

Searching Foreign Patents[†]

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Technology accessible in foreign patent publications is important to the scientist, patent liaison person, patent attorney, and patent examiner. The increasing number of foreign patents and published applications due to normal growth and new patent laws has caused both industry and Patent Offices to seek better ways of dealing with this information. The problem and solutions that have been effected are reviewed.

The purpose of this paper is to show the importance of following and searching technology in foreign patent publications, to cite occurrences which have made the job increasingly difficult, and to review cooperative actions taken by industries and by Patent Offices toward coping with the vast amount of foreign patent art.

I. IMPORTANCE OF SEARCHING FOREIGN PATENT PUBLICATIONS

A well-informed scientific community must be knowledgeable about technological discoveries published in foreign countries. Industry cannot afford costly duplication in research or the expense of filing and prosecuting unpatentable inventions or the liability of licensing invalid patents. Moreover, the applicant is expected to cite related foreign art when applying for a patent and the U.S. Patent Office must consider technology published in other countries to avoid issuing invalid patents.

Patentability laws in the United States stipulate that a person will not be entitled to a patent if (1) the invention was patented or described in a foreign country more than one year prior to the date of the application or (2) the applicant first patented his invention in a foreign country prior to the date of the application in this country on an application filed more than 12 months before the filing of the application in the United States.¹

Non-U.S. patent offices also have novelty requirements which must be met in order for an application to become a patent. E.g., West Germany's law says you cannot get a patent if your invention was described anywhere in a printed publication during the last hundred years prior to the filing or convention date; French law provides that you cannot be granted a patent if your invention was disclosed orally or in written form before the filing or convention date.^{2,3}

A significant difference in the novelty requirements stated above is that publication or public use of the invention up to one year before the filing date is not a bar to the grant of a U.S. patent whereas publication or public use of the invention even a day before the filing or priority date will invalidate a foreign patent.

The International Convention has influenced the number of filings and determines the effective date in novelty searches. This convention provides for the filing of an application in a Convention country within twelve months after the filing of the first application in any Convention country with the same force and effect as if the same had been filed simultaneously with such first filed application.²

Patents or applications which are published relatively soon after filing are particularly valuable to searchers and to those who follow new technology disclosed in patents. The country

Table I. Publication Dates of Equivalent Patents or Applications^{1,4}

| A | |
|-----------------------|----------------------------|
| Priority date 1/19/72 | Priority no. 219164 (U.S.) |
| BE 794,234 | May 16, 1973 |
| DT 2,301,004 | Aug 2, 1973 |
| FR 2,168,387 | Aug 31, 1973 |
| JA 73/86988 | Nov 16, 1973 |
| US 3,846,384 | Nov 5, 1974 |
| GB 1,418,804 | Dec 24, 1975 |
| B | |
| Priority date 2/2/72 | Priority no. 4828 (GB) |
| BE 794,960 | Aug 2, 1973 |
| NL 73/1453 | Aug 6, 1973 |
| DT 2,305,203 | Aug 30, 1973 |
| FR 2,170,136 | Sept 14, 1973 |
| JA 73/96613 | Dec 10, 1973 |
| AU 5166/73 | Aug 1, 1974 |
| IT 986957 | Jan 30, 1975 |
| GB 1,420,315 | Jan 7, 1976 |
| ES 411,221 | Apr 16, 1976 |
| SW 385,690 | July 19, 1976 |

which has gained recognition for being the most prompt in granting patents is Belgium. Applications are granted as patents either three or six months after filing date without any examination except for form.

The data in Table I illustrate the difference in publication dates in different countries for two families of equivalent patents. Note in part A that the Belgian patent is the first member of the family to be published. The U.S. patent appeared almost one and a half years later, and the British over two and a half years later. In part B, the Belgian patent was again the first to be published. The Dutch application appeared shortly after the Belgian and the German, French and Japanese appeared within a few months. Note that there is no U.S. equivalent. Technology in this patent publication would not have been found in a search restricted to U.S. patents.

II. OCCURRENCES WHICH HAVE MADE SEARCHING THE FOREIGN ART INCREASINGLY DIFFICULT

The number of foreign patent publications has changed dramatically over the years. Within the past ten years three of the more prolific patent-issuing countries have passed new patent laws which provide for publication of unexamined applications. Each law has resulted in sizable increases in numbers of publications and changes in numbering procedures which have led to complications in procuring the documents.

