

# Use of Patent Information (Including J-PlatPat)

Japan Patent Office

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

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## 1. Introduction

According to statistics<sup>1</sup> 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?

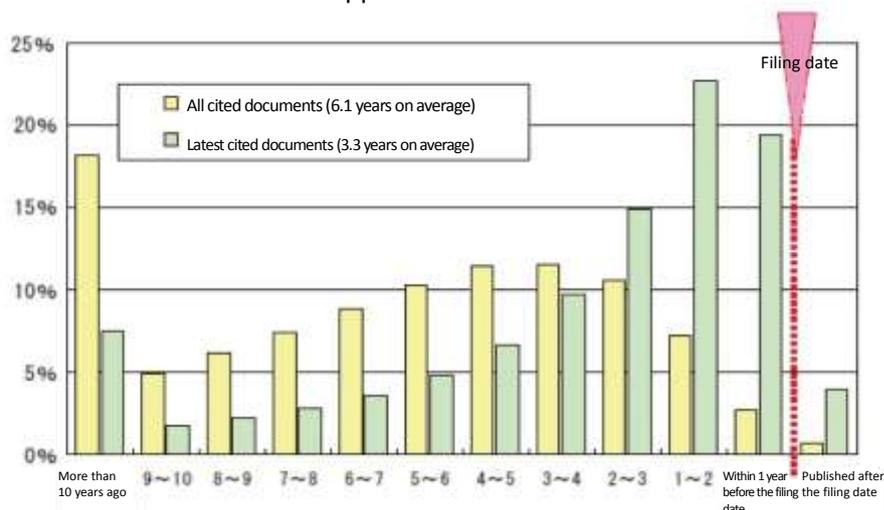
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<sup>1</sup> WIPO IP statistics data center <http://www.wipo.int/ipstats/en/>

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.

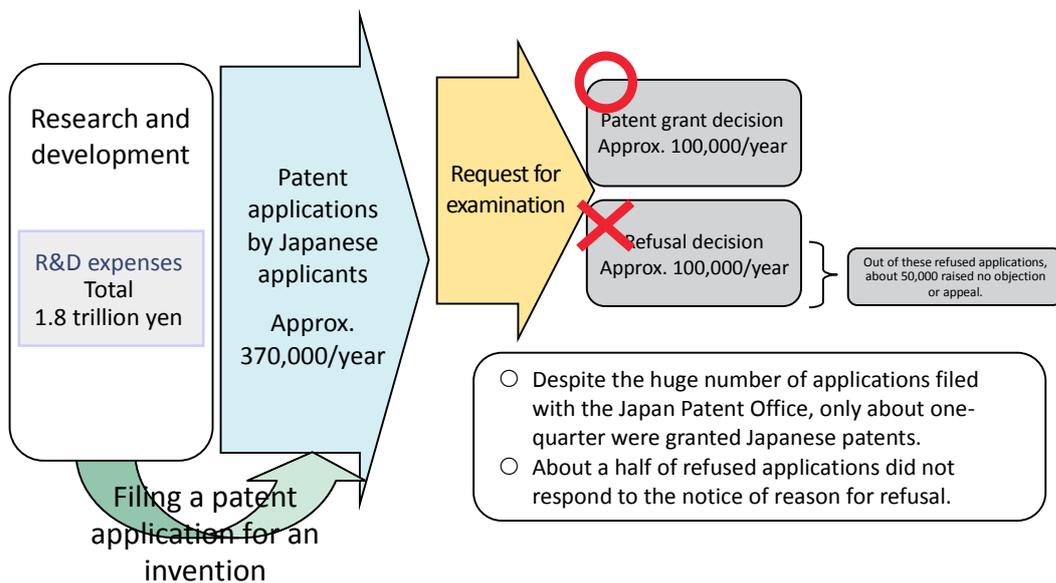
(Source) Japan Patent Office

**Fig. 1 Distribution of Published Patent Applications Cited in the Reason for Refusal in 2009<sup>2</sup>**

<sup>2</sup> Japan Patent Office Annual Report FY2011

<https://www.jpo.go.jp/shiryoutoushin/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)<sup>3</sup>**

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.

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

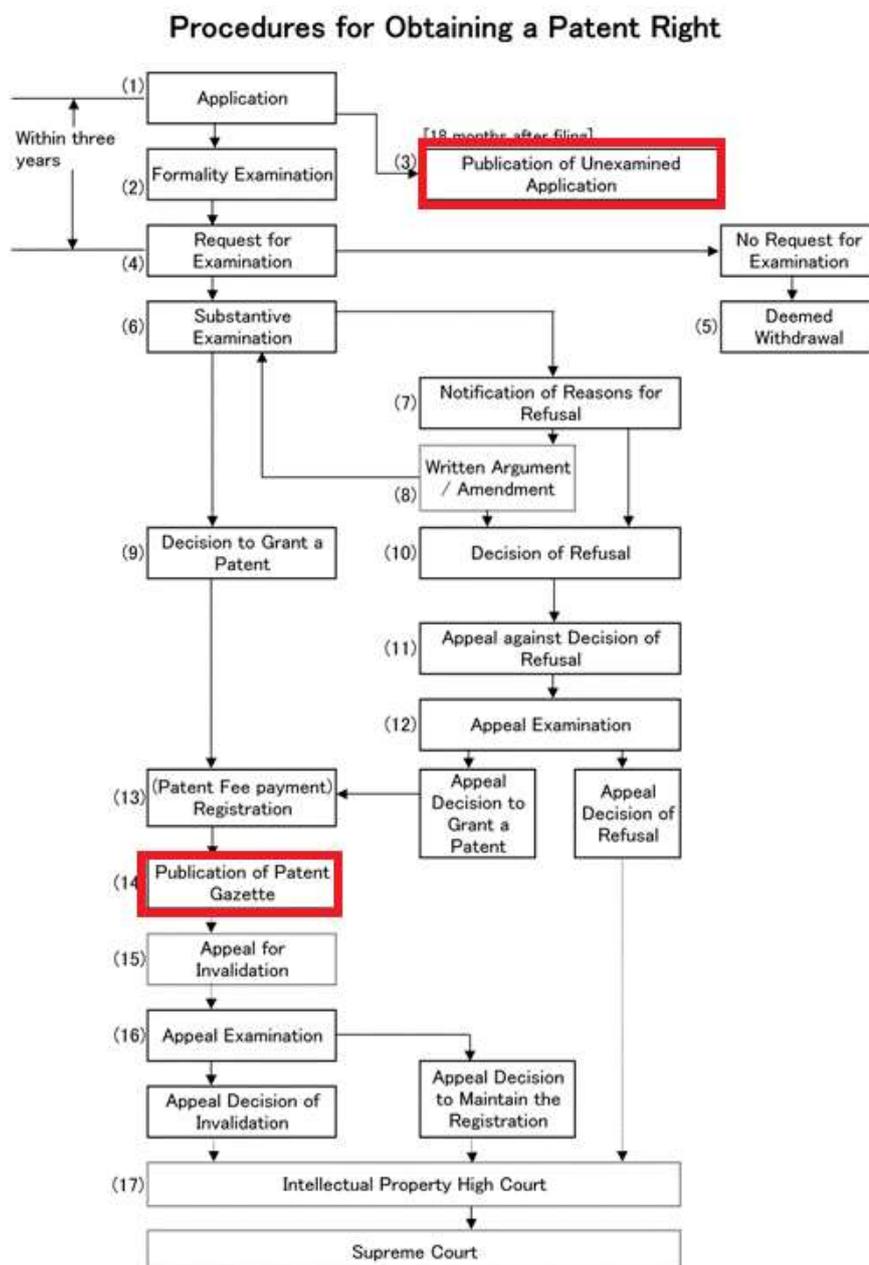
## 2. Basics of Patent Information

### 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<sup>4</sup>**

<sup>4</sup> Procedures for Obtaining a Patent Right:

[https://www.jpo.go.jp/tetuzuki\\_e/t\\_gaiyo\\_e/pa\\_right.htm](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.

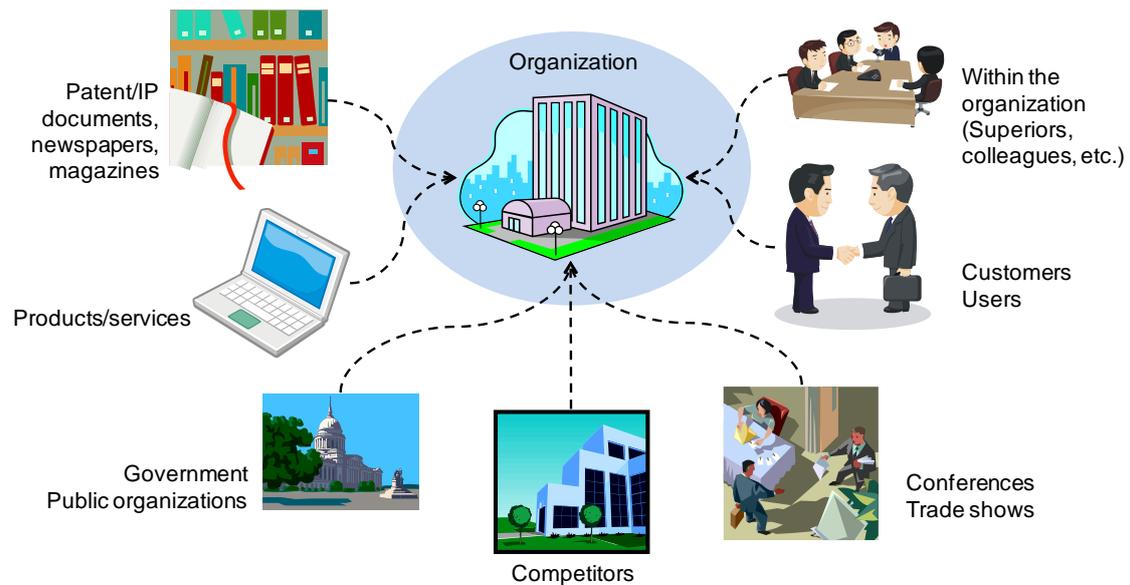
File wrappers are a package of documents related to a patent application, including the patent application and a request for examination submitted by the applicant to the patent office, a notice of reason for refusal issued by the Commissioner of the Patent Office or patent examiner, a written argument 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<sup>5</sup> 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.

<sup>5</sup> <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) 

(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**

(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**  
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**Toyota-shi**  
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(11) **EP 2 418 114 A1**

(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)**

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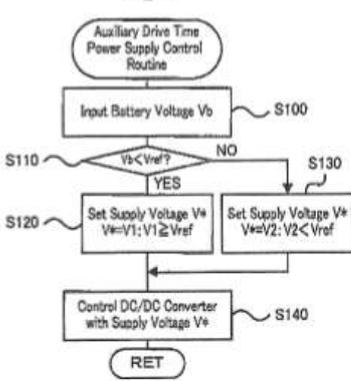
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(54) **AUTOMOBILE AND METHOD FOR CONTROLLING SAID AUTOMOBILE**

(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  $V_b$  of the battery is more than or equal to the threshold value  $V_{ref}$  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  $V_2$  that is a little smaller than the threshold value  $V_{ref}$  (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.

EP 2 418 114 A1

Fig. 2



```

graph TD
    S100[Input Battery Voltage Vb] --> S110{Vb < Vref?}
    S110 -- YES --> S120[Set Supply Voltage V* V* = V1; V1 >= Vref]
    S110 -- NO --> S130[Set Supply Voltage V* V* = V2; V2 < Vref]
    S120 --> S140[Control DC/DC Converter with Supply Voltage V*]
    S130 --> S140
    S140 --> RET([RET])
    
```

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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)<sup>6</sup> defines type codes as follows:

---

<sup>6</sup> <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.

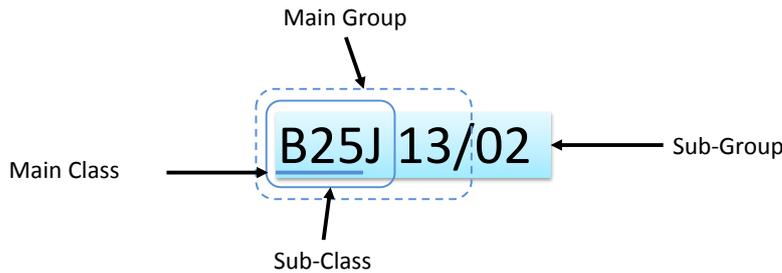
The first one, the internationally used patent classification, is that of the International Patent Classification, or IPC. The second ones, those used in individual countries, include FI (File Index) and F-term used only in Japan, and CPC used in the U.S. and Europe. The last ones, those used in specific 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

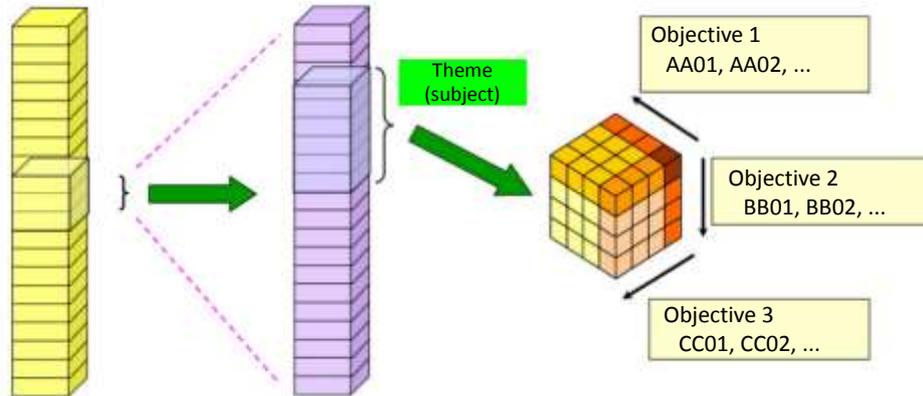
In addition to IPC, individual countries have established their own classifications. In Japan, FI (File Index) and F-term are unique patent classifications. Because the segmentation of IPC is not narrow enough, the Japan Patent Office uses FI to divide classification groups into smaller groups. As shown 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
<b><i>C01B31/04,101</i></b>	<b><i>· · · Preparation of graphite</i></b>
<b><i>C01B31/04,101@A</i></b>	<b><i>· · · Compact</i></b>
<b><i>C01B31/04,101@B</i></b>	<b><i>· · · Powder</i></b>
<b><i>C01B31/04,101@Z</i></b>	<b><i>· · · Others</i></b>
<b><i>C01B31/04,102</i></b>	<b><i>· · · Pyrolytic graphite</i></b>

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.

**Relationship Between IPC, FI and F-term**  
**IPC**   **FI (mainly search by a single objective)**   **F-term (search by multiple objectives)**



**Fig. 6 Relationship of IPC, FI and F-term<sup>7</sup>**

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.

List	Description
5H601	IRON CORE OF ROTATING ELECTRIC MACHINES H02K1/00-1/16#C1/18-1/26#C1/28-1/34

Viewpoint	F-term											FI Cover Range																					
AA PURPOSE OR EFFECT	AA00	AA01	AA02	AA03	AA04	AA05	AA06	AA07	AA08	AA09	AA10	AA11	AA12	AA13	AA14	AA15	AA16	AA17	AA18	AA19	AA20	AA21	AA22	AA23	AA24	AA25	AA26	AA27	AA28	AA29	AA30		
	Strength increase	Vibration prevention	Unbalancing	Weight saving	Miniaturization	... axially (thinner profile)	... radially (smaller diameter)	Facilitating (Easy fastening or strength increase)	Productivity improvement	Easier assembly																							
	Coil density improvement	Sealing improvement	Insulation improvement	Protection of iron cores	Rust proofing	Cooling	Monitoring or detection of abnormalities	provided with protective or safety devices	Improvement of maintenance checking or inspection	Silence improvement																							
BB USE	BB00	BB01	BB02	BB03	BB04	BB05	BB06	BB07	BB08	BB09	BB10	BB11	BB12	BB13	BB14	BB15	BB16	BB17	BB18	BB19	BB20	BB21	BB22	BB23	BB24	BB25	BB26	BB27	BB28	BB29	BB30		
	General purpose	Construction equipment	Spindle motors	... Cylindrical hub (for driving HDD or the like)	... Disc shaped hub (to place a disc)	... for driving polygon mirrors		... for consumer use	Power tools	Elevators																							
	Compressors or pumps	for air blowers	Fan motors for CPUs			for automobiles	for power steering	for wiper drive	Starter motors	for EV drive including HEV and FCV																							

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

<sup>7</sup> 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
<b>C01B31/0407</b>	<b>• • • Purification; Recovery or purification of graphite formed in iron making, e.g. kish graphite</b>

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

An outline of the CPC is available on the official CPC website<sup>8</sup>. 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

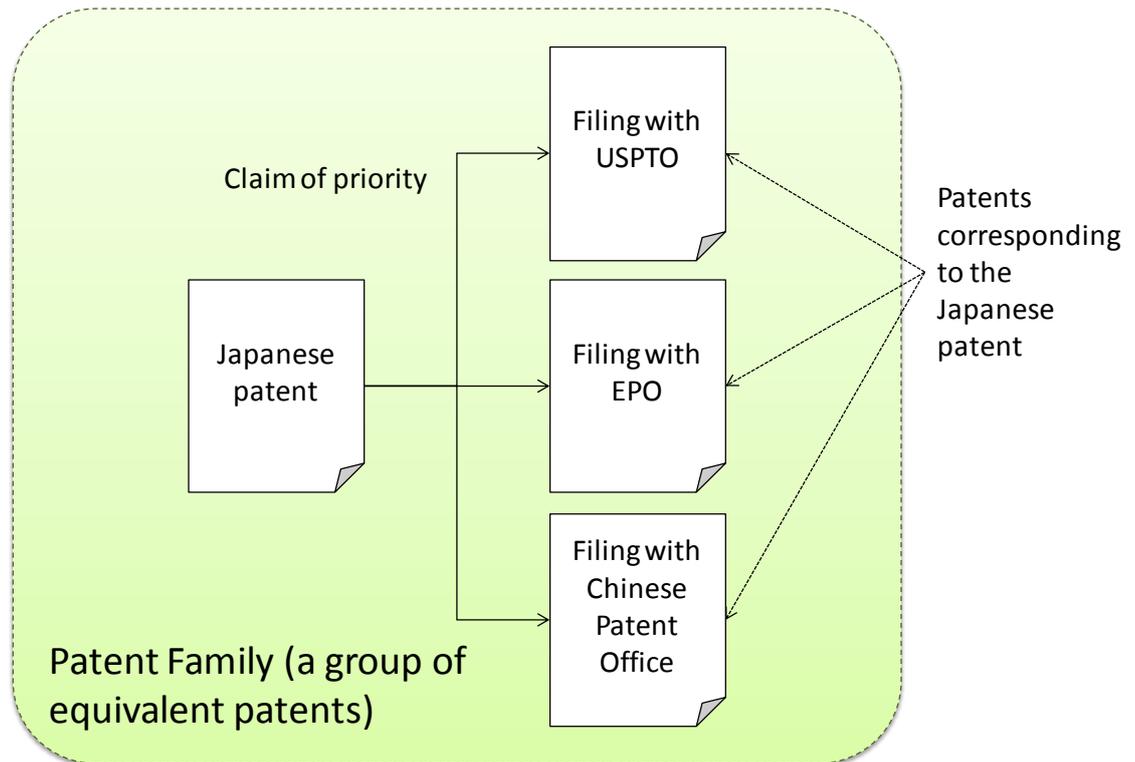
- 1 VEHICLE CONTROL, GUIDANCE, OPERATION, OR INDICATION
- 2 . Remote control system
- 3 . Aeronautical vehicle
- 4 . . Altitude or attitude control or indication
- 5 . . . Rate of change (e.g., ascent, descent)
- 6 . . . . Angle of attack
- 7 . . . Air speed or velocity measurement
- 8 . . . Threshold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

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<sup>8</sup> <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.

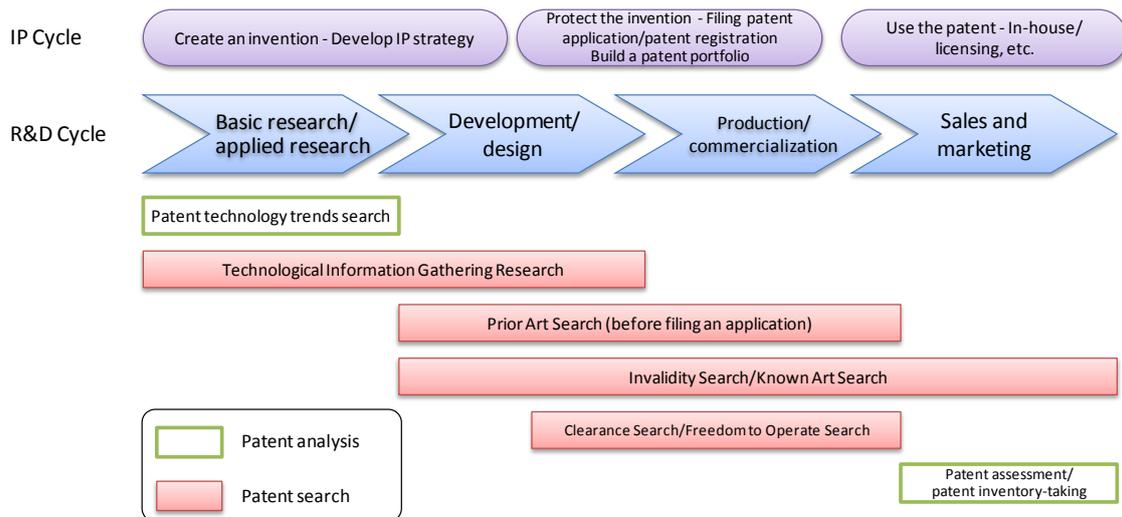
The second benefit is a practical one. If you find an interesting or conflicting patent for your company while searching for patents, but the documents are in a foreign language (such as English, German, or Chinese), you may look at the patent family to find relevant patent documents published by the 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<sup>9</sup>, an annual report published by the Japan Patent Office, and the WIPO Patent Landscape Reports (PLRs)<sup>10</sup> 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.

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<sup>9</sup> <http://www.jpo.go.jp/shiryou/gidou-houkoku.htm> (\* Link to the Japanese page)

<sup>10</sup> [http://www.wipo.int/patentscope/en/programs/patent\\_landscapes/](http://www.wipo.int/patentscope/en/programs/patent_landscapes/)

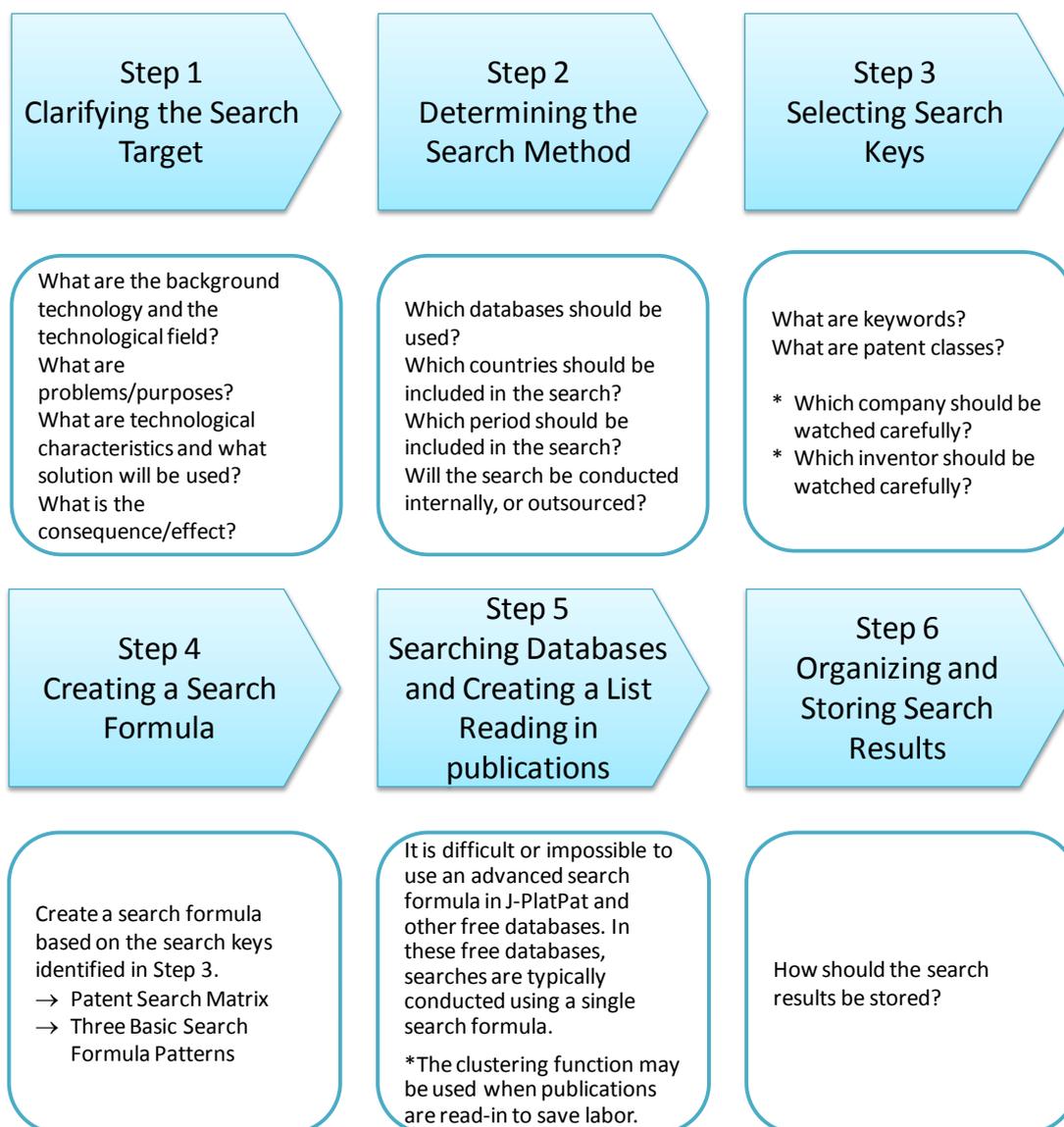
## v. Other Research

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,<sup>11, 12</sup> English-English dictionaries<sup>13</sup> 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)<sup>14</sup> and the patent class keyword search in the J-PlatPat Patent Map Guidance.

The Japan Patent Office operates the Patent Search Portal site<sup>15</sup> 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.

