Several Tips on the Skill of Patent Search

Masahiro Hiratsuka

1. Graduate School of Engineering, Tohoku University, hiratsuka-masahiro@jpo.go.jp

Abstract

Training concerning prior art search of patent documents and the best practice combination of lecture, practical exercises, and discussion improves trainees' search skills, and improves self-efficacy. Taking inventive step into consideration in the early stages of experience, as well as experience, has effected tangible improvements in capabilities to perform prior art searches. In future, it is very important that those involved with intellectual property receive special training, with a particular emphasis on making practitioners aware of such points and techniques in prior art search. Ongoing investigation of efficacy in this filed is urgently required to ensure the efficiency and integrity of the patent system worldwide.

Keywords: intellectual property, patent, prior art search, inventive step, technical field, personnel training.

1. Introduction

The current patent system is predicated on a complex combination and interrelationship of legal and technological fields, spanning the entire globe and every area of technological innovation. Although technological innovation is most clearly recognized and rewarded in the patent system, the very issuance of patents and their validity depends crucially on a correct and comprehensive understanding of patentability in its many aspects. For example, patented inventions must meet stringent requirements for inventive step or the improvement over prior art in a given domain. However, patent searchers often demonstrate a poor understanding of this essential element of patentability, thereby compromising the efficacy of their patent searches. This problem has become particularly acute in recent decades, as technology has undergone rapid and accelerating development, rendering routine searches exceptionally challenging.

This paper reviews literature related to patent search efficacy and then presents a detailed analysis of the advanced training program currently conducted at The National Center for Industrial Property Information and Training (INPIT). Several trends are clear from the literature and the analysis of the advanced training program. First, patent search training is of the utmost importance in ensuring competent searches. Second, the proper pedagogical approach to training is necessary to obtain practical results, following best practices discussed below. Finally, patent search training is most effective when it reaches practitioners early in their careers and focuses on proper techniques for search and evaluation of inventive step.

2. Existing Research on Patent Search


Yet another set of studies have examined the difficulty of dealing with patent-related information for information specialists. Muto (2000) suggests that the reasons include the legal framework of patenting, the sophisticated system of patent classification, and a complicated international correspondence between patents [5]. Further claims have been made that although it is clear that experience and know-how are important in patent search efficiency, nobody can establish a manual for it.

In the past decade, there have been big changes in the use of the Internet and there have been correspondingly large changes in how the internet is used in patent search. Takahashi (2002) focused on the increasing number of end users and their capability as patent searchers [6]. Shimura (2008) pointed out that those in the intellectual property field should be aware of the importance of information retrieval particularly in relation to the utility of patent information [7]. Kiriyama (2007) examined the “Patent Search Contest” and concluded that the majority of participants were unaccustomed to index searches [8]. Sakai's (2007) study concluded urged the creation of a manual of patent search techniques [9].

Recently, The National Center for Industrial Property Information and Training (INPIT) has been conducting “Search Expert Training”. Nishina (2007) reported that the program is based on the following three findings [10]:

(1) Prior art search by private sector relies primarily on text searches.
(2) Prior art searches in the private sector pay insufficient attention to patentability, such as inventive step, which patent examiners routinely take into account.
(3) Improvements in prior art searches in the private sector lead to improved rationales for applications and more
principled requests for examination.

Hiratsuka et al., (2008) analyzed the result of a training program and concluded that (1) indexes are important for patent search, and (2) taking patentability into consideration is important for patent search efficacy [11].

3. Training Program for Specialists in Charge of Patent Search by INPIT

3.1 Outline of the Program

INPIT has started several programs of patent search training program, which assist those training to do various types of searches (Kawakami, 2005) [12]. Currently, INPIT conducts a series of “Search Expert Training” programs. Specifically, these are a beginning class, an advanced class, and a design-patent class. Among these, the “Search Expert Training [advanced class]” is most suitable for analysis because of its good reception from trainees, its systematic approach to the training curriculum, the high quality of its lecturers, etc.

