(78) *Ibid.*, **47**, 41 (1961).
(79) *Ibid.*, p. 113.
(80) *Ibid.*, **46**, 81 (1960).
(81) *N. Y. Fish Game J.* **6**, 57 (1959).
(82) *Ibid.*, **5**, 9 (1958).
(83) *Ibid.*, **11**, 148 (1964).
(84) *Proc. Ann. Conf. S. E. Assoc. Game Fish Comm.* **11**, 71 (1957).
(85) *Ibid.*, **15**, 60 (1961).
(86) *Ibid.*, p. 107.
(87) *Proc. N. Dakota Acad. Sci.* **17**, 66 (1963).
(88) *Ibid.*, **7**, 44 (1953).
(89) *Ibid.*, **15**, 90 (1961).
(90) *Ibid.*, **21**, (1967).
(91) *Ibid.*, **12**, 86 (1958).
(92) *Trans. Ill. Acad. Sci.* **55**, 13 (1962).
(93) *Proc. Minn. Acad. Sci.* **13**, 8 (1945).
(94) *Utah Acad. Sci., Arts, Lett.* **40**, 1 (1963).
(95) *Proc. Iowa Acad. Sci.* **70**, 205 (1963).
(96) *Trans. Wis. Acad. Sci., Arts, Lett.* **33**, 115 (1941).

Documentation of the Chemical Patent Literature*

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Chemical Abstracts Service must select, abstract, index, and distribute information on the world's chemical and chemical engineering patent literature. The accumulation and subsequent dissemination of patent information differ from the handling of journal literature in two ways. Firstly, equivalent patents are usually granted in several countries at different times, which poses the problem of determining corresponding patents. CAS handles this problem through its priority date control system and the Patent Concordance. Secondly, patent data must be sifted to obtain the scientific and technological significance CAS users normally desire, rather than the legal benefits for which the patent was written. The solution has been the use of highly skilled abstractors and indexers capable of making these distinctions.

It is the purpose of the American Chemical Society's Chemical Abstracts Service (CAS), to disseminate usable chemical and chemical engineering information to the technical public. An important part of that information appears in the patents issued to inventors by various countries. Recognizing the vital role the patent literature plays in research and development, *Chemical Abstracts* (*CA*) has published abstracts of patents almost since its beginning in 1907. This patent coverage has been expanded steadily and has been made more usable. Today, patents are covered not only in *CA*, but also in *POST-P* (*Polymer Science & Technology-Patents*), a new computer-based information service.

The processing of the patent literature by CAS involves five operations: acquisition, selection, organization and determination of duplicates, abstracting and indexing, and distribution.

ACQUISITION

CAS monitors, in whole or in part, the patent literature of 25 countries (Table I). All Belgian, British, French, German, and United States patents of chemical and chemical engineering interest are covered. It is especially important that CAS cover the patents of Belgium and France completely and promptly. In these two countries, patent information is disclosed within 3 to 9 months after filing with little or no examination for novelty. Thus these are very popular countries in which to file. Patents from the other 20 countries are abstracted and published only if they have been issued to individuals or companies that reside in the country where the patent was issued, or they originated in a country not otherwise covered. Although other countries issue patents, CAS does not cover these because inventions from a country not covered are almost certainly patented in one of the major countries whose patents are monitored.

Table I. Countries Whose Chemical and Chemical Engineering Patents are Covered in Whole or in Part

Australia	India
Austria	Israel
Belgium	Italy
Canada	Japan
Czechoslovakia	Netherlands
Denmark	Norway
France	Poland
Finland	Romania
Germany	Spain
Germany (East)	Sweden
Great Britain	Switzerland
Hungary	United States
	U.S.S.R.

*Presented in part at the Patent Symposium, 58th Convention of the Special Libraries Association, May 30, 1967, New York, N. Y.

To keep *CA* users promptly and fully informed, methods of acquisition are as rapid as possible. United States patents are received in the Columbus offices each Wednesday morning—within 12 hours of their publication. British and German patents arrive within 2 days of issue, while French patents are sent by Air Mail immediately upon issuance of the printed specifications. CAS is presently exploring ways to obtain economically file copies of French patents as the file copies of these patents are available 5 to 6 months earlier than the printed specifications. Earlier receipt of these patents would further enhance the timeliness of coverage.