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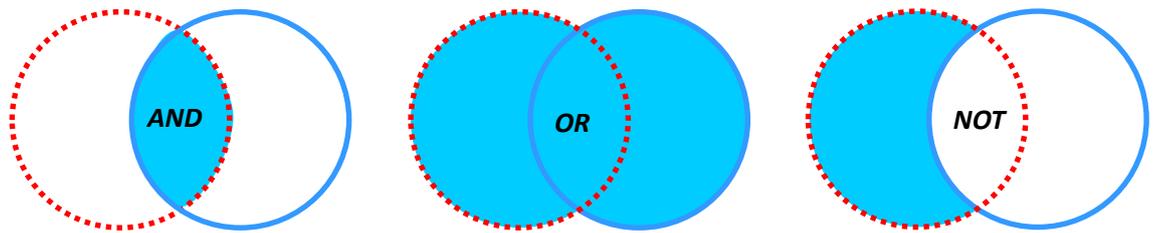
<sup>11</sup> Weblio: <http://thesaurus.weblio.jp/>

<sup>12</sup> Thesaurus.com: <http://www.thesaurus.com/>

<sup>13</sup> Longman English Dictionary Online: <http://www.ldoceonline.com/>

<sup>14</sup> “Kantan Tokkyo Kensaku” (Quick Patent Research): <http://kantan.nexp.jp/>  
(\* Link to a Japanese page)

<sup>15</sup> 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				← Clarifying the Search Target
Keywords/equivalent terms (in Japanese)				} Selecting Search Keys
Keywords/equivalent terms (in English)				
IPC				
FI				
F-term				
CPC				

**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.

**特許・実用新案テキスト検索** [ヘルプ](#) 入力画面 → 結果一覧 → 詳細表示

専断的事項・要約・請求の範囲のキーワード、分類(F・I・Fターム、IPC)等から、特許・実用新案の公報を検索できます。

公報発行、更新予定については、 [ニュース](#) をご覧ください。

**種別**

公開特許公報 (特開・特表(A)、再公表(A1))   
 特許公報 (特公・特許(B))   
 米国特許と文抄録  
 公開実用新案公報 (実開・実表・実案(U)、再公表(A1))   
 実用新案公報 (実公・実登(Y))   
 欧州特許と文抄録  
 中国特許と文抄録   
 中国実用新案機械翻訳と文抄録

**J-GLOBAL検索**

文献   
 科学技術用語   
 化学物質   
 資料

**キーワード**

全角の場合は100文字以内、半角の場合は200文字以内で、検索キーワードを入力してください。

検索項目	検索キーワード	検索方式
要約 + 請求の範囲 ▼    含む ▼	マンホール "マンホール" is a Japanese word for manhole.	OR ▼
<b>AND</b>		
要約 + 請求の範囲 ▼    含む ▼	滑り止め "滑り止め" is anti-slip.	OR ▼
<b>AND</b>		
要約 + 請求の範囲 ▼    含む ▼	模様 凹凸 "模様 凹凸" is the concave-convex pattern.	OR ▼

- 削 + 追加  
除

**キーワードで検索**

**論理式**

「論理式に展開」ボタンにより、検索キーワードを、論理式に展開できます。  
(全角750文字以内、半角1500文字以内)

例) コンピュータ/APR201201012/GI0-製造方法/CL

**論理式で検索**

ヒット件数 **17件**    一覧表示

**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		<b>2D047BB23</b>	

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	○ / Δ	<ul style="list-style-type: none"> <li>• May result in a huge number of hits unless the keywords are carefully chosen (Δ).</li> <li>• It is useful to run an operation by using two or more keywords to prevent omission (○).</li> </ul>
Basic Pattern (2) Patent classes only	⊙ / ×	<ul style="list-style-type: none"> <li>• Very useful if there is a patent class that matches the search target technology (⊙).</li> <li>• 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.</li> </ul>
Basic Pattern (3) Combined use of keywords and patent classes	⊙	<ul style="list-style-type: none"> <li>• Easy to set the mother population for the search to a desired size (fewest hits possible or lowest noise, etc.)</li> </ul>

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.

	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)			
IPC			
FI			
F-term			
Corresponding F-term			

**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.

**特許・実用新案テキスト検索** [ヘルプ](#) [入力画面](#) [結果一覧](#) [詳細表示](#)

書誌的事項・要約・請求の範囲のキーワード、分類(F I・Fターム、IPC)等から、特許・実用新案の公報を検索できます。

公報発行、更新予定については、[ニュース](#)をご覧ください。

**種別**

公開特許公報 (特開・特表(A)、再公表(A1))   
 特許公報 (特公・特許(B))   
 米国特許和文抄録  
 公開実用新案公報 (実開・実表・実案(U)、再公表(A1))   
 実用新案公報 (実公・実登(Y))   
 欧州特許和文抄録  
 中国特許和文抄録   
 中国実用新案機械翻訳和文抄録

**J-GLOBAL検索**

文献   
 科学技術用語   
 化学物質   
 資料

**キーワード**

全角の場合は100文字以内、半角の場合は200文字以内で、検索キーワードを入力してください。

検索項目	検索キーワード	検索方式
IPC <input type="text" value="IPC"/> <input type="button" value="含む"/>	E02D29/14	OR <input type="button" value="▼"/>
<b>AND</b>		
要約 + 請求の範囲 <input type="button" value="含む"/>	蓋 ふた フタ "蓋","ふた",and"フタ" all refer to a cover.	OR <input type="button" value="▼"/>
<b>AND</b>		
要約 + 請求の範囲 <input type="button" value="含む"/>	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.	OR <input type="button" value="▼"/>
<b>AND</b>		
要約 + 請求の範囲 <input type="button" value="含む"/>	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.	OR <input type="button" value="▼"/>

**論理式**

「論理式に展開」ボタンにより、検索キーワードを、論理式に展開できます。  
(全角750文字以内、半角1500文字以内)

---

ヒット件数 **44件**

**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>

The screenshot displays the J-PlatPat website interface. At the top, there is a header with the J-PlatPat logo, contact information for a help desk, and navigation links. Below the header, a navigation bar features icons for Patent & Utility Model, Design, and Trademark. The main content area is organized into a grid with four columns: Number search, Classification search, Text search, and Classification. Each column contains links to various search functions. For example, the 'Number search' column includes links for 'Patent & Utility Model Number Search' and 'Design Number Search'. The 'Classification search' column includes links for 'JIP-term Search' and 'Design Classification Search'. The 'Text search' column includes links for 'PJ' and 'Japanese Trademark Database'. The 'Classification' column includes links for 'Patent Map Guidance (PMGS)' and 'Japanese Design Classification List'. At the bottom of the page, there are sections for 'NEWS', 'Links', 'Database Contents', and 'Access Total'. The footer contains a 'Notice of Usage' link and copyright information for 2015 JPO and INPIT.

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)

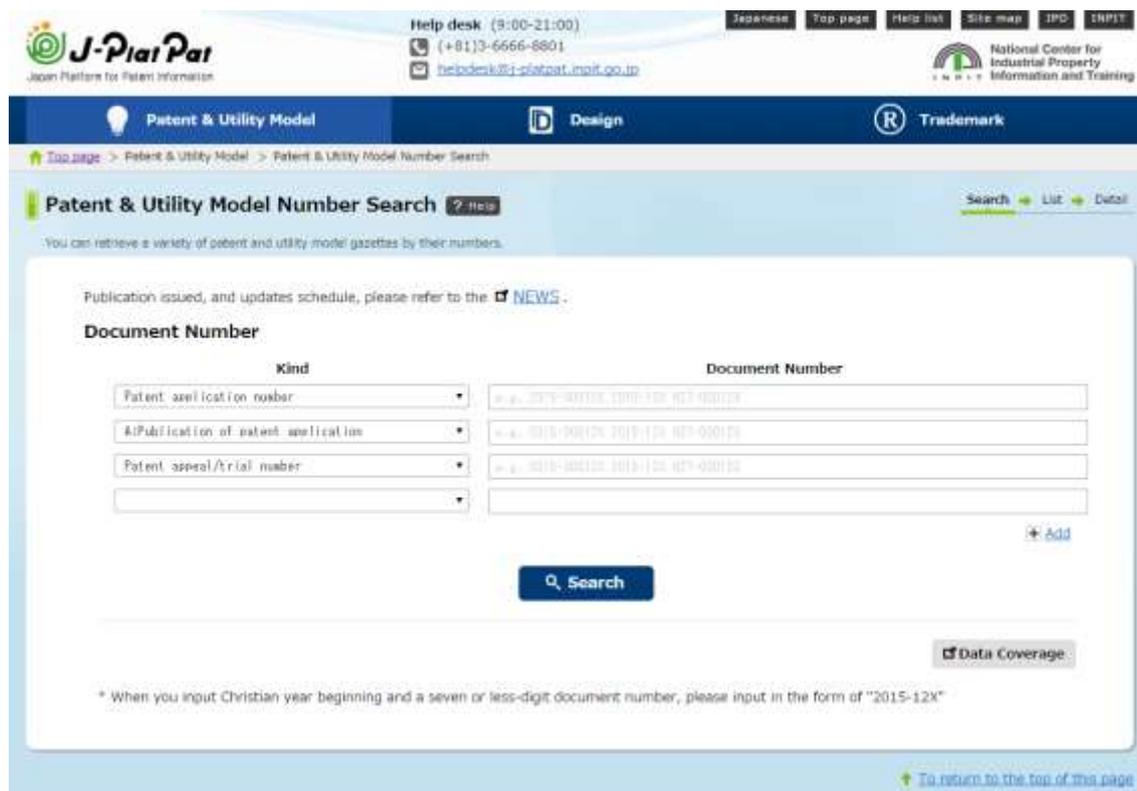
**Designs**

- 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**

<b>Publication Number</b>	<b>J-PlatPat Format (Description in ( ) is a kind (type) of publication)</b>	<b>Espacenet Format</b>
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.

**Patent & Utility Model Number Search** [Back](#) [Help](#) [Search](#) [List](#) [Detail](#)

You can retrieve a variety of patent and utility model gazettes by their numbers.

**Results**

Display Type:  All Pages  Front Page  Claims  Drawings  Specification(unexamined)

Results 1 records.

Number	Application Number	Unexamined Publication Number	Examined Publication Number	Registration Number	Appeal/trial Number	other
1	JP,1991-154221	<a href="#">JP,05-004567,A(1993)</a>	-	-	-	-

[To return to the top of this page](#)

**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.

**Selected Gazette** [Previous Document](#) 1/1 [Next Document](#)

**JP,05-004567,A**

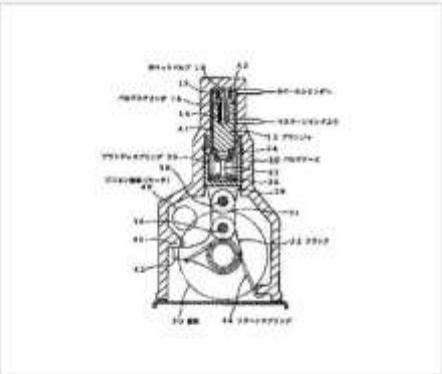
[PAJ](#) [Detail](#) [Image](#)

[Legal Status](#)

(11)Publication number	: 05-004567
(43)Date of publication of application	: 14.01.1993
(51)Int.Cl.	: <b>B60T 8/26</b> <b>B60T 8/34</b>
(21)Application number	: 03-154221
(22)Date of filing	: 26.06.1991
(71)Applicant	: RHYTHM CORP
(72)Inventor	: HIRAIWA KAZUMI SASAKI MASAOKI

**(54)HYDRAULIC CONTROL VALVE OF BRAKE FOR VEHICLE**

**(57)Abstract**  
 PURPOSE: To simplify the structure and reduce the cost of the structure which is not only used for an antilock brake system but also additionally control reduction of the pressure of a rear wheel, in a hydraulic control valve for a brake for a vehicle used for hydraulic control through which a rear wheel is prevented from lock occasioned by movement of a load during the stop of a brake, and for antilock control for preventing a skid at the time of hard braking.  
 CONSTITUTION: An internal valve 18 located between a hydraulic pressure part on the master cylinder side and a hydraulic pressure part on the wheel cylinder is closed according to the stroke of a plunger 12. Further, the volume of the hydraulic pressure part on the wheel cylinder side is changed through a stroke and a plunger 12 is normally held at a top dead center through a crank mechanism. During antilock control, the plunger 12 is caused to effect a stroke by crank rotation through running of a motor to close a valve. By changing the volume of the hydraulic pressure part on the wheel cylinder side at a further stroke after closing of the valve, a hydraulic pressure fed to the wheel cylinder is regulated.



**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.

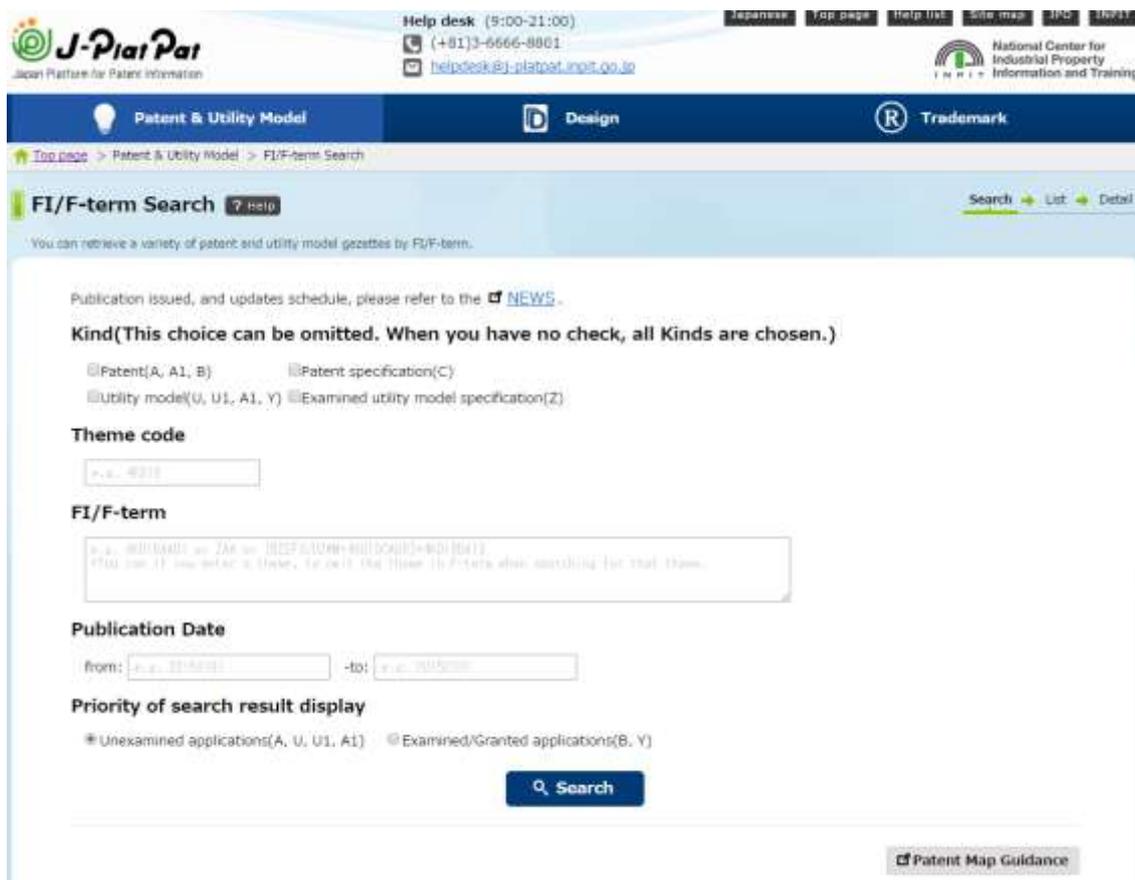
Click the [Legal Status] button on the upper-right corner to show the status of the patent right in the pop-up window as shown below.