The first of these countries, the German Federal Republic, passed a new patent law in 1968 which provided (1) that all patent applications filed on or after October 1, 1968, would be published without examination 18 months after priority date unless a novelty search had been requested; (2) that applications filed prior to October 1, 1968, would be laid open to public inspection without examination in accord with publi-

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Table II. Published Examined and Unexamined German Applications⁸

| | OLS | DAS |
|-------------------------|--------|------|
| April 1968 | | 2099 |
| April 1969 | 4 599 | 2421 |
| April 1970 ^a | 9 499 | 831 |
| April 1971 ^a | 11 244 | 1959 |
| April 1972 | 6 407 | 1348 |
| April 1973 | 4 908 | 2167 |
| April 1974 | 4 793 | 1791 |
| April 1975 ^a | 6 242 | 1958 |
| April 1976 ^a | 6 062 | 2515 |

^a 5 weeks.

cation decisions made by the German Patent Office; (3) that the applicant or another party could request an examination anytime within seven years of publication; (4) that any application which survived examination would be published as an examined application; and (5) that opposition to an examined application must be filed within three months from publication date.^{2,3}

A published unexamined application is called an *offenlegungsschrift* (OLS). A published examined application is called an *auslegeschrift* (DAS). Applications applied for prior to October 1, 1968, have numbers in the range 1 400 000–1 800 000. The first 350 000 of this group have unique application numbers. The last 50 000 and all subsequent applications are assigned numbers which are retained for the examined applications and issued patents.

Examined and unexamined applications published after October 1, 1968, do not appear in numerical sequence which means (1) that a request by patent number for a copy from a microfilmed collection must be accompanied by a publication date and (2) that it is impossible to ascertain if an unexamined application has been examined unless one has access to an accumulated numerically arranged index.

The impact of the 1968 German patent law on the number of publications is illustrated in Table II which gives the number of *offenlegungsschriften* and *auslegeschriften* published in the month of April from 1968 to 1976.

The French Patent Office also passed a new patent law in 1968. According to this law all applications filed on or after January 1, 1969, are required to be published 18 months after filing or priority date. Request for examination can be made on filing or any time within two years of filing. If there is no request for examination within that time, the application becomes a utility patent.³ Examination is conducted by the Institut International des Brevets (IIB) and not by the French Patent Office.

The new applications have a national registration number and a publication number. The applications are published in numerical sequence according to the publication number. Legal personnel, at least in some companies, use the registration number. This presents a problem because there is no listing which enables one to go from registration number to publication number.

The Bulletin Officiel de la Propriété, the weekly official publication of the French Patent Office, groups publications into three sections: (1) patents issued under the law of July 5, 1844, (2) applications filed under the 1968 law, and (3) patents filed under the 1968 law which were granted without previous publication of the application. The last two sections are listed in numerical sequence. Patents issued after publication of the applications are not included, but are listed in a separate weekly index.

Table III lists the numbers of "old law" French patents (Section 1) and the combined number of "new law" French unexamined applications and patents issued from applications not previously published (Sections 2 and 3) for the years

Table III

| | Section 1 | Sections 2 and 3 |
|------|-----------|------------------|
| 1969 | 32 849 | 4 044 |
| 1970 | 17 750 | 30 039 |
| 1971 | 2 049 | 46 978 |
| 1972 | 599 | 52 384 |
| 1973 | 181 | 46 974 |
| 1974 | 11 | 47 387 |
| 1975 | 78 | 41 481 |
| 1976 | 14 | 40 772 |

Table IV. Unexamined Japanese Applications⁹

| Year | Number |
|------|---------|
| 1971 | 7 900 |
| 1972 | 46 300 |
| 1973 | 104 600 |
| 1974 | 136 000 |
| 1975 | 161 700 |

1969–1976.⁶ As in the case of the German publications, the numbers reached a peak and now seem to be decreasing somewhat.