3.2 Program Content

Training is conducted over 5 days, and includes lectures, practical patent search exercises and classroom discussion in small and large group formats. Trainees are expected to master, systematically, knowledge required for advanced prior art patent searches through (1) lecture first, (2) practical exercises and (3) discussion, in this order.

(1) Lecture: Basic knowledge such as patent law and practice, index search skills, etc. are the lecture topics. Trainees are given sufficient time to ask for tips on patent search prior to performing practical exercises.

(2) Exercise: A document-selection exercise helps trainees select the proper documents efficiently. Also, computer terminal operation is performed using the computer terminal prior to attempting patent search exercises. In patent search exercises, trainees are supposed to perform patent searches of a given invention independently and complete a search report.

(3) Discussion: Trainees present their search reports in small group and discuss it in a small-group setting. After coming to a consensus in small groups, an inter-group, plenary discussion is held, including time for comments from the lecturer.

(4) Subject for the Search: The invention under consideration for a patent search exercise depends on the technical field of search. The training program addresses several technical fields. Among these, this paper reviews two technical fields, “Field 1” (traffic restriction equipment), and “Field 2” (high-polymer composition).

3.3 Trainee Responses

Using the questionnaire administered during training, this paper examines the resulting changes among participants, along with advances in the training program according to the replies of subjects involved in training. This paper also investigates the trainee’s background and experience with patent search using the questionnaire below.

(Table 1) Questionnaire

| (1) give sufficient consideration to inventive step as in the training |
| (2) ignore considerations of inventive step as in the training |
| (3) perform search using text search |
| (4) perform search using index search |
| (5) other |

4. Result and Discussion

4.1 Sufficiency of Training Program

Transitions in the comprehensive evaluation of each subject are shown in Table 2. The percentage of “Very Good” in exercise/discussion sessions is 43%.

(Table 2) Comprehensive evaluation according to subject (n=68-65)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Search index</th>
<th>Search practice</th>
<th>Document-seletion exercise</th>
<th>Computer terminal operation</th>
<th>Patent search exercise etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Good</td>
<td>24%</td>
<td>28%</td>
<td>25%</td>
<td>20%</td>
<td>43%</td>
</tr>
<tr>
<td>Good</td>
<td>76%</td>
<td>64%</td>
<td>71%</td>
<td>74%</td>
<td>57%</td>
</tr>
<tr>
<td>Not Good</td>
<td>0%</td>
<td>6%</td>
<td>4%</td>
<td>6%</td>
<td>0%</td>
</tr>
<tr>
<td>Bad</td>
<td>0%</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Changes in the evaluation of training levels are shown in Table 3. The reply of wanting "Raise" decreased, and of wanting "Lower" increased it as training advanced.
(Table 3) The training level according to subject (n= 68-65)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Search index</th>
<th>Search practice</th>
<th>Document-selection exercise</th>
<th>Computer terminal operation</th>
<th>Patent search exercise etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>76%</td>
<td>81%</td>
<td>84%</td>
<td>72%</td>
<td>84%</td>
</tr>
<tr>
<td>Raise</td>
<td>24%</td>
<td>18%</td>
<td>12%</td>
<td>28%</td>
<td>10%</td>
</tr>
<tr>
<td>Lower</td>
<td>0%</td>
<td>1%</td>
<td>4%</td>
<td>0%</td>
<td>6%</td>
</tr>
</tbody>
</table>

Transition of evaluation of time sufficiency is shown in Table 4.