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

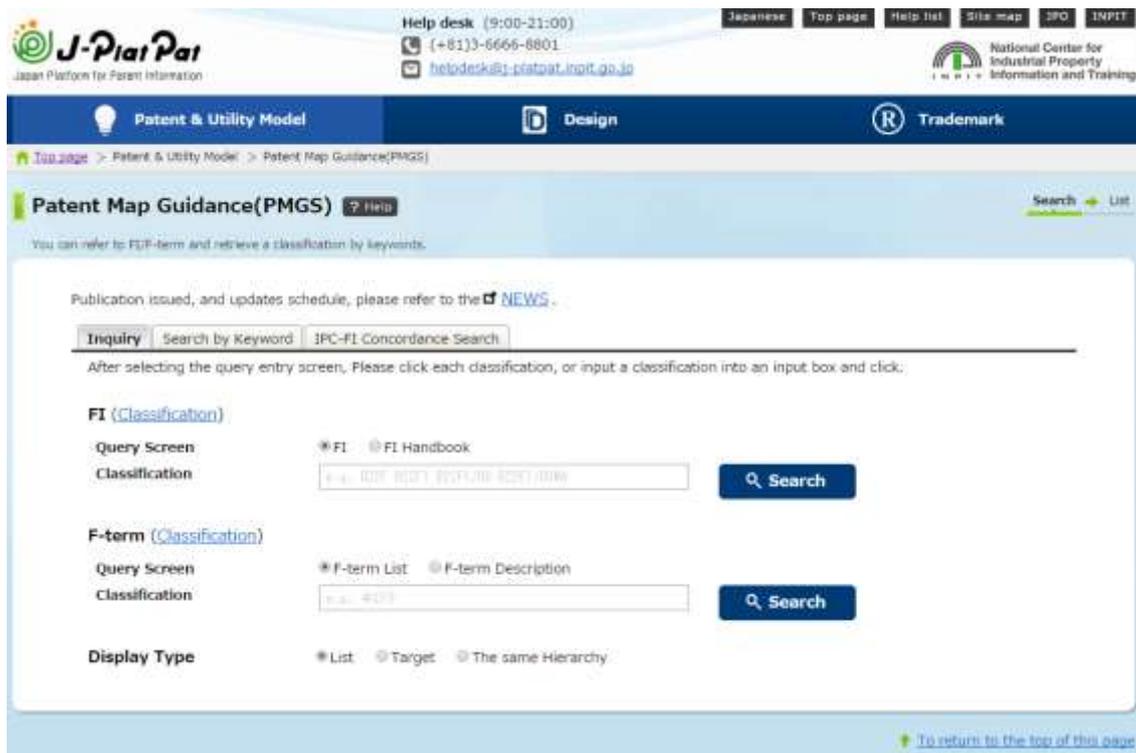
The [Date of request for examination] and [Registration info] lines are left blank. The [Detailed info. of application] line shows “Kind of final decision (Deemed to be withdrawn).” From this data, you learn that no request for examination was made for the patent application, so the JPO deemed that the application must have 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 8B/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 <u>in situ</u> , e.g. of concrete	<a href="#">2D047</a>	<a href="#">HB</a>
	B Basements	<a href="#">2D047</a>	<a href="#">HB</a>
	C . Enclosures, e.g. boxes	<a href="#">2D047</a>	<a href="#">HB</a>
	D . . Split bodies, e.g. panels	<a href="#">2D047</a>	<a href="#">HB</a>
	E . Accessories	<a href="#">2D047</a>	<a href="#">HB</a>
	Z Others	<a href="#">2D047</a>	<a href="#">HB</a>
- 29/02	. Retaining or protecting walls (piers or quay walls E02B 3/06)	<a href="#">2D048</a>	<a href="#">HB</a>
	301 . . Constructing retaining walls	<a href="#">2D048</a>	<a href="#">HB</a>
	302 . . . by sheet blocks	<a href="#">2D048</a>	<a href="#">HB</a>
	303 . . . by porous blocks	<a href="#">2D048</a>	<a href="#">HB</a>
	304 . . . by non-porous blocks	<a href="#">2D048</a>	<a href="#">HB</a>
	305 . . . by L-shaped blocks	<a href="#">2D048</a>	<a href="#">HB</a>
	306 . . . by parallel cross blocks	<a href="#">2D048</a>	<a href="#">HB</a>
	307 . . Constructing retaining walls	<a href="#">2D048</a>	<a href="#">HB</a>
	308 . . . by non-concrete members	<a href="#">2D048</a>	<a href="#">HB</a>
	309 . . . by prefabricated members and site-installed concrete	<a href="#">2D048</a>	<a href="#">HB</a>
	310 . . . by site-installed concrete	<a href="#">2D048</a>	<a href="#">HB</a>
	311 . . Planting on retaining walls, e.g. by vegetation blocks	<a href="#">2D048</a>	<a href="#">HB</a>
	312 . . Draining retaining walls, e.g. by perforated blocks	<a href="#">2D048</a>	<a href="#">HB</a>

**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'.

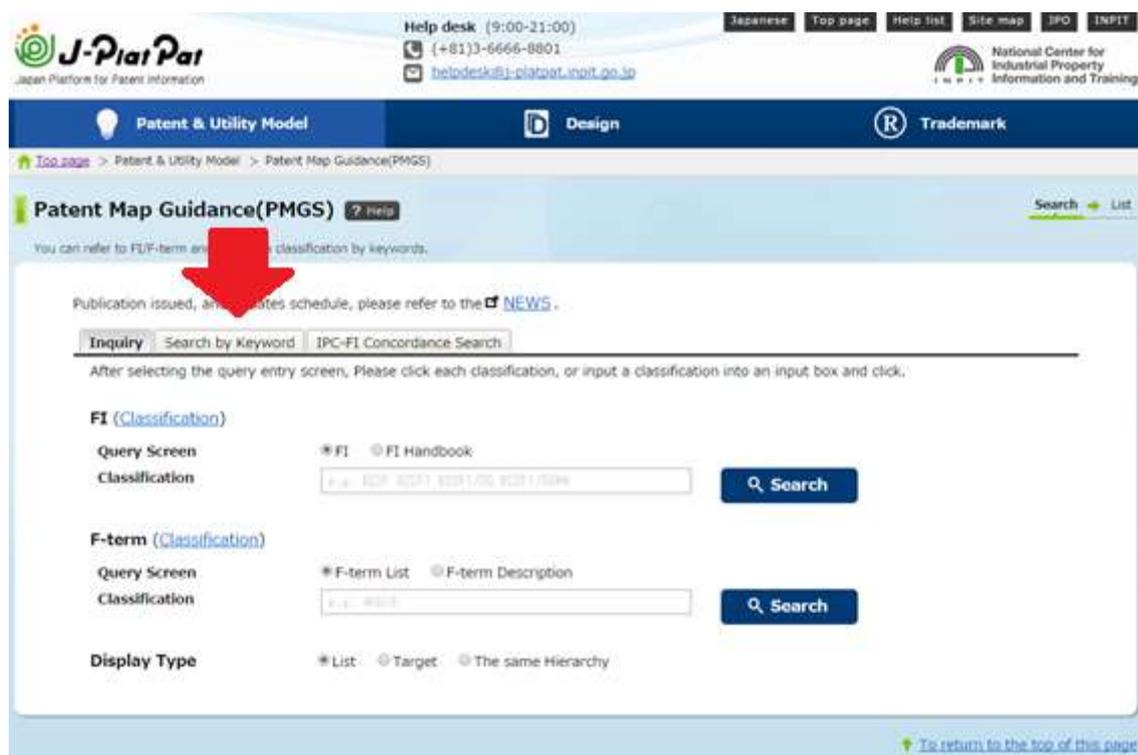
List	Description
2D047	Underground structures, and protection, testing and repair of foundations EC2D29/00-29/00@Z:29/04-37/00

Viewpoint	F-term											FI Cover Range
AA	AA00	AA01	AA02	AA03		AA05	AA06	AA07	AA08	AA09	AA10	EC2D29/00-29/00@Z:29/04-37/00
	UNDERGROUND STRUCTURES	Underground spaces	Waterproofing	Heat insulation		Sectional units	Partitions	Panels	Secondary facilities	Ventilation systems	Drainage systems	B10-1 B10 D02
AB	AB00	AB01	AB02		AB04		AB06		AB08			EC2D29/00-29/00@Z:29/04-37/00
	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			B10-1 B10 H02
AC	AC00	AC01	AC02		AC04	AC05	AC06	AC07	AC08		AC10	EC2D29/00-29/00@Z:29/04-37/00
	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	B10-1 B11 D02
BA	BA00	BA01	BA02	BA03	BA04	BA05		BA07	BA08	BA09		EC2D29/00-29/00@Z:29/04-37/00
	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		B10-1 B11 H02
		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
<b>E</b>	<b>Structures of lids per se, e.g. laminated lids, non-slip lids</b>

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.

**FI/F-term Search** [Back](#) [? Help](#) [Search](#) [List](#) [Detail](#)

You can retrieve a variety of patent and utility model gazettes by FI/F-term.

**Results**

Display Type  All Pages  Front Page  Claims  Drawings

Results 897 records.

No.	Document Number
1	<a href="#">JP_2015-175195.A</a>
2	<a href="#">JP_2015-124601.A</a>
3	<a href="#">JP_2015-121063.A</a>
4	<a href="#">JP_2015-049720.A</a>
5	<a href="#">JP_2015-042816.A</a>
6	<a href="#">JP_2015-031121.A</a>
7	<a href="#">JP_2015-012504.A</a>
8	<a href="#">JP_2014-231671.A</a>
9	<a href="#">JP_2014-224761.A</a>
10	<a href="#">JP_2014-173365.A</a>
11	<a href="#">JP_2014-091964.A</a>
12	<a href="#">JP_2014-088850.A</a>
13	<a href="#">JP_2015-094107.A</a>

**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.

**J-PlatPat** Japan Platform for Patent Information Help desk (9:00-21:00)  
(+81)3-6666-8001  
helpdesk@j-platpat.ipsit.go.jp Japanese Top page Help list Site map IPO INPTI

National Center for Industrial Property Information and Training

**Patent & Utility Model** **Design** **Trademark**

[Top page](#) > Patent & Utility Model > Searching PAJ

**Searching PAJ** [? Help](#) [Search](#) [List](#) [Detail](#)

You can retrieve the PAJ (Patent Abstracts of Japan) by keywords.

Publication issues, and updates schedule, please refer to the [NEWS](#)

**Abstract**  
 AND ▾

**Title of invention**  
 AND ▾

**Applicant**  
 AND ▾

**Publication Date**  
 from:  to:

**IPC**

**Search**

[Data Coverage](#)

**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.

Searching PAJ [Help](#) Search [List](#) [Detail](#)

You can retrieve the PAJ (Patent Abstracts of Japan) by keywords.

Publication issues, and updates schedule, please refer to the [NEWS](#)

**Abstract**  
VEHICLE

**Title of invention**  
e.g., COMPUTER, WWW, PRODUCT

**Applicant**  
GOOGLE

**Publication Date**  
from: 0-0-2010/01 to: 0-0-2010/01

**IPC**  
e.g., H01L001/00, H02J001/00

Search results: **3**

[Data Coverage](#)

**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.

Searching PAJ [Back](#) [? Help](#) [Search](#) [List](#) [Detail](#)

You can retrieve the PAJ (Patent Abstracts of Japan) by keywords.

### Results

3 documents are found for "VEHICLE GOOGLE". Documents 1 to 3 out of 3 hits are displayed.

No.	Publication No.	Title of invention
1	<a href="#">2014 - 232535</a>	ITERATIVE PUBLIC TRANSIT SCORING
2	<a href="#">2014 - 197404</a>	TRANSITIONING MIXED-MODE VEHICLE TO AUTONOMOUS MODE
3	<a href="#">2014 - 089691</a>	VEHICLE LATERAL LANE POSITIONING CONTROL

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.

