

## The Effects of Information Storage and Retrieval Techniques and Computers on Problems of Patentability\*

JULIUS FROME

Information Processing Unit, National Clearinghouse for Mental Health Information,  
National Institute of Mental Health, Bethesda, Md. 20014

Received September 15, 1965

**The problems of the effect of information storage and retrieval techniques on patentability are discussed in relation to five areas: computer printouts as "printed publications"; the implications of computer manipulations of structural formulas and chemical groups; the implications of indexing instructions and code sheets as suggesting combinations to a person skilled in the art; and composition or superimposed random coding interpreted as a reference. Possible solutions to the problems are indicated in relation to quoted judicial decisions.**

When most patent laws were passed by Congress, and certainly when the provision for granting patents was inserted in the Constitution, no thought was given to the possible effect of punched cards, computers, or information storage and retrieval techniques upon the granting of patents. This paper discusses the effects of information storage and retrieval techniques on the problems of patentability.

With the advent of information storage and retrieval techniques, punch cards and computers, certain unique problems have arisen. These problems will be discussed and some pertinent decisions will be cited. Most of these problems have not been adjudicated by the courts, and in most instances, their solution is very much in doubt. However, there may be some clear indications based on prior decisions of what courts will do in certain situations. Most of the paper will be devoted to raising of the problem without giving the answer. Only when the answers seem clear-cut will an opinion be given. Of course, the opinion is only the opinion of the author and is as he sees it. Certain of the decisions may be stretched to meet the problems but decisions will be used mainly from the point of view of indicating a possible solution or trend. The paper will discuss five areas:

Are magnetic tapes, punch cards, or computer printouts "printed publications" within the meaning of patent laws? What is the effect of the computer printouts showing structural formulae in view of the doctrine set forth in *re* Von Bramer (19)?

What is the effect of a computer's (25) printing out all the permutations and combinations in a Markush group?

Do code sheets or instructions for indexing and coding in effect suggest combinations, and suggest such combinations to a person skilled in the art as to prevent the granting of a patent?

If a question is asked of a mechanized system using composing or superimposed random coding, does an answer resulting from such a system constitute a reference even if the answer was merely a result of the composing?

These problems will be considered individually and discussed. It is not to be considered that these are the only problems involved, but they are five of the most important problems that I see in this particular area and it is hoped that a frank discussion of some of these problems might lead to really constructive thinking and perhaps a clarification of what the results actually might be.

In considering whether magnetic tapes, punch cards, or computer printouts are "printed publications" within the meaning of patent laws, it is necessary to attempt to define "printed publication." The reason for being concerned about whether something is a prior "printed publication" is because of the statutory statement "described in a printed publication in this or a foreign country." The terms "printed" and "publication" both have been analyzed by many courts and the Board of Appeals of the U. S. Patent Office. In order to prevent the granting of a patent, assuming that a clear description of the invention is given, such description must have been:

"Printed"

"A publication"

before the invention was made or more than one year before the application for patent was filed.

The statute does not define "printed." The term "publication" has been interpreted many ways by the courts. Standard authorities (1) define "print" as:

To fix or impress,

To stamp something in or upon; to make an impression or mark by pressure,

To strike off an impression from a set of type or the like,

To take a copy from a negative by the action of light upon a sensitized surface.

The above definitions are a layman's and were not set up by the courts.

Let us consider some of the statements of the Board of Appeals and the courts on what is "printed."

In *Hamilton Laboratories v. Massengill* (15), the intent to dedicate to the public was considered more important than whether the description was printed or typewritten.

\* Presented before the Division of Chemical Literature, 150th National Meeting of the American Chemical Society, Atlantic City, N. J., Sept. 13, 1965.

In *Exparte Herschberger* (3), the Board of Appeals held that a typewritten document was a "printed publication" if made known to the general public, where a thesis had been placed on the shelves of a university library. However, the Board of Appeals also ruled that a foreign (typewritten) patent open to public inspection was not a "printed publication" (4). This view was also expressed by the courts in *Carter Products et al. v. Colgate-Palmolive Co.* (5). Thus, it seems clear that the courts have held that a typewritten copy of a patent in a foreign country available to the public is not an anticipation. From an analysis of the above, Coulter (6) urged that typewritten manuscripts deposited in libraries are not "printed publications." However, it is believed that this may not be the actual case law. The basis on which Coulter built his arguments was on typewritten foreign patents and it is believed that the ruling is applicable only to foreign patents and not other situations.

