

Small patent-information groups, who provide a patent abstract bulletin and maintain indexes in addition to their primary responsibility of literature and patent searching, usually have a serious problem in maintaining a satisfactory balance between these functions.

Many reports on information-handling processes and equipment have appeared in the literature in the last decade, both in the United States and abroad.^{1,2} Most, if not all, of the suggested solutions are not adopted easily by small information groups, especially where the described equipment is expensive and the need for specially trained personnel is emphasized.

The Uniterm system of coordinate indexing³ and what can, perhaps, be called its offspring, the Peek-a-Boo system,^{4,5} offer ways of handling some phases of information in a manner which is inexpensive and which is more advantageous than conventional library indexing procedures.

In 1956 our company became subscribers to the Uniterm Index to Chemical Patents. This service⁶ is valuable and its coverage of U.S. patents is well worth the subscription cost. At the same time we decided, in view of the importance of foreign patents, to carry out a procedure which would be both economical and comprehensive, and which would include abstracting, indexing, and bulletin preparation of our foreign patent accessions. The procedure is based on the Peek-a-Boo system using Remington Rand cards which are pre-punched with pilot holes and pre-printed with document numbers (Fig. 1). Each card has a capacity of 500 documents, and additional sets of cards can be made to accommodate larger collections of documents. A special hand-punch is used.

Patents are routinely selected from the current official gazettes of 18 foreign countries and from other information sources such as Derwent. Upon arrival each foreign patent is assigned a document number.

ABSTRACT BULLETIN OF FOREIGN PATENTS AND INDEX PREPARATION: A COMBINED PROCEDURE*

BY S. J. WEINSTEIN,** M. DAUKANTAS, R. J. DROZDA AND F. K. BROOME**

Armour and Company

I. INTRODUCTION

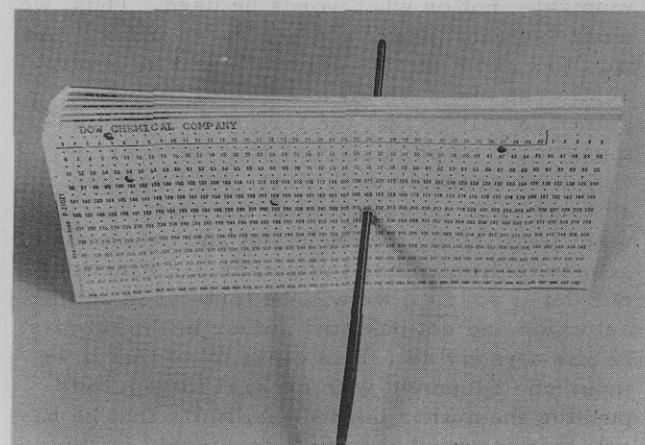


Fig. 1.—Remington Rand's 500-position cards, showing terms typed at upper left, and some holes punched. Further description is found in the text.

An abstract is then made for the bulletin, which is issued at monthly intervals and given company-wide circulation. One copy of each bulletin is bound into a loose-leaf volume, one year's bulletins per volume, and this volume is used as the document source upon which our index is based. The abstracter prepares the index entries at the same time as she prepares the abstracts.

II. INDEXING PROCEDURES

The effectiveness of an indexing system varies in direct proportion to the effort expended by the indexer, whose primary concern is the selection of useful index entries. This applies regardless of what indexing system is used.

The indexer must know company areas of broad as well as specific interest, the viewpoints of the people who request information, and the terminology used in making such requests.

These viewpoints and terminology must be made a part of the indexing system, and in those

*Presented before Division of Chemical Literature, ACS National Meeting, St. Louis, Mo., March 28, 1961.
**Abbott Laboratories, North Chicago, Ill.

instances where the terminology or the viewpoints contained in the patents differ from those used in addressing the system, the required cross-references must be made.

With these viewpoints and terminology in mind, the indexer is ready for the actual process of indexing which involves (1) analysis, (2) identification, (3) evaluation, and (4) description.⁷

In step 1, Analysis, the indexer scans the patent to determine what the patent is about. Information can be derived from the title, from the patent specification, and from some of the patent claims.

In step 2, Identification, the indexer then determines (a) what product is being made, (b) how it is made, (c) what special reaction conditions or components are required to make it, and (d) what the product is used for.

In process patents the indexer determines (a) what is being done and to what, (b) under what special conditions, (c) with what special reagents, and (d) with what apparatus or equipment.

In step 3, Evaluation, which occurs simultaneously with step 2, the indexer determines which concepts contained in the patent are to become index entries so that the patent containing these concepts can be recalled later as needed, and secondarily, the indexer further evaluates any additional information which, in a specific patent, may be only supporting or background material, but which may be important from a different viewpoint.

