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WIPO

IPC/SEM/98/5
ORIGINAL: English
DATE: November 20, 1998

WORLD INTELLECTUAL PROPERTY ORGANIZATION
GENEVA

ADVANCED SEMINAR ON THE INTERNATIONAL PATENT CLASSIFICATION (IPC)

Newport, United Kingdom, December 7 to 11, 1998

IPC IN THE NEW MILLENNIUM – CHALLENGE AND OPPORTUNITY

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Background

The upcoming seventh edition of the International Patent Classification (IPC) system is the culmination of three decades of technical level international cooperation. It represents uncounted years of work by a large and varied cast of skilled, imaginative and dedicated experts from many countries. It is, at once, both an outstanding success and a disappointing failure.

The success of the IPC is evident in the worldwide scope of its use. Applied by nearly all Intellectual Property Offices (IPOs) to newly publishing documents, the IPC is the only internationally accepted patent categorization system. For patent information users, IPC classification is a universally expected and relied upon component of a patent document's bibliographic data. The IPC system's status clearly approaches that of an established international standard.

Unfortunately, due to systemic deficiencies, the IPC has never been able to achieve the full utility its status implies; and it has fallen far short of its potential. Problems, discussed below, combine to rob the IPC of what should be its primary value -- that of a system upon which reliance can be placed to reflect the content of patent documents with consistency and technological currentness. Further, these and other problems, also discussed, have historically denied to the IPC its potential to serve effectively the increasingly complex and pressing user need for patent information retrieval. For while the IPC today may be widely used for document storage and routing, no IPO of any size in the World uses the IPC, per se, as a search tool.

The Challenge

If the IPC is to remain viable in today's rapidly changing technological environment, and if there is to be any hope of its achieving its full potential, the challenge presented by several problems, most long standing, must be addressed.

Problems

Inconsistent placement of patent documents in the system severely limits the IPC's value and utility. The system provides classifiers very little guidance concerning how patent documents should be placed in the system. Additionally, few clues are offered to differentiate between similar or related categories as regards the proper location for a given technology. This has given rise to widely varying approaches to document placement, resulting in high levels of system incoherence and substantial system user dissatisfaction.

IPC system presentation makes it difficult to locate related art. For example, notes are limited in the information they provide and in the locations where they are provided. Similar to the problem above, this deficiency also relates to too little guidance, in this case for system users trying to identify the appropriate classifications in which to find documents pertinent to their search needs.

Advantage of patent family information is not taken in patent document placement. Over the decades of the IPC's existence, the collection, organization and availability of patent family information have created a tool widely recognized as of great value for many purposes. Clearly, this information can be put to good use within the IPC context as an aid to document placement, contributing both to consistency and economy in that process. Yet the IPC provides users with no suggestion or guidance as regards the appropriate uses of this potentially valuable tool.

Classifications containing a very large number of patent documents have resulted from the IPC system's revision process, which is largely theoretical and disconnected from the realities of document placement and system use. The reverse of this problem and having the same cause is a surplus of classifications containing very few documents. Whether containing too many or too few documents, such classifications are essentially useless for either storage or retrieval. They are burdensome to the system, causing expense with little value and adding to system disrepute.

The backfile of patent documents is not reclassified when a new IPC edition issues. Consequently, the IPC has become not one system but rather seven systems, rendering it - in 'pure' form - virtually unusable by most for its intended purposes. It has become nearly impossible, even with the aid of computers, to trace a search through the plurality of IPC editions. It is certainly necessary to revise the IPC to provide for technological change and growth. However, to do so in the present manner will ultimately make the system too cumbersome to continue. Indeed, a disinterested observer might wonder if that point had not already been reached.

The five-year revision cycle is too long. It is obvious to many that the pace of technological change and the pressing needs of the IPOs render the IPC's five-year revision process an anachronism. It is recognized that the length of the revision cycle is, in large measure, a product of the current working methods, which are often excessively extended and slow. However, the world in which the IPC currently exists is far different from that within which it was established thirty years ago. Where technology is involved, timeliness and value are now inextricably joined; and ways must be found to create and make available the products of the IPC revision process in a more timely manner.