Belgium, Germany, the Netherlands, and Denmark open their patent applications to public inspection, and CAS is able to abstract and publish these applications 6 months to 3½ years earlier than if they waited for the corresponding accepted patents. Only in the Netherlands do the application numbers differ from the final patent numbers. Therefore, the *CA* abstracts for Netherlands applications use the abbreviation "Appl." (for application) preceding the patent number.

The acquisition of patents presents a number of problems. For example, CAS is experiencing delays of several months in obtaining photocopies of Belgian patent applications. Some years ago, the delays were due to the periodic condemning of the Patent Office Building in Brussels, which prevented examination and ordering of the published applications. The patent facilities have recently been housed in a new building, but now a lack of manpower and equipment apparently prevents the prompt filling of orders. CAS continues to make every effort to obtain Belgian patent applications more rapidly.

Another problem encountered concerns published German patent applications, *Auslegeschriften*, which can be amended with great ease. This raises the question of how CAS, which abstracts applications, should handle the final printed specifications—*Patentschriften*. Some 20% of the final chemical *Patentschriften* differ in some manner from the corresponding original *Auslegeschriften*, but CAS has found that only 8% of the *Patentschriften* contain changes which may affect the content of the abstract. Since the German patent gazette, *Patentblatt*, only denotes the amended patents by an asterisk without indicating the differences, it is not economically feasible for CAS to establish and document the differences through a line-by-line comparison of the application and final specification. Requests by CAS to the German Patent Office to provide the specific nature of the amendments have met with no success. As a result, the question remains open, and CAS continues to abstract only the *Auslegeschriften*. Abstracts of USSR patents are essentially translations of claims given in the Soviet Official Bulletin, while abstracts of Japanese, Czechoslovakian, and Polish patents are prepared by members of CAS abstracting teams in those countries.

SELECTION

After acquiring patents, CAS must exercise its judgment on which ones to abstract. CAS criteria for including a patent in its coverage are determined by the needs of users who, although they represent all the many disciplines of the broad spectrum of the physical sciences, are primarily concerned with the chemistry of the subject under investigation. As CAS uses the terms, "chemistry" and "chemical engineering" are broadly defined. Chemistry is the study of the composition and structure of matter, of the transformation that it undergoes, and of theories and laws thereof. In the field of chemical engineering, CAS covers the development and application of manufacturing processes as well as the engineering studies of equipment, tools, and apparatus used by the chemical engineer.

In essence, CAS covers the technical (as distinguished from legal) information in patents whenever that information is germane to chemistry or chemical engineering.

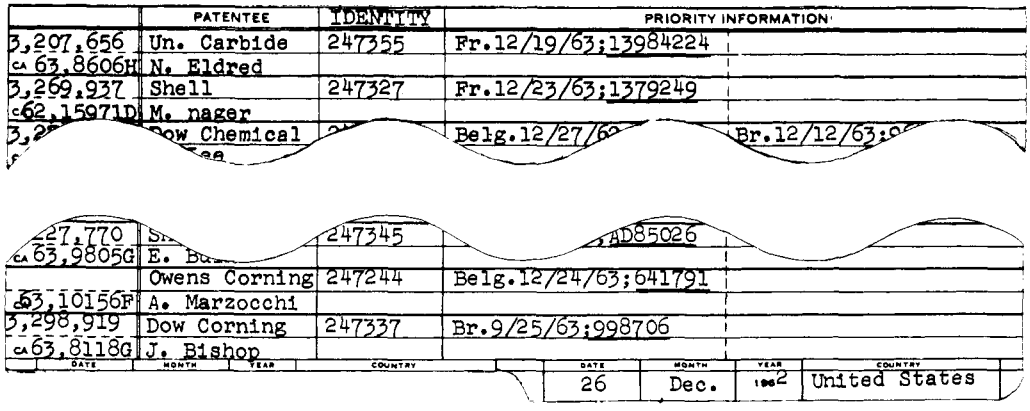
ORGANIZATION AND DETERMINATION OF DUPLICATES

In contrast to journal or serial publications, the coverage of the patent literature presents a unique problem in that only about one-half of the chemical patents published throughout the world contain new information that has not already been published in another country. This is because corporations commonly protect the same invention in a number of different countries. For example, our studies show that 32% of the French chemical patents and 22% of Belgian chemical patents are issued to U.S. companies who will also patent their inventions in the U.S. In these two "quick issue" countries, patents are usually issued before the corresponding U. S. patents.