An example of this type of evaluation might be a patent showing preparation of a steroid compound involving a hydrogenation step in which nickel is used as the catalyst. At the completion of the reaction, the nickel is removed by one of several methods described. The indexer who selects index entries from this patent giving the starting materials, reaction conditions, catalyst, and final products obtained will have provided a sufficient number of entries to recall this particular patent if it is needed. However, proper evaluation of the patent would show that the additional index entries Nickel and Removal should be made, since this particular information could be of interest to a chemist concerned with hydrogenation of fats who addressed the index for information on nickel catalyst removal regardless of what type of chemical reaction or product is involved.

This further evaluation may show that certain terms which have been selected describe concepts which do not add anything of value to the index. It is in this second phase of evaluation that the indexer has a great responsibility, which is to identify and include in the index valuable information not readily identifiable in terms of the primary purposes of the patent, and to evaluate and exclude from the index information of negligible reuse value.

In step 4, Description, the indexer writes on an Index Entry Tracer Sheet (Fig. 2) those

INDEX ENTRY TRACER SHEET

Patent No. 840,154 Country Gt. Britain Document No.
or
Application No. Or Uniterm No. 2256.

MEAT	LARD
COATING	MINERAL
CELLULOSE	PLASTICIZER
VEGETABLE	GLYCOLATES
OIL	FATTY ACID
CORN	TRIGLYCERIDES
SOYBEAN	EPOXIDIZING, EPOXIDIZED, EPOXIDATION
COCONUT	ANTIOXIDANT
PEANUT	DOW CHEMICAL COMPANY
FATS	

Fig. 2.—Index Entry Tracer Sheet: for convenience, this sheet has been set up in type together with its entries. In actual practice, the form is prepared in quantity ahead of time, with spaces for the necessary identifying and descriptive entries.

terms which most concisely and accurately describe the concepts contained in the patent.

As the number of index entries increases, they will serve the indexer not only as a list of words which have been selected as entries but also as an authority list or dictionary.

The words contained in this list are supplemented in many instances by suitable cross-references such as See references and See also references, and by scope notes to define the meanings of certain index entry words.

To clarify the nomenclature problems and questions which will arise regarding synonyms, near synonyms, and generic terms, particularly in the beginning stages of index compilation, the indexer must consult various reference sources, handbooks, and texts, and in some instances may need advice from the research people.

Useful reference sources include Kirk-Othmer's "Encyclopedia of Chemical Technology," Clark's "Encyclopedia of Chemistry," and the "Naming and Indexing of Chemical Compounds by Chemical Abstracts."

The terms contained in the Uniterm Index of U. S. Chemical Patents (Information for Industry) may be used as the nucleus of the Patent Index.

Since the appearance of the index in 1955 the staff of Information for Industry have derived a satisfactory list of indexing words which can be used to advantage. This list contains precoordinated words, generic words, groupings of words which bear a direct relationship to one central concept, and cross references.

With such a nucleus, the formation of the authority list or dictionary is well on its way. A big stumbling block, the initiation of a dictionary, has been removed, and the novice indexer has a concrete collection of terms with which to begin.

For each word selected as an entry, the indexer refers to his collection of words--i.e., the dictionary or authority list--in order to verify his selection of the term and to select additional words when generic concepts are involved.

Since information requests are sometimes made which require coordination of a unit concept with a particular company, a selected list of company names is included in our index.

In order to individualize a series of related concepts, association links⁷ within a patent may be developed. This is best done by assigning separate document numbers to those sections of a patent in which specific concepts are presented. Each numbered section of a patent is then treated as a separate document from which index entry words are selected.

The following example will clarify the concept of association links:

Canadian Pat. No. 499,596 (1954) relates to the preparation of tribromosteroids, particularly 3-acyloxy-5,6,21-tribromopregnane-20-ones wherein the acyloxy group is acetoxy. These compounds are useful in the preparation of 11-desoxycorticosterone acetate.

This patent might be indexed adequately by selecting a sufficient number of appropriate index entries showing preparation of brominated steroids, specific examples of such compounds, starting compounds, and reaction conditions.

For deeper indexing and to avoid the possibility of many false coordinations, individual unit concepts for which information is given in this patent can be indicated by association links.

This is done by assigning appropriate consecutive document numbers to those sections of a patent in which the unit concepts are presented.

The starting compounds are the 3,20-diacyloxy-5,20-pregnadienes which may be prepared by treatment of 3-hydroxy- or 3-acyloxy-5-pregnene-20-ones with isopropenyl acetate in the presence of an acid catalyst such as p-toluenesulfonic acid. This much of the patent might be called Document No. 64.

Treatment of the 3,20-diacyloxy-5,20-pregnadienes with bromine in a solvent such as methylene chloride or chloroform results in the formation of 3-acyloxy-5,6,21-tribromo-pregnane-20-ones. This portion might be designated Document No. 65.