The third country to pass a new patent law was Japan. This law, promulgated on May 22, 1970, became effective January 1, 1971. It stated (1) that applications filed before that date would be handled according to the provisions of the old law, i.e., they would be published only after examination; (2) that applications filed on or after the effective date of the new law would be laid open to public inspection 18 months from the earliest priority date, the laying-open to take the form of printed publication in the Patent Gazette of the full text of the specification; (3) that examination would be carried out only on written request by the applicant or another party within seven years from date of filing in Japan; and (4) that after successfully passing examination, the application would have the status of a pre-1971 application to which opposition must be made within two months of publication.²

Publications resulting from this new Japanese law introduced another complication for patent personnel. The two types of applications, examined and unexamined, are published in numerical sequence, both starting with number one at the beginning of each year. The only distinction is that the word *Kokoku* appears on the examined application and the word *Kokai* appears on the unexamined application. This has led to confusion in ordering and, even more costly, having the wrong application translated. Moreover, it is difficult to watch for publication of an examined application from a particular unexamined application unless one has access to a equivalent file. The dramatic increase in the number of patent publications resulting from the new Japanese law is shown in Table IV. Unlike the German and French publications, the number continues to climb.

The January 13, 1977, issue of the *New Scientist* published a notice stating that the British Parliament is considering a new bill which calls for stricter novelty examination of applications and for laying applications open to public inspection eighteen months after first filing. If this bill is adopted, the scientific community and patent examiners could be faced with another increase in the number of publications to be considered in a novelty search.

New patent legislation was not the only cause for concern to patent personnel. Even before passage of the aforementioned bills, there was an overall upswing in the number of patent publications in some countries. This is evidenced in Table V. The examined applications in West Germany are the only publications which showed no increase.

The United International Bureau for the Protection of Intellectual Property (BIRPI) published the number of applications filed in France, West Germany, Japan, and the

Table V. Applications or Patents Published in Four Countries⁶⁻⁹

| | 1958 | 1960 | 1962 | 1964 | 1966 |
|----------------------------|--------|--------|--------|--------|--------|
| France ^a | 21 499 | 32 899 | 33 149 | 36 049 | 41 749 |
| Great Britain ^a | 18 249 | 32 619 | 28 739 | 33 519 | 38 499 |
| Japan ^b | 10 800 | 18 750 | 19 000 | 30 380 | 22 400 |
| West Germany ^b | 26 429 | 23 729 | 20 969 | 24 329 | 23 369 |

^a Patents. ^b Published examined applications.**Table VI.** Filings and Publications in 1965

| | Applications filed in 1965 ¹⁰ | Patents or examined applications published ⁶⁻⁹ |
|----------------|---|--|
| France | 47 793 | 39 099 ^a |
| United Kingdom | 55 507 | 37 449 ^a |
| Japan | 81 923 | 29 240 ^b |
| West Germany | 66 470 | 23 549 ^b |

^a Issued patents. ^b Published examined applications.

United Kingdom in 1965. These numbers and the numbers of patents and examined applications published in the same year are given in Table VI. It is interesting to note that West Germany had the second highest number of applications, but the lowest number of publications.

The statistics cited in Tables V and VI were cause for both industry and Patent Offices to seek better and less repetitive access to information appearing in foreign patent publications even before the passage of the new patent laws.

III. CHANGES IN AVAILABLE SEARCH FILES AND PROCEDURES

Prior to 1970, companies had the choice of spending considerable amounts of money on creating internal indexes, employing search bureaus, or using inadequate search tools which were not set up to handle generic-type information or define time coverage. Du Pont employed all three methods of dealing with foreign patents.

In the early 1930's, a division of Du Pont which dealt only in information work started to acquire, abstract, and index U.S., British, French, and German patents which pertained to chemical and chemical-related subjects. The abstracts were circulated weekly to interested technical personnel. In 1950, Canadian patents, which had only recently become available in printed form, were added. In 1960, an internally created equivalent file was started to avoid duplicate indexing of equivalent patents.

The expense of preparing indexes, plus the inadequacy of country coverage, led to Du Pont's decision to seek other means of covering foreign patent art. In the late 1960s, industry initiated a concerted effort to find a vendor who would prepare and market abstracts and indexes for patents from all the major countries on a broad range of chemical and chemical-related subjects.

Derwent Ltd. of London, England, which was already offering Patent Abstract Bulletins covering patents on selected subjects from seven countries and indexes to patents dealing with agricultural chemicals, pharmaceuticals, and polymers was a natural target. In 1970 Derwent introduced its Central Patents Index covering 12 chemical or chemical-related areas of technology in patents from 12 countries. Today this service is widely used by industry in Europe, Great Britain, Japan, and the United States. In 1974, Derwent Ltd. increased its patent coverage to nonchemical subjects in a service called the World Patents Index.

Several patent equivalent files also became available to industry. These are extremely valuable to Patent Liaison and Legal personnel, as well as to scientists. The ones which have been used by Du Pont include the Derwent indexes which cover patents and applications abstracted in the Derwent Alerting Bulletins (CPI and WPI); the Chemical Abstracts Patent

Table VII. Codes Recommended by ICIREPAT for Identification of Data on the First Page of Patent Documents¹⁵

(10-19) Document Identification
(20-29) Documentation Filing Data
(30-39) Convention Priority Data
(40-49) Date(s) of Making Available to the Public
(50-59) Technical Information
(60-69) Reference(s) to Other Legally Related Domestic Documents
(70-79) Identification of Parties Concerned with the Document

PATENT SPECIFICATION (11) 1201512

NO DRAWINGS

(21) Application No. 55066/67 (22) Filed 4 Dec. 1967
(31) Convention Application No. 598 979 (32) Filed 5 Dec. 1966 in
(33) United States of America (US)
(31) Convention Application No. 622 407 (32) Filed 13 March 1967 in
(33) United States of America (US)
(31) Convention Application No. 668 704 (32) Filed 18 Sept. 1967 in
(33) United States of America (US)
(45) Complete Specification published 5 Aug. 1970
(51) International Classification C 07 d 57/00, 99/02
(52) Index at acceptance
C2C 177—189—283 1E6K4 1E7C1 1E7D1 1E7D2 1E7E2
1E7F1 1E7F2 1E7N5 1E7P3 1G5B 1G6A1 213 247
250 251 25Y 313 31Y 321 32Y 337 351 352
3A12A4A 3A12B1 3A12B2 3A12C1 3A12C43A12C6
3A13C10D 3A13C1C 3A14A3A 3A14A5 3A14A8D
3A14B3E 3A14B8A 3A14B8D 670 761 762 B4A1
B4A4 LK

(54) PROCESS FOR THE MANUFACTURE OF NEW 11-AMINO-
5,6-DIHYDRO-6-MORPHANTHRIDONES

(71) W6, CIBA LIMITED.

Figure 1. Computerized format of the first page of a patent.

Concordance; the Rhone-Poulenc File, so-called because that company accumulated equivalency data fed in by several European companies; the IDC (Internationale Dokumentations Gesellschaft fur Chemie m.b.H) file which was a successor to the Rhone-Poulenc File; and the INPADOC (International Patent Documentation Center) Family Patent Service. Definitive time coverage, completeness, currentness, and frequency of accumulations are factors which determine relative value of these files.

Patent Offices which conduct searches in their own classified collections, supplemented by foreign patents selected from patent copies received from other patent offices, also saw the need for cooperative efforts to achieve better and more efficient access to the vast amount of information in foreign as well as domestic patents and to cut down on duplicate searching of equivalent patent applications.

In 1961 the United States Patent Office (USPO) extended an invitation to nine leading Patent Offices to participate in a workshop on information retrieval. The outcome of that meeting was the formation of the Committee for International Retrieval Among Examining Offices known as ICIREPAT.¹¹ This committee, consisting of patent experts from 18 countries and two treaty organizations, established a list of projects which included research on indexing systems which would shorten and improve novelty searches. Each country was assigned an area of technology on which to develop a method for storing and accessing information. Progress reports were made at meetings which were held annually in different countries. The last meeting of the committee as such was held in Japan in 1968. It subsequently became associated with the Paris Union Committee for International Cooperation in Information Retrieval Among Patent Offices.¹³

Two projects associated with ICIREPAT are a standardized list of country abbreviations and the computerized format of the first page of a patent which is now used by many countries. This format and an illustration are shown in Table VII and Figure 1.

Another act of international significance was implemented when the Strasbourg Agreement, signed on March 24, 1971, designated the International Patent Classification (IPC) as a common classification for patents, inventors certificates and utility models and certificates. The text of this classification was published on September 1, 1968. The revised version

SEARCHING FOREIGN PATENTS

INTERNATIONAL PATENT CLASSES ASSIGNED TO EQUIVALENT PATENTS

| | |
|----------------|--------------------------|
| U.S. 3,719,562 | C12D 13/10 |
| SU 396014 | A61K 19/00 |
| CH 544098 | C07D 51/50 |
| ES 390743 | C12D |
| GB 1,355,251 | C07G 7/028 |
| DE 316,464 | C12D 13/10 |
| CH 553,226 | C07G 7/02 |
| IL 36,707 | C07G 7/028 C12D 13/10 |
| HU 166448 | C12D 13/10 C07G 7/028 |
| EI 35076 | C07G 7/028 |

