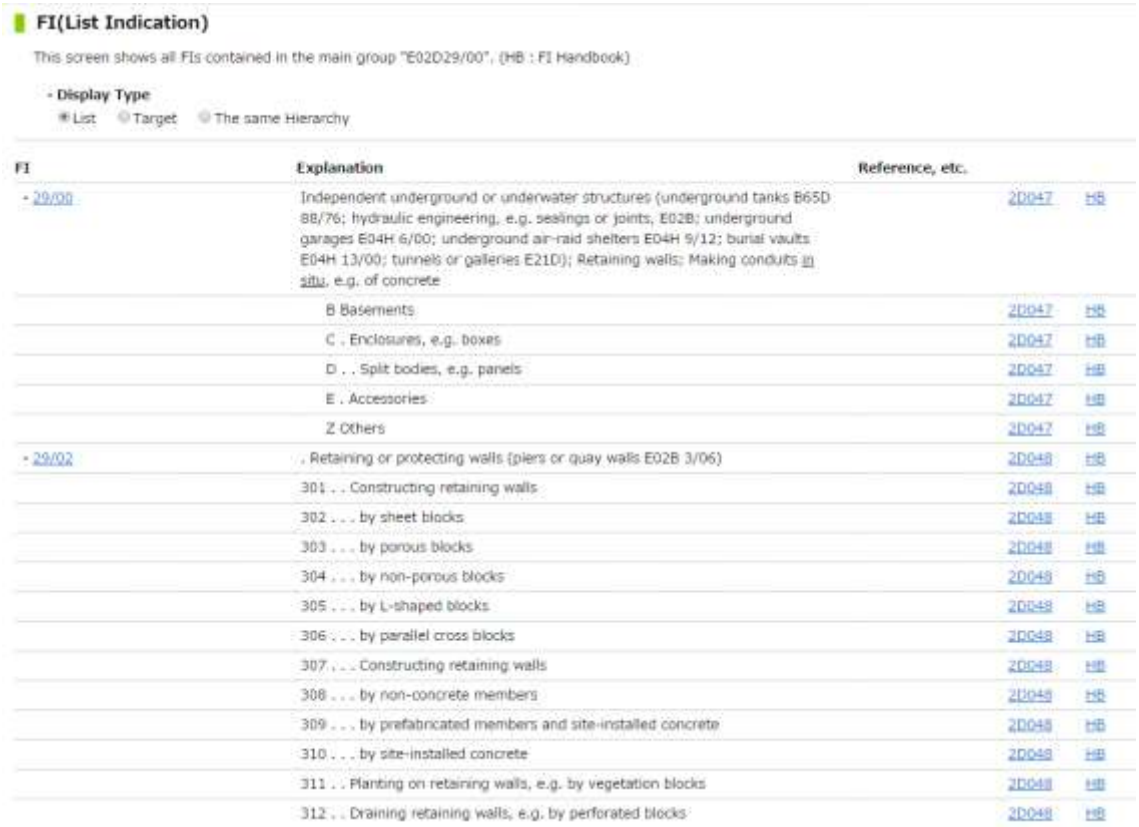


Fig. 25 Patent Map Guidance Screen of J-PlatPat

If you already know an FI class, you may click the [Classification] link shown next to FI to select the class, or directly enter the identified FI class in the blank field. As an example, the FI classification for E02D29/00 is shown below.



FI(List Indication)

This screen shows all FIs contained in the main group "E02D29/00". (HB : FI Handbook)

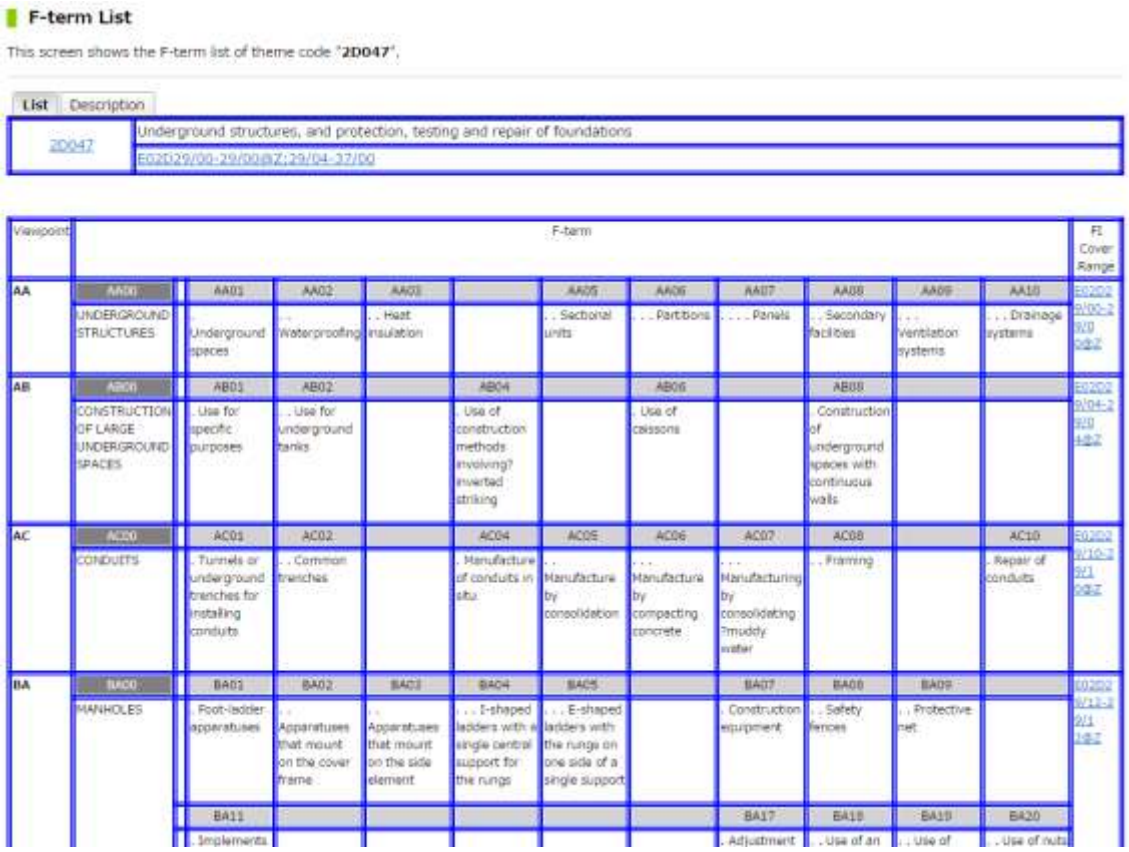
- Display Type

◉ List ○ Target ○ The same Hierarchy

FI	Explanation	Reference, etc.	
- 29/00	Independent underground or underwater structures (underground tanks B65D 88/76; hydraulic engineering, e.g. sealings or joints, E02B; underground garages E04H 6/00; underground air-raid shelters E04H 9/12; burial vaults E04H 13/00; tunnels or galleries E21D); Retaining walls; Making conduits in situ, e.g. of concrete	2D047	HB
	B Basements	2D047	HB
	C . Enclosures, e.g. boxes	2D047	HB
	D . . Split bodies, e.g. panels	2D047	HB
	E . Accessories	2D047	HB
	Z Others	2D047	HB
- 29/02	. Retaining or protecting walls (piers or quay walls E02B 3/06)	2D048	HB
	301 . . Constructing retaining walls	2D048	HB
	302 . . . by sheet blocks	2D048	HB
	303 . . . by porous blocks	2D048	HB
	304 . . . by non-porous blocks	2D048	HB
	305 . . . by L-shaped blocks	2D048	HB
	306 . . . by parallel cross blocks	2D048	HB
	307 . . . Constructing retaining walls	2D048	HB
	308 . . . by non-concrete members	2D048	HB
	309 . . . by prefabricated members and site-installed concrete	2D048	HB
	310 . . . by site-installed concrete	2D048	HB
	311 . . Planting on retaining walls, e.g. by vegetation blocks	2D048	HB
	312 . . Draining retaining walls, e.g. by perforated blocks	2D048	HB

Fig. 26 Screen of FI E02D29/00 List

The list also shows the F-term classification link corresponding to FI E02D29/00. Click this link, then a list of the F-term theme code 2D047 will be displayed as shown below.



F-term List

This screen shows the F-term list of theme code "2D047".

List | Description

2D047	Underground structures, and protection, testing and repair of foundations
	E02D29/00-29/00@Z;29/04-37/00

Viewpoint	F-term											FI Cover Range
AA	AA00	AA01	AA02	AA03		AA05	AA06	AA07	AA08	AA09	AA10	E02D2
	UNDERGROUND STRUCTURES	. Underground spaces	. . Waterproofing	. . Heat insulation		. . Sectional units	. . . Partitions	. . . . Panels	. . Secondary facilities	. . . Ventilation systems	. . . Drainage systems	9/00-2 9/0 0@Z
AB	AB00	AB01	AB02		AB04		AB06		AB08			E02D2
	CONSTRUCTION OF LARGE UNDERGROUND SPACES	. Use for specific purposes	. . Use for underground tanks		. Use of construction methods involving? inverted striking		. Use of caissons		. Construction of underground spaces with continuous walls			9/04-2 9/0 4@Z
AC	AC00	AC01	AC02		AC04	AC05	AC06	AC07	AC08		AC10	E02D2
	CONDUITS	. Tunnels or underground trenches for installing conduits	. . Common trenches		. Manufacture of conduits in situ	. . Manufacture by consolidation	. . . Manufacture by compacting concrete	. . . Manufacturing by consolidating ?muddy water	. . Framing		. Repair of conduits	9/10-2 9/1 0@Z
BA	BA00	BA01	BA02	BA03	BA04	BA05		BA07	BA08	BA09		E02D2
	MANHOLES	. Foot-ladder apparatuses	. . Apparatuses that mount on the cover frame	. . Apparatuses that mount on the side element	. . . I-shaped ladders with a single central support for the rungs	. . . E-shaped ladders with the rungs on one side of a single support		. Construction equipment	. . Safety fences	. . Protective net		9/13-3 9/1 1@Z
		BA11						BA17	BA18	BA19	BA20	
		. Implements						. Adjustment	. . Use of an	. . Use of	. Use of nuts	

Fig. 27 Screen of F-term List of Theme Code 2D047

If you do not know an FI or F-term class, select the [Search by Keyword] button on the upper side of Patent Map Guidance.

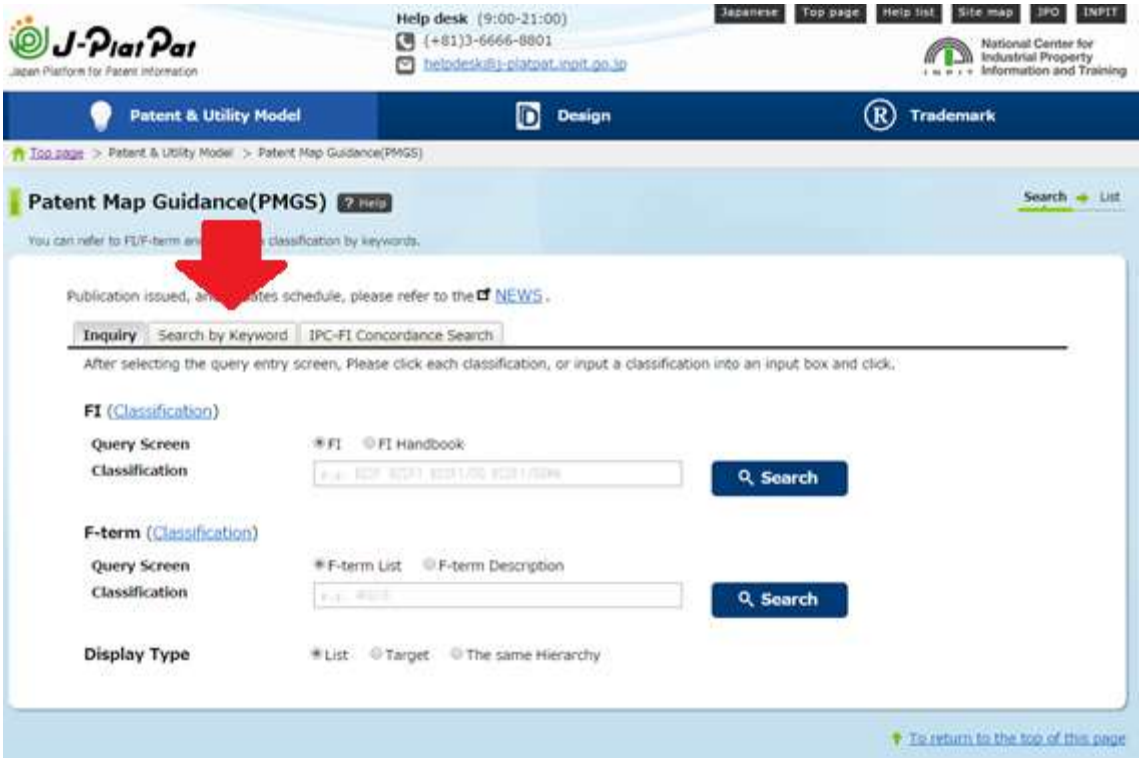


Fig. 28 Patent Map Guidance Screen of J-PlatPat

The [Search by Keyword] screen has the following layout. Checkmark the classification you want to search (FI, FI Handbook, F-term List, F-term Description) and enter the English keywords in the [Keyword] blank field.