The 3-acyloxy-5,6,21-tribromopregnane-20-ones are shown to be useful in the preparation of 11-desoxycorticosterone acetate, although the claims of this patent do not cover this compound. The 11-desoxycorticosterone acetate is prepared by a series of three reactions: (a)

treatment by 3β -acetoxy-5,6,21-tribromopregnane-20-one (the final product claimed in this patent) with sodium iodide (Document No. 66); (b) esterification of that product, 3β -acetoxy-21-iodo-5-pregnene-20-one using potassium bicarbonate and glacial acetic acid to give 3β -21-diacetoxy-5-pregnene-20-one (Document No. 67), and finally, (c) saponification and re-esterification of the 21-hydroxy group with subsequent oxidation of the 3-hydroxy to 3-keto, yielding 11-desoxycorticosterone acetate (Document No. 68).

Part of the responsibility of the indexer is to decide when it is essential to treat a particular patent as more than one document in order to assure complete, accurate retrieval of the information given in the patent.

The responsibility of the indexer ends with the completion of the Index Entry Tracer Sheet. The remainder of the processing can be carried out by clerical personnel.

III. PREPARATION OF TERM CARDS

The Remington Rand term cards are prepared by typing one term per card on the top space. When the Index Entry Tracer Sheet is complete, cards bearing the entered terms are pulled from the file and punched at the document number of the patent being indexed (Fig. 1). An entire issue of the Patent Bulletin containing 50 to 75 foreign patents can be punched by a clerk in no more than 1.5 days. This time includes the typing of new cards when a new term is introduced.

The term card has 40 numbers on the top line in addition to the regular 500 numbers. These numbers can be used for information such as the year, or the group to which each card belongs. Document numbers 1-500 are punched in position number 1; documents 501-1000 are punched in position 2, etc. In Figure 1, for example, special number 5 has been punched. The holes on these cards, therefore, represent documents 2001-2500. Hole 256, through which the probe has been thrust for clearer understanding, thus represents document 2256. Calendar years are indicated by a punch at the other end of the row of 40 numbers. We punch number 40 for 1956, number 39 for 1957, etc.

IV. RETRIEVAL

For retrieval of information, term cards selected on the basis of the information that is needed are compared to find matching numbered holes. The patent identification and abstract for each of these numbers are then found in the bulletin volume containing abstracts of all the patents which were indexed.

V. RECENT MODIFICATIONS

We have recently converted our indexing system to a 5 X 8 card accommodating 18,000 documents or patents⁵ which uses punch and read-out devices developed by the National Bureau of Standards (Fig. 3). We had the devices made for us following plans obtained from Mr. Joshua Stern of the Bureau of Standards. Conversion to this card has given us two improvements over the 500-position card. The preparation of new decks of cards is necessary only 1/35 as often. The new cards also make the use of role indicators more feasible.

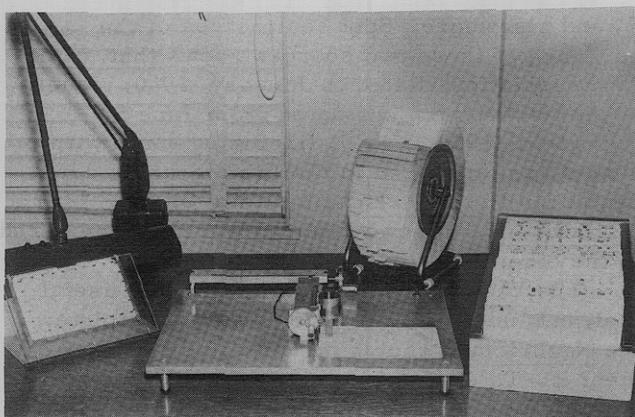


Fig. 3.—Punch, read-out stand, and card storage units used by Armour and Company. The punch and read-out devices are patterned after those of the National Bureau of Standards.

An index entry with a role indicator is defined as a precoordination of the term with an implied definitive concept term, which imparts to the index entry word an element of syntax or word ordering which enables coordination of index entries to be made with fewer false associations.

Our modifications of the role indicators used by Costello and Wall⁷ are:

1. Product: output; manufacture, production, fabrication or synthesis of.
2. Reactant: raw material; starting material; input.
3. Uses of (for); applications of (for); used to (for).
4. Medium; vehicle, solvent.
5. By-product; waste; contaminant.
6. Special agent: A component of a reaction mixture which acts in a special way, e.g., a catalyst, emulsifier, gelling agent, foaming agent, stabilizer, etc.

7. Apparatus.
8. Physically processed, treated, changed, handled; passive.
9. Deferred results; product; uses; process.
10. Attributes; e.g., the ability of a micro-organism to cause amination or dehydrogenation.
11. Intermediates.
12. Absence of.