IPC indexing procedures are prohibitively expensive to follow. Indexing systems can be of significant value to searchers as has been demonstrated by numerous systems, both experimental and operational, that the USPTO has undertaken in years past. However, without exception, these systems, which are inherently labor intensive, have proven to be ultimately not feasible because the cost and disruption caused by their maintenance outweighed benefits. This same outcome has been seen in the similar experiences of other IPOs. Thus, obligatory indexing within the context of the IPC is regarded as highly problematic. Accompanying this paper as an Annex is a review of USPTO views and suggestions as regards obligatory indexing. Also envisioned is a possible search tool substitute for indexing.

No interface between the Standing Committee on Information Technology (SCIT) and the IPC now exists. The recent reorganization of WIPO patent information activities has resulted in a separation of IPC functions from the information technology functions. While this does not represent a problem with the IPC, per se, it is likely to represent an important problem for the IPC as we seek to solve its many problems. In that process, technology will play a vital role. Therefore, at this critical juncture, the IPC should not loose its close relationship with the technological expertise represented by the SCIT.

The Opportunity

The Advanced IPC Seminar is charged with preparing recommendations to IPC revision procedure and policy -- a task that, inherently, assumes change within the existing systemic framework. In this paper, the USPTO will respond by proposing actions within that framework to address the challenge presented by the problems discussed above. However, in the current, unique set of circumstances, which include:

- rapid, dramatic change in automated patent information storage and retrieval;
- reorganization and refocus of WIPO patent information activities;
- upcoming completion of the seventh IPC edition revision cycle;
- search by IPOs for more cost effective means to store and retrieve patent information for both internal and external use; and
- psychological impact of the new millenium resulting in an openness to new approaches to old problems;

the USPTO sees an opportunity to address the challenges of the IPC by thinking outside the existing systemic framework. To that end, this paper proposes for consideration by the Advanced IPC Seminar approaches that include some outside that framework's confines.

Solutions

The following suggested substantive and administrative actions are intended to address the problems noted above. Some will be seen as operative outside the current IPC framework. It will be obvious that most actions have pertinence to more than one problem. A table is attached as an aid to understanding these relationships.

Provide rules of placement and proof of concept. Expand, enhance and make consistent rules for consistent placement of documents to enable users to be able reliably to retrieve desired documents. Rules of placement should include:

- schemes for establishing consistent interrelationships between classifications;
- instructions to classify documents based upon claimed subject matter;
- provision of definitions;
- provision of representative documents for each classification; and,
- inclusion of additional reference notes wherever necessary.

Require either previous in-Office use, or a test phase, prior to approving proposals for projects. This requirement will enhance the quality of the classification schemes created and increase productivity by establishing the potential usefulness of all proposed classifications through their successful use within an Office or testing by classification of representative sets of patent documents.

Improve access to training. Utilize modern training techniques such as computer based training, video presentations and internet training tools to ensure that all users understand the ipc and are better able to follow with consistency the document placement rules. On-site and wipo training by knowledgeable trainers should also be considered.

Investigate automated tools for indexing, schedule generation and document placement. Determine the usefulness of various commercial software products including concepts such as relevancy ranking and the use of linguistic tools to reduce the amount of intellectual and manual effort needed to index, generate tentative schedules and place documents into classifications.

Investigate use of concepts found in existing tools, e.g., DE, EP, JP, UK, US systems. Determine the value of rules, concepts, classification schemes and other tools available from intellectual property offices, technically oriented organizations and commercial entities.

Reclassify the backfile for all new reclassification projects and begin using the new classifications as the projects are completed. Reclassify the entire backfile as each new classification scheme is created and agreed to by the member offices. New classifications should be made available to offices and the public for their immediate use as soon as possible. The new classification schemes and documents placed in each classification would begin to form a new IPC in which the backfile of documents is kept current. The old IPC would not have any additional classifications added after the 7th edition. As new classifications are added to the new IPC, their equivalents would be removed from the old IPC. Eventually the new IPC would contain most of the new and active classifications while the old IPC would contain inactive or less important classifications. To reduce the number of documents needing to be reclassified, patent family information should be taken advantage of whenever appropriate to assign classifications to a number of family members based on the classification of one member.

The following suggested administrative actions are intended to enable and facilitate substantive initiatives toward IPC improvement.