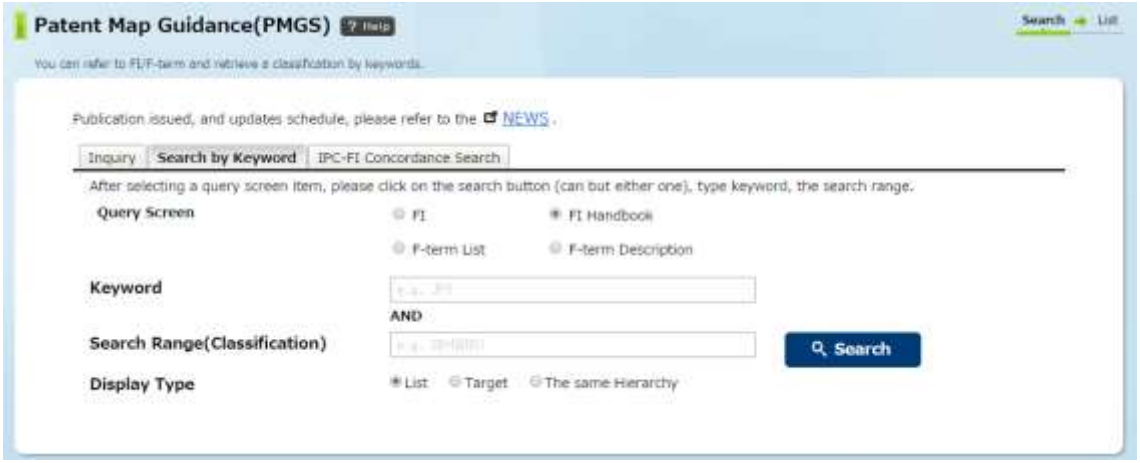


Fig. 29 Patent Map Guidance Screen of J-PlatPat (Search by Keyword)

In this example, checkmark FI, enter “manhole” in the [Keyword] field and click the [Search] button. Then, a screen listing the FI search results as shown below will be displayed.

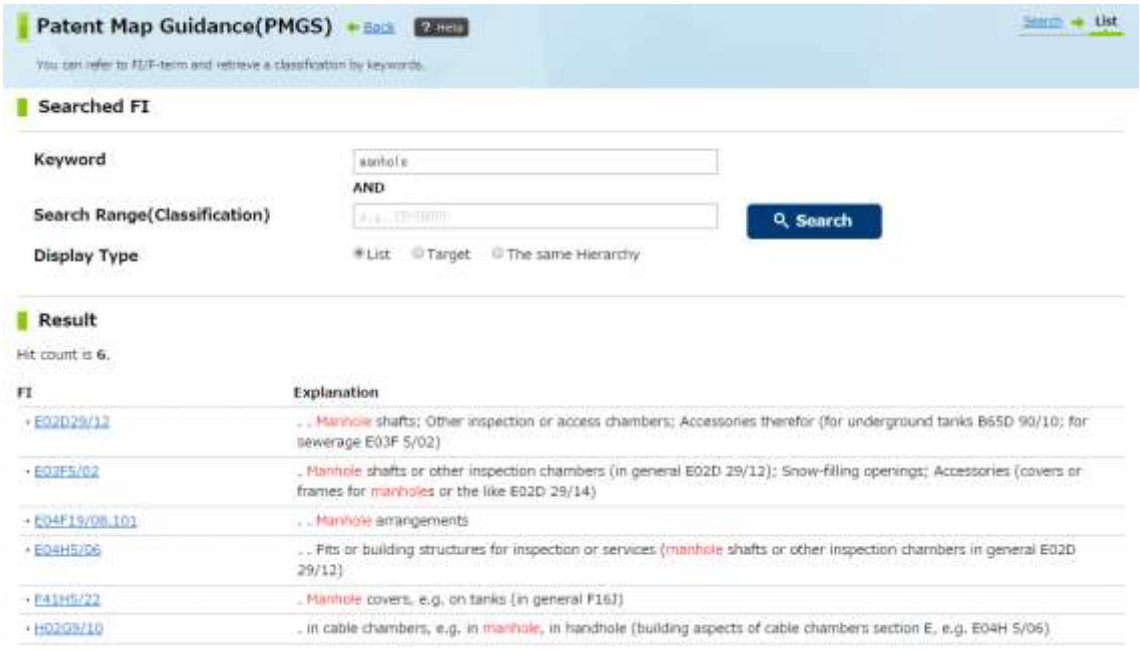


Fig. 30 Patent Map Guidance Screen of J-PlatPat (Keyword Search Results)

Click a searched FI to view the list of other FI main groups including that FI. Read the FI definitions and choose the appropriate class. In the following example, assume the keyword search results are as follows:

E02D29/00	Independent underground or underwater structures; Retaining walls; Making conduits in situ, e.g. of concrete
E02D29/10	. Tunnels or galleries specially adapted to house conduits, e.g. oil pipe-lines, sewer pipes; Making conduits in situ, e.g. of concrete; Casings or coverings of boreholes or narrow wells
E02D29/12	. . Manhole shafts; Other inspection or access chambers; Accessories therefor
E02D29/14	. . . Covers for manholes or the like; Frames for covers
E	**Structures of lids per se, e.g. laminated lids, non-slip lids**

Choose E02D29/14E, a subordinate FI class of E02D29/14, then conduct a search in FI/F-term Search by using this FI.

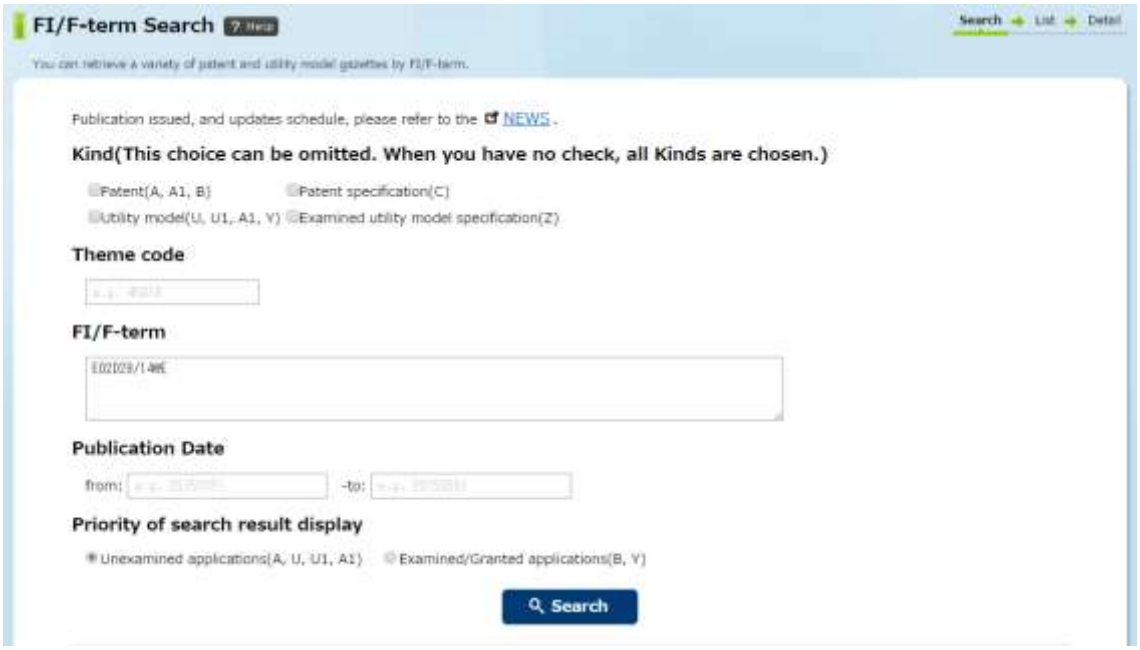


Fig. 31 FI/F-term Search Screen of J-PlatPat

Note that when you enter E02D29/14E in the FI/F-term search, you must add @ (at mark) before E (a letter suffixed to a FI sub-group code is called a file discrimination code). To specify the type(s) of publications, choose the desired type(s) from [Kind]. To specify the date, enter the date in the [Publication Date] field in the YYYYMMDD format. The [Priority of search result display] field is used to choose which results should be listed first, publications of unexamined applications or publications of examined applications/registrations. In this example, 897 matches were found by the search shown above (as of December 15, 2015). If there are more than 1,000 matches, you cannot view them in a single screen. Choose a lower FI class or choose a cross coupling of two or more FI classes to narrow the search range. If a narrower F-term class is found by clicking the F-term link corresponding to the FI class, that F-term may be used.

The result of the search is as shown below, listing the numbers of publications. Click each publication number link to view the details of the publication.

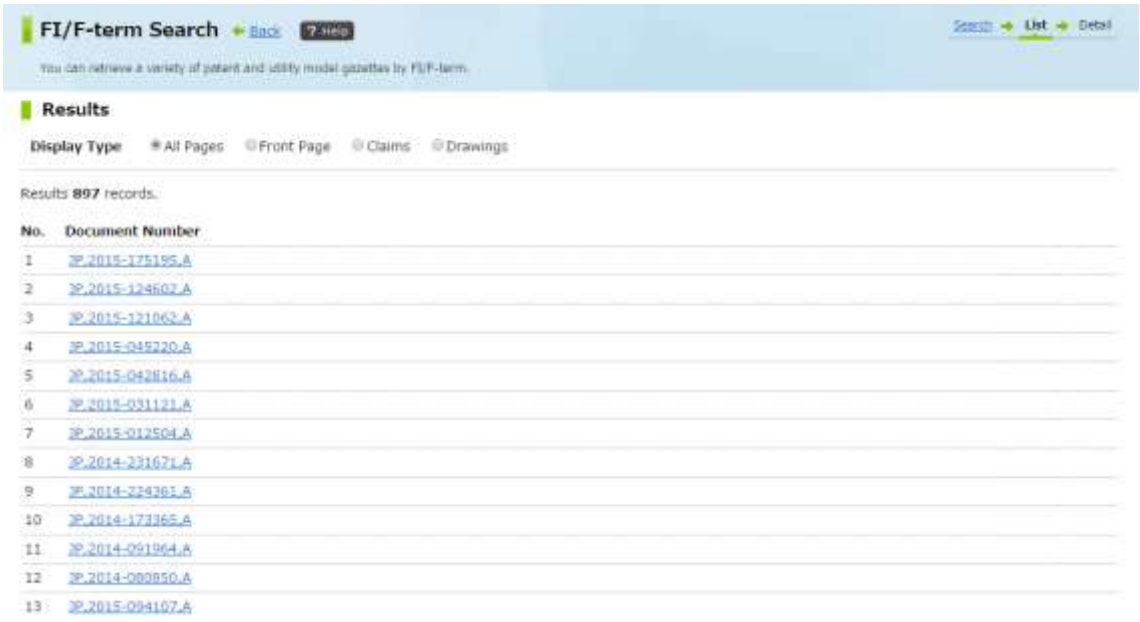


Fig. 32 FI/F-term Search Result Screen of J-PlatPat

Lastly, let's look at PAJ in the Patent & Utility Model search menu of J-PlatPat.