To facilitate literature searching and eliminate costly waste of technical manpower in abstracting the same information two or three times, it is CAS' policy to abstract only the first-issued patents. However, a system had to be established to detect the equivalent, later-published patents and make the resulting information available in easily usable form. Several systems were considered for determining patent equivalents. Systems based on subject matter or company-inventor names were rejected. Inventors' names often are not given and companies often are incorporated under different names in different countries. Thus, to use company names would require constant reference to a voluminous thesaurus of equivalent company names that would be subject to frequent changes. Likewise, subject matter is a poor basis for duplicate checking because patent titles are purposely written to be general and ambiguous. Furthermore, the equivalent patents of different countries frequently carry completely different titles. For these reasons, CAS has developed a system based on the priority date—the earliest application date for a particular invention in any country.

When a patent is received in CAS offices, it is checked immediately against our priority files which are organized first by country and then by date of application. As there is a separate card for each working day of the year for each country, these files have permanent records with very rapid access. When real-time, direct-access computer equipment becomes available to CAS, the patent priority file will be included in the computer system.

To illustrate the use of the patent priority file and the manner in which it is used to detect equivalent patents, let us assume we have just received United States Patent 3,296,050 having the application number 247244, applied



	PATENTEE	IDENTITY	PRIORITY INFORMATION
3,207,656	Un. Carbide	247355	Fr.12/19/63;13984224
CA 63,8606H	N. Eldred		
3,269,937	Shell	247327	Fr.12/23/63;1379249
CA62,15971D	M. nager		
3,2	ow Chemical		Belg.12/27/62 Br.12/12/63;6
	ea		
27,770	S	247345	AD85026
CA 63,9805G	E. Bu		
	Owens Corning	247244	Belg.12/24/63;641791
CA63,10156F	A. Marzocchi		
3,298,919	Dow Corning	247337	Br.9/25/63;998706
CA 63,8118G	J. Bishop		

DATE	MONTH	YEAR	COUNTRY
26	Dec.	1962	United States

Figure 1. Patent priority file record

for on December 26, 1962. Upon inspection of the United States priority file card for that date (Figure 1), we immediately note that we had already received and abstracted a Belgian patent which claimed a United States priority on that date and bore the corresponding application number. Thus, a possible duplicate relationship is quickly discerned. Patents which bear no priority information data, but whose patentees are of a nationality different from that of the issuing country are also checked for possible duplication through *CA* indexes. Alternatively, if the patent proves to be a first-issued patent, the relevant information is recorded. This information includes number, patentee, identity (preferably expressed by international classification number or priority application number), and available priority information. In the case of a first-issue patent, the patent is immediately assigned for abstracting.

If a possible duplicate relationship exists, further research is necessary. It is most important to note that a patent is not adjudged to be a duplicate of a previously abstracted one solely on the basis of matching priority file data. Each possible equivalency is verified by checking the newly received patent against the first-issued patent or its *CA* abstract. For this purpose, CAS is building a file of patents on microfilm. CAS holds that patents are equivalent if their indexable information is the same. This information includes all examples and compounds for which there is evidence of actual preparation. Claims are also considered, recognizing differences due to the discrepancies of the patent laws of the various countries. For example—in the Netherlands and Germany, a substance as such is not patentable; only processes of manufacture and the substances provided thereby are acceptable for patenting.

Verified duplicate relations are recorded directly on computer magnetic tape by keyboard equipment. From this record, weekly *CA* and biweekly *POST-P* Concordances are produced by computer program. These provide the user with a guide to equivalent patents from different countries. Their usefulness to legal departments of chemical companies is obvious. Entry is afforded from the later-issued patents as well as the first-issued one. However, it is at the first-issued entry that all of the relationships and references are given.