Augment WIPO IPC support resources. Timely and effective implementation of substantive initiatives, as exemplified by the suggestions above, requires full time centralized coordination. This should include sufficient staff expertise in the IPC and in the needs of member offices to enable efficient performance of administrative activities of the type suggested below.

Use contractors *or member offices* for creating search tools, classifications and placing documents. Obtain bids from contractors *or member offices* to:

- initially classify all or major sub-sets of newly publishing documents, or
- review and verify/correct already assigned classifications, and
- reclassify selected areas of technology needing reclassification.

Specific rules to follow when creating new classifications, new search tools and assigning classifications to documents would be provided to successful bidders. Contracting organizations having detailed knowledge of a specific technology and aware of modern searching systems and techniques could provide new classifications and search systems that would be circulated for review by all member offices for compliance with the rules and goals of the IPC. Faster and more flexible reclassification efforts based on a more unified and consistent point of view would be possible.

Defray expenses by per-document assessment. Costs associated with centralized coordination activities, including contracting costs, could be defrayed, totally or in part, by member office assessment based on the number of member office documents involved in classification or reclassification projects. Of course, costs can also be kept to a minimum through the use of patent family information.

Provide means for more effective participation by the IPC Committee of Experts in IPC improvement. It is unlikely that timely and effective development and implementation of solutions to the complex problems vexing the IPC system can be achieved within the limitations of the current Committee of Experts operating processes. Twice yearly meetings necessarily devoted for the most part to review of completed projects are insufficient. A Working Group should be established with a clear focus on IPC improvement issues. Its work should be closely interactive with WIPO IPC coordination staff. Regular reports of progress, including recommendations, should be provided to the Committee of Experts, whose meetings should be extended, as necessary, to allow for adequate consideration of Working Group submissions.

Coordinate efforts of IPC with SCIT to take advantage of new tools, methods and opportunities provided. Maintain an active interface between IPC Committee of Experts (CE) and the SCIT to ensure that the IPC takes full advantage of all available technology and methods of doing business. On a formal level, SCIT meeting observer status might be accorded CE members. The CE might also be invited to provide periodic reports to the SCIT on technological issues and needs related to the IPC, including requests for advice and support in respect of such matters. On an informal level, close interaction between WIPO SCIT and IPC coordination support staffs should be actively encouraged.

Conclusion

The USPTO sees the IPC system as at a crossroad. We hold strong views that unless the system, conceptually and operationally, is changed to be more responsive to current needs and realities, its future will be one of rapidly progressing irrelevance. We welcome the opportunity provided by the Advanced Seminar to address the IPC's pressing problems.

ATTACHMENT

PROBLEMS WITH RELATED SOLUTIONS

Problem	Possible solution(s)						
	Provide rules of placement and proof of concept	**Improve access to training**	**Investigate automated tools for indexing, schedule generation and document placement**	**Investigate use of concepts found in existing tools, e.g., DE, EP, JP, UK, US systems**	**Reclassify the backfile for all new reclassification projects and begin using the new classifications as the projects are completed**	**Use contractors for creating search tools, classification and placing documents**	**Coordinate efforts of IPC with SCIT to take advantage of new tools, methods and opportunities provided**
1. Inconsistent placement of patent documents	X	X	X			X	
2. System presentation makes it difficult to locate related art, e.g., notes are limited in the information they provide and in the locations where they are provided	X			X			
3. Patent family information is not taken advantage of for placement of patent documents			X		X		
4. Classifications containing very large number of patent documents			X	X		X	
5. Plural IPC editions and backfile of patent documents is not reclassified when a new edition issues			X		X	X	
6. Five year revision cycle is too long - Working methods slow reclassification					X	X	X

Problem	Possible solution(s)						
	Provide rules of placement and proof of concept	**Improve access to training**	**Investigate automated tools for indexing, schedule generation and document placement**	**Investigate use of concepts found in existing tools, e.g., DE, EP, JP, UK, US systems**	**Reclassify the backfile for all new reclassification projects and begin using the new classifications as the projects are completed**	**Use contractors for creating search tools, classification and placing documents**	**Coordinate efforts of IPC with SCIT to take advantage of new tools, methods and opportunities provided**
7. IPC Indexing procedures are prohibitively expensive to follow			X				
8. No interface between SCIT and IPC now exists							X

[Annex follows]