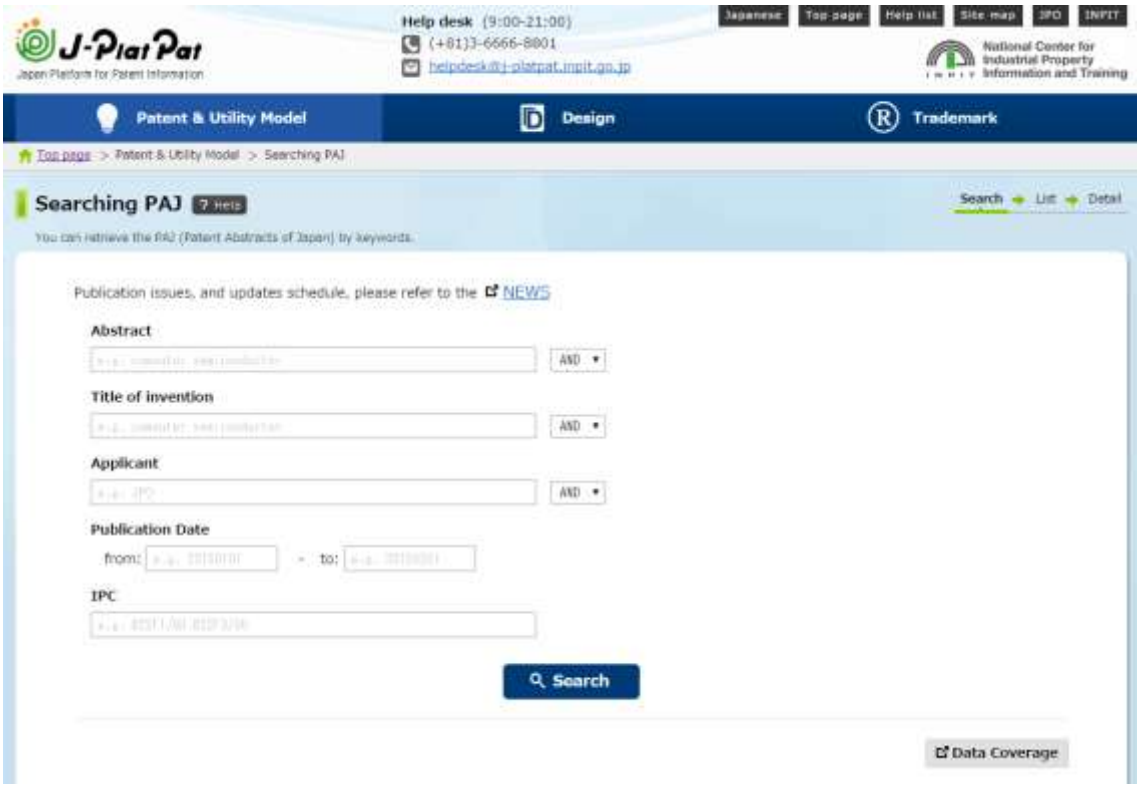


Fig. 33 PAJ Search Screen of J-PlatPat

PAJ is an abbreviation of Patent Abstracts of Japan. The titles and abstracts of inventions are translated manually, not by machine, from Japanese to English. English abstracts of Japanese patents accessible from Espacenet are those from PAJ.
In the PAJ Search Menu, you can couple the following five items to search publications:

- Abstract,
- Title of invention,
- Applicant,
- Publication date, and
- IPC

In J-PlatPat, this is the only search menu with English interfaces from which you can use English keywords for the search of Japanese patents and utility models. In this example, “VEHICLE” is entered in the [Abstract] field, and “GOOGLE” is entered in the [Applicant] field. In this case, three patents matched as shown below.

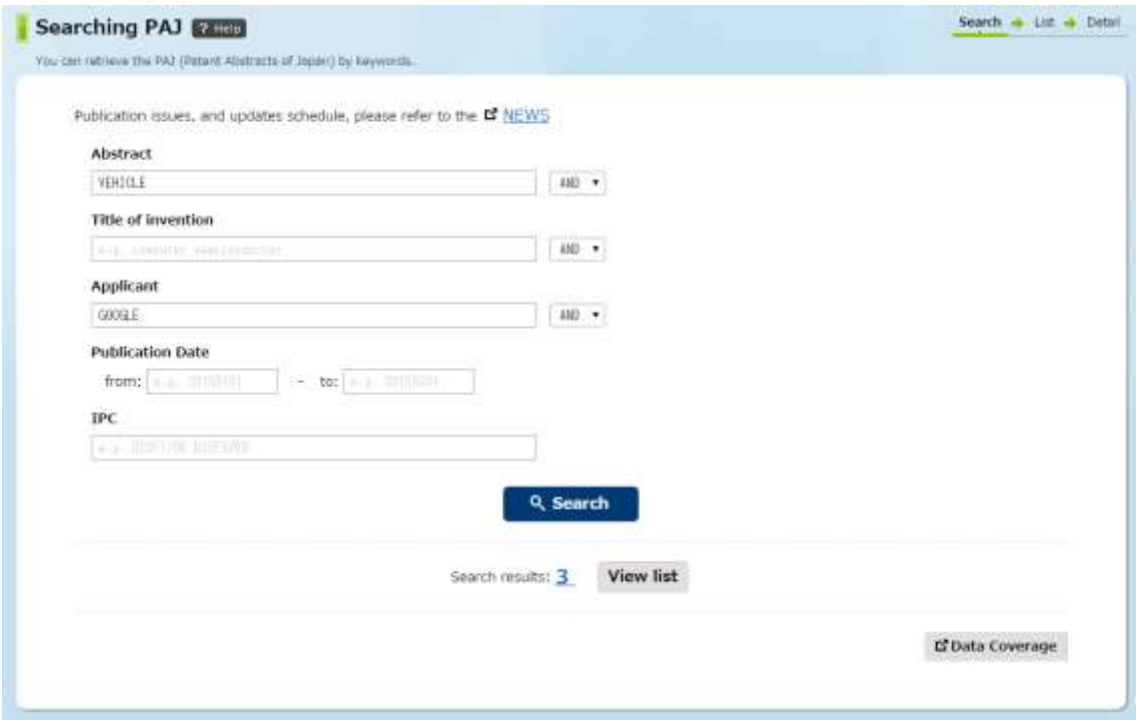


Fig. 34 Example of PAJ Search of J-PlatPat

Click [View list] to view the list of publication numbers and titles of inventions of these three matches, as shown below.

Fig. 35 PAJ Search Results of J-PlatPat

Click the second line item of the list (2014-197404) to see the PAJ for the publication as shown below. The keyword and the applicant name used in the search are highlighted in red.

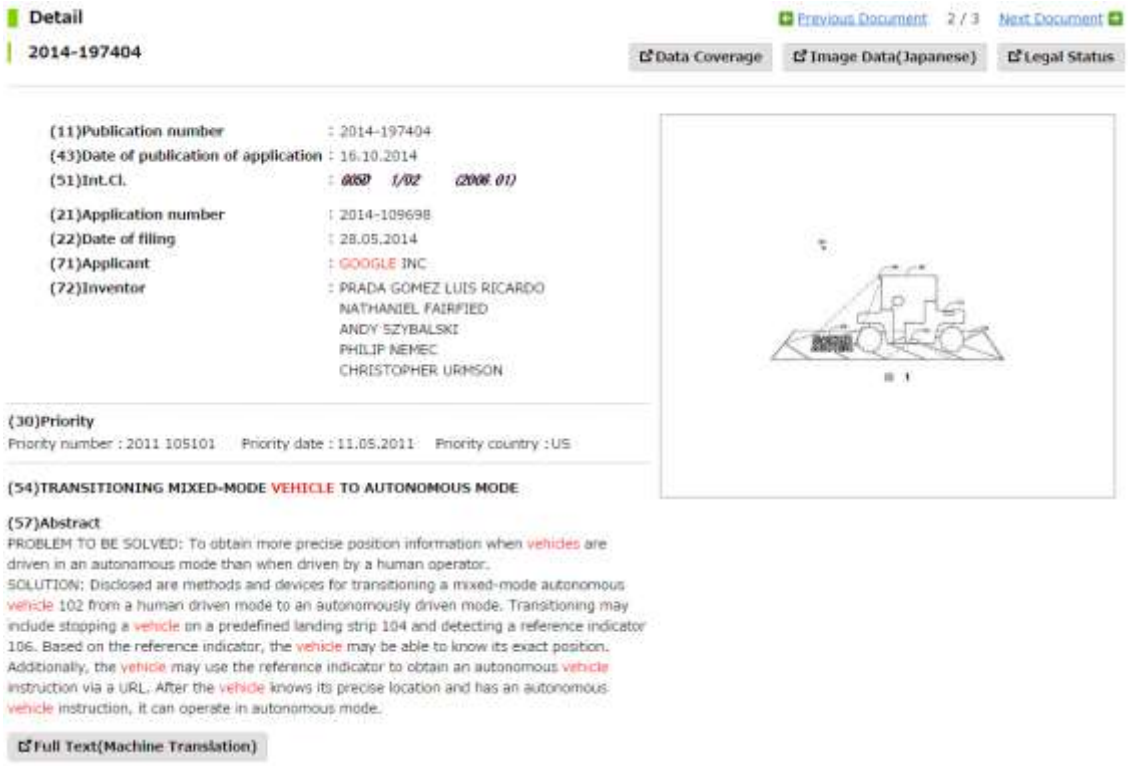


Fig. 36 PAJ Search Results of J-PlatPat

To see more details of the patent, click the [Full Text (Machine Translation)] button at the bottom of the page to show the full text of the machine translation. To check the right-related status of the publication, click the [Legal Status] button at the upper-right corner.

ii. **European Patent Office (EPO) Espacenet**

Espacenet is a database operated by the European Patent Office (EPO) that manages patent information not only in Europe but in about 90 total countries and regions. Unlike the J-PlatPat patent data platform and the USPTO database, Espacenet allows you to search patent family information. Espacenet has smart search, advanced search and classification search menus. The figure below shows the interface in the advanced search menu.

