Patent visualisation: part three

Akihiro Ryuka and **Stephen Hamon** of **Ryuka IP Law Firm** present a strategy for obtaining strong IP rights in the electronics and software fields

In the electronics and software fields, the applications that result in the most valuable patents are typically the ones filed early, before the market for the protected products grows. Patent visualisation is an inventing strategy aimed at systematically developing ideas from a very early stage to optimise the chances of filing patent applications at the critical time before market growth. Central to patent visualisation are the processes of brainstorming, in which an early-stage idea is developed through a series of questions, and theme determination, in which a technical area of focus is selected and tested to determine its potential to yield early inventions with respect to market growth. Patent visualisation represents an opportunity for IP professionals to take on new roles and have a greater impact on the development of technology and the success of their companies.

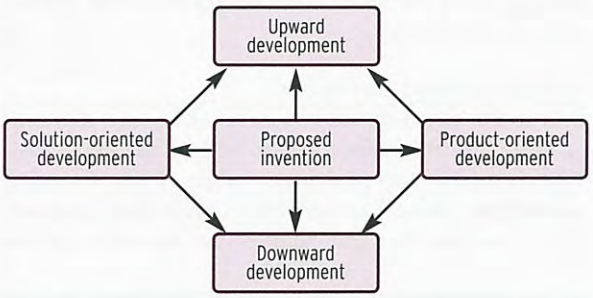
This article is the third of a paper. The first part appeared in the *Managing IP* Japan IP Focus (February), the second part appeared in the MIP Handbook (April), the fourth and fifth and final part will appear in later publications.

Parts one and two of this paper described the basics of the brainstorming process of patent visualisation. In brief, the brainstorming leader considers specific thought processes at each of the three steps – visualising a future product, visualising problem states and visualising solutions – in order to formulate the most effective questions for the participants. Toward the end of part two, the idea of studying the degree of development in the prior art was introduced as a means of further focusing the efforts of the participants. In this part, the overview of the brainstorming process concludes with the specifics of how an assessment of the degree of development can be used. Then we will discuss how brainstorming fits into the overarching process of patent visualisation.

Selecting a direction of development

During the brainstorming process, a consideration of the degree of development in the prior art helps the brainstorming leader choose a direction in which to develop the proposed invention. In turn, the selected direction of development informs the decision of which thought patterns to focus on when brainstorming. Directions of development can be divided into four categories, as shown in figure 1: downward development, solution-oriented development, product-oriented development, and upward development.

Figure 1: Directions of development



Downward development

Downward development means developing more specific technology. When an application is eventually drafted, claims based on the more specific technology will of course have narrower scope. However, considering more specific technology, and including such claims in an application, increases the chances of being granted a patent and the likelihood that a granted patent will stand up to invalidity attacks. Downward development is appropriate when the proposed invention falls short of the degree of development in the prior art, that is, when the proposed invention is less developed. When downward development is selected, thought processes aimed at considering problems associated with specific uses of the

invention are particularly effective, such as those listed under "Step 2: Visualising problem states" in figure 2 of part two of this paper (as printed in the MIP Handbook), for example, searching for irregular occurrences.

When obtaining a patent seems unlikely for a proposed invention, it is important to recognise that developing downward is often better than abandoning the idea. If a more specific invention is realised, an application that is more likely to have some patentable subject matter can be filed without giving up the possibility of being granted the highly valuable rights for the broad, original invention.

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Solution-oriented development

Solution-oriented development means finding additional ways that the invention can achieve the same goal. This is useful for preventing others from designing around the patent. Consider the example from part two of the receiver that compensates for distortion caused by the transmission line (see page 4 of part two in the MIP Handbook). By imagining that instead the transmitter might be used to compensate for the signal distortion, the engineers are using solution-oriented development. When solution-oriented development is selected, particularly effective brainstorming methods include expanding spatially or temporally under "Step 1: Visualising a future product" and switching component pairs under "Step 3: Visualising solutions" (see figure 2 of part two in the MIP Handbook).