ANNEX

US Views In Respect of Paragraph 19 of the Committee of Experts Report IPC/CE/26/8 Concerning Obligatory Assignment of Indexing Codes

And US Proposal for Creating a Related New Searching Tool

> In paragraph 19 of the Committee of Experts Report IPC/CE/26/8, it was agreed to discuss whether the current IPC indexing practice should be changed to make the assignment of indexing codes *obligatory*. We understand this to mandate the topic's discussion at a future Committee of Experts meeting. However, an opportunity to review this issue will present itself at the upcoming advanced IPC Seminar this December. We believe advantage should be taken of this opportunity. It is also our opinion, that it would be best to have at least some discussion of any proposed alterations in indexing practice prior to the next meeting of the Committee of Experts where all modifications to the seventh edition Guide will be approved.

In the matter of making indexing codes obligatory, the US is unconditionally opposed to making obligatory the current indexing practice that specifies 'non-discretionary assignment'. We believe that such deep indexing systems are inherently expensive both to create and to maintain. At this time, we do not wish to incur the additional expense associated with a new mandatory work step for our staff, which results in a final product of questionable general utility.

Furthermore, in our view the proposed change would also result in violation of the clear intent of Article 4(3) of the Strasbourg Agreement. The Agreement makes it explicit that only the classification of 'invention information' is to be considered obligatory. The current indexing practice requires non-discretionary assignment of an IPC code to even a *merely* named concept when it is provided for in the indexing scheme. Obviously, many of these indexing codes will not be representative of their patent document's invention and their assignment should not be obligatory.

In our opinion, the intent of the 'non-discretionary assignment' policy is to accomplish the following three goals:

1. Guarantee that absolutely all newly published patent documents from associated classifications, even those broadly disclosing a provided for indexed concept, are assigned to all indexing codes for this information. This would ensure that a searcher would not miss any document, even those merely naming the indexed concept, so that the search for this information is exhaustive in nature.

2. Allow examiners to 'term' search documents in 'foreign' languages without the need to translate the indexed concept.

3. Allow searching for additional information that may not be included in the patent document's abstract when full text searching is not available.

In many situations the above three goals may be valuable. However, we believe that there are more situations where the 'non-discretionary assignment' of indexing codes is detrimental to a search. The US believes that no Patent Office can afford a completely exhaustive search of its search files for each concept found in every patent document application. Productivity requirements dictate that patent examiners only view prior art patent documents having a high probability of applicability to the application being searched. This concept is very critical for the future of IPC, since the impact of expanded searching of the search files of multiple Offices on their Web sites will further exacerbate everyone's existing productivity and cost problems in the near future.

Extending the practice of non-discretionary assignment of patent documents to indexing codes will vastly overpopulate IPC indexing codes with documents having very limited utility to searchers. To require classifiers to assign an indexing code to information, no matter how trivial, results in a system that is less, not more useful to searchers. The rate of assignment to a code, when it is discretionary, is one valid method for determining when a concept covers subject matter that is important to a searcher.

Further, by utilizing patent family data online, searchers can easily search by any of the indexing codes assigned to a patent family by one of several examining Offices. For more important disclosures, this means that it is very unlikely that any meaningful concept associated with the invention, or found in the disclosure, is not indexed by at least one of the classifiers involved. Requiring 'non-discretionary assignment' of these documents will only add useless documents to the indexing codes and cause expensive redundant multiple indexing of the same codes by several Offices.

All patent documents, particularly US patent documents because of the "best mode of use" requirement and the practice of claiming 'old combinations', frequently name and broadly disclose very old information which is not essential to searches for current inventive subject matter. For this reason, most US examiners are very judgmental and selective when they assign patents into their cross-reference patent classification codes in the USPC (i.e., our equivalent to IPC indexing codes). In fact, it is essential forour examiners not to continue assigning classifications to subject matter that is already well represented in the existing body of art (e.g., what was new five years ago is the standard today). To do so would increase examination cost with very little potential increase in overall quality.