**Detail** [Previous Document](#) 2 / 3 [Next Document](#)

**2014-197404** [Data Coverage](#) [Image Data\(Japanese\)](#) [Legal Status](#)

(11)Publication number : 2014-197404  
 (43)Date of publication of application : 16.10.2014  
 (51)Int.Cl. : ~~G08G 1/02~~ **G08G 1/02** (2006.01)

(21)Application number : 2014-109698  
 (22)Date of filing : 28.05.2014  
 (71)Applicant : **GOOGLE INC**  
 (72)Inventor : PRADA GOMEZ LUIS RICARDO  
 NATHANIEL FAIRFIED  
 ANDY SZYBALSKI  
 PHILIP NEMEC  
 CHRISTOPHER URNISON

(30)Priority  
 Priority number : 2011 105101 Priority date : 11.05.2011 Priority country : US

(54)TRANSITIONING MIXED-MODE **VEHICLE** TO AUTONOMOUS MODE

(57)Abstract  
 PROBLEM TO BE SOLVED: To obtain more precise position information when **vehicles** are driven in an autonomous mode than when driven by a human operator.  
 SOLUTION: Disclosed are methods and devices for transitioning a mixed-mode autonomous **vehicle** 102 from a human driven mode to an autonomously driven mode. Transitioning may include stopping a **vehicle** on a predefined landing strip 104 and detecting a reference indicator 106. Based on the reference indicator, the **vehicle** may be able to know its exact position. Additionally, the **vehicle** may use the reference indicator to obtain an autonomous **vehicle** instruction via a URL. After the **vehicle** knows its precise location and has an autonomous **vehicle** instruction, it can operate in autonomous mode.

[Full Text\(Machine Translation\)](#)

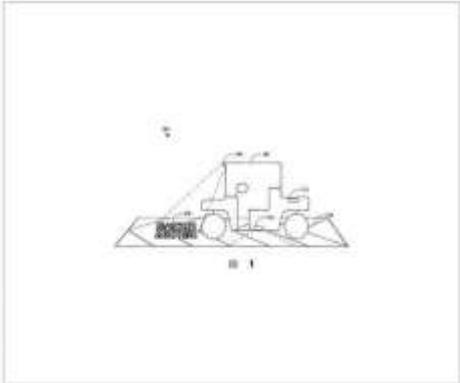


Fig. 36 PAJ Search Results of J-PlatPat

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>

The screenshot displays the Espacenet Advanced Search interface. At the top, there is a header with the EPO logo, the text 'Espacenet Patent search', and language options (Deutsch, English, Français) along with a 'Change country' dropdown. Below the header is a navigation bar with links for 'Search', 'Result list', 'My patents list (0)', 'Query history', 'Settings', and 'Help'. The main content area is titled 'Advanced search' and features several input fields for search criteria:

- Collection selection:** A dropdown menu set to 'Worldwide - collection of published applications from 90+ countries'.
- Search terms:** A section titled 'Enter your search terms - CTRL-ENTER expands the field you are in' containing three input fields:
  - Title:** 'plastic and bicycle'
  - Title or abstract:** 'hair'
  - Publication number:** 'WO2008014520'
  - Application number:** 'DE19971031696'
  - Priority number:** 'WO1995US15925'
- Date ranges:** An input field for 'Publication date' with the format 'yyyymmdd'.
- Persons/Organisations:** Input fields for 'Applicants' (filled with 'Institut Pasteur') and 'Inventors' (filled with 'Smith').

On the left side, there is a sidebar with navigation options: 'Smart search', 'Advanced search' (selected), and 'Classification search'. Below these are 'Quick help' links and 'Related links'.

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.)

Enter keywords in English

Title:

Title or abstract:   hair

Enter numbers with or without country code

Publication number:   EP

Application number:

Priority number:

Enter one or more dates or date ranges

Publication date:

Enter name of one or more persons/organisations

Applicant(s):

Inventor(s):

Enter one or more classification symbols

CPC

IPC

**Fig. 38 Example of Advanced Search in Espacenet**

Eight matches are retrieved as a result of the search.

Refine search → Results

Smart search  
Advanced search  
Classification search

Quick help

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

Related links

### Result list

Select all (0/8) Compact Export (CSV | XLS) Download covers Print

8 results found in the Worldwide database for:  
AIR CONDITIONER in the title or abstract AND EP as the publication number AND B60K8 as the Cooperative Patent Classification

Sort by: Upload date Sort order: Descending Set

**1. AUTOMOBILE AND METHOD FOR CONTROLLING SAID AUTOMOBILE**

Inventor:	Applicant:	CPC:	IPC:	Publication info:	Priority date:
★ ENDO HIROKI [JP] YAMAMOTO MASAYA [JP]	TOYOTA MOTOR CO LTD [JP]	B60K8/445 B60L1/003 B60L11/0818 (+14)	B60K5/445 B60L1/00 B60L11/18 (+2)	EP2418114 (A) 2012-02-15	2009-04-10

**2. An apparatus for controlling auxiliary equipment driven by an internal combustion engine**

Inventor:	Applicant:	CPC:	IPC:	Publication info:	Priority date:
★ KINUGASA YUKIO [JP] IBARASHI KOUHEI [JP] (+1)	TOYOTA MOTOR CO LTD [JP]	B60H1/00771 B60K25/00 B60K25/02 (+19)	B60H1/00 B60H1/32 B60K25/00 (+15)	EP0811757 (A2) 1997-12-10 EP0811757 (A3) 1997-12-17 EP0811757 (B1) 2002-02-06	1996-06-06

**3. A hybrid car and an operating method therefor;**

Inventor:	Applicant:	CPC:	IPC:	Publication info:	Priority date:
★ YOSHIDA MASATO [JP]	MITSUBISHI MOTORS CORP. [JP]	B60K6/48 B60K6/543 B60L1/003 (+19)	B60K6/20 B60K5/46 B60L1/00 (+12)	EP0570240 (A1) 1993-11-18 EP0570240 (B1) 1997-08-06	1992-05-15

**4. Hybrid vehicle and method for controlling the same**

Inventor:	Applicant:	CPC:	IPC:	Publication info:	Priority date:
★ OSHIDA SHUJI [JP] TATARA YUSUKE [JP] (+2)	HONDA MOTOR CO LTD [JP]	B60K17/35E B60K6/48 B60K6/52 (+8)	B60K6/44 B60K5/48 B60K5/52 (+11)	EP1405750 (A2) 2004-04-07 EP1405750 (A3) 2006-04-12 EP1405750 (B1) 2014-11-26	2002-10-01

**5. Control apparatus for automatically stopping and restarting an engine**

Inventor:	Applicant:	CPC:	IPC:	Publication info:	Priority date:
★ KURODA SHIGETAKA [JP] ADACHI HIROMITSU [JP] (+4)	HONDA MOTOR CO LTD [JP]	B60H1/00735 B60K25/02 B60K6/48 (+25)	B60H1/00 B60H1/22 B60H1/32 (+12)	EP1391338 (A1) 2004-02-25 EP1391338 (B1) 2005-05-25	2002-08-22

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.

EP0811757 (A2)

**Bibliographic data**

Description

Claims

Abstracts

Original document

Cited documents

Citing documents

INPADOC legal status

INPADOC patent family

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**Quick help**

- What is meant by high quality text as facsimile?
- What does A1, A2, A3 and B stand for after a European publication number?
- What happens if I click on "In my patents list"?
- What happens if I click on the "Register" button?
- Why are some sidebar options deactivated for certain documents?
- How can I bookmark this page?
- Why does a list of documents with the heading "Also published as" sometimes appear, and what are these documents?
- Why do I sometimes find the abstract of a corresponding document?
- What happens if I click on the red "don't translate" button?
- What is Global dossier?

### Bibliographic data: EP0811757 (A2) — 1997-12-10

★ In my patents list    Previous 1/6    Next    EP Register    Report data error    Print

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**An apparatus for controlling auxiliary equipment driven by an internal combustion engine**

**Page bookmark**    EP0811757 (A2) - An apparatus for controlling auxiliary equipment driven by an internal combustion engine

**Inventor(s):**    KINUDASA YUKIO [JP] IGARASHI KOUHEI [JP] ITOH TAKAAKI [JP] ±

**Applicant(s):**    TOYOTA MOTOR CO LTD [JP] ±

**Classification:**

- international: B60H1/00; B60H1/22; B60K25/00; B60K6/04; B60L15/20; B60W10/08; B60W10/36; B60W20/00; F02D29/02; F02D45/00; G01C21/00; G01C21/26; H02J7/100; B60K25/02; B60K6/12; IPC1-7; B60K25/00; B60K41/00; B60K9/08; F02B67/00

- cooperative: B60H1/00771; B60K25/00; B60K6/04; B60L11/14; B60L15/2045; B60W10/08; B60W10/30; B60W10/1886; B60K25/02; B60K6/12; B60L224082; B60L226054; B60W20/00; B60W25/0402; Y02T106/208; Y02T106/221; Y02T107/283; Y02T107/291; Y02T108/4; Y02T90/16; Y02T90/161; Y02T90/162

**Application number:**    EP19970108797 19970602

**Priority number(s):**    JP19960144461 19960606

**Also published as:**    EP0811757 (A3)    EP0811757 (B1)    JPH09324665 (A)    JP3596170 (B2)    CN1167873 (A) → more

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**Abstract of EP0811757 (A2)**

Translate this text into  [polonitranslate](#) powered by Bing and Google

An apparatus (141) for controlling auxiliary equipment driven by an internal combustion engine (111), which can suppress the deterioration of a specific fuel consumption by controlling the auxiliary equipment based on running environment information provided from a car navigation system or the like. Namely, this apparatus (141) predicts the future maximum output of the internal combustion engine (111) and a running load thereof according to running environment information and vehicle information. Further, if the maximum output is larger than the running load, the auxiliary equipment (for example, a light and an air conditioner) are directly driven by the internal combustion engine. Moreover, surplus energy is stored in an energy storing device (134). When the maximum output is nearly equal to the running load and that the specific fuel consumption is deteriorated when driving the auxiliary equipments, they are driven by using the energy stored in the energy storing means (134). Consequently, the deterioration of the fuel consumption ratio due to the operations of the accessories is suppressed.

**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.

EP0811757 (A2)

**Family list: EP0811757 (A2) — 1997-12-10**

Select all (0/6) Compact Export (CSV | XLS) Download covers CCD Print

6 application(s) for EP0811757 (A2)

Sort by Priority date Sort order Descending Sort show citations

**1. An apparatus for controlling auxiliary equipment driven by an internal combustion engine**

Inventor:	Applicant:	CPC:	IPC:	Publication info:	Priority date:
★ KINUGASA YUKIO [JP] IGARASHI KOUHEI [JP] (+1)	TOYOTA MOTOR CO LTD [JP]	B60H1/00771 B60K25/00 B60K25/02 (+19)	B60H1/00 B60H1/32 B60K25/00 (+16)	EP0811757 (A2) 1997-12-10 EP0811757 (A3) 1997-12-17 EP0811757 (B1) 2002-02-06	1996-06-06

**2. Apparatus for controlling auxiliary equipment driven by internal combustion engine**

Inventor:	Applicant:	CPC:	IPC:	Publication info:	Priority date:
★ KINUGASA YUKIO [JP] IGARASHI KOUHEI [JP] (+1)	TOYOTA MOTOR CO LTD [JP]	B60H1/00771 B60K25/00 B60K25/02 (+19)	B60H1/00 B60H1/32 B60K25/00 (+14)	CN1167873 (A) 1997-12-17 CN1078307 (C) 2002-01-23	1996-06-06

**3. An apparatus for controlling auxiliary equipment driven by an internal combustion engine**

Inventor:	Applicant:	CPC:	IPC:	Publication info:	Priority date:
★ KINUGASA YUKIO [JP] IGARASHI KOUHEI [JP] (+1)	TOYOTA MOTOR CO LTD [JP]	B60H1/00771 B60K25/00 B60K25/02 (+19)	B60H1/00 B60H1/32 B60K25/00 (+16)	DE69710254 (T2) 2002-08-14	1996-06-06

**4. AUXILIARY EQUIPMENT DRIVE CONTROL DEVICE OF INTERNAL COMBUSTION ENGINE**

Inventor:	Applicant:	CPC:	IPC:	Publication info:	Priority date:
★ KINUGASA YUKIO IGARASHI KOHEI (+1)	TOYOTA MOTOR CORP	B60H1/00771 B60K25/00 B60K25/02 (+19)	B60H1/00 B60H1/32 B60K25/00 (+17)	JPH09324665 (A) 1997-12-16 JP3596170 (B2) 2004-12-02	1996-06-06

**5. APPARATUS FOR CONTROLLING AUXILIARY EQUIPMENT DRIVEN BY AN INTERNAL COMBUSTION ENGINE**

Inventor:	Applicant:	CPC:	IPC:	Publication info:	Priority date:
★ ITOU TAKAAKI [JP] IGARASHI KOUHEI [JP] (+1)	TOYOTA MOTOR CO LTD [JP]	B60H1/00771 B60K25/00 B60K25/02 (+19)	B60H1/00 B60H1/32 B60K25/00 (+13)	KR100255257 (B1) 2000-05-01	1996-06-06

**6. Apparatus for controlling auxiliary equipment driven by an internal combustion engine**

Inventor:	Applicant:	CPC:	IPC:	Publication info:	Priority date:
★ KINUGASA YUKIO [JP] IGARASHI KOUHEI [JP] (+1)	TOYOTA MOTOR CO LTD [JP]	B60H1/00771 B60K25/00 B60K25/02 (+19)	B60H1/00 B60H1/32 B60K25/00 (+14)	US5924406 (A) 1999-07-20	1996-06-06

INPADOC legal status

**INPADOC patent family**

Quick help

- + Can I export this list?
- + What happens if I click on "Download covers"?
- + Can I sort the list?
- + What happens if I click on the star icon?
- + What is a patent family?
- + What happens if I click the "show citations" box?
- + What is an INPADOC patent family?
- + Are all the documents in an INPADOC family equivalents?
- + Why is the same document published several times in the same country?