ABSTRACTING AND INDEXING

Patents present some unique challenges to abstractors and editors. For example, specification titles are usually uninformative and nonspecific, making them inadequate for documentation purposes without considerable augmentation. The specific examples that detail new compounds or processes are the most important part of the specification to the research worker and novelty searcher. For this reason, CAS patent abstracts are based on the examples given in the patent. Ordinarily, an abstract opens by giving the purpose and scope of the patent, Next, a single example of the procedure or apparatus is abstracted in detail. If more than one method is shown, the abstractor gives an example of each. All compounds actually prepared, with their identifying properties, are then included in the abstract. In addition, at least one structural diagram appears in each patent abstract having a structural theme.

One problem encountered in documenting patent literature is the prevalence of "paper examples." These mention compounds or substances only for legal purposes, but contain no information on reaction conditions or physical constants. Therefore, they are abstracted in neither *CA* nor *POST-P*. Their proliferation in the patent literature can be illustrated by considering the results of a CAS study on 68 German dye patents abstracted in *CA*, Vol. **60**. Of the 1852 dyes enumerated in these patents, 1508 were "paper examples" unsuitable for abstracting.

From the legal point of view, claims comprise the most important part of the patent. They provide the inventor with the license to produce, use, or sell his invention at the exclusion of all others. Therefore, any product or process claimed in a patent is abstracted even if it is not specified in the descriptive text of the patent. In the indexes to CAS publications, all claimed compounds are now identified by the letters PC to alert the user to the fact that they represent Patent Claims.