URL: http://worldwide.espacenet.com/advancedSearch

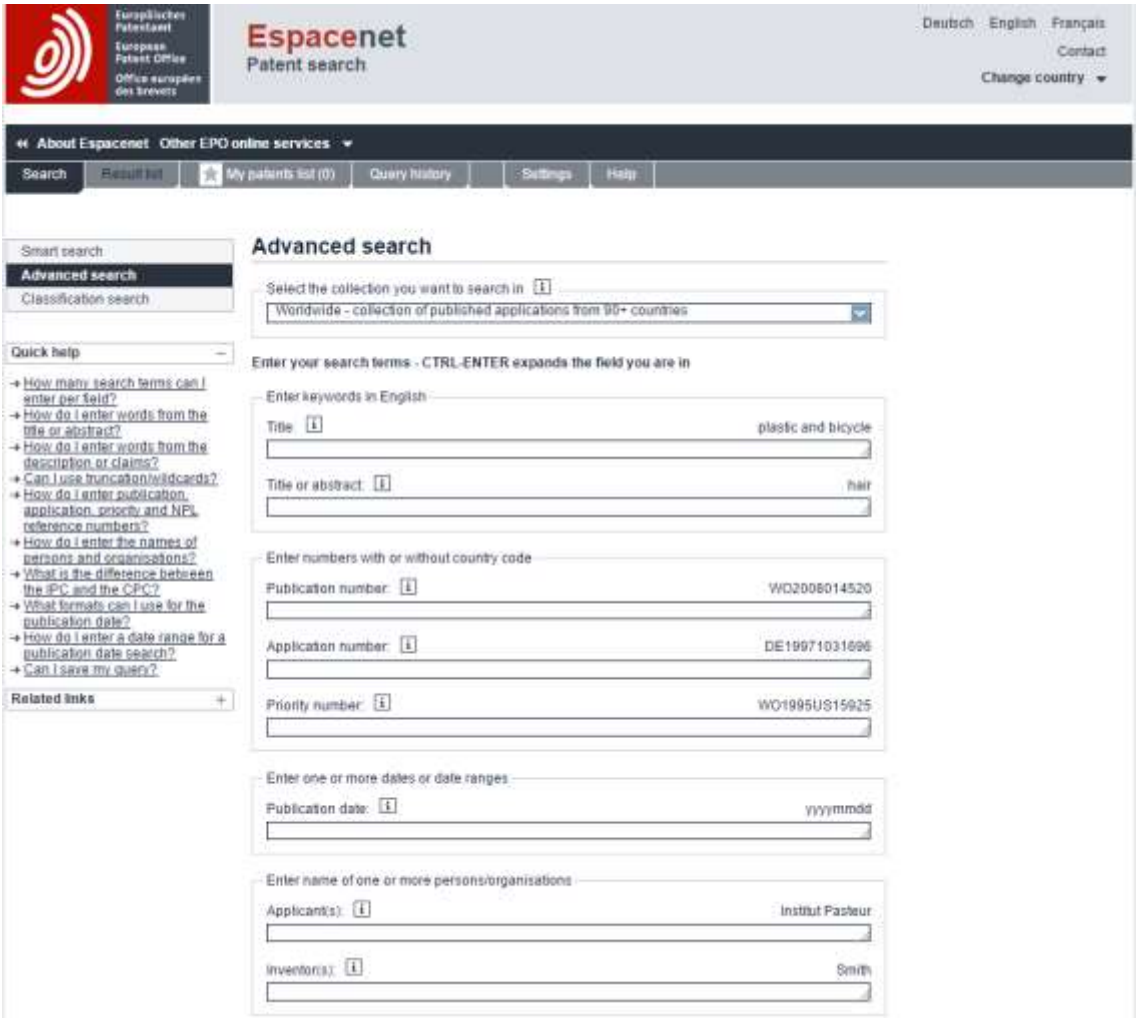


Fig. 37 Top Page of the Advanced Search Menu of Espacenet

Searchable items are the invention titles, abstracts, publication numbers, application numbers, priority numbers, publication dates, applicants, inventors, CPCs and IPCs. By entering a country code (e.g. JP for Japan, and US for the United States), you may limit the search range to publications in a specific country. The following search items are entered in this example:

Title or abstract: AIR CONDITIONER
Publication number: EP
CPC: B60K6

as shown below. Entering EP in the Publication number field, the search is made only for publications in Europe. (By adding a type code to the country code, you may also limit the search to a specific type of publication. For example, entering EPA will limit the search to publications of patent applications in Europe, and entering EPB will limit the search to publication of granted patents in Europe.)

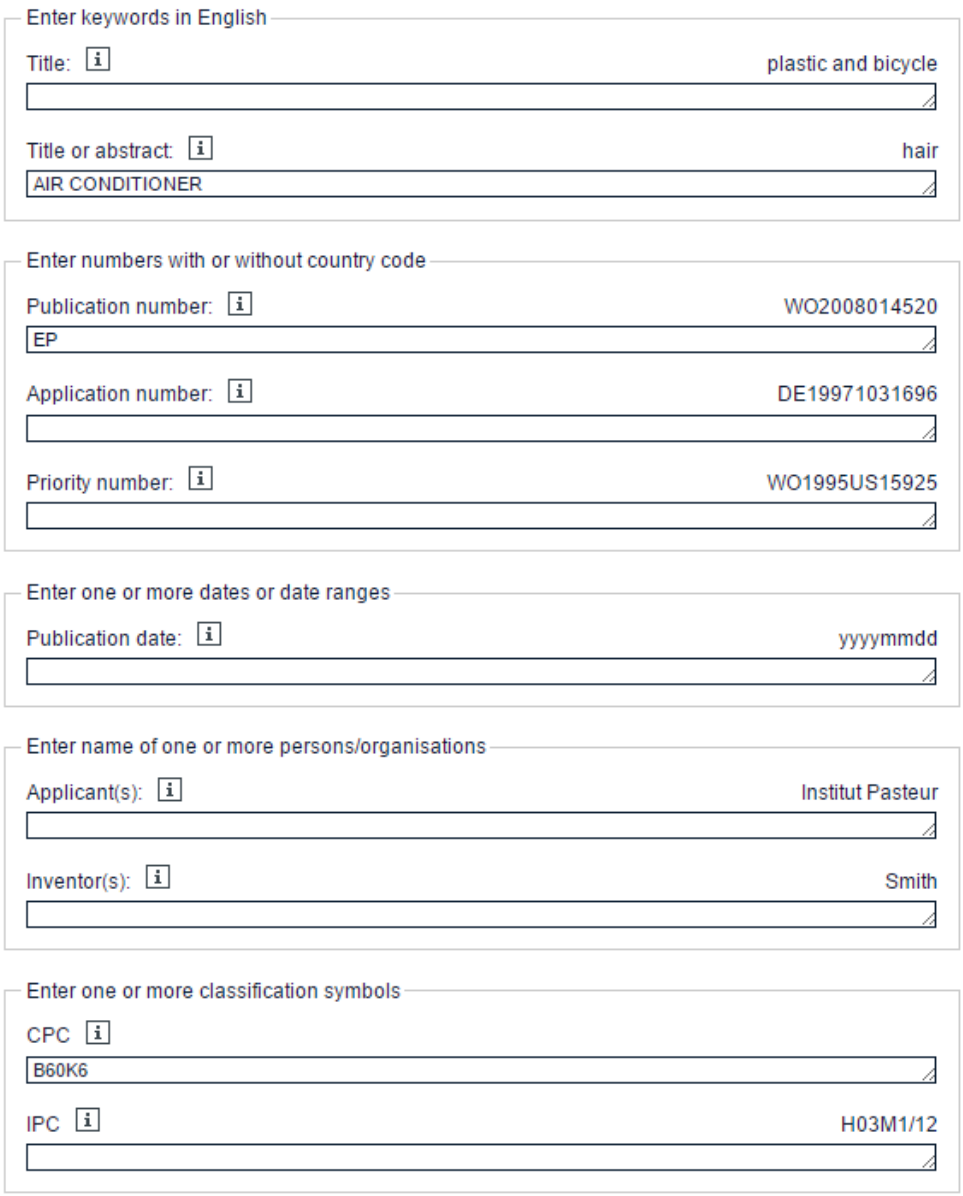


Fig. 38 Example of Advanced Search in Espacenet

Eight matches are retrieved as a result of the search.

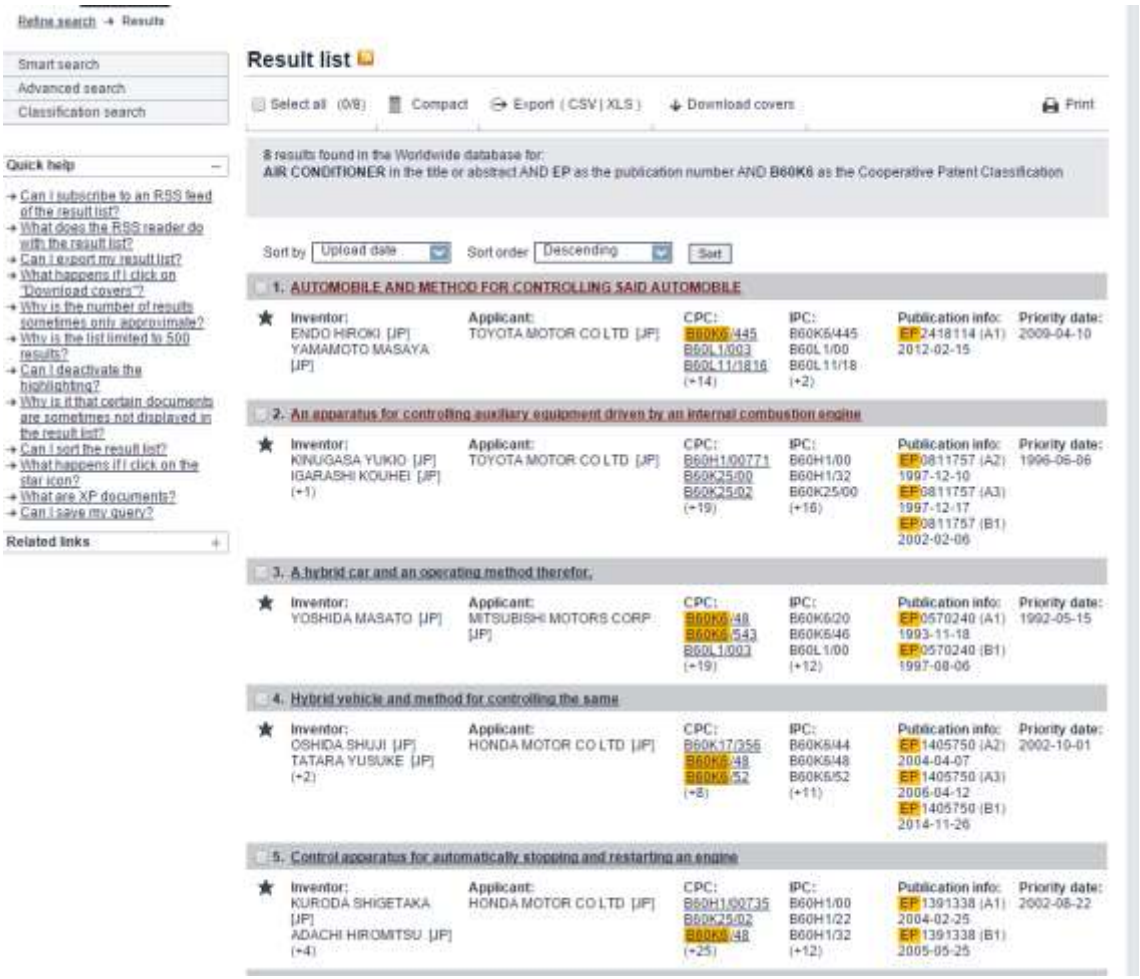


Fig. 39 Example of Advanced Search Results in Espacenet

Click the title of the invention of the first item in the match list. Bibliographic data and abstracts in English are displayed as shown below.

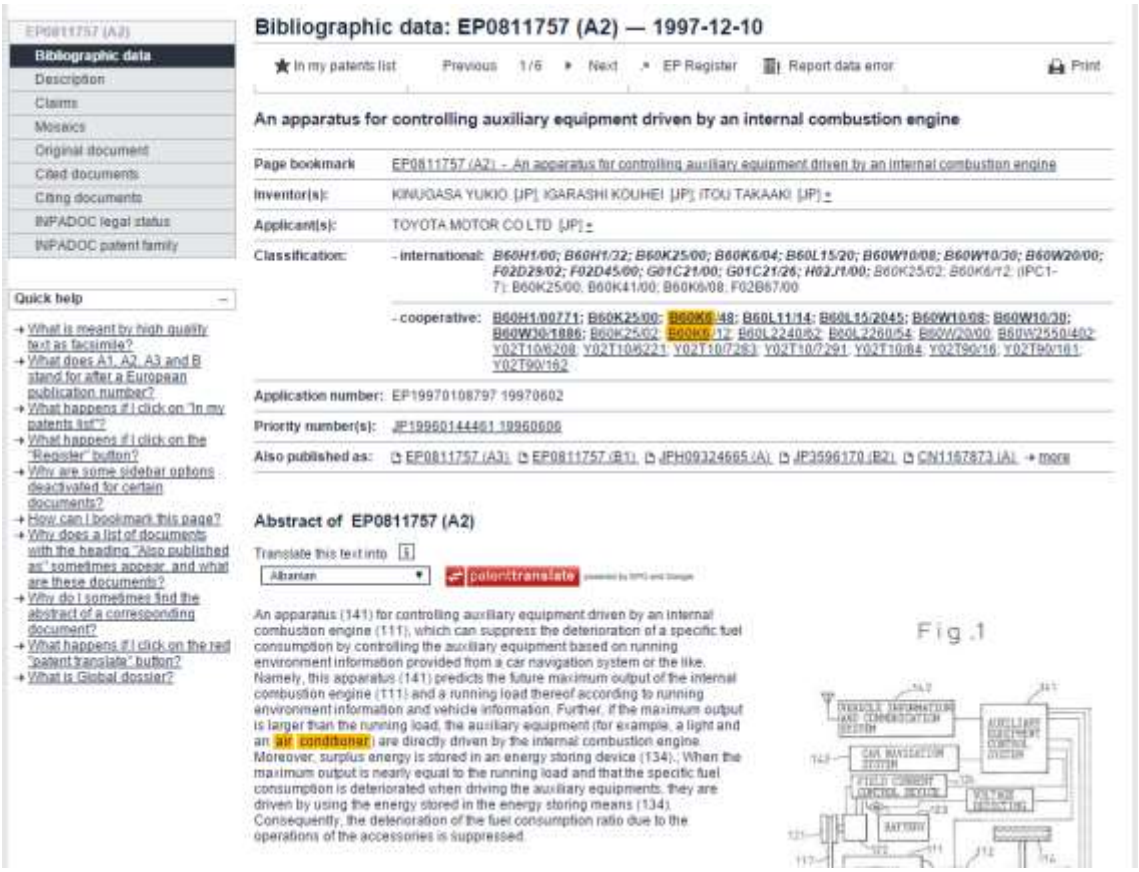


Fig. 40 Example of Advanced Search Results in Espacenet (publication view)

By clicking [INPADOC patent family] on the left side menu, you can see the patent family related to this patent.

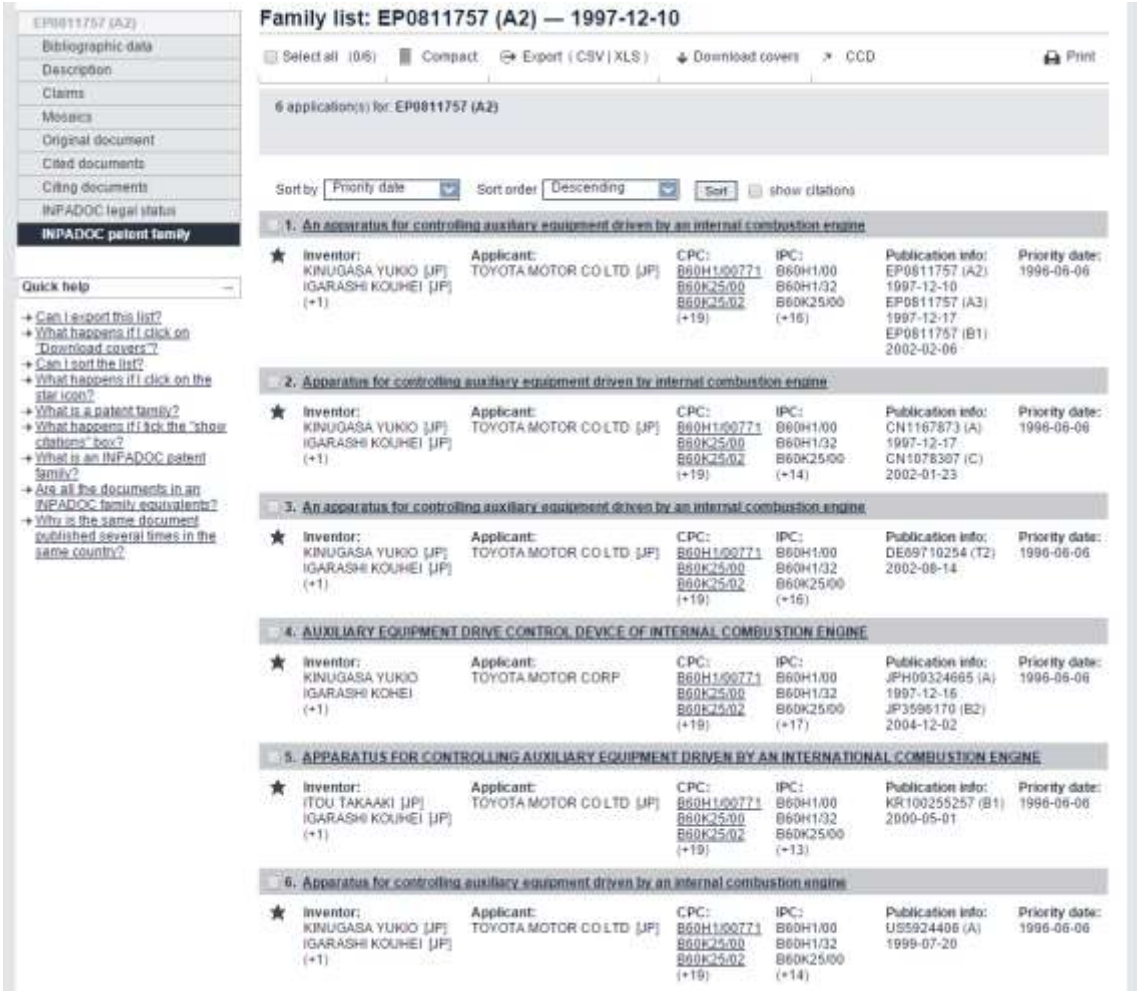


Fig. 41 Example of Advanced Search Results in Espacenet (patent family)

By clicking [INPADOC legal status] on the left side menu, you can see the right-related status of this patent (there may be a time lag, or right-related status data may not be provided in some countries and regions).

Fig. 42 Example of Advanced Search Results in Espacenet (INPADOC legal status)

If you are looking for information on patents in Europe, you may click the [EP Register] button as indicated by an arrow in Fig. 42 to navigate to the examination progress details page.

iii. PatFT/AppFT of U.S. Patent and Trademark Office (USPTO)

The U.S. Patent and Trademark Office (USPTO) provides free patent databases, known as Patent Fulltext Databases (PatFT/AppFT)19). PatFT is a database of granted patents and AppFT is a database of patent application publications. Both databases have Quick Search, Advanced Search and Number Search menus.

URL: http://patft.uspto.gov/

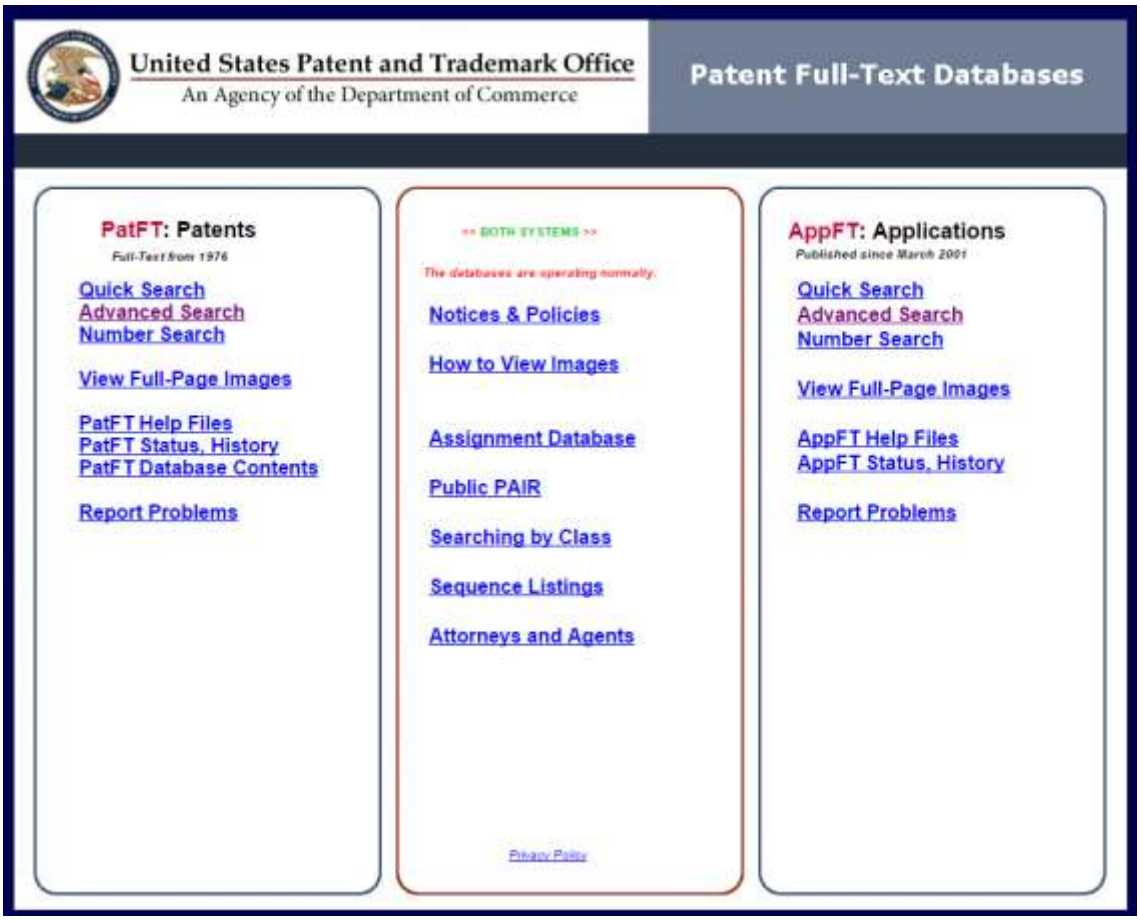


Fig. 43 Top Page of USPTO Patent Full-Text Databases

Interfaces in the [Advanced Search] menu are as shown in the figure below. Field codes can be combined to create a search formula.

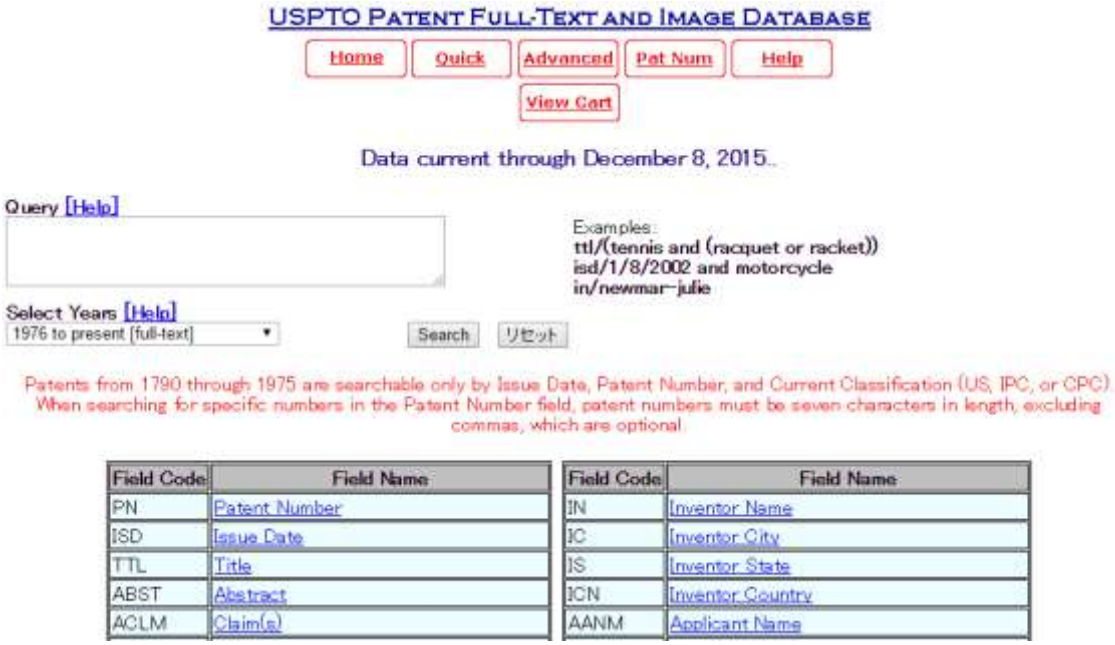


Fig. 44 Top Page of the Advanced Search Menu of USPTO

A query can be structured in the search formula. For example,

TTL/HYBRID AND TTL/VEHICLE AND ABST/AIR AND ABST/CONDITIONER

TTL specifies a keyword included in the title of inventions, and ABST specifies a keyword included in abstracts. If you want to use patent classification, you may use International Classification (ICL), Cooperative Patent Classification (CPC) or U.S. Current Classification (CCL). The figure below shows the search results of this example.