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).

EP0811757 (A2)

**INPADOC legal status: EP0811757 (A2) — 1997-12-10**

★ In my patents list Previous 1/6 Next EP Register Report data error Print

**An apparatus for controlling auxiliary equipment driven by an internal combustion engine**

The EPO does not accept any responsibility for the accuracy of data and information originating from other authorities than the EPO; in particular, the EPO does not guarantee that they are complete, up-to-date or fit for specific purposes.

Legal status of EP0811757 (A2) 1997-12-10; EP0811757 (A3) 1997-12-17; EP0811757 (B1) 2002-02-06

EP	F	97108797 A (Patent of invention)
Event date :	1997/12/10	
Event code :	AK	
Code Expl.:	+ DESIGNATED CONTRACTING STATES:	
KD OF CORRESP. PAT.:	A2	
DESIGNATED COUNTR. :	DE FR GB IT SE	
Event date :	1997/12/10	
Event code :	17P	
Code Expl.:	+ REQUEST FOR EXAMINATION FILED	
EFFECTIVE DATE :	19970701	
Event date :	1997/12/17	
Event code :	AK	
Code Expl.:	+ DESIGNATED CONTRACTING STATES:	
KD OF CORRESP. PAT.:	A3	
DESIGNATED COUNTR. :	AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE	
Event date :	1998/08/26	
Event code :	AKX	

**Quick help**

- What happens if I click on "In my patents list"?
- What happens if I click on the "Register" button?
- What does "legal status" mean?
- Why is the legal status not always available?
- How might this information be useful to me?
- How reliable is this data?
- What is Global dossier?

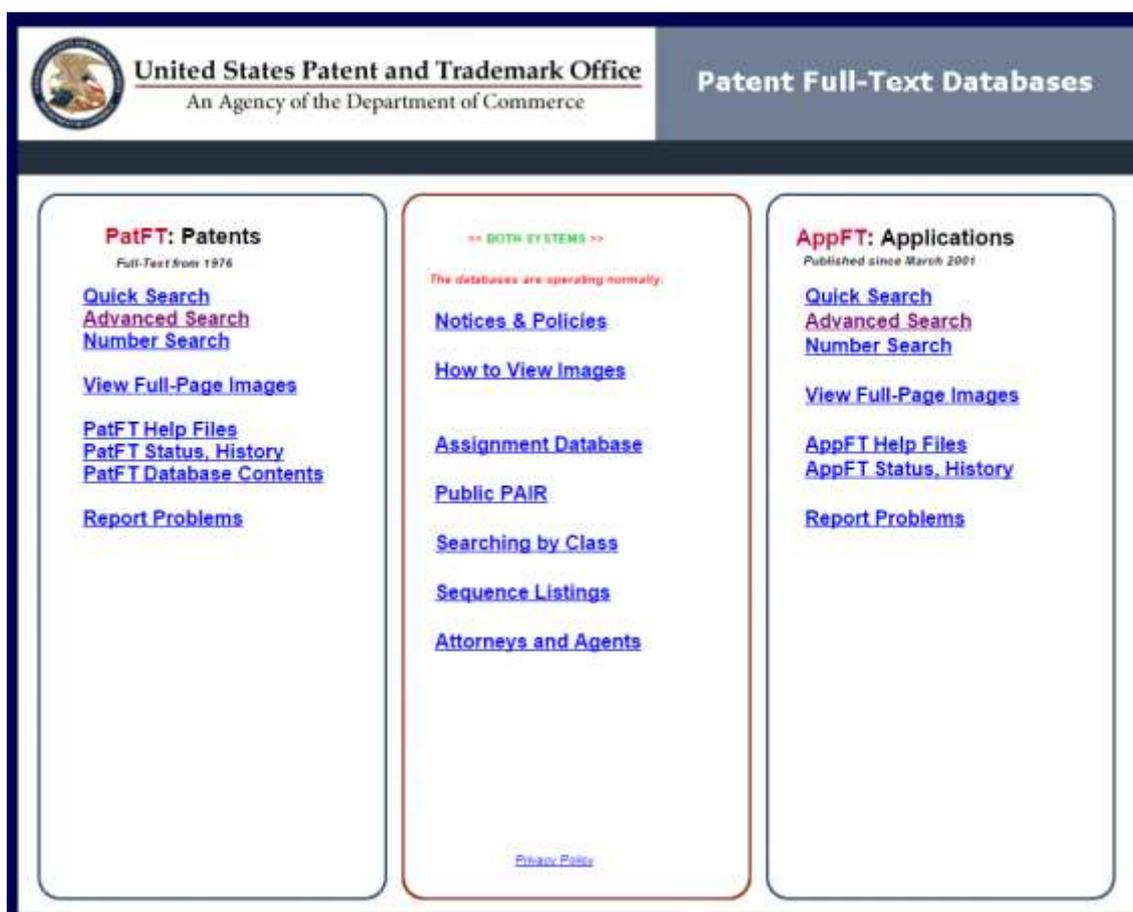
**Fig. 42 Example of Advanced Search Results in Espacenet (INPADOC legal status)**

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.

**USPTO PATENT FULL-TEXT AND IMAGE DATABASE**

[Home](#)   [Quick](#)   [Advanced](#)   [Pat Num](#)   [Help](#)  
[View Cart](#)

Data current through December 8, 2015.

Query [\[Help\]](#)

Examples:  
 ttl/(tennis and (racquet or racket))  
 isd/1/8/2002 and motorcycle  
 in/newmar-julie

Select Years [\[Help\]](#)

1976 to present [full-text] ▼

Patents from 1790 through 1975 are searchable only by Issue Date, Patent Number, and Current Classification (US, IPC, or CPC).  
 When searching for specific numbers in the Patent Number field, patent numbers must be seven characters in length, excluding commas, which are optional.

Field Code	Field Name	Field Code	Field Name
PN	<a href="#">Patent Number</a>	IN	<a href="#">Inventor Name</a>
ISD	<a href="#">Issue Date</a>	IC	<a href="#">Inventor City</a>
TTL	<a href="#">Title</a>	IS	<a href="#">Inventor State</a>
ABST	<a href="#">Abstract</a>	ICN	<a href="#">Inventor Country</a>
ACLM	<a href="#">Claim(s)</a>	AANM	<a href="#">Applicant Name</a>

**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.

USPTO PATENT FULL-TEXT AND IMAGE DATABASE



Searching US Patent Collection...

Results of Search in US Patent Collection db for:  
(((TTL/HYBRID AND TTL/VEHICLE) AND ABST/AIR) AND ABST/CONDITIONER) 11 patents.  
Hits 1 through 11 out of 11

Jump To:

Refine Search:

PAT. NO.	Title
1 8,892,287	Hybrid vehicle control unit and control method
2 7,478,691	Hybrid vehicle and control method of same
3 7,213,865	Hybrid vehicle and control method of same
4 7,191,857	Hybrid vehicle and method for controlling the same
5 6,874,330	Air conditioner for hybrid vehicle
6 6,840,055	Air conditioner for hybrid vehicle
7 6,761,037	Vehicle air conditioner using a hybrid compressor
8 6,748,750	Hybrid air-conditioning system and method thereof for hybrid electric vehicle
9 6,516,621	Air conditioner for hybrid vehicle
10 6,515,448	Air conditioner for hybrid vehicle
11 6,452,286	Control device of a hybrid vehicle

**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



( 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.:	WO2012/009461				
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.

United States Patent and Trademark Office  
 Home Site Index Search FAQ Glossary Guides Contacts eBusiness eBiz alerts News Help

Patent #: US008892287 Section: Front Page 1 of 27 pages Help

US000008892287B220141118 1 / 1

Full Text Help  
 Go to Page:  Go

Sections:  
 Front Page  
 Drawings  
 Specifications  
 Claims

Full Document:  
 Full Pages



US008892287B2

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

(10) Patent No.: **US 8,892,287 B2**  
 (45) Date of Patent: **Nov. 18, 2014**

(54) **HYBRID VEHICLE CONTROL UNIT AND CONTROL METHOD**

(75) Inventors: **Masahiro Takeuchi**, Saitama (JP);  
**Takefumi Ikegami**, Saitama (JP);  
**Shigetaka Kuroda**, Saitama (JP)

(73) Assignee: **Honda Motor Co., Ltd.**, Tokyo (JP)

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

(21) Appl. No.: **13/700,304**

(22) PCT Filed: **Jul. 12, 2011**

(86) PCT No.: **PCT/JP2011/065904**  
 § 371 (c)(1), (2), (4) Date: **Nov. 27, 2012**

(87) PCT Pub. No.: **WO2012/008461**  
 PCT Pub. Date: **Jan. 19, 2012**

(65) **Prior Publication Data**  
 US 2013/0103242 A1 Apr. 25, 2013

(30) **Foreign Application Priority Data**  
 Jul. 12, 2010 (JP) ..... 2010-157984

(51) **Int. Cl.**  
**B60W 20/00** (2006.01)  
**B60W 10/10** (2012.01)  
 (Continued)

(52) **U.S. Cl.**  
 CPC ..... **B60W 20/106** (2013.01); **B60L 11/14**

B60K 6/20; B60K 6/42; F16H 55/36; F16H 3/006; F16D 41/088; B60W 10/06  
 USPC ..... 701/22; 74/329; 180/65.22, 165; 477/3, 477/5; 474/171; 361/146; 192/84.9  
 See application file for complete search history.

(56) **References Cited**  
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 6,499,370 B2 \* 12/2002 Bowen ..... 74/330  
 7,836,986 B1 \* 11/2010 Gilletcirosl ..... 180/65.21  
 (Continued)

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 CN 101244693 A 8/2008  
 CN 101578191 A 11/2009  
 (Continued)

OTHER PUBLICATIONS  
 Machine Translation of Japanese Patent 3647399 B; Marunouchi, Chiyoda-ku; Feb. 8, 2005.\*  
 (Continued)

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*Assistant Examiner* — Yuri Kan  
 (74) *Attorney, Agent, or Firm* — Westerman, Hattori, Daniels & Adrian, LLP

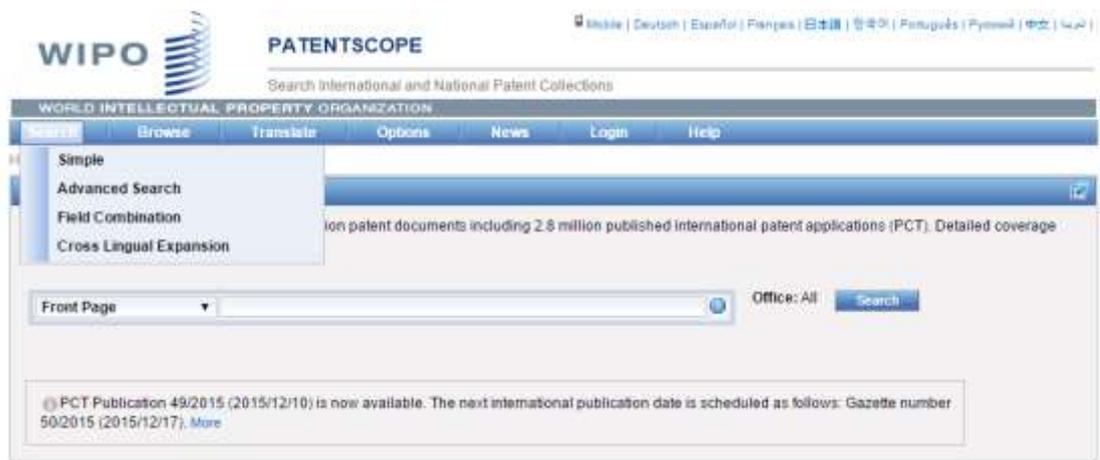
(57) **ABSTRACT**  
 With a hybrid vehicle drives at extremely low speeds only by power from the electric motor, when a state-of-charge of the battery becomes equal to or smaller than a predetermined level or when a rotational speed required on the air conditioner compressor is less than a desired rotational 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

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)