As an example, British patent 815,167 relates to the preparation of 2-N-alkylaminoethane-1-sulfonic acids (N-alkyltaurines). Taurine is selected as one of the index entries and the role indicator (1) is used to designate this compound as a product: Taurine (1).

Patents concerning preparation of taurine would be found by referring to the Taurine (1) card, whereas a patent concerning taurine as a component of a reaction mixture would be found by referring to the Taurine (2) card.

VI. PERSONNEL

One person with training at the bachelor's or master's level, in the subject area being covered by the organization, easily can be trained to carry out all the described processes. The part-time services of a clerk cover the remainder of the work load.

In summary, the procedures described in this paper combine abstract-bulletin publication with indexing and eliminate duplication of much of the effort which conventional bulletin publication and indexing require. (Cost information, when available, is given in the Appendix.)

APPENDIX

Material and Supplies	Cost
1. Uniterm Index to Chemical Patents, Information for Industry, 1000 Connecticut Avenue, Washington 8, D. C.	\$880/yr. (on a 5 year contract basis)
2. Remington Rand Cards, P-21021, Spot Punch Type 301, Remington Rand, 444 N. Michigan, Chicago, Ill.	\$15/4000 cards. \$35.00
3. National Bureau of Standards Punch, Read-Out Device, Frazier Precision Instrument Co., 8913 Glenville Road, Silver Springs, Maryland	\$1000 approx. ?
4. Plastic 18000-Position Card, Wassell Organization, Inc., Westport, Connecticut	\$65/1000 cards

REFERENCES

- (1) F.I.D. Manual on Document Reproduction and Selection, Vol. C, Chapter 7, International Federation for Documentation, 6 Willem Witsenplein, The Hague, Netherlands.
- (2) Proceedings of The International Conference on Scientific Information, Washington, D. C., November 16-21, 1958; 2 vols. National Academy of Sciences, National Research Council, Washington, D. C., 1959.
- (3) M. Taube and Associates, "Studies in Coordinate Indexing," 4 vols., Documentation, Inc.
- (4) W. E. Batten, "Specialized Files for Patent Searching," in "Punched Cards," R. S. Casey and J. W. Perry (eds.), Reinhold Publ. Corp., New York, N. Y., 1951, pp. 169-181.
- (5) W. A. Wildhack and J. Stern, "The Peek-a-Boo System — Optical Coincidence Subject Cards in Information Searching," in "Punched Cards," R. S. Casey, J. W. Perry, M. M. Berry and A. Kent (eds.), 2nd ed., Reinhold Publ. Corp., New York, N. Y., 1958, pp. 125-151.
- (6) Information for Industry, Inc., 1000 Connecticut Ave., N. W., Washington 8, D. C.
- (7) Recent Improvements in Techniques for Storing and Retrieving Information, by J. C. Costello, Jr., and Eugene Wall, which was given before the Society for Advancement of Management, Technical Session, Wilmington, Delaware, January 13, 1959.

BOOK REVIEW

Bibliographie der deutschen Hochschulschriften zur Chemie 1959, 2. Halbjahr, Sonderbibliographien der Deutschen Bücherei No. 29, Deutsche Bücherei, Leipzig, 1961, 83 pp., 7.90 DM (on 9/27/61, 1 DM = \$0.25).

This bibliography is the third in a series listing dissertations of German schools of higher learning. It lists 783 dissertations, classified by the Chemisches Zentralblatt system and indexed by author. Entries consist of the author, title, number of pages, school and department, and year. (The year is given to indicate dissertations discovered too late to include in the first bibliography, covering 1957-1958 (261 pp. 25.40 DM), and the second bibliography, covering the first half of 1959 (8.40 DM).

The only other handy source of this information, to the reviewer's knowledge, is the Nachrichten aus Chemie und Technik (blue pages of Angewandte Chemie), which lists a varying number per month of "Chemie-Dissertationen" from the Deutschen Nationalbibliographie, Reihe

B, and elsewhere. Spot comparison of the coverage of these two sources shows that, of the 88 dissertations listed in January, 1960, issues of the Nachrichten and dated from June to November, 1959, only 51 (including some with June dates) appeared in the Bibliographie der deutschen Hochschulschriften zur Chemie 1959 2. Halbjahr. The two sources were not compared in the other direction.

The Bibliographie promises to be a useful tool, but, until its coverage is more complete, the Nachrichten should be consulted to supplement it. To end on an optimistic note, however, the organization of the Bibliographie is a great convenience in checking in specific areas of chemistry, and, in addition, instructions are given for ordering copies.

BENN E. CLOUSER
Hercules Powder Company
Research Center
Wilmington, Delaware