Abstract: this paper sorts out the relations among different inventive step determination methods and concludes the overall principles for inventive step argumentation by agents with various inventive step determination methods through comparing the Three-step Method indicated in Examination Guidelines and other supporting inventive step determination methods; arranges and summarizes the usual argumentation perspectives used in inventive step argumentation based on the Three-step Method in patent agency practice, and focuses on the argumentation perspectives likely to be ignored.

Key Words: inventive step determination methods, Three-step Method, inventive step argumentation

I. Foreword

Paragraph 3 of Article 22 of the Patent Law specifies that "inventive step of an invention means that, as compared with the prior art, the invention has prominent substantive features and represents notable progress". To be specific, that an invention has prominent substantive features means that, having regard to the prior art, it is non-obvious to a person skilled in the art. That an invention represents notable progress means that the invention can produce advantageous technical effect as compared with the prior art.

During the substantive examination of an invention patent application, the examiner usually relies on the following logic in examination of an inventive step: The invention patent applied for is deemed as involving an inventive step with no reason found to negate the inventive step. The inventive step is seldom given with affirmative evaluations directly and positively. It is a kind of logic as "No Negation Means Affirmation" rather than "Direct Affirmation". As to the patent applicant, no news is good news in terms of inventive step. In patent agency practice, the handling work in respect of inventive step is mainly from the negative examination opinions against the inventive step. In other words, the inventive step argumentation is only needed with the existence of negative opinions against the inventive step, which is actually based on the logic as "No Negation Means Affirmation".

In patent agency practice, however, an inventive step of technical solutions can be directly and positively given with affirmative evaluations except for directly refuting the negative opinions which are imposed against the inventive step. Two different types of thinking for inventive step argumentation are formed accordingly: (1) argue on the grounds that "the excuse to negate the inventive step is untenable"; and (2) directly and positively affirm the inventive step.

II. Inventive Step Determination Methods
Chapter IV, Part Two of the Guidelines for Patent Examination (hereinafter referred to as the “Examination Guidelines”) has classified the types of invention and provided examples for different types of invention (See Section 4, Chapter IV, Part Two of the Examination Guidelines[1]). The aforesaid classification is mainly realized on the basis of distinguishing features between inventions and the closest prior art and actually puts emphasis on the consideration of acquisition process of inventions. For example, an invention by combination is defined as being obtained from the combination of existing and known technical solutions. The specific types of invention include invention opening up a whole new field, invention by combination, invention by selection, invention by diversion, invention of new use of known product, and invention by changing elements. Besides, other factors to be considered upon determining an inventive step of an invention are provided either. These factors to be considered actually constitute inventions-creations of different types (See Section 5, Chapter IV, Part Two of the Examination Guidelines[2]) and focus on the natures of inventions, including solving a long-felt but unsolved technical problem, overcoming a technique prejudice, producing unexpected technical effect, and achieving commercial success (Success is directly attributable to technical features of inventions).

Most of all, the Examination Guidelines provide the relatively general method for determining an inventive step - Three-step Method. The procedures of the Three-step Method are as follows: determining the closest prior art; determining the distinguishing features of the invention and the technical problem actually solved by the invention; determining whether or not the claimed invention is obvious to a person skilled in the art. The Three-step Method is corresponding to a kind of common process for obtaining inventions-creations or being compared to a kind of process for obtaining inventions-creations. This common process for obtaining the inventions-creations refers to a process during which an inventor who intends to solve the existing problems finds out solutions and thus obtains an invention-creation on the basis of all the prior art known to him (such as literature or available real object). Each step of the Three-step Method is completely corresponding to the common process for obtaining inventions-creations. Objectively speaking however, the actual process for obtaining inventions-creations may vary greatly. The Three-step Method is merely one of the processes for obtaining inventions-creations. For instance, the aforesaid invention opening up a whole new field, invention by combination, invention by selection, invention by diversion, invention of new use of known product, and invention by changing elements are respectively corresponding to a process for obtaining inventions-creations other than the Three-step Method. Besides, there are other processes, for example, accidental obtainment. The nature of the Three-step Method lies in standardizing and normalizing the different processes for obtaining inventions-creations and further providing a kind of standardized and normalized determination method. In other words, neglect the differences in actual processes for obtaining inventions-creations, and unify and standardize these processes as the Three-step Method process for obtaining inventions, which is compared to the actual processes in order to ensure whether the inventions-creations can be obviously obtained. Because the differences in actual processes
for obtaining inventions—creations are neglected, the approach for establishing inventions will not be taken into consideration in inventive step evaluation. Therefore, the difficulty level will not affect the conclusions of the inventive step determination no matter the inventions are obtained through hardships or with extreme ease.

III. Comparison of Effects of Different Determination Methods

In patent agency practice, there may be cases that different determination methods lead to different conclusions on inventive step. For example, an invention is determined as not involving an inventive step through the Three-step Method while determined as involving an inventive step through the invention by diversion determination method. Or an invention is determined as not involving an inventive step through the Three-step Method while the technique prejudice is overcome by the invention, especially when different determination conclusions are obtained under different determination methods adopted by the agent and the examiner.