Subject of patent: Production of Polynucleotide Phosphorylase

Definitions of IPC's Assigned:⁽¹⁶⁾

| | |
|------------|---|
| C12D | Production of chemical substances by fermentation or biosynthesis |
| C12D 13/10 | ----- using enzymes |
| A61K | Preparations for medical, dental or toilet purposes |
| A61K 19/00 | Not listed |
| C07D | Heterocyclic Compounds |
| C07D 51/50 | ----- not listed |
| C07G | Compounds of Unknown Structure |
| C07G 7/02 | ----- Proteins -- enzymes |
| C07G 7/028 | ----- Proteins - extraction from microorganisms |

Figure 2. International patent classes assigned to equivalent patents.

contained in the second edition was adopted, in 1973, by the Committee of Experts on Patents of the Council of Europe and entered into force on July 1, 1974.¹⁶ This edition was published for the World Intellectual Property Organization (WIPO) and may be purchased from Morgan-Grampian Ltd. in London, England.

The Dutch Patent Office switched to the International Patent Classification in 1973, the West German Patent Office did the same in 1975, and the British, Japanese, and United States Patent Offices now assign IPC's in addition to classes from their respective systems. The United States Department of Commerce has published a concordance which equates United States Patent Office Classes with International Patent Classes. Many other countries are tending to adopt the International Patent Classification. Some smaller countries now require that IPC's be submitted with patent applications.

As with any classification, uniformity in the assigning of classes must be considered when conducting searches. IPC's assigned to two families of equivalent patents are shown in Figures 2 and 3. These examples point to considerable inconsistency in the assigning of IPC's, the need for use of more than one class when conducting searches, and other obvious problems.

The World Intellectual Property Organization (WIPO) initiated another important development when, in 1972, it signed an agreement with the Republic of Austria for the establishment of the International Patent Documentation Center known as INPADOC. Its objective was to compile patent documentation on a worldwide basis which would be made available in comprehensive form to patent offices and industry. Through cooperative agreements with patent offices now numbering 42, INPADOC receives at the end of each week patent copies and tapes containing bibliographical information on all patents or applications published during that week. From the tapes, four files are created on microfiche: a patent family or equivalent file, a numerical data base, a patent applicant file, and a patent classification service based on IPC's. Information provided in the equivalent files include

INTERNATIONAL PATENT CLASSES ASSIGNED TO EQUIVALENT PATENTS

| | |
|--------------|--------------------------|
| BE 789,818 | C08G |
| DT 2,248,961 | C08F 15/00 |
| US 3,734,888 | C08G 23/20 |
| FR 2,156,113 | C08G 33/00 C08G 55/00 |

Subject of patent: Polyketals of Aromatic Polyketones and 1,2- or 1,3-glycols

Definitions of IPC's Assigned:⁽¹⁶⁾

| | |
|------------|--|
| C08G | Macromolecular compounds obtained otherwise than by reactions only involving unsaturated carbon-carbon bonds |
| C08G 23/20 | Not listed |
| C08G 33/00 | Transferred to 73/00, 79/00 |
| C08G 55/00 | Not listed |
| C08F | Macromolecular compounds obtained by reactions only involving carbon-to-carbon unsaturated bonds. |
| C08F 15/00 | Transferred to C08K, L |

Figure 3. International patent classes assigned to equivalent patents.

priority date and number; patent or application numbers of all equivalents; and for each member of the patent family the publication date, the application number and date, the document status, i.e., examined or unexamined application or issued patent, the applicant's name, and the title if it is in English, French, German, or Dutch. These files, which date from January 1973, are excellent in that they are complete, they are current, they contain publication dates, and they are accumulated so that it is not necessary to consult more than the accumulation of previous years and the accumulation of the current year. Sale of the INPADOC services in the United States is handled by IFI/Plenum located in Washington, D.C.