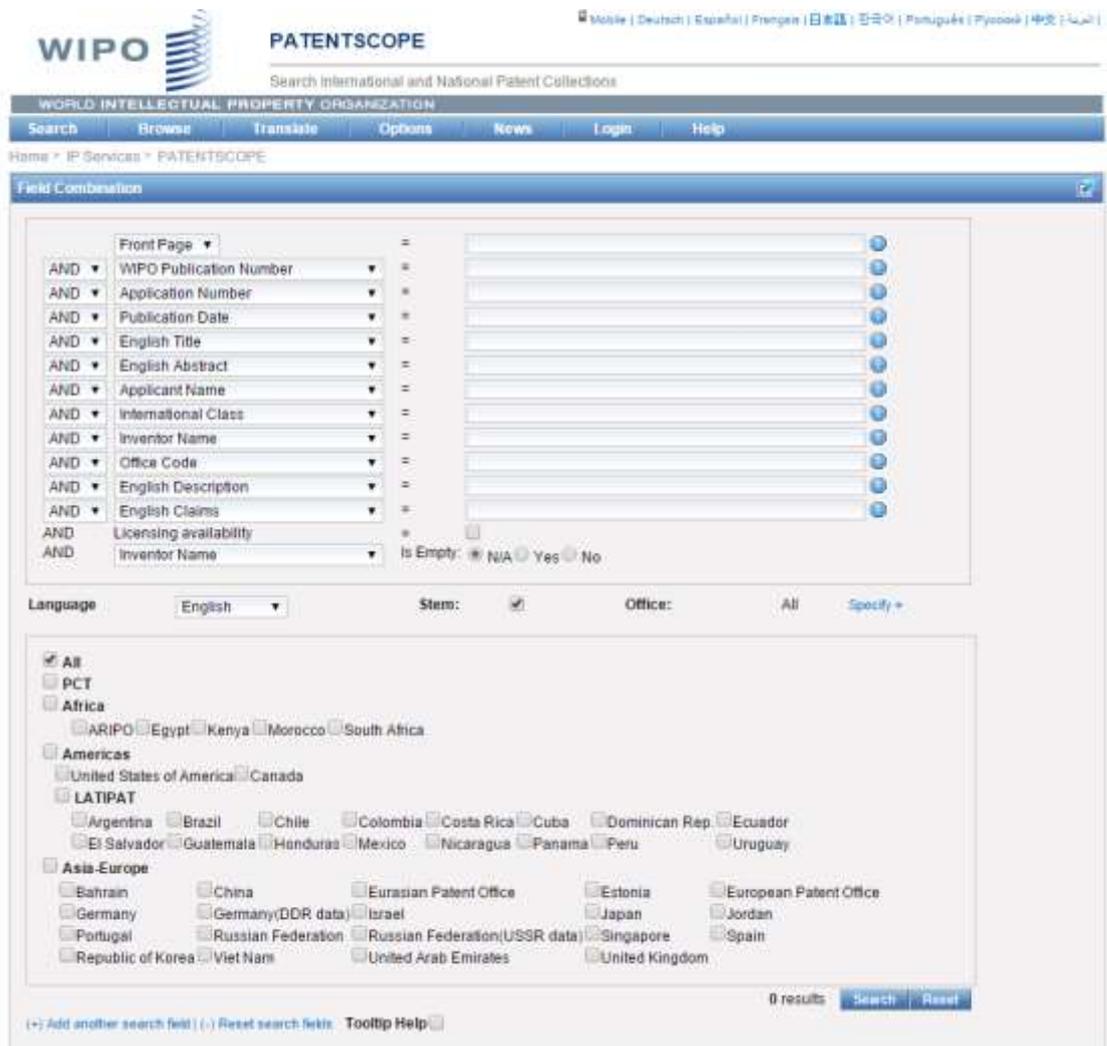
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**Fig. 48** Top Page of Patentscope

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:

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### National Collections - Data Coverage

Last Update: 2015-11-27

Country	Biblio Data	Abstract	Doc images	OCR (full-text) Indexed	No records	Note
PCT	20.10.1978 - 27.11.2015	20.10.1978 - 27.11.2015	2750936	Total records: 2745944 English: 1712133 French: 102995 Spanish: 19632 German: 313496 Korean: 49471 Japanese: 422911 Chinese: 187652 Russian: 15239 Portuguese: 2415	2,750,936	
Argentina	12.02.1965 - 26.03.2015	01.11.1990 - 26.03.2015	8741	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	229867	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	20,776	

**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.

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Results 1-10 of 246 for Criteria **EN\_AB:HYBRID AND EN\_AB:VEHICLE AND EN\_AB:AIR AND EN\_AB:CONDITIONER** Office(s):all Language:EN [Stemming: true](#)

[prev](#) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | [next](#) | Page: 1 / 25 [Go](#)

Refine Search: **EN\_AB:HYBRID AND EN\_AB:VEHICLE AND EN\_AB:AIR AND EN\_AB:CONDITIONER** [Search](#) [RSS](#) [Print](#)

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Analysis

Sort by: **Relevance** | View: **Simple** | List Length: **10** | [Machine translation](#)

Int. Class	App.No.	Title	Applicant	Cl.	PubDate
1. 1020090118228	1020080043895	APPARATUS AND A METHOD FOR CONTROLLING AN AIR CONDITIONER OF A HYBRID VEHICLE, CAPABLE OF PREVENTING POWER OF AN ISG FROM BEING TRANSFERRED TO THE AIR CONDITIONER	CONTINENTAL AUTOMOTIVE SYSTEMS CO., LTD.	KR	18.11.2009
B60H 1/00   <a href="#">Info</a>   PURPOSE: An apparatus and a method for controlling an <b>air conditioner</b> of a <b>hybrid vehicle</b> are provided to drive an <b>air conditioner</b> at a corresponding rotation ratio of the <b>air conditioner</b> and minimize an installation space of an engine room using a planetary gear. CONSTITUTION: An apparatus and a method for controlling an <b>air conditioner</b> of a <b>hybrid vehicle</b> includes a <b>hybrid control device</b> (11), an ISG(13), an <b>air conditioner</b> (15), and a planetary gear. The <b>hybrid control device</b> generally controls the <b>hybrid vehicle</b> . The ISG drives an engine according to control of the <b>hybrid control device</b> . The <b>air conditioner</b> controls indoor temperature by receiving power of the ISG under the control of the <b>hybrid control device</b> . The planetary gear transfers a driving force of the ISG to the <b>air conditioner</b> . COPYRIGHT KIPO 2010					
2. 1020090097442	1020080022576	APPARATUS AND A METHOD FOR CONTROLLING AN AIR CONDITIONER OF A HYBRID VEHICLE, CAPABLE OF OPERATING AN AIR CONDITIONER AT A DESIRED ROTATION RATIO	CONTINENTAL AUTOMOTIVE SYSTEMS CO., LTD.	KR	16.09.2009
B60H 1/00   <a href="#">Info</a>   PURPOSE: An apparatus and a method for controlling an <b>air conditioner</b> of a <b>hybrid vehicle</b> are provided to install an <b>air conditioner</b> with an ISG(Integrated Starter Generator) in series by using a planetary gear, thereby minimizing installation space of an engine room. CONSTITUTION: An <b>air conditioner</b> controller of a <b>hybrid vehicle</b> comprises a <b>hybrid control device</b> (11), an ISG(13), and an <b>air conditioner</b> (15). The <b>hybrid control device</b> controls the <b>hybrid vehicle</b> . The ISG operates an engine through the <b>hybrid control device</b> . The <b>air conditioner</b> receives power from the ISG through the <b>hybrid control device</b> to control indoor temperature. The ISG and the <b>air conditioner</b> are connected by using a planetary gear. ©KIPO 2009					
3. 20030233840	10331227	Hybrid air-conditioning system and method thereof for hybrid electric vehicle	Hyundai Motor Company	US	25.12.2003
F25B 1/00   <a href="#">Info</a>   The method for controlling a <b>hybrid air conditioning system</b> of a direct coupled motor-driven <b>hybrid electric vehicle</b> includes detecting operating conditions of the <b>air conditioning system</b> , and controlling the <b>hybrid air conditioning system</b> . The <b>hybrid air conditioning system</b> includes a mechanical <b>air conditioner</b> driven by an engine and an electric <b>air conditioner</b> driven by electric power of a battery.					

**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.

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Machine translation

1. (KR1020090118228) APPARATUS AND A METHOD FOR CONTROLLING AN AIR CONDITIONER OF A HYBRID VEHICLE, CAPABLE OF PREVENTING POWER OF AN ISG FROM BEING TRANSFERRED TO THE AIR CONDITIONER

National Biblio. Data Description Claims Drawings Documents

Permanent Link/Bookmark:

Application Number: 1020080043895 Application Date: 13.05.2008  
 Publication Number: 1020090118228 Publication Date: 18.11.2009  
 Publication Kind : A KOREAN PATENT ABSTRACTS

IPC: B60H 1/00  
 B60H 1/32

出願人: CONTINENTAL AUTOMOTIVE SYSTEMS CO., LTD.  
 콘티넨탈 오토모티브 시스템 주식회사

発明者: CHOI, JOON HO  
 최준호  
 JUNG, HU YONG  
 정후용

代理人: 이종승  
 김문재  
 권정용

優先権情報:  
 発明の名称: (KO) 하이브리드 차량의 에어컨 제어 장치 및 방법  
 (EN) APPARATUS AND A METHOD FOR CONTROLLING AN AIR CONDITIONER OF A HYBRID VEHICLE, CAPABLE OF PREVENTING POWER OF AN ISG FROM BEING TRANSFERRED TO THE AIR CONDITIONER

要約: (KO) 하이브리드 차량의 에어컨 제어 장치 및 방법이 개시되어 있다. 본 발명에 의하면, 엔진의 구동 용이하고 에어컨 구동 스위치로부터 제공되는 에어컨 요청 신호가 수신될 때 ISG의 구동력을 유성 기어의 선기어, 캐리어, 및 링 기어의 회전을 통해 에어컨의 해당 회전비로 변속한 후 에어컨에 전 송함으로써, 원하는 에어컨의 해당 회전비로 에어컨 구동이 가능하고 유성 기어를 이용하여 ISG와 직렬로 에어컨을 설치할 수 있어 엔진 룸의 설치 공간을 최소화할 수 있으며, 또한, 하이브리드 차량의 동력을 제어하는 하이브리드 제어장치에서 수신되는 엔진 상태 정보 및 에어컨 요청 신호에 따라 캐리어의 회전을 제어하여 엔진 시동, 엔진 정지, 및 에어컨 요청 신호가 없는 경우 중 하나일 때 에어컨의 구동을 방지함으로써, 상기 ISG의 동력이 에어컨에 전달되는 것을 방지할 수 있는 효과를 얻는다.  
 (EN) PURPOSE: An apparatus and a method for controlling an air conditioner of a hybrid vehicle are provided to drive an air conditioner at a corresponding rotation ratio of the air conditioner and minimize an installation space of an engine room using a planetary gear.  
 CONSTITUTION: An apparatus and a method for controlling an air conditioner of a hybrid vehicle includes a hybrid control device(11), an ISG(13), an air conditioner(15), and a planetary gear. The hybrid control device generally controls the hybrid vehicle. The ISG drives an engine according to control of the hybrid control device. The air conditioner controls indoor temperature by receiving power of the ISG under the control of the hybrid control device. The planetary gear transfers a driving force of the ISG to the air conditioner. COPYRIGHT KIPO 2010

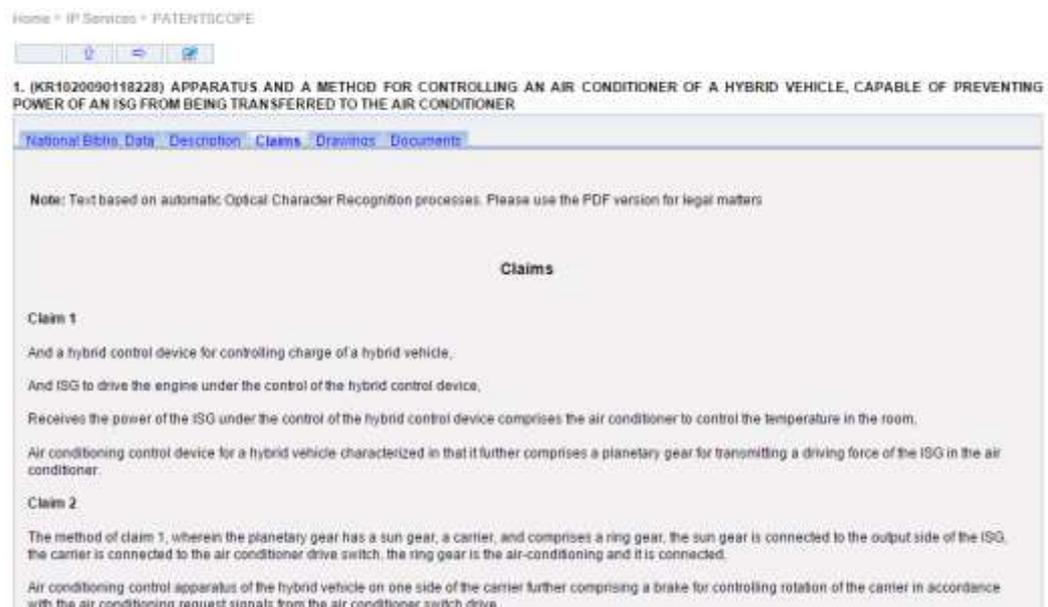
Fig. 52 Publication Page Found in the Patentscope Search (Example: KR1020090118228)

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.