Product-oriented development

Product-oriented development means considering whether the proposed technology can be applied to products other than the initially visualised future product. For example, the air conditioner control method in the domestic solar cell example introduced in part one of this paper (see page 135 of part one in the MIP Japan IP Focus) might be developed to apply to a refrigerator as well, or the domestic solar cell might be replaced by a fuel cell. This type of development is particularly important for fundamental inventions whose configuration or effect differs greatly from known technology, because such inventions may have many diverse applications. When product-oriented development is chosen, various uses of the invention should be considered during step 1, visualising a future product (see figure 2 of part two in the MIP Handbook).

Upward development

Upward development involves imagining a broad concept covering a wide scope of potential rights. This should be chosen as a direction of development when the proposed invention is highly developed compared to the degree of development in the prior art, that is, when the engineers are thinking about the proposal too narrowly. Upward development seeks to remove unnecessary aspects of the imagined future product that might colour the engineers' vision of the inventive concept, which would eventually result in unnecessary phrases limiting the scope of the claims.

Consider again the above example of the receiver that compensates for the distortion caused by the transmission line. In this invention, as originally conceived, receiving the signal seems like such a basic, essential part of the invention that it is difficult to imagine a way to eliminate the word receiving from the claims. Therefore, a sending device that does not receive might be excluded from the scope of protection. If the engineers exercise solution-oriented development as explained above and recognise that the transmitter can be considered an embodiment of the invention, upward development can then be used to

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Since founding Ryuka IP Law Firm in 1998, Akihiro's practice has included patent prosecution specialising in computer software, data communication, radio communication, semiconductors and electronics, as well as design patents, trade marks, licensing, litigation and opinions. He is an active member of the Japan Patent Attorneys Association (JPAA) and the Japan Intellectual Property Association (JIPA).

arrive at a broader inventive concept encompassing both the receiver and the transmitter. In this way, a receiving device and a transmitting device can be included within the scope of the broadest claim and the word receiving may be eliminated.

Similarly, in the example of the domestic solar cell, after having engaged in product-oriented development of the solar cell to consider a fuel cell, upward development can lead the engineers to imagine a broader invention such as a power generating apparatus. Claims can be drafted that include both a solar cell and a fuel cell.

As can be seen from these examples, it is often effective to initially put more effort into solution-oriented development and product-oriented development, rather than upward development. It is often easier to conceive of a broader scope after alternative embodiments and products have been considered.

As explained above, understanding the degree of development in the prior art can help the brainstorming leader choose a direction of development for the proposed invention. This allows for a more focused and effective brainstorming session.

Prior art in invention development

In part two of this paper, we explained how reading the unexamined application publications from the last year or two in preparation for the brainstorming sessions can help one ascertain the degree of development in the relevant technical field. It is worth mentioning that the same prior art material includes a lot of helpful information to share with the engineers simply for the purpose of giving them ideas. During the brainstorming sessions, the most relevant products, problems, and solutions learned from the prior art should be presented to the engineers. The engineers can then go through the steps of brainstorming: visualising a future product, visualising problem states, and visualising solutions.

The introduction of prior art to the brainstorming participants shouldn't be a one-sided presentation. The engineers should be permitted to interrupt at any time to suggest any improvements to the invention. In the experience of our office, a simple one-sided explanation of the prior art takes about 30 minutes, but when engineers are encouraged to interrupt with their ideas, the process of presenting the prior art can take up to 2 hours. If the prior art is introduced in this manner, many inventions will have been proposed by the time the prior art presentation ends. Moreover, since the inventive ideas discussed already take into account the newest products, problems, and solutions, it is more likely that a novel and non-obvious invention will result from the brainstorming session.

The prior art search and follow-up meeting

Even when the proposed invention seems patentable based on the degree of development in the prior art, filing an application based solely on this intuition does not very often result in a valid patent. It is advisable to perform a prior art search for each invention resulting from the brainstorming sessions. Unlike the pre-brainstorm investigation of unexamined application publications from the last year or two described above, the post-brainstorm prior art search is an exhaustive search aimed at uncovering all potentially relevant prior art.