Let us consider what the term publication means. "The Encyclopedia of Patent Practice" (1) urges that the term "printed publication" must be considered as a unit and not separate parts. I agree with this statement. However, the term "publication" must be considered. What is a publication? It has been held that, "Publication means to be in general circulation or on sale, where the work is accessible to the general public" (7, 8). Accessibility to the public, or its equivalent, seems to be a prime requirement in interpreting the meaning of publications. Accessibility to the public has been interpreted in several decisions. The Board of Appeals in *Exparte Herschberger* (3) has held that a single thesis in a library, even with a notice forbidding the copying of all or part, constituted accessibility to make the thesis a "printed publication." A copy of a catalog in a library (6) has been indicated as satisfying the requirement as to accessibility to the public to constitute anticipation (9).

Many decisions have been rendered setting forth in each case whether there has been sufficient accessibility to the document to consider it a publication. Only two are mentioned here—*Tampax, Inc. v. Personal Products Corp.* (10), which held that the restricted circulation of an advertising leaflet is adequate for publication; and *Imperial Glass v. Heisey* (11) which held that the intent that the publication be restricted to a particular class and not available to the whole public does not avoid anticipation.

It is apparent from the above that neither "printed" nor "publication" alone is very explicitly defined. A fairly good statement of what a "printed publication" is was set forth in *Cottier vs. Stimpson* (8): "Work accessible to the public which is printed without any injunction of secrecy distributed to any part of public in any country."

The following statement is also quoted: "A printed publication is accessible to the public when it is available in a library" (12).

A single copy of a book has been held to be a publication—*Stern v. Remick* (13). University, college, or school theses available in libraries have been held to be "printed publications" (14, 15, 16).

For the purposes of this paper, and in order to particularly focus attention on certain aspects of the problem, it will be assumed that there has been sufficient publica-

tion, accessibility, lack of secrecy, distribution, and deposition in libraries to fulfill the requirement of the publication part of the "printed publication." Hence, in considering this problem, let us examine the "printed" part of the "printed publication." Or, as indicated before, perhaps the whole concept "printed publication" must be considered together.

Magnetic tapes, punch cards, and computer printouts should be considered separately. Let us start with perhaps the simplest case of computer printouts, which are produced by the printer of the computer with one or more copies. If these copies are available and accessible and are put in places such as libraries, where they are accessible to the public, it is clear that they are "printed publications." No one can seriously argue that printing by computer chain is different from normal printing in this respect.

Let us consider when a punch card is a "printed publication." We have assumed for the purposes of this paper that the cards are accessible and available to the public. Punch cards convey intelligence normally by holes in the card. These holes can be interpreted either visually or mechanically provided the code is known. There is no question that an article in the English language, or in French or Russian, is a "printed publication" because people can read and understand it. Thus, if the punched card is in the common, ordinary Hollerith code, persons skilled in the punch card art could fairly easily look at the holes in the card and make intelligence from it in the same manner they can make intelligence of an article in a foreign language. Do these cards, in fact, then constitute a publication?

Let us consider something in the English language. What does the written English language consist of? It really consists of marks on paper. The only reason it conveys intelligence to us is that we know the code—English—which converts these marks into intelligence. Any language in reality is a code. Now, if someone is not bilingual and picks up a French article, the only way he can interpret this article is by use of a French dictionary. French words can be really considered as code marks which, by means of a French dictionary, can be converted into English. I am sure that no one would argue that an article in French is not a "printed publication" provided it had all the other attributes of a publication. Therefore, it seems fairly clear that punch cards, if they are easily accessible (such as deposited in libraries) would, in fact, constitute "printed publications." Now, let us consider those cards in which there is a specific code, a code which is not commonly, widely known—for example, where we have a combination of binary bits in one column. In this particular case, a card by itself would convey no intelligence unless one knew where or how to interpret the code. Thus, this type of punch card might not constitute a publication unless the code sheet or the code dictionary was available and was identified with the card. Then, at that point, if the other elements of a printed publication were available, the card might constitute a "printed publication." However, another factor ought to be considered. A punched card by itself has no intrinsic meaning without the code dictionary. In some cases in the information retrieval field, where the system of modulators is used, the card by itself has no meaning and

the punches in the modulant field tell what the coding means with the aid of a dictionary. In this instance, it appears clear that unless a punch card of this type is accompanied by a dictionary, or it is very clear where the dictionary is, the card itself would not be a publication since the meaning of the card would not be clear.

Let us consider punch cards which have been punched on the IBM 026, a printing punch which interprets the holes and prints across the top of the card. In this case, it is clear that the card is a "printed publication", all the other elements being present. It should also be noted where Hollerith code is used and the card is not punched on the 026, it can pass through a mechanical interpreter which prints the information across the top of the card. In this case, it is clearly a "printed publication", all the other elements being present. No one would argue that an interpreter which prints is any different from an ordinary printer.

Let us consider magnetic tapes. Magnetic tapes convey intelligence by means of magnetized spots. This differs from the case of the punch cards. In the case of the punch cards, we can see the holes in the cards and by means of a code sheet interpret the holes. However, in the case of magnetic tapes, no one can see the magnetic spots. A mechanical device is needed to interpret the magnetic spots. Furthermore, one would not only need a code dictionary but a program to interpret these spots. Also, in the case of magnetic tapes, one would need a certain type of computer to convert the spots to intelligence. Now here again, does this constitute a "printed publication"? Let us assume that these tapes are widely distributed and deposited in a library with proper instructions for their use.

Now the question arises: Is it a printed publication? Is it analogous to a printed page? In a printed page, we have certain black and white marks which are interpreted by the human eye and the human mind to give us meaning. This also follows really in the punch cards, certainly those containing the Hollerith code. Now, in the case of magnetic tapes, it is not quite so clear. Here, in order to get intelligence out of the magnetic spots on the tape, several things have to happen. First, the coded magnetic tapes need a certain type of computer, code, and appropriate programming to interpret the code. Because of these factors, tapes become fairly removed from the clear category of "printed publication." However, we are assuming the situation where a magnetic tape is widely distributed. The coding is known, the particular type of machine is indicated, and the programs are available. Is this any less a "printed publication" than an article which is written, say, in Chinese or Japanese which is difficult to read and must be interpreted? Aren't marks on magnetic tape, which can surely be easily reproduced in hundreds of copies, analogous to letters or ideograms? Aren't these tapes the same as printed publications? Until this is finally adjudicated, some doubt might remain. However, certain analogous decisions have been reached. It seems logical, or it seems more or less to follow the pattern in today's technology, that a magnetic tape containing a certain disclosure and deposited in a library that also lends the coding sheet and printing instructions, would constitute a "printed publication" within the meaning of the law.

The above conclusion is based in part on some of the decisions in closely analogous situations from which some inferences but no definite conclusions can be drawn.

The question of whether microfilm constitutes a "printed publication" is closely analogous to whether punch cards or magnetic tapes are "printed publications." The reason microfilm is analogous is that microfilm cannot be read by the human eye alone. It must be put into a machine and magnified before it can be read. Thus, the same situation applies to magnetic tape and microfilm. In any event a consideration of the two important decisions on whether microfilm is a "printed publication" will be valuable for drawing inferences and possibly conclusions.

The following headnotes appeared in *re Tenney et al.* 117 U.S.P.Q. 348, decided April 23, 1958:

"1. Microfilm is not 'printed publication' nor is it printed within the meaning of 35 U. S. C. 102(b) since it was made available to the public only by virtue of publication of bibliography containing offer to sell copies of microfilm. None have been made or seen by members of the public.

"5. Wholly handwritten publication is not printed publication under 35 U.S.C. 102(b). Illegible publication whether printed or handwritten is not a statutory bar under 35 U.S.C. 102(b).

"8. Although 35 U.S.C. 102(b) has in mind the probability of public knowledge of contents of publication, it does not require that the probability become active. Once established it was printed and published, it is not necessary to show number of people who actually saw it. Law set up conclusive presumption that public has knowledge of publication when single printed copy is proved to have been published."

In the Tenney case there was a faulty indexing of the O.T.S. bibliography. There was no record of any copies ever having been made from it.

However, Justice Worley concurred but stated:

"I agree with results reached by majority but do not wish to be understood as holding that under no circumstances can a microfilm be printed within the statutory meaning."

The case should be used only when the facts are on all fours with the cited case.

However, in *Exparte Paul W. Garbo*, decided March 30, 1962, 803 O.G. 315 (18), it was held that microfilm was a printed publication and distinguished over the Tenney case. The following are quotations from *Exparte Garbo*:

"In *Re Tenney et al.* [44 C.C. PA 894] it was found access to the PBL citation was inadequate because of error of indexing the reference within a collection of documents pertaining to an entire different subject matter.

"In present case the citation was properly indexed in a reel of microfilm pertaining to foundry work and hence to the same general subject matter as the instant application.

"In *Re Tenney et al.* . . . that the statute was held to preclude microfilm form of reproduction and distribution of information to be wholly outside the printed publication field.

"On the citation at hand, the Government undoubtedly went to considerable expense in accumulating the material contained in the microfilmed disclosure of which the citation is a part. The whole purpose of this expenditure was to make the information available to all who could use it. The Government in choosing microfilm as a vehicle selected the only economical

low cost method available to it for making this information available to the entire metal industry. It seems incongruous that the best of efforts by our government to make knowledge available shall come to naught through the patent system in effect ruling that they are insufficient in law to accomplish the purpose for which they were intended."

Justice Rich *in re Tenney et al.*:

"While I agree with the majority opinion in its ultimate conclusion that a single microfilm shown to be on file in Library of Congress is not a 'printed publication' under sec. 102(b), and with the supporting conclusion that it is not 'printed,' I think the basis for the latter conclusion requires clarification because I feel under different circumstances we may in the future wish to be free to hold that a 'printed publication' can be made by microfilm technique. I think it should be clear we are not holding that microfilms can under no circumstances be deemed to be 'printed.'"

The Board of Appeals stated:

"It has been four years since that decision (*In Re Tenney*) and advances have been made in scientific needs for numerous changes in traditional modes of distributing information. Today microfilm of the examiner's search files, as well as duplicate search facilities, is being seriously considered. The philosophy of the past in which prior knowledge was broadcast through printed and mass circulation of books and journals is now being seriously challenged by techniques which direct specific information only to those people requiring such specialized knowledge. Conventional printing is failing in this respect. Today the use of microcopy offers the best known solution to the problem of economically directing the information to those who have a need for it."

From the language of the above case, particularly from the cited Board of Appeals position, it seems clear that the trend would be to hold that computer printouts, punch cards, and magnetic tapes would be "printed publications." What is the effect of the computer printouts showing structural formulae in view of the doctrine set forth in *re Von Bramer* (19)? *In re Von Bramer*'s the doctrine was set forth:

"It is not necessary that a reference patent for a device or chemical compound disclose an operative process for producing article or product."

The doctrine was further emphasized in *re Crossley* 34 C.C.P.A. 882 (20), in *re Stoll* 34 C.C.P.A. 1058 (21), and in *re Schackel* 38 C.C.P.A. 847 (22).

*In re Baranauckas* (23) the following was stated:

"It is well settled . . . that a reference which clearly names a compound or identifies it by structural formula constitutes a full anticipation of a claim to that compound even though the reference contains only an inoperative method for producing the compound or no method at all."

However, the following dictum was delivered by Judge Jackson:

"At the same time however, though our decision is compelled by existing law, we are wise to point out that there are limits to the doctrine of those cases. What the precise boundary limits are we are unable to discern. Certainly they do not extend so far as to permit publication of *theoretical* lists of hundreds or thousands of possible compounds to deny patent protection on compounds to those who actually discover them later. The exact boundaries will have to be delineated on a case by case basis."

*In re Brown* (24) the headnote stated:

"1. To the extent that anyone may draw an inference from the *Von Bramer* case that the mere printed conception or the mere printed contemplation which constitutes the designation of a 'compound' is sufficient to show that such a compound is old, regardless of whether the compound is involved in a 35 U.S.C. 102 or 35 U.S.C. 103 rejection, we totally disagree. Carrying such proposition to the extreme could, we think, result in a holding that a reference reciting of specifically named compounds without anything else is adequate to show that such compounds are old. We do not think that the *Von Bramer* case was intended to be carried to such an extreme.

"2. We think \* \* \* that the true test of any prior art relied on to show or suggest that a chemical compound is old, is whether the prior art is such as to place the disclosed 'compound' in the possession of the public."

However, close attention should be paid to the facts of the case. The reference definitely stated that the compounds could not be made and furthermore the claims were to a composition and not the compound itself. Attention is called to headnote 2 which still leaves the question open. Thus it appears that the *Von Bramer* decision has been modified so that each case stands on its own merits but only that. The showing of a mere printed list of compounds and nothing more does not anticipate the invention. The story is not complete without the recent decision in *re Krazinski et al.* (25), in which the following headnote appeared:

"1. Since statutory basis of rejection is 35 U.S.C. 103, court is compelled to consider the invention as a whole. Names and structural formulae are not compounds but mere designations therefor. Since the invention is a group of compounds, it is the obviousness of the compounds, including all their properties, with which the court is concerned. Certainly the structure and/or name of compound might well be suggested when the compound itself is not.

"2. A utility is really a manifestation of a property.

"3. Showing of relative properties of chemical compound is relevant evidence on issue of unobviousness. Ultimate determination must be based on all the relevant evidence.

"4. Best showing of unobviousness of claimed compound and though not necessarily only acceptable comparison involves comparison with next adjacent homologue provided they come within limits of generic disclosure of art even though those homologues like claimed compounds are not disclosed."

The statement in headnote 1 may be a two-edged sword. A compound might not now be able to be claimed by structure or formula alone, but there may be a necessity for inclusion of other properties in the claims.

In view of the above cases, it seems clear that the mere printing by computer of hundreds or thousands of structural formulas, without anything more, would not constitute an anticipation under the *Von Bramer* doctrine which appears to have been modified.

What is the effect of a computer's printing out all the permutations and combinations in a Markush group (27)?

A Markush group normally can be considered as a limited generic group. A Markush group normally does not constitute a direct anticipation of all the permutations and combinations that are shown. The compound must be fairly suggested by the permutations and combinations.

If the permutations and combinations which have been suggested are so complicated, so numerous, that the specific compounds are not fairly suggested by the Markush group, it does not anticipate a compound coming within the purview of such a Markush group. However, punch card machines and computers can make permutations and combinations very easily. A computer program can be written in which all of these permutations and combinations can be printed out and each specific compound clearly shown.

What would be the effect of printing out every one of the compounds portrayed by every one of these members of the Markush group and each listed as single compounds? Would this, then, be an anticipation of all the compounds coming within the Markush group? This situation is slightly different from that discussed under Von Bramer, since the reference actually conceived the Markush structure of each compound. If a computer takes these permutations and combinations of a Markush group and prints out these particular compounds and this list is published, would such a list constitute a publication?

In *Dupont v. Ladd* (26), it was indicated that a disclosure of a compound within a Markush group did not constitute an anticipation of that compound. A careful reading of the decision indicates that the decision was probably based on the fact that one had to speculate on the thousands of compounds that could be produced. However, if the computer actually printed out these compounds, might not this published listing constitute an anticipation? This is different from the Von Bramer situation, since here the compounds can be considered taught. The decisions clearly indicate that, where a Markush is so broad, claimed compounds have been allowed over that Markush group. However, there is no indication of what would have happened if the names of the specific compounds coming under the Markush group had been printed by a computer, for there is more here than just a printed list but a clear teaching of the compounds.

Do code sheets or instructions for indexing and coding in effect suggest combinations, and suggest such combinations to a person skilled in the art?