Fig. 45 Search Results of USPTO Advanced Search (Search formula: TTL/HYBRID AND TTL/VEHICLE AND ABST/AIR AND ABST/CONDITIONER)

You can view the publication either by clicking the publication number link or the title of invention link. For example, click the publication number link in the first line. Then, the following page for that publication will be displayed. This publication page includes only text data, and has no drawings.

USPTO PATENT FULL-TEXT AND IMAGE DATABASE

Home | Quick | Advanced | Pat Num | Help

Hit List | Next | Bottom

View Cart | Add to Cart

Images

(1 of 11)

United States Patent
Takeuchi , et al.

8,892,287
November 18, 2014

Hybrid vehicle control unit and control method

Abstract

With a hybrid vehicle driven at extremely low speeds only by power from the electric motor, when a state-of-charge of the battery becomes equal to or smaller than a predetermined level or when a rotational speed required on the ***air conditioner*** compressor is less than a desired rotational speed, power from the internal combustion engine is transmitted to the output shaft by engaging the first engaging and disengaging mechanism, starting the internal combustion engine by power from the electric motor, and thereafter, engaging the first engaging and disengaging mechanism or the second engaging and disengaging mechanism between a fully applied state and a fully released state.

Inventors:	Takeuchi; Masahiro (Saitama, JP), Ikegami; Takefumi (Saitama, JP), Kuroda; Shigetaka (Saitama, JP)
Applicant:	Name City State Country Type
	Takeuchi; Masahiro Saitama N/A JP Ikegami; Takefumi Saitama N/A JP Kuroda; Shigetaka Saitama N/A JP
Assignee:	Honda Motor Co., Ltd (Tokyo, JP)
Family ID:	45469458
Appl. No.:	13/700,304
Filed:	July 12, 2011
PCT Filed:	July 12, 2011
PCT No.:	PCT/JP2011/065904
371(c)(1),(2),(4) Date:	November 27, 2012
PCT Pub. No.:	WO2012/008461
PCT Pub. Date:	January 19, 2012

Fig. 46 Example of Publication Page found in the USPTO Advanced Search (US 8,892,287)

If you want to view drawings, click the [Images] button on the upper section of the page. The publication in the PDF format is then displayed.

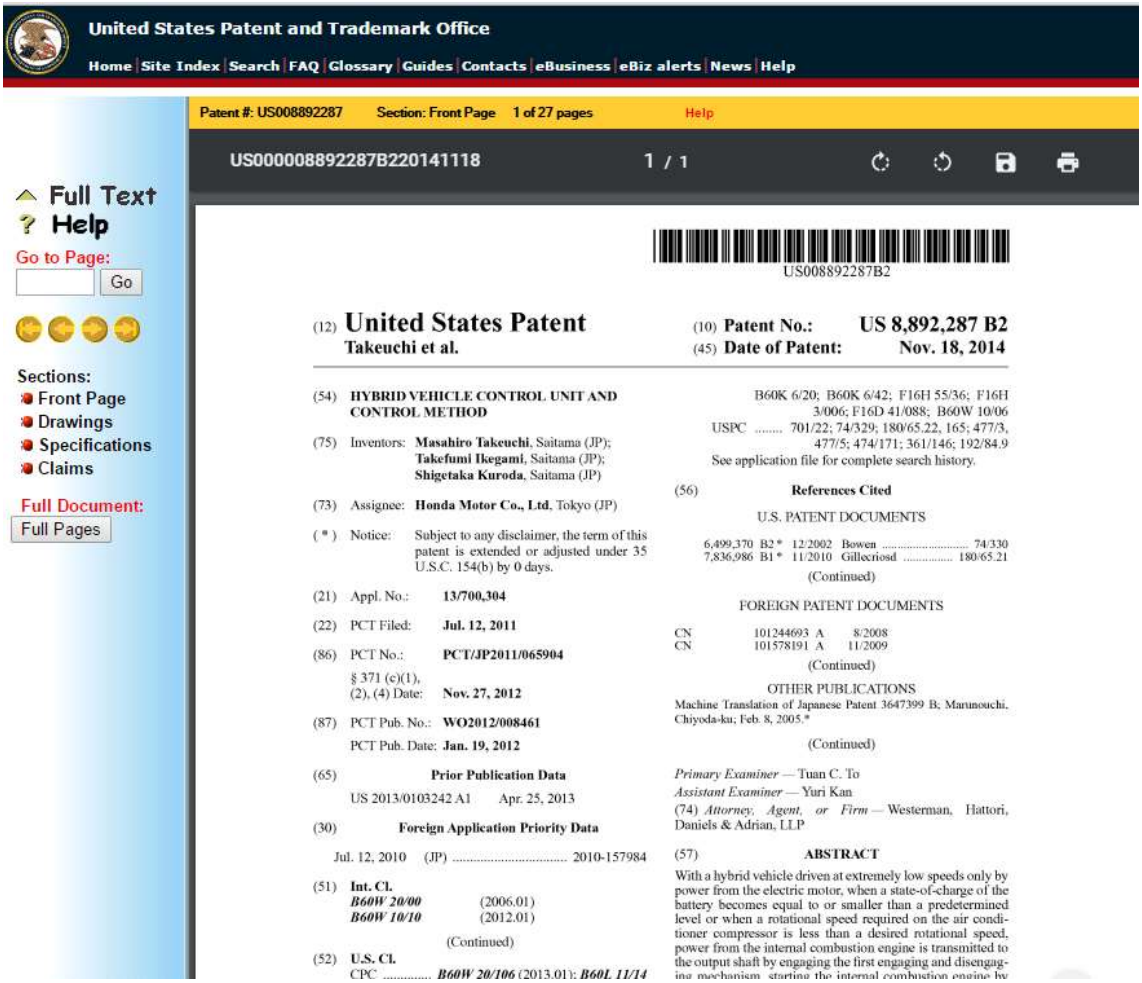


Fig. 47 Example of Publication Page found in the USPTO Advanced Search (US 8,892,287)

iv. **Patentscope of the World Intellectual Property Organization (WIPO)**

Patentscope is a free database operated by the World Intellectual Property Organization (WIPO), storing not only information on WO international patent applications but also patent information collected from various countries and organizations including IP5 (Japan, U.S., Europe, China and Korea).

URL: http://patentscope.wipo.int/

Fig. 48 Top Page of Patentscope

Patentscope has Simple, Advanced and Field Combination search menus. To perform a simple search, you can use the [Simple search] menu. To customize a search formula, use the [Advanced Search] menu. If you want to select multiple search items and combine them, you may use the [Field Combination] menu. This example is used to explain how the Field Combination search is performed.

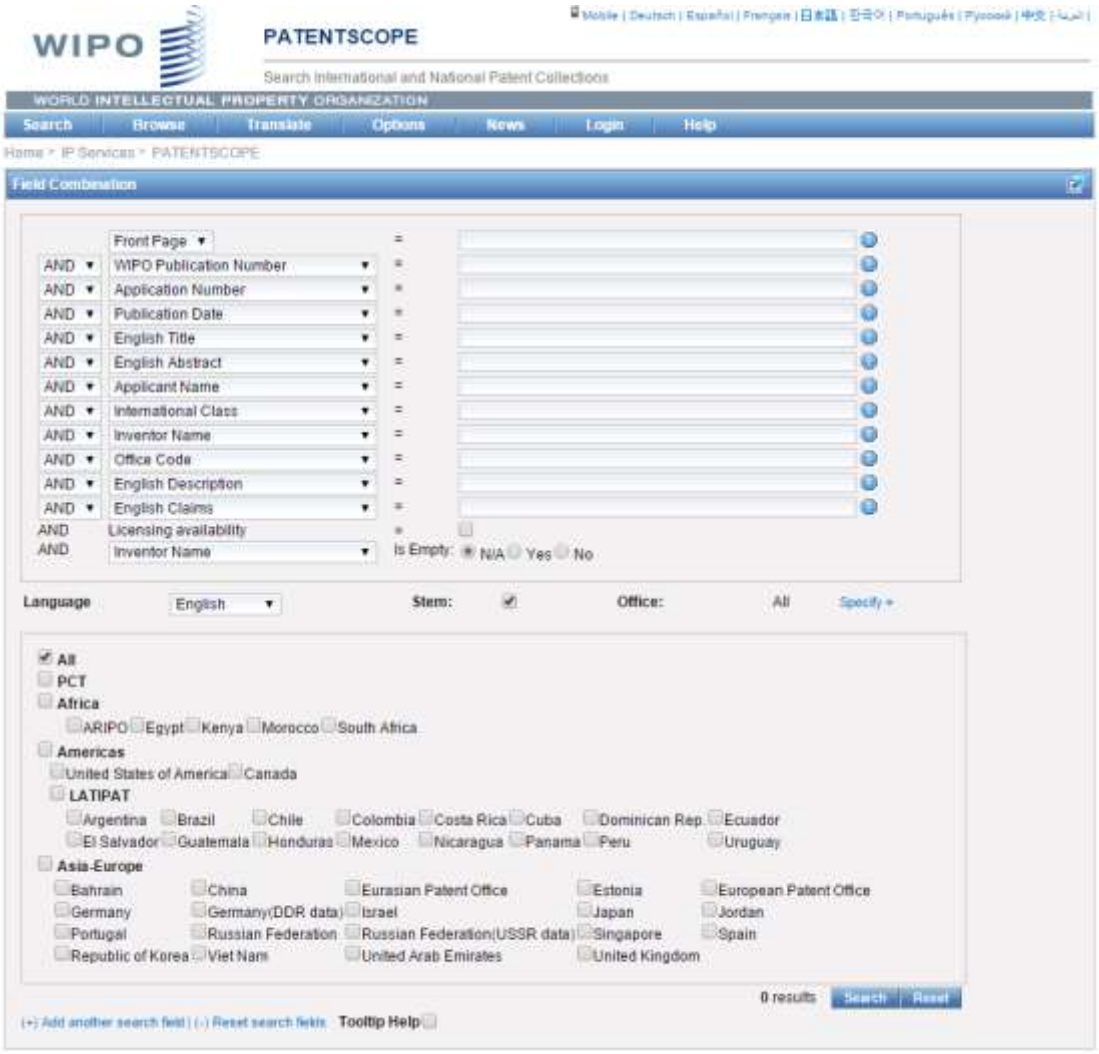


Fig. 49 Top Page of Patentscope Field Combination Search Menu

In the top page of the Field Combination Search Menu, a search item is listed in each line. You may also use the pull-down menu to choose the search items you want to use. By clicking [Specify] in the lower-right corner of the menu, you can specify countries to be included in the search as shown in the figure above. In the default setting, [All] is checkmarked to search all relevant applications filed in countries in Africa, America, Asia and Europe, not only PCT applications. You can check the filing conditions of individual countries covered by Patentscope (such as the start date of record filing, and the latest filing date) by navigating through the following:

Help > Data Coverage > National Collections

WIPO PATENTSCOPE

Search International and National Patent Collections

WORLD INTELLECTUAL PROPERTY ORGANIZATION

Search | Browse | Translate | Options | News | Login | Help

National Collections - Data Coverage

Last Update:2015-11-27

Country	Biblio Data	Abstract	Doc images	OCR (full-text) Indexed	Nb records	Note
PCT	20.10.1978 - 27.11.2015	20.10.1978 - 27.11.2015	2758936	Total records: 2745844 English: 1712133 French: 102995 Spanish: 19632 German: 313486 Korean: 49471 Japanese: 422911 Chinese: 107652 Russian: 15239 Portuguese: 2415	2,750,936	
Argentina	12.02.1965 - 26.03.2015	01.11.1990 - 26.03.2015	9741	Total records: 8500 Spanish: 8500	144,412	
Bahrain	10.03.1957 - 29.09.2005	10.03.1957 - 29.09.2005			1,411	
Brazil	26.04.1972 - 10.06.2015	26.04.1989 - 10.06.2015	229967	Total records: 217726 Portuguese: 217726	558,766	
Canada	12.08.1869 - 21.10.2015	- 21.10.2015		Total records: 1126559 English: 1083008 French: 43551	2,236,528	
Chile	08.01.2005 - 22.11.2014	08.01.2005 - 22.11.2014			19,836	
China	- 17.09.2015	- 17.09.2015		Total records: 4534296 Chinese: 4534296	4,697,388	
Colombia	14.02.1995 - 01.10.2015	14.02.1995 - 01.10.2015	1032	Total records: 397 Spanish: 397	29,776	

Fig. 50 Patentscope National Collections - Data Coverage

In the Field Combination Search menu, patents including English search keywords of HYBRID, VEHICLE, AIR, and CONDITIONER were searched. (Patentscope's search formula is: EN_AB:HYBRID AND EN_AB:VEHICLE AND EN_AB:AIR AND EN_AB:CONDITIONER) The hit list is displayed as shown below, and the searched keywords are highlighted.

Fig. 51 Patentscope Search Results (Search formula: EN_AB:HYBRID AND EN_AB:VEHICLE AND EN_AB:AIR AND EN_AB:CONDITIONER)

Click the publication number in the first item in the search result list. The link opens a page with publication details.

Fig. 52 Publication Page Found in the Patentscope Search (Example: KR1020090118228)

The example above is a publication related to a Korean patent. To view claims in the Korean language, click the [Claim] tab in the upper part.

Fig. 53 Publication Page Found in the Patentscope Search - Claims (Example: KR1020090118228)

Click the [Machine translation] button in the upper part of the page to show the machine translation tool options. In this example, choose [Google Translate], and choose [English]. The claims in the Korean language are translated into English by machine translation as shown below. You can now examine the contents of the Korean patent in English.

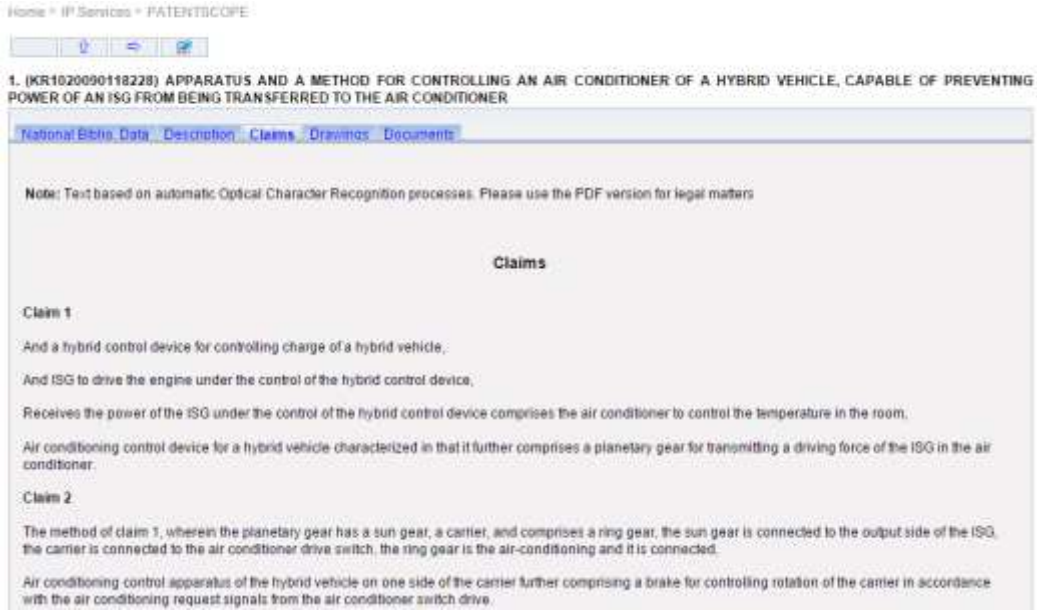


Fig. 54 Publication Page Found in the Patentscope Search - Claims Translated into English by Machine Translation (Example: KR1020090118228)

You may go back to the list of search results and click the [Analysis] button above the list to view the macro statistic results of the search.

Fig. 55 Patentscope Search Results (Search formula: EN_AB:HYBRID AND EN_AB:VEHICLE AND EN_AB:AIR AND EN_AB:CONDITIONER)

The following statistics are shown:

- Countries,
- Main IPC,
- Main Inventor,
- Main Applicant, and
- Pub Date

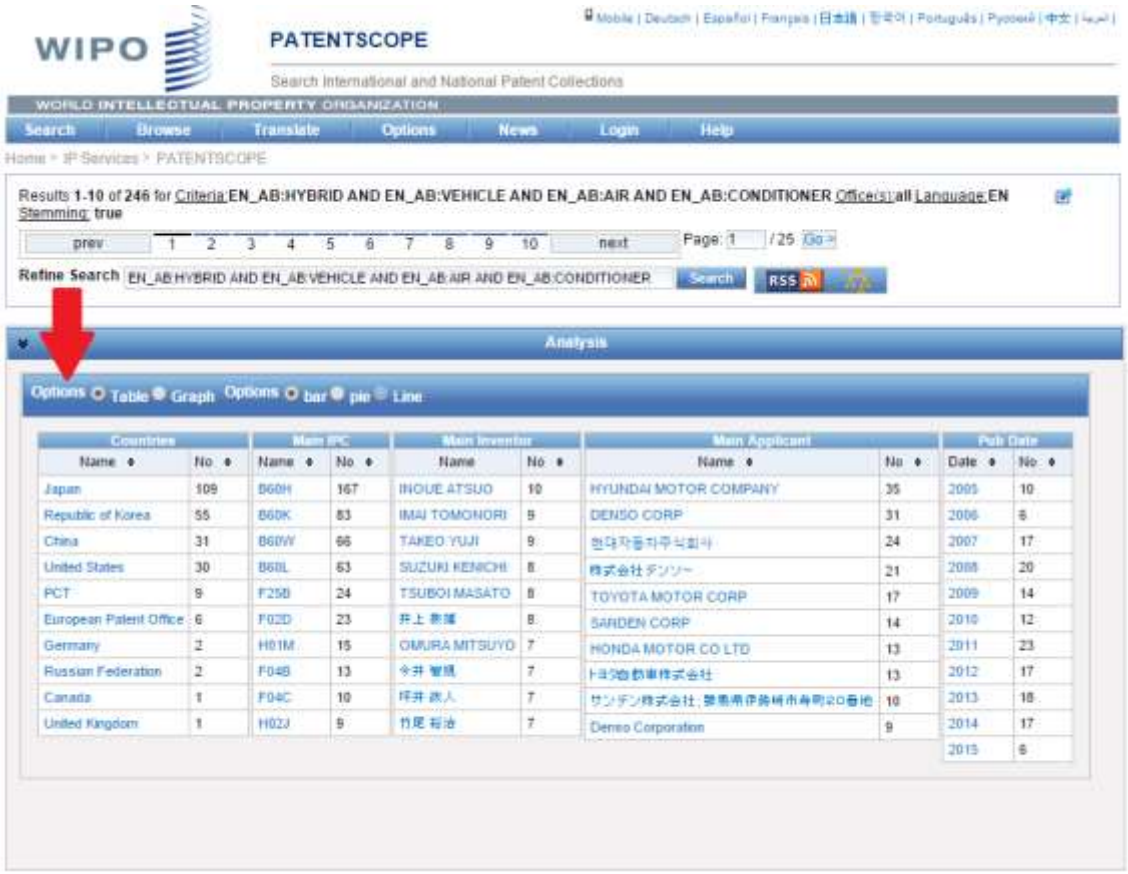


Fig. 56 Result of Patentscope Search Analysis

If you change the format from [Table] to [Graph] in the options section, the statistics will be displayed as a graph.

v. **Google Patents**

Google Patents is a patent search database operated by Google, not by national patent offices. It includes not only U.S. patents, but also European, Japanese, WO, Chinese, Canadian and German patents.

URL: https://patents.google.com/

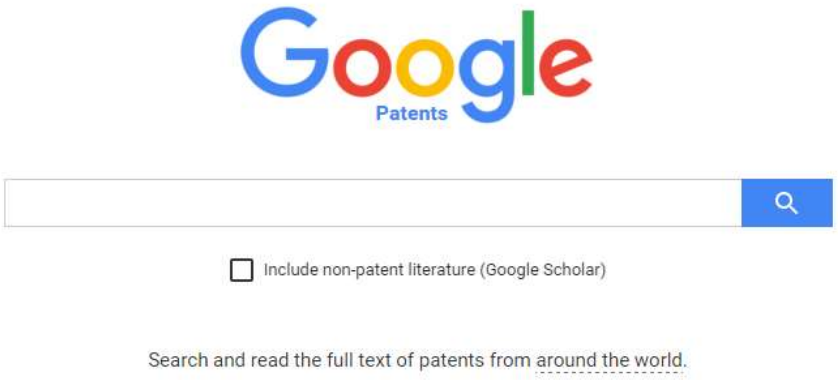


Fig. 57 Top Page of Google Patents

You just enter keywords as with usual Google searches, and relevant patents are shown. The first search results are derived by groupings based on patent classifications, and are listed in descending order of relevance. To change the order of the search results, you can choose options from the pull-down menu of "order by relevance" and "grouped by classification" at the top of the search result page.

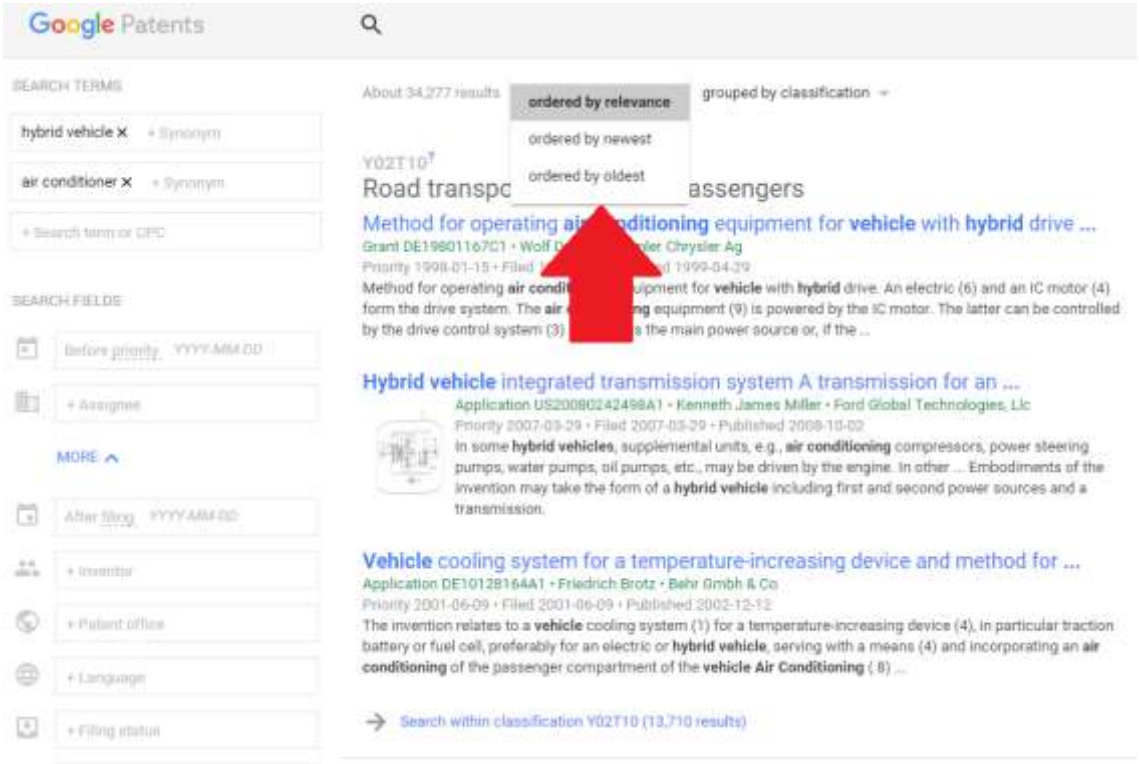


Fig. 58 Search Result in Google Patents
(Search keywords: hybrid vehicle air conditioner)

In the default setting, all relevant patents are searched in addition to U.S. patents. To narrow the search range to U.S. patents, specify [US] in the [Patent office] field provided in the left side of the search results page.