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After the prior art search, a follow-up meeting is held in which the inventions are reevaluated based on the results of the search. The number and variety of ideas is less important at this stage, so typically only a few of the original brainstorm participants are

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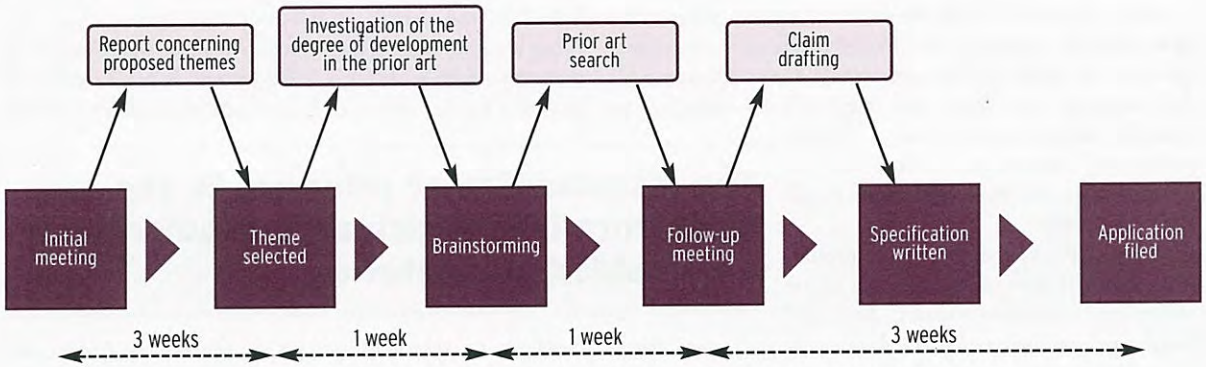
Figure 3: Patent visualisation flow

(The time spent on each step varies depending on the number of inventions proposed)



present. In the follow-up meeting, specific configurations of the proposed inventions and the content to be included in the actual patent applications are discussed to clarify the differences with respect to the prior art discovered during the search. At this stage, the thorough development of the invention that was already done during the original brainstorm makes it easier to plan and draft the broadest possible specification and claims. Since many conceivable modifications of the invention have already been considered, an application drafted in this way will result in a patent that is difficult for competitors to successfully design around.

In addition to its basic functions of clarifying the invention in light of the prior art and serving as a starting point for specification and claim drafting, the follow-up meeting helps improve the efficiency of the earlier stages of patent visualisation. During the brainstorming stage, because the brainstorm participants are aware that a prior art search and re-evaluation of the invention will be undertaken, time is not wasted discussing patentability or the finer points of the inventions. Therefore, scheduling such a follow-up meeting has the effect of greatly increasing productivity in creating inventions. Furthermore, keeping in mind that the goal of the brainstorming session is to select inventions to undergo further evaluation, ideas will not be prematurely abandoned just because the engineers have a feeling that an invention will be difficult to patent.

Figure 3 shows the overall process flow of patent visualisation, as undertaken by our office to the advantage of many of our clients. So far, only the later processes in figure 3, beginning with the "Investigation of the degree of development in the prior art," have been discussed. For these processes, a theme of invention has already been selected. Next, we will begin describing in detail the earlier portion of the patent visualisation flow, beginning with the initial meeting, and we will explain how a theme of invention is selected.

Theme determination

Before the brainstorming process of patent visualisation can even begin, a technical area of focus must be selected. How should this technical area, that is, the theme of the invention to be created, be chosen? An invention that is developed through patent visualisation has a good chance of resulting in highly valuable patent rights if the resulting product is actually commercialised. However, the likelihood that the product of such an invention is actually commercialised is lower than for inventions resulting from ordinary product development. Selecting a suitable theme is a means of overcoming this problem. Parts four and five of this paper will describe how themes are generated and chosen according to the patent visualization process.

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