For several years there has been a great deal of cooperative planning among patent offices to reduce duplication of effort in cases where patents are sought for the same invention in more than one country. One result is the Patent Cooperation Treaty which evolved from a proposal submitted by the United States of America to the Executive Committee of the International (Paris) Union for the Protection of Industrial Property.^{3,10} This treaty provides for an international patent application, an international search to be conducted by an International Searching Authority and, if requested, a preliminary examination based on the references cited in the search report. Another outcome of this cooperative effort is the European Patent Treaty which makes provision for an application to be filed with a European Patent Office where it will be subjected to one procedure of grant.³ A resulting granted European patent will have the same effect as a national patent in any of the member states designated by the applicant, subject to national patent laws of the respective states. Both treaties could come into force in 1977.

This cursory look at some of the patent-related occurrences of the past 20 years gives an indication of progress that can be accomplished by cooperation among industries and among countries.

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The Patent File and the Patent and Trademark Office Technology Assessment and Forecast Program[†]

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The U.S. Patent and Trademark Office technology assessment and forecast program was established to enhance and stimulate the use and usability of the patent file. In carrying out this goal, use is made of a machine-readable database covering all U.S. patents. This database and the functions of the program are described.

THE PATENT FILE

The voluminous collection of technical literature within the Patent and Trademark Office (PTO) is known as the patent file. At present, it consists of about 11.5 million U.S. patent documents, some 9.5 million foreign patent documents, and approximately 1 million pieces of nonpatent literature—a total of 22 million documents—classified into more than 95 000 subdivisions of technology, called subclasses. Each year the file grows with the addition of about 650 000 new documents.

Within this file can be found the disclosure of almost all major technological advances that have occurred both here and abroad during the 186 years since the first U.S. patent was granted. The patent file, therefore, represents a compendium of the history, development, and current status of technology. In a sense, the patent file also is an irreplaceable national resource, because much of the technical information it contains is not duplicated elsewhere and is unique to patents.

Such information could be of value to professionals in many disciplines. Yet, today, the file is mostly used only for a part of the information it contains, and by a relatively narrow segment of the scientific community.

Historically, the patent file has been used primarily by inventors, attorneys, and others in the patent community who have need of a patent's substantive disclosure in their efforts relating to preexamination, validity, and infringement determinations; and by patent examiners who look at this same information to assess the state of the art in their determinations of patentability. To a much lesser extent the file is used by researchers interested in technical information of a problem-solving nature.

Often ignored is the additional descriptive information printed on the face of the patent document that adds to the usefulness of the patent file. This includes the inventorship, inventor's address, assignment, application filing date, field of search, and references cited in the patent.

The first of these, inventorship, is very unlike authorship in the nonpatent literature. Inventorship of a patent, which

may be singular or plural, is a very precise legal concept which identifies the developer of the patented technology. Only a substantial contributor to the technology can be an inventor. Authorship, on the other hand, often is a matter of convention or the preference of the principal author. A common practice today is to include as coauthors of technical papers those who contributed in only a minor way to its development.

By address of inventor is meant his or her place of residence. When a patent issues, the city and state or country of every inventor is printed on the patent document. In most cases this address corresponds to the geographic source of the technology and can be used to determine whether the technology is U.S. or foreign origin.

Assignment refers to ownership of the patent. Patents are like real property in that ownership can be transferred to a second party, known as the assignee. When ownership is transferred prior to issuance of the patent, the name and address of the assignee becomes part of the patent document. Often this is a public or private research organization since the effort leading to a patent is done by employees who assign patent rights to their employers. This is especially true in the chemical industry where about 90% of all patents issued are assigned to organizations.

The application filing date refers to the date the application for patent was received in the Patent and Trademark Office. It has importance because it is an accurate reflection of when the technology was developed, this being true because inventors usually file an application for a patent as soon as the invention is completed and an application can be prepared. The incentive for doing this is both financial (expected monetary returns from the patent grant) and legal, the law requiring filing of a patent application prior to disclosure by another. This is in contrast to the nonpatent literature where requirements for publication, including prior disclosure, are far less stringent.

The field of search identifies those areas of the Patent Classification System searched by the examiner for state-of-the-art information. While these are frequently the same areas where the patent may be classified, often they are not. For example, reaction apparatus for preparing esters may be found with processes for preparing halogenated hydrocarbons. For this reason, field of search information can be used to locate other technologies where pertinent references may be found.

[†] Presented in the symposium on "Meeting the Challenges of the Changing Patent Literature", Division of Chemical Information, 173rd National Meeting of the American Chemical Society, New Orleans, La., March 21, 1977, and 11th Middle Atlantic Regional Meeting of the American Chemical Society, Newark, Del., April 20, 1977.