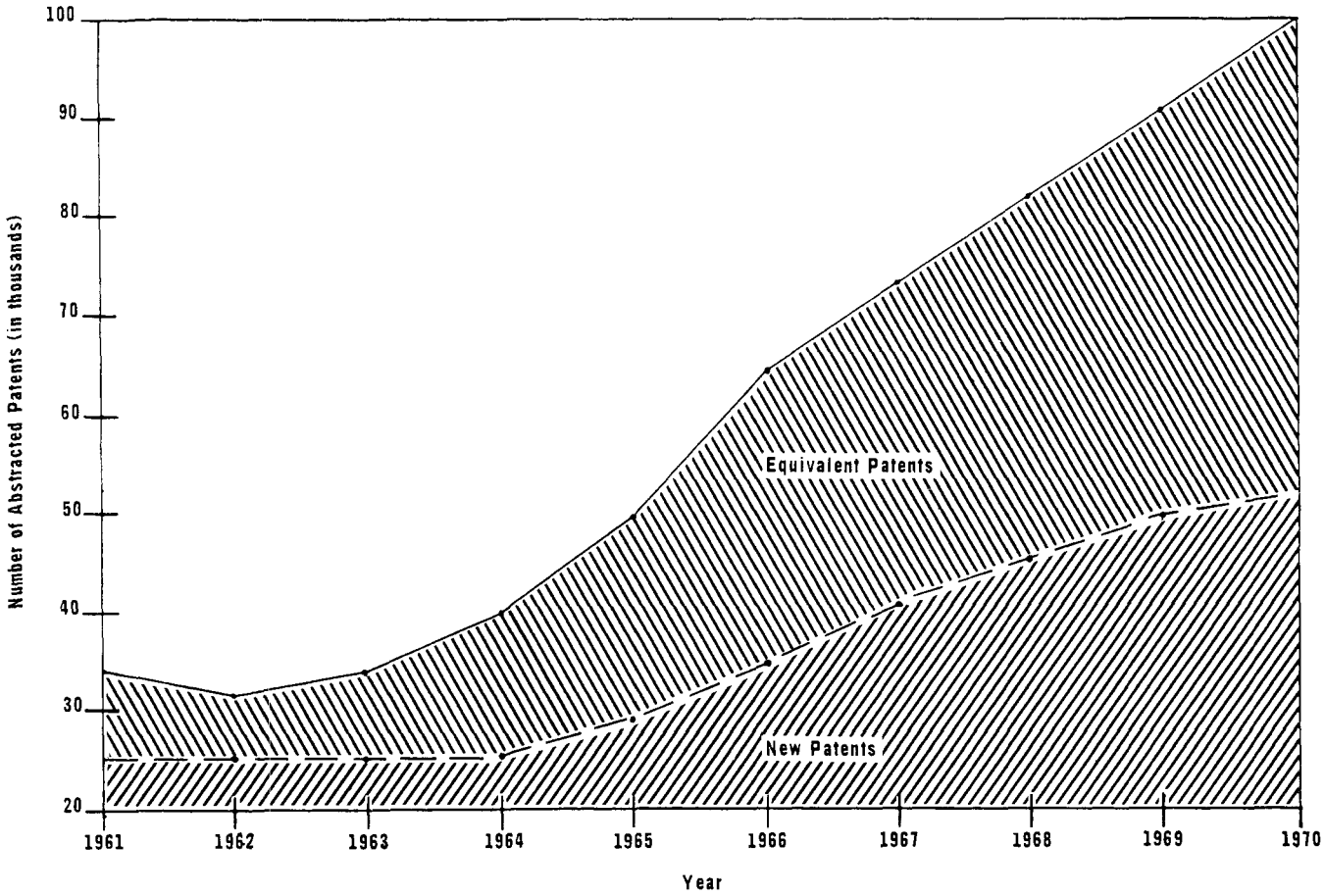


Figure 2. CAS patent coverage, 1961–1970

DISTRIBUTION

CAS distributes abstracts of patents in weekly *CA* issues, and digests of patents of interest to polymer chemists in biweekly *POST-P* issues. The digests appearing in *POST-P* differ from the *CA* abstracts only to the extent that the *POST-P* digests are somewhat more descriptive and do not necessarily include experimental details. Also, in *POST-P*, applications and uses of the products or processes are stressed. Furthermore, the important concepts—for example, the material, the method, and the use—must be coded by the abstractor to allow for the computer searching of *POST-P*. For this purpose, 12 different concept flags are used; these flags are added to the *POST* computer record, but do not appear in the printed version of *POST*. The flagged concepts are subjected by the computer to a thesaurus-vocabulary control and appear in a keyword subject index which accompanies the printed form of the digests.

References to the large body of patent information contained in *CA* are found in weekly Author, Keyword, and Numerical Patent Indexes, and the Patent Concordance. The volume and collective indexes of *CA* contain similar information. The numerical patent and patent concordance indexes have been published for the seventh collective period (1962–1966). *POST-P* contains author and molecular formula indexes, as well as a numerical patent index and a patent concordance.

The weekly author, keyword, and patent indexes to *CA* are now computer-processed and can therefore be tied together through identical abstract number references to produce what we refer to as Condensates. These weekly issue-indexes in tape form are now being examined in a controlled marketing experiment.

GROWTH OF PATENT INFORMATION

The dramatic growth of patent literature illustrated in Figure 2 is due to both increased activity of the world's patent offices and expanded CAS coverage—both by subject and by county. Nearly 64,000 new chemical patents were documented by CAS in 1966, and we expect to cover 100,000 in 1970, almost half of which will be duplicates.

The distribution by country of patents covered in 1966 (Figure 3) shows that ⅔ of the over 15,000 U. S. chemical patents were abstracted (meaning that they were first-issue) while only ⅓ of the over 10,000 British chemical specifications were first-issue patents, the remainder of the inventions having been previously abstracted from patents of other countries. France, Belgium, the Netherlands, and Germany all contributed heavily to the world's chemical patent literature, as did the USSR.

A look at the language distribution of patents covered by *CA* in 1966 (Figure 4), shows 40% were in English.