(Table 4) Time sufficiency according to subject (n= 68-65)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Search index</th>
<th>Search practice</th>
<th>Document-selection exercise</th>
<th>Computer terminal operation</th>
<th>Patent search exercise etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>66%</td>
<td>53%</td>
<td>54%</td>
<td>58%</td>
<td>72%</td>
</tr>
<tr>
<td>Long</td>
<td>10%</td>
<td>7%</td>
<td>3%</td>
<td>29%</td>
<td>7%</td>
</tr>
<tr>
<td>Short</td>
<td>24%</td>
<td>40%</td>
<td>43%</td>
<td>12%</td>
<td>21%</td>
</tr>
</tbody>
</table>

The "Learning Pyramid" [13] is referred to in the training program. According to the Learning Pyramid, the efficiency of training is 50% in group discussion and 75% in practical exercises, whereas it is 5% in lecture and 10% in reading comprehension exercises [14]. On the other hand, to become a proficient patent searcher, it is necessary to acquire systematic knowledge, such as examination practice or strategy of information retrieval. Therefore, competence can be obtained through the combination of lecture, practical exercises and discussion. Trainees’ questionnaire results support the validity of the best practice mentioned above. Furthermore, there is a close relationship between training and self-efficacy, mentioned by Miwa (2003) [15].

4.2 Result of the Practice

(1) Experienced Years: Argote (1990) states that mastery follows a learning curve [16]. Fig. 1 shows the learning curve observed in the patent search exercise. The vertical axis shows the percentage of failure (incorrect answer rate), and the horizontal axis shows the number of years of experience of the trainee in question.

![Fig. 1 Influence of experienced years](image)

(a) Field 1  
(b) Field 2

The constant in Field 1 (61.2) is smaller than that in Field 2(100); therefore, Field 1 is easier to search than Field 2. In addition, there are similarities in their exponents.

(2) Consideration of Inventive Step: Table 5 shows the relationship between consideration of inventive step using the above-mentioned choice (1) and (2) in table 1. Each number represents a risk ratio (choice (1) / choice (2)) of correct answer rate.

(Table 5) Influence of inventive step

<table>
<thead>
<tr>
<th></th>
<th>Less than two years</th>
<th>Less than four years</th>
<th>Whole</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field 1</td>
<td>1.27</td>
<td>0.94</td>
<td>0.96</td>
</tr>
<tr>
<td>Field 2</td>
<td>(divergence)</td>
<td>2.86</td>
<td>1.54</td>
</tr>
</tbody>
</table>

Therefore, improvement in the capability of patent search can be effected by emphasizing inventive step, especially in the early stages of a searcher’s experience (Quick Effect).
(3) Variation in Search Skill: Table 6 shows the relationship between the search technique using the above-mentioned choice (3) (text search) and the (4) (index search) in table 1. Each number represents a risk ratio (choice (4) / choice (3)) of trainee’s correct answer rate.

<table>
<thead>
<tr>
<th>Field</th>
<th>Less than two years</th>
<th>Less than four years</th>
<th>Whole</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.55</td>
<td>0.78</td>
<td>0.90</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0.74</td>
<td>2.17</td>
</tr>
</tbody>
</table>

4.3 Cross-Field Comparison

The number of documents in Field 1 is small (ca. 7,200) compared with that of Field 2 (ca. 240,000), despite the ideal screening numbers (70 and 140, respectively). In Field 2, index system such as F term is substantial, and results change dramatically with practical experience. Therefore, skill is influenced by the database characteristics.

The progress of technology field may be arranged along a time-axis. In that case, basic inventions will proceed slowly at first; subsequently, many inventions with minor improvements will be created. Under these circumstances, where innovation relates to an applied technology, compound technologies applied to the same field of innovation follow rapidly. In such a case, the state of the prior art search at each stage also tends to broaden and diversify. Depending on the patent search for each stage of invention, changes may also arise in considerations of inventive step (since each invention relates to an upper-lower stream of inventions and to time, the opinion that invention is "easy" at a given time deteriorates rapidly over time). Similarly, considerations of inventive step vary according to application / compound technology.

5. Conclusion

The patent system is both legally and technologically complex, with growing complexity to be expected in the future. However, patent searchers are often poorly prepared to play a role in the system, thereby compromising its (and their) effectiveness. This paper has reviewed the literature on this topic and offered findings from training efforts for advanced patent searchers at INPIT.

References