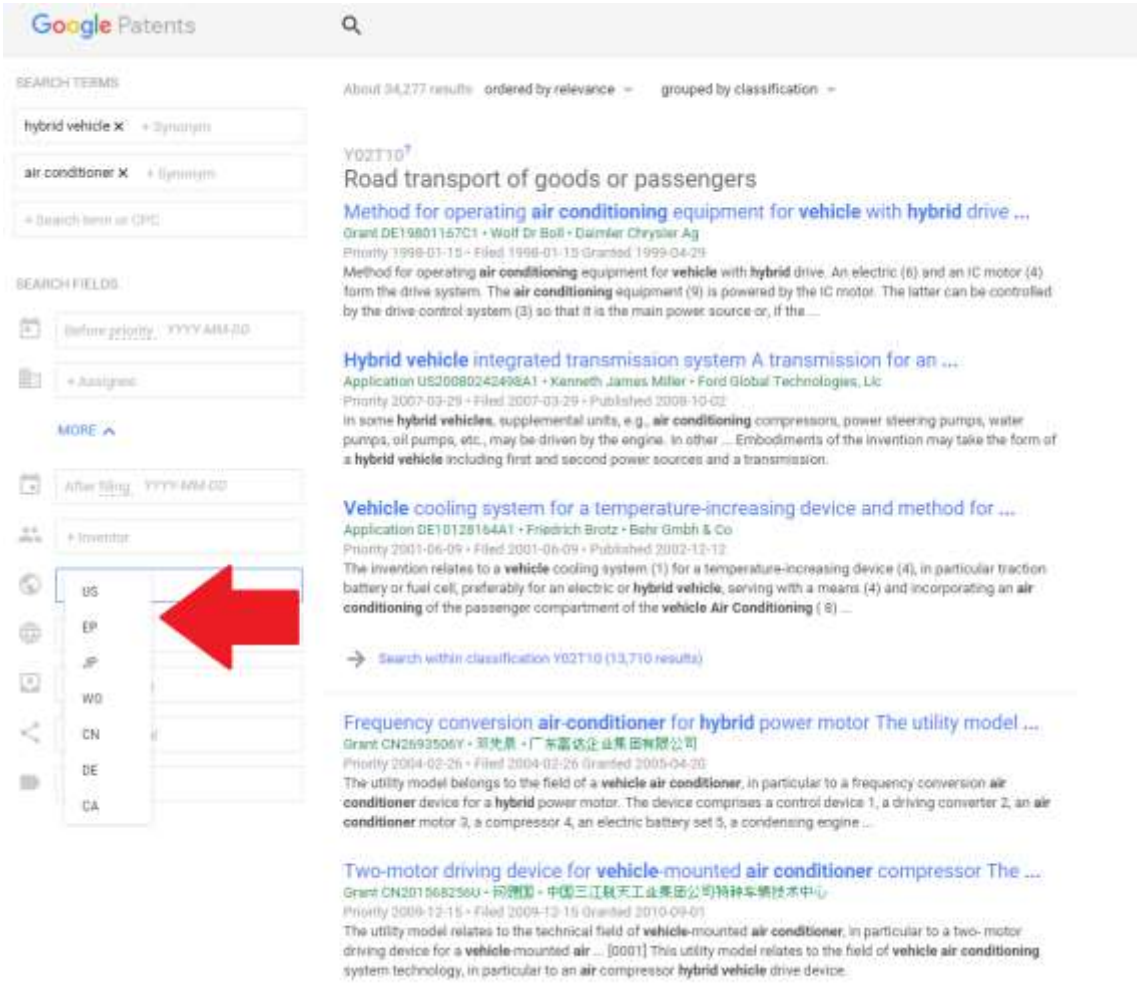


Fig. 59 Narrowing the Search Results to a Specific Country of Publication

The screen below is a page of a patent registered in Germany found by the Google Patents search. In Google Patents, publications in foreign languages are translated to English by machine translation. You can confirm the title of invention, abstract, claims and detailed description of invention in English.

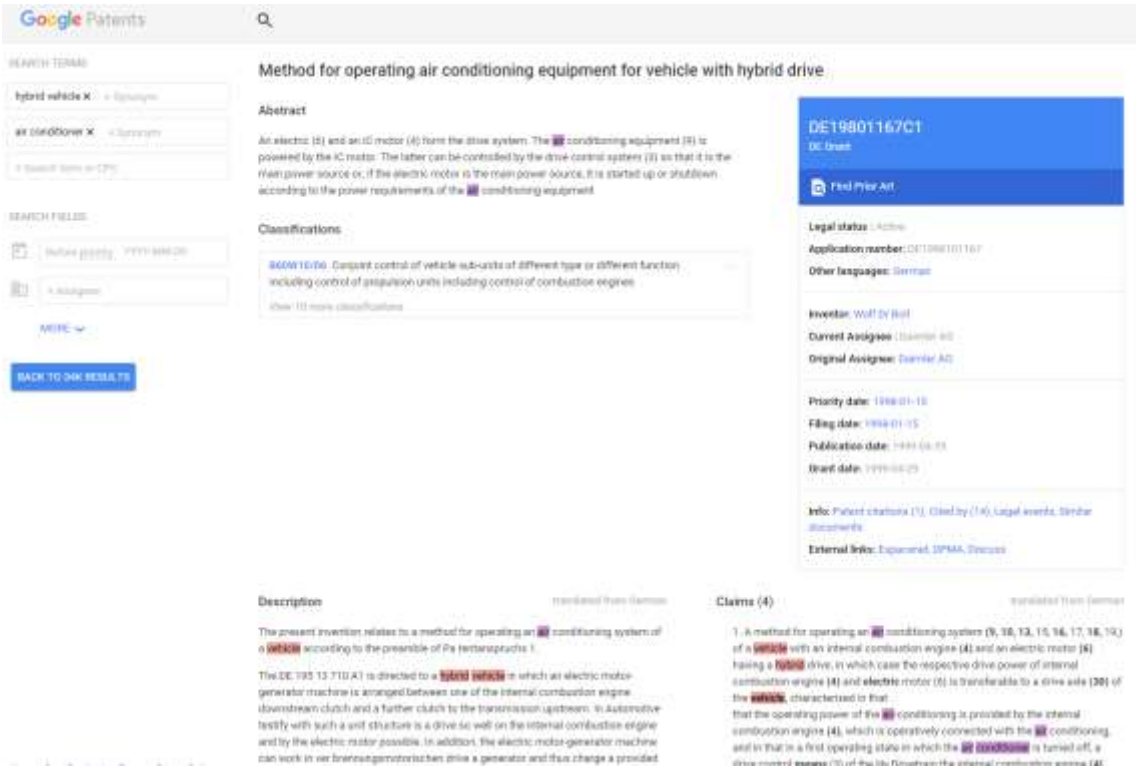


Fig. 60 Page of a Publication found by the Google Patents Search (Example: DE19801167C1)

In the upper-right corner of the page, basic data such as [Legal status], [Applicant], [Right holder], [Filing date], [Publication date], [Registration date], are shown. In [External links], links to patent office databases, such as Espacenet, are provided so that you can confirm the patent family or obtain the publication in PDF format.

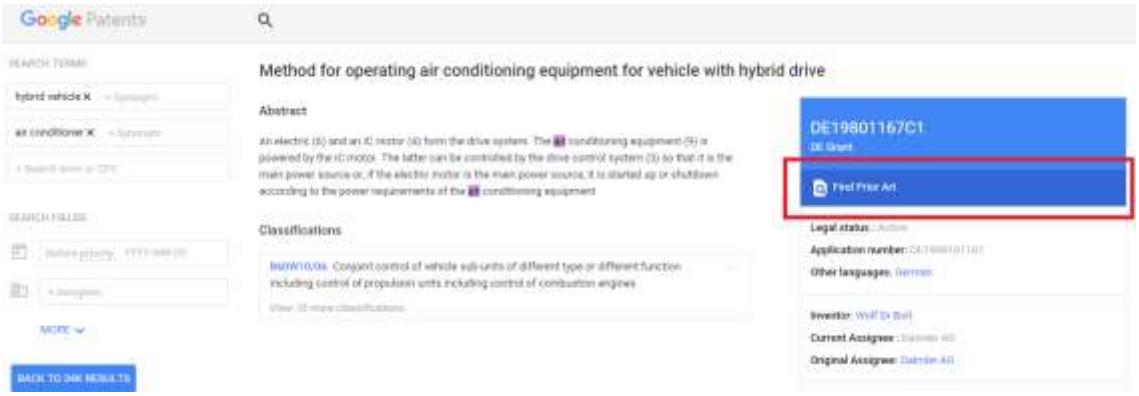


Fig. 61 Find Prior Art Button in Google Patents (Example: DE19801167C1)

The [Find Prior Art] button provided in each publication page is a useful function.

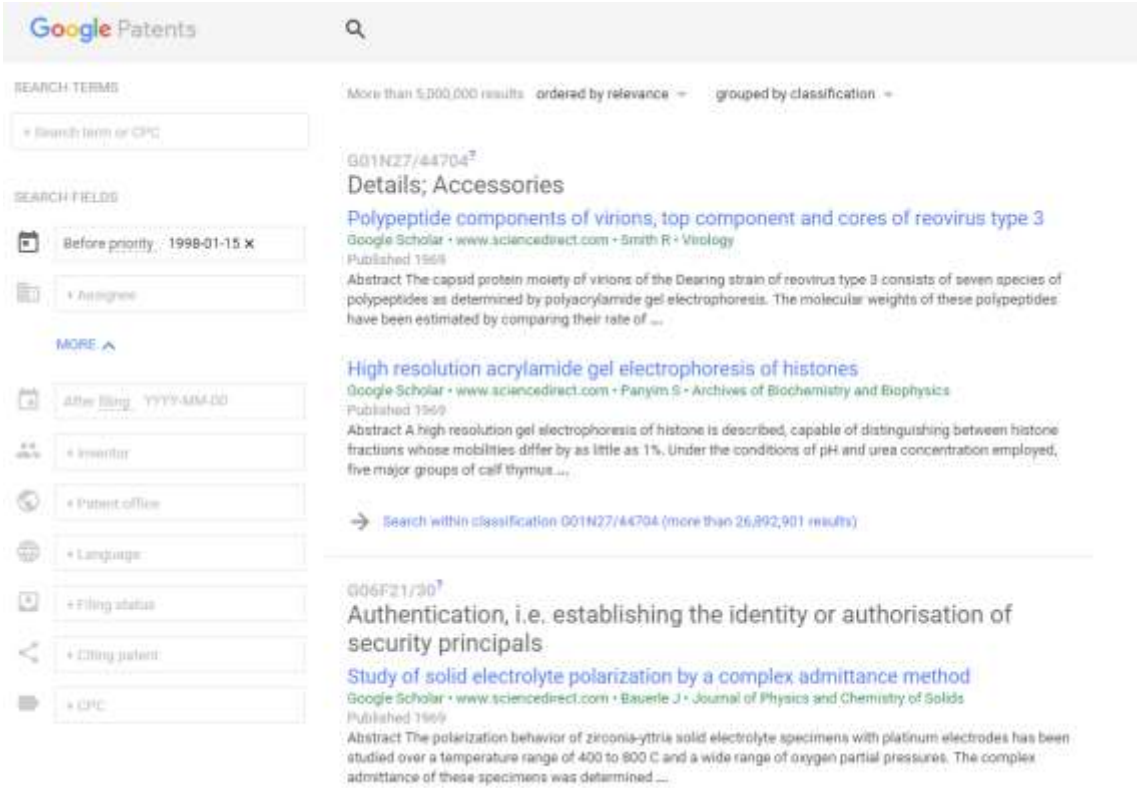


Fig. 62 Search Results of Find Prior Art Button in Google Patents (Example: DE19801167C1)

When this button is clicked, prior arts related to the patent are automatically extracted from patents, literatures, websites, books and other materials. This function can be used for simplified invalidity searches.