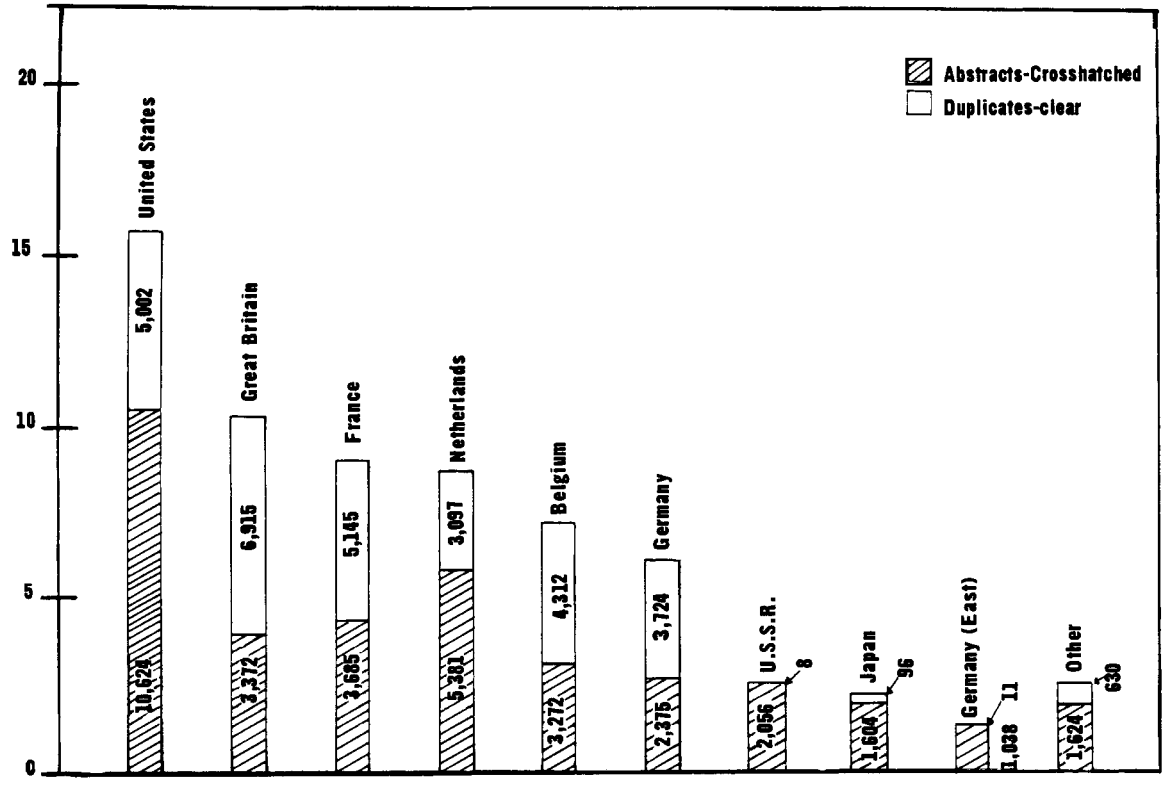


Figure 3. Distribution by country of patents covered by CA in 1966

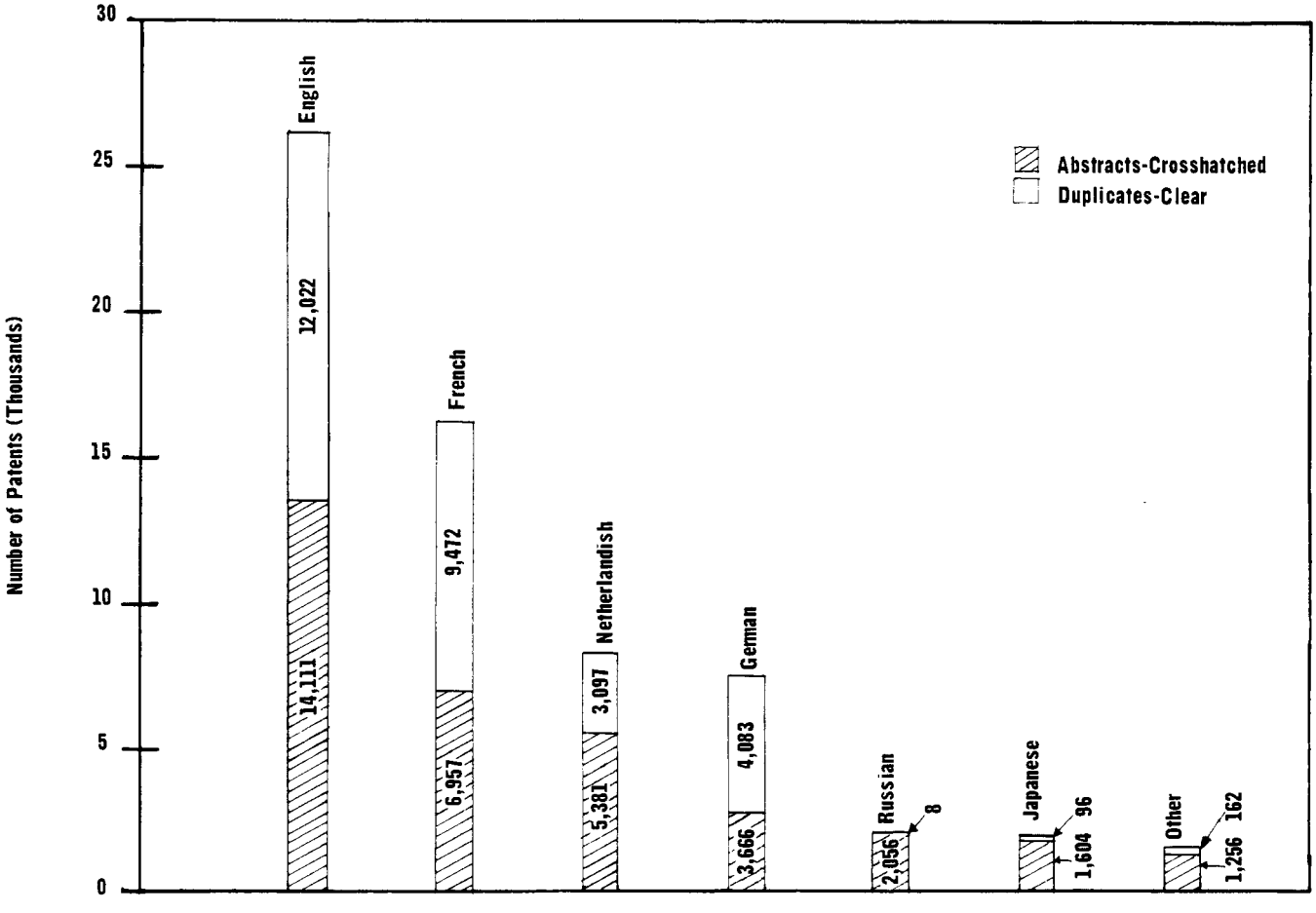


Figure 4. Language distribution of patents covered by CA in 1966

The French language accounts for another 25%. The latter figure is that high because 90% of the Belgian patents are in French.

CONCLUSIONS

The world's patent literature is written primarily to fulfill legal requirements, not to convey detailed technical information. However, patents are a significant source of chemical and chemical engineering information, even though they require proper analysis to make their data useful. Because of the basically legal nature of patent literature, its abstraction and distribution requires special techniques if its technical aspects are to be brought promptly and accurately to the user. Chemical Abstracts Service has developed and will continue to enhance these necessary skills and procedures.

CORRECTION

A Method for Generating Unique Computer Structural Representations of Stereoisomers

In the article by Petrarca, Lynch, and Rush [J. CHEM. DOC. **7**, 154 (1967)] the last sentence on page 157 should begin:

> The clockwise sequence rule is applied to each stereogenic atom which has peripheral atoms attached in this fashion, the assignment of stereodescriptors (Figure 10) being based on the following conventions: . . . .

Procedures for Converting Systematic Names of Organic Compounds into Atom-Bond Connection Tables

In the article by Vander Stouw, Naznitsky, and Rush [J. CHEM. DOC. **7**, 165 (1967)], parts of Figures 3 and 4 have been mixed. The heading "Structure" and the two structural diagrams below it presently in Figure 3 belong at the top of Figure 4. Thus, Figure 3 should contain only two structures, while Figure 4 should have three sections headed "Structure," "Names Translated," and "Names Rejected," respectively.