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Refine Search EN\_AB:HYBRID AND EN\_AB:VEHICLE AND EN\_AB:AIR AND EN\_AB:CONDITIONER Search RSS

Analysis

Sort by: Relevance View: Simple List Length: 10 Machine translation

Int. Class	App. No	Title	Applicant	Inv.	Pub. Date
B60H 1/00	1020006118220	APPARATUS AND A METHOD FOR CONTROLLING AN AIR CONDITIONER OF A HYBRID VEHICLE, CAPABLE OF PREVENTING POWER OF AN ISG FROM BEING TRANSFERRED TO THE AIR CONDITIONER	CONTINENTAL AUTOMOTIVE SYSTEMS CO., LTD.	CHOL JOON HO	18.11.2009

PURPOSE: An apparatus and a method for controlling an air conditioner of a hybrid vehicle are provided to drive an air conditioner at a corresponding rotation ratio of the air conditioner and minimize an installation space of an engine room using a planetary gear. CONSTITUTION: An apparatus and a method for controlling an air conditioner of a hybrid vehicle includes a hybrid control device(11), an ISG(13), an air conditioner(15), and a planetary gear. The hybrid control device generally controls the hybrid vehicle. The ISG drives an engine according to control of the hybrid control device. The air conditioner controls indoor temperature by receiving power of the ISG under the control of the hybrid control device. The planetary gear transfers a driving force of the ISG to the air conditioner. COPYRIGHT KIPO 2010

**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

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Results 1-10 of 246 for Criteria: EN\_AB:HYBRID AND EN\_AB:VEHICLE AND EN\_AB:AIR AND EN\_AB:CONDITIONER Offices: all Language: EN Stemming: true

prev 1 2 3 4 5 6 7 8 9 10 next Page: 1 / 25

Refine Search EN\_AB:HYBRID AND EN\_AB:VEHICLE AND EN\_AB:AIR AND EN\_AB:CONDITIONER Search RSS

Analysis

Options Table Graph Options bar pie Line

Countries		Main IPC		Main Inventor		Main Applicant		Pub Date	
Name	No	Name	No	Name	No	Name	No	Date	No
Japan	109	B60H	167	IHOUE ATSUO	10	HYUNDAI MOTOR COMPANY	35	2005	10
Republic of Korea	55	B60K	83	IMAJ TOMONORI	8	DENSO CORP	31	2006	6
China	31	B60W	66	TAKEO YUJI	9	현대자동차주식회사	24	2007	17
United States	30	B60L	63	SUZURI KENICHI	8	株式会社ダンソー	21	2008	20
PCT	9	F25B	24	TSUBOI MASATO	8	TOYOTA MOTOR CORP	17	2009	14
European Patent Office	6	F02D	23	井上 孝雄	8	SANDEN CORP	14	2010	12
Germany	2	H01M	15	GMURA MITSUYO	7	HONDA MOTOR CO LTD	13	2011	23
Russian Federation	2	F04B	13	今井 智哉	7	トヨタ自動車株式会社	13	2012	17
Canada	1	F04C	10	坪井 誠人	7	サンデン株式会社 愛知県伊勢崎市寿町20番地	10	2013	18
United Kingdom	1	H02J	5	竹尾 菊治	7	Denso Corporation	9	2014	17
								2015	6

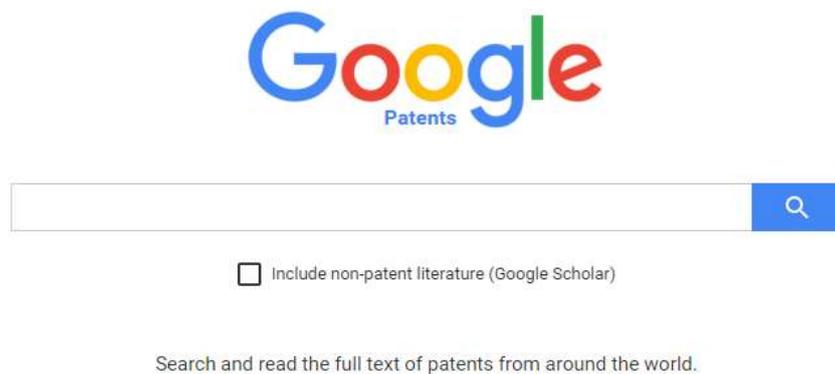
Fig. 56 Result of Patentscope Search Analysis

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

## v. Google Patents

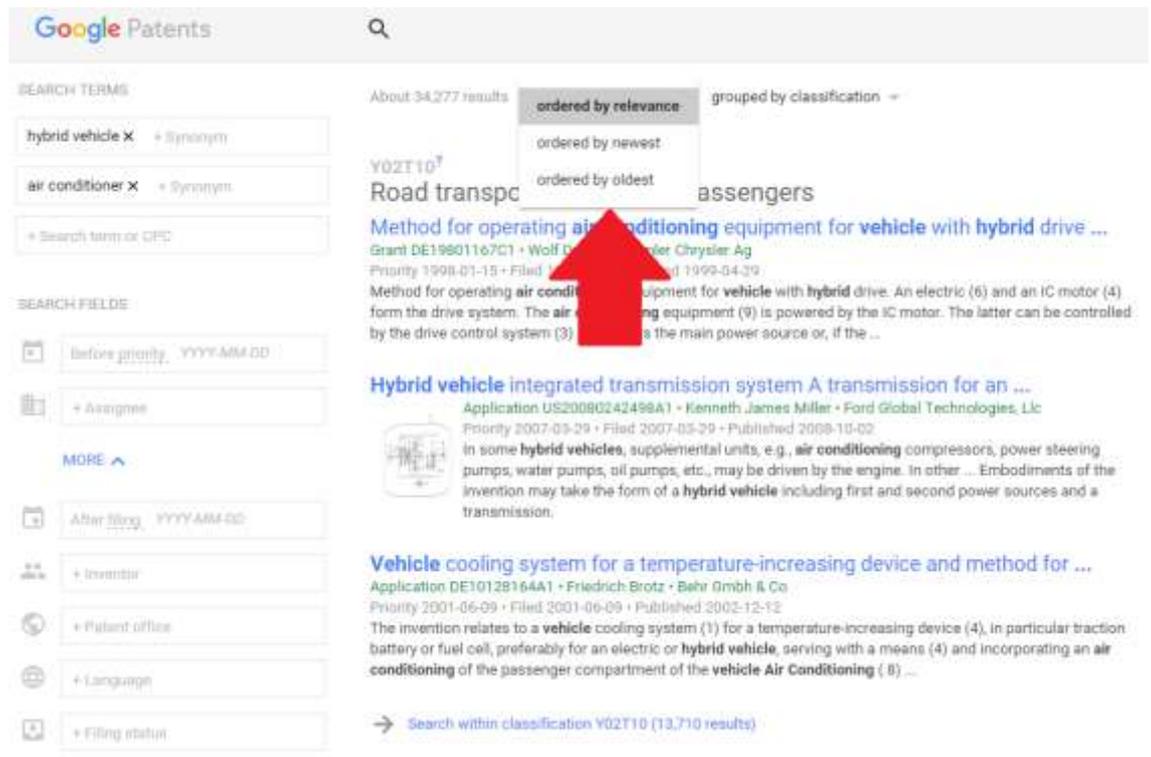
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**Fig. 57 Top Page of Google Patents**

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.

Google Patents

SEARCH TERMS

hybrid vehicle x + Synonyms

air conditioner x + Synonyms

SEARCH FIELDS

Before priority: YYYY-MM-DD

+ Assigned

MORE

After filing: YYYY-MM-DD

+ Inventor

US

EP

JP

WO

CN

DE

CA

About 34,277 results ordered by relevance grouped by classification

Y02T10<sup>7</sup>

Road transport of goods or passengers

Method for operating air conditioning equipment for vehicle with hybrid drive ...

Grant DE19801157C1 • Wolf Dr Boll • Daimler Chrysler Ag  
Priority 1998-01-15 • Filed 1998-01-13 • Granted 1999-04-29

Method for operating air conditioning equipment for vehicle with hybrid drive. An electric (6) and an IC motor (4) form the drive system. The air conditioning equipment (9) is powered by the IC motor. The latter can be controlled by the drive control system (3) so that it is the main power source or, if the ...

Hybrid vehicle integrated transmission system A transmission for an ...

Application US20080242498A1 • Kenneth James Miller • Ford Global Technologies, Llc  
Priority 2007-03-29 • Filed 2007-03-29 • Published 2008-10-02

In some hybrid vehicles, supplemental units, e.g., air conditioning compressors, power steering pumps, water pumps, oil pumps, etc., may be driven by the engine. In other ... Embodiments of the invention may take the form of a hybrid vehicle including first and second power sources and a transmission.

Vehicle cooling system for a temperature-increasing device and method for ...

Application DE10128164A1 • Friedrich Brotz • Behr GmbH & Co  
Priority 2001-06-09 • Filed 2001-06-09 • Published 2002-12-12

The invention relates to a vehicle cooling system (1) for a temperature-increasing device (4), in particular traction battery or fuel cell, preferably for an electric or hybrid vehicle, serving with a means (4) and incorporating an air conditioning of the passenger compartment of the vehicle Air Conditioning ( 8) ...

→ Search within classification Y02T10 (13,710 results)

Frequency conversion air-conditioner for hybrid power motor The utility model ...

Grant CN2593506Y • 邓光景 • 广东富达企业集团有限公司  
Priority 2004-02-26 • Filed 2004-02-26 • Granted 2005-04-20

The utility model belongs to the field of a vehicle air conditioner, in particular to a frequency conversion air conditioner device for a hybrid power motor. The device comprises a control device 1, a driving converter 2, an air conditioner motor 3, a compressor 4, an electric battery set 5, a condensing engine ...

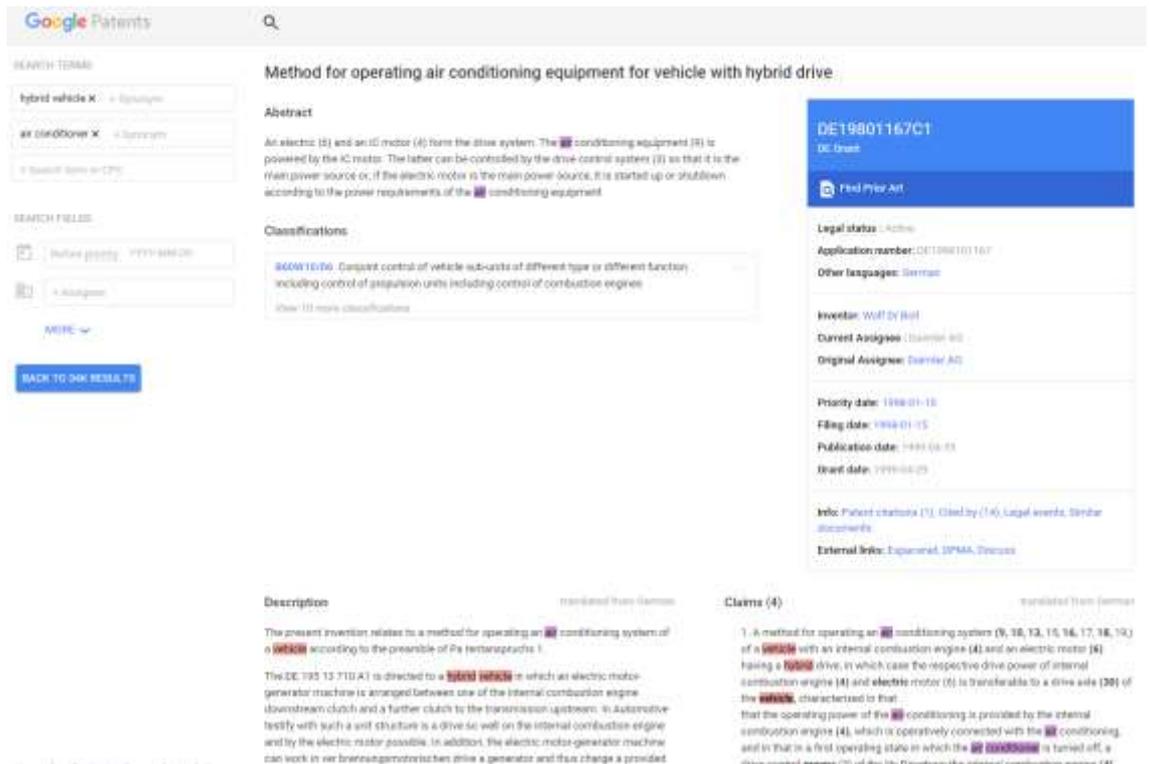
Two-motor driving device for vehicle-mounted air conditioner compressor The ...

Grant CN201568258U • 何建强 • 中国三江航天工业集团公司特种车辆技术中心  
Priority 2009-12-15 • Filed 2009-12-15 • Granted 2010-09-01

The utility model relates to the technical field of vehicle-mounted air conditioner, in particular to a two-motor driving device for a vehicle-mounted air ... [0001] This utility model relates to the field of vehicle air conditioning system technology, in particular to an air compressor hybrid vehicle drive device.

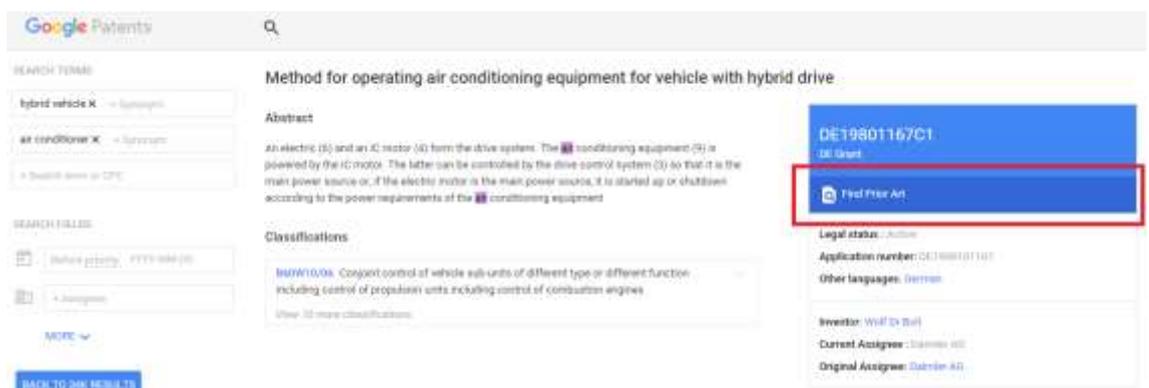
**Fig. 59 Narrowing the Search Results to a Specific Country of Publication**

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.

The screenshot shows the Google Patents interface. On the left, there are search filters under 'SEARCH TERMS' and 'SEARCH FIELDS'. The 'SEARCH FIELDS' section includes options like 'Before priority', 'Assigned', 'After filing', 'Inventor', 'Patent office', 'Language', 'Filing status', 'Citing patent', and 'CPC'. The main content area displays search results for the classification G01N27/44704<sup>2</sup>. The first result is titled 'Details; Accessories' and 'Polypeptide components of virions, top component and cores of reovirus type 3', published in 1968. The second result is titled 'High resolution acrylamide gel electrophoresis of histones', published in 1969. Below these, there is a link to 'Search within classification G01N27/44704 (more than 26,892,901 results)'. The third result is for classification G06F21/30<sup>7</sup>, titled 'Authentication, i.e. establishing the identity or authorisation of security principals', published in 1969.

**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.