Furthermore, the ability of our examiners to search the full text of newer US patents makes unnecessary and superfluous theIPC's non-discretionary indexing practice for indexing codes that cover mere terms or simple concepts. Shortly, full text searching capability will become available to examiners for searching the full text of patent documents from other Offices as the work of the Standing Committee on Information Technologies (SCIT) progresses toward its long term goal. We believe that this expansion in the capability to term search should be fully utilized to replace a large number of currently existing indexing codes. This will both reduce the cost of indexing andoffer the promise of improved overall search quality. In our view, whenever exhaustive searching of a term is desirable, using a computer to term search, instead of a classified search dependent uponmanual coding, should be considered since, in some arts, it is a superior 'non-discretionary' selector of information.

As a possible partial substitute or supplement for indexing and to increase the effectiveness of full text searching, theUS proposes that the Committee consider the creation of a new search tool. We will refer to it in this paper asa 'catch term list'. What we broadly envision, is creating for every IPC subclass an online list composed of terms and simple concepts that are considered useful to limiting searches in that technology. These terms would be in at least one of the official IPC languages. Any Office could then propose and link an equivalent term(s) or phrase(s) in their official publication language to each listed catch term. This would allow searchers in each Office to select a 'catch term or phrase' in their own language from the list and 'catch term' search, without translation, the equivalent terms in other languages used in full text files. Additionally, some method must be used to avoid unintended hits caused by similarities in the spelling of disparate terms in different languages. We suggest that the country codes of Offices could be associated with the equivalent terms appropriate for text searching their files (e.g., B 60 R – boot [GB] or trunk [US], since trunks or suitcases are placed in a boot).

The 'catch term' concept, when its use is appropriate, has several advantages over non-discretionary indexing. Some of its advantages are:

- All of cost for creating a 'catch term list' are involved with selecting terms appropriate for the list and linking equivalent terms in other languages to each official term. There are no ongoing classifier coding costs involved as in indexing.
- The cost of finding equivalent terms for the official 'catch terms' should not result in significant additional cost for most Offices. Many Offices already spend the money necessary to cover similar cost for translating indexing codes into their language for their Office's use.
- A 'catch term' may be added to or removed from the official list at any time. Since each list is only linked online to a subclass, they may be changed at anytime without regard to the edition of the IPC manuals. This allows 'catch terms' to be more quickly responsive to examiners needs.
- Equivalent terms or phrases could be linked at any time to the official 'catch term'. If an Office, or expert, declines to participate due to other priorities, that Office or expert could add the term at any later date to the list of equivalent terms.
- Unlike an index code, a 'catch term' will be useable for the entire word searchable file of each Office and there is no problem with reclassification of back files.
- Subclasses covering related technologies would be able to utilize several of each other's terms and reduce cost.
- The equivalent terms will be interpretations, and not mere translations, of each 'catch term'. This is possible because experts in the technology of each subclass will be able to view online, by term searching a 'catch term' in full text files, example patent documents of the art intended to be retrieve by the term.
- The 'catch term' concept and 'Thesaurus' searching concept (e.g., linking equivalent terms in the same language – water vehicle = boat or raft or ship) can easily be blended together when appropriate for a particular subclass.

This proposed search tool should be viewed as a supplemental, or alternative, search tool and not a general replacement for indexing codes. Manually assigned indexing codes would still be useful for complex concepts or whenever selectivity based on the quality and novelty of inventive disclosure was desirable. For example, in classification schemes having large numbers of patent documents with 'Markush'-type formulae, both indexing codes and 'catch terms' covering the same subject matter might be useful. This would be the case if the indexing codes were only assigned when a patent document's disclosure for the concept was significant and novel. In this situation, if a more exhaustive search of the concept was useful, the searcher could utilize the equivalent 'catch term' to locate additional art.

With the availability of the 'catch term' tool, the continuing assignment of indexing codes in a non-descretionary manner, as a general practice, could be extensively restricted to judiciously selected special circumstances. We believe standard indexing practice must be modified to more effectively utilize experts' knowledge to control file size and quality. This modification of indexing practice, when used in conjunction with a 'catch term' tool , is beneficial to reducing search time and will result in no decrease in search quality.

Finally, the US believes thatall existing indexing codes should be periodically reviewed and rated by searchers for their usefulness. In our opinion, the time period for review should be no longer than ten years. Indexing codes that did not demonstrate their usefulness, as evidenced by strong support from searchers during the review process, should be canceled. Suggestions for new indexing codes by dissatisfied searchers should also be encouraged during the review process and given priority action.

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