In common every day patent practice where a product or a process is obvious to a person skilled in the art, this fact would constitute lack of patentability or lack of invention. Now let us consider what happens when we set up a code sheet or indexing sheet for chemical compounds. In order to take care of most of the situations, we would normally set up all the possibilities and a matrix showing such possibilities. Let us consider the matrix set up in the steroid mechanized system. An attempt was made here to be able to code all the possibilities and all the positions. When this is symbolized and portrayed in a picture form, say in the form of a matrix, would this suggest all the permutations and combinations to someone skilled in the art? Let us say for example, the 6-fluoro group has not been shown in a specific compound. However, in setting up a coding matrix for our indexers, the coding matrix shows the 6-fluoro compound. Is this a teaching of the 6-fluoro substituent? Doesn't this clearly suggest that there can be a 6-fluoro substituent?

As has been stated before in considering Markush practice, where permutations and combinations are so complex that the compounds are not fairly suggested by the Mar-

kush group, it has been held that the compounds can be patentable over the Markush group. In the same analogous manner, it seems fairly clear that just the code sheet itself, by suggesting all the permutations and combinations alone, would not be considered an anticipation.

Let us consider another situation. In the steroid code sheets—after a great many patents had been coded and a great many compounds have been indexed—it is possible to make up a matrix showing the frequency and the character of the substituents in the various positions in the steroid nucleus. Let us consider the instance where the matrix showed that there are fluoro groups in many positions but almost none in the 6-position. It is clear that there are almost no compounds with fluoro in the 6-position and hence there is a good possibility of obtaining a patent on 6-fluoro compounds. Wouldn't this situation clearly suggest to someone in the art to investigate 6-fluoro compounds? One skilled in the art would know that there are not many compounds with 6-fluoro substituents and would realize that if the compound did exist and did have good useful properties, it might be fairly easy to get a patent.

Does this type of disclosure constitute obviousness to someone skilled in the art? What might make this situation more complex is that the method of making the 6-fluoro compounds might be the same as making fluoro compounds in other positions. I believe this situation is very analogous to the situation in the case of higher homologs as illustrated in *re Hass* (28) position. Here, it is obvious to one skilled in the art to make the next higher homolog. Patents are regularly granted on products exhibiting new and surprising results even though they are higher homologs (28, 29). In the case of higher homologs, the reasoning is somewhat along the following lines. Although it may be obvious to produce a compound for the next higher homolog where there is a new, unusual, and surprising result, the presumption of obviousness is rebutted. Thus, if in the case of the next higher homolog there is a new and surprising and unexpected result and this can be proved, normally a patent is granted for the next higher homolog. In the situation here, in which the coding matrix suggests a compound, it may be that a new and surprising result must be shown for a compound suggested by the code sheet. However, this situation is still an open question.

Let us consider what the effect is if a question is asked of a system where compositing or superimposed randomized coding is used. Does an answer resulting from such a question constitute a reference even if the answer was merely a result of the compositing? In a disclosure—say one of 3-chloropyridine and 4-hydroxypyridine—a compositing technique was used. If one asks for 3-chloro-4-hydroxypyridine, an answer could come out. If we were trying to get a patent on 3-hydroxy-4-chloropyridine would such an answer constitute a reference? Commissioner Watson had sent a memo to a mechanized Division A that the patent examiner should not use a composited card as a reference, since the card referred to a document, but should use the document itself. I believe this has been followed by the U. S. Patent Office and is correct considering the mentioned decisions.

In conclusion, I would like to point out that punch cards, computers, and information storage and retrieval techniques may have a profound effect on patentability.

Some examples of some problems have been raised. It is not the intention of the author to supply the answers to some of these problems. However, it is felt that it would have a salutary effect if more people would think about the problems. Until the courts clearly indicate what the situation will be, the questions raised here remain clearly open. The decisions seem to indicate that:

Punch cards, magnetic tape, and computer printouts would be considered "printed publications."

It is unlikely that the court would hold that mere listing of compounds by computer would anticipate under the Von Bramer doctrine.

The printing out by computer of permutations and combinations under a clear teaching of a Markush group still falls under the Von Bramer principle and is an anticipation.

Indexing and coding instructions may constitute a presumption of teaching of a compound that can be rebutted by a proper showing.

An answer given as the result of the use of the composing technique would probably not constitute an anticipation of the claimed compound.

## LITERATURE CITED

- (1) "The Encyclopedia of Patent Practice and Invention Management," Reinhold Publishing Co., 1964.
- (2) "Scope of the phrase described in a printed publication," A. R. Benson, Dir. 28 U.S.P.Q. 54 & 56.
- (3) *Exparte Herschberger*, 96 U.S.P.Q. 54 & 56.
- (4) *Exparte Haller*, 103 U.S.P.Q. 332, 334.
- (5) *Carter Product et al. v. Colgate-Palmolive Co.*, 104 U.S.P.Q. 314.
- (6) R. I. Coulter, "Typewritten library manuscripts are not printed publications," 36 *J.P.O.S.* 258.
- (7) *Reeves v. Keystone Bridge*, 5 Fisher 467.
- (8) *Cottier v. Stimson*, 20 Fed. 906, 910.
- (9) *Jockmus v. Leviton*, 28 Fed. 812, 814.
- (10) *Tampax Inc. v. Personal Products Corp.*, 39 U.S.P.Q. 311.
- (11) *Imperial Glass v. Heisey*, 291 F 267.
- (12) *Truman v. Cavill Mfg. Co.*, 87 F 470.
- (13) *Stern v. Remick*, 175 F 282.
- (14) *Gulliksen v. Halberg et al.*, 75 U.S.P.Q. 252, 253.
- (15) *Hamilton Laboratories v. Massengill*, 45 U.S.P.Q. 594, 595, 111 F 584.
- (16) *Exparte Ordan*, 164 U.S.P.Q. 74.
- (17) *In re Tenney et al.*, 117 U.S.P.Q. 348 (1958).
- (18) *Exparte Paul W. Garbo*, 803 O.G. 315 (1962).
- (19) *In re Von Bramer et al.*, 29 C.C.P.A. 1018.
- (20) *In re Crossley*, 34 C.C.P.A. 882.
- (21) *In re Stoll*, 34 C.C.P.A. 1058.
- (22) *In re Shackel*, 39 C.C.P.A. 847.
- (23) *In re Baranauckas et al.*, 108 U.S.P.Q. 226-228.
- (24) *In re Brown*, 141 U.S.P.Q. 245.
- (25) *In re Krazinski et al.*, 146 U.S.P.Q. 25, June 24, 1965.
- (26) *In re Dupont v. Ladd*, 140 U.S.P.Q. 297.
- (27) *Exparte Markush*, 51 U.S.P.Q. 70.
- (28) *In re Hass*, 60 U.S.P.Q. 544, 548, 552.
- (29) *In re Henze*, 83 U.S.P.Q. 167.

## A Note on the Style of *Chemical Abstracts*\*

M. I. SASTRI

Center for Documentation and Communication Research,  
Western Reserve University, Cleveland, Ohio

Received May 18, 1965

This note, examining some of the more common stylistic features of *Chemical Abstracts*, is based on 200 sentences representing both continuous and discontinuous text. A preliminary look at the sample has revealed a certain uniformity of expression and sentence construction which is, no doubt, attributable to the strict editorial policy of the journal. It is felt worthwhile to go further into the matter and see what grammatical and syntactic devices are characteristically employed to achieve this uniformity. The findings are here briefly reported under three heads: (1) general features, (2) the subject, and (3) the complement.

\* This study was supported by National Science Foundation Grant No. NSF G-24488.

### 1. GENERAL FEATURES

The first remark that one can make about the general nature of the writing in CA is that it is as a rule simple in linguistic structure and straightforward in intent. The major single factor that contributes to the simplicity is the choice, as far as possible (over 75% in our sample), of simple declarative sentences. The basic (kernel) sentence types used are NVN (subject + transitive verb + object), N is A (adjective), N is N (complement), NVPN (prepositional phrase), and less frequently NV (intransitive). In addition to these kernels, some transforms are employed. The one major sentence transformation consistently and frequently employed is