The authors believe that the confirmation of conclusions upon inventive step of invention actually involves the effect of various inventive step determination methods.
The table above classifies and compares different inventive step determination methods. The five inventive step determination methods (Group 2), namely invention opening up a whole new field, solving a long-felt but unsolved technical problem, overcoming a technical prejudice, achieving an unexpected technical effect, and achieving commercial success (directly brought about by technical features of an invention), can form the positive and affirmative opinions about the inventive step. In other words, once an invention is successfully defined as falling into one of the aforesaid five types, affirmative conclusions about the inventive step can be made directly. By reference to the provisions set out in Examination Guidelines, it is not hard to find out that they have the top effect priorities. It means that the inventive step of an invention which falls within one of the aforesaid five types must be affirmed even if the invention does not involve an inventive step under the Three-step Method, invention by combination or any other inventive step determination methods. Obviously, the affirmation for the inventive step of an invention only needs the invention to fall within one of the five types. That is “Affirmed if one type is
affirmed”.

The six inventive step determination methods (Group 1), namely the Three-step Method, invention by combination, invention by selection, invention by diversion, invention of new use of known product, and invention by changing elements, can form the opinions about inventive step from positive and negative aspects, which, as easily understandable, are utilized by the examiner to form negative opinions and the agent for refutation, arguing on the grounds that “the excuse to negate the inventive step is untenable”. The aforesaid six inventive step determination methods have the second top effect priorities. Their inventive step conclusions can not be used to challenge the conclusions obtained through the inventive step determination methods in Group 2. As for the effect relations among the six types, an invention will be concluded as not involving an inventive step as long as the invention is concluded as not involving an inventive step under any one of the methods. Under this condition, the inventive step can only be negated even if the inventive step conclusions can be made under other inventive step determination methods in Group 1. That is “Negated if negated under one method”.

The clarification of overall relations among inventive step determination methods can assist the patent agent to master the overall principle for inventive step argumentation with different inventive step determination methods. Given the top effect priorities, the inventive step determination methods in Group 2 can be used for inventive step argumentation at any time, which are the optimal argumentation methods if the difficulty level of certification is not taken into account. Objectively speaking, this kind of argumentation is hard to prove in most cases. For instance, to prove that the technique prejudice is overcome by an invention, lots of proof-providing work is needed, which however is a totally different subject. As for the inventive step determination methods in Group 1, they can only be targetedly refuted due to the effect relations among them. For example, an invention is concluded as not involving an inventive step under the determination method of invention by combination adopted in examination opinions, which can only be refuted with the determination method of invention by combination unless the invention is proved as falling into other types rather than the invention by combination. In other words, as specified in Examination Guidelines, the argumentation shall be carried out from the perspective whether the technical features after combination are functionally supportive to each other, or whether the combination is difficult or not. It does not make sense to carry out refutation with other inventive step determination methods provided in Group 1. For example, adopting the Three-step Method argumentation makes no technical motivation and provides no obvious assistance in changing the inventive step conclusions theoretically. Take a vivid metaphor for example, the examiner kicks the ball to the agent through the method A while the agent kicks the ball back through the same method, which certainly facilitates persuading the examiner.

**IV. Common Argument Perspectives Based on Three-step Method**
1. Fact finding

One of the common argument perspectives is arguing against the facts recorded in the claims and the facts publicized in reference documents. For example, the omission of evaluations on individual technical features recorded in the claims in examination opinions or the discrepancies between the actually publicized contents in reference documents and the confirmations made in examination opinions are both classified as the flaws existing in facts finding, which can be argued against from the perspective of fact finding that would usually result in desirable results.

2. Technical problem actually solved by an invention

1) Technical problem per se is hard to be figured out

There exists in reality such an invention-creation which creatively discovers the problem in the prior art. The solutions are prominent upon the finding of the problems. In other words, the technical problem to be solved rather than the solution is critical to an invention-creation. Such an invention-creation shall be affirmed considering that the problem in the prior art is creatively figured out. In other words, an inventive step shall be affirmed.

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**Three-step Method**

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<th>Step 1: Determining the closest prior art</th>
<th>Step 1: Relying on the closest prior art</th>
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<td>Step 2: Determining the distinguishing features of the invention and the technical problem actually solved by the invention</td>
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<td>Step 3: Determining whether or not the prior art provides a technical motivation and thus determining whether the invention is obvious or not</td>
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**Comparison between the Three-step Method and Actual Accomplishment Process of Inventions-creations**

The Three-step Method has natural defects in evaluations on the inventions-creations creatively discovering problems in the prior art. As mentioned previously, the Three-step Method is the analogy of actual accomplishment process of inventions-creations. Each step of the Three-step Method is corresponding to the step in the process for obtaining the inventions-creations as shown in diagram above. As for the Three-step Method, its second step requires to define the
distinguishing features of inventions in order to confirm the technical problem actually solved by the invention. As specified in the Examination Guidelines, the confirmation of technical problem will be relied on the achievable technical effect by the distinguishing features, including and with priority reference to the technical effect learnt by a person skilled in the art from the records in the description of an application. However, the disclosure or announcement of the technical problem to be solved made in the description of the application by the applicant will lead to the result that a person skilled in the art can always easily figure out the technical problem to be actually solved by the invention. In other words, the second step of the Three-step Method can always be completed without efforts on the basis of the publicized contents in application documents. It is usually called the hindsight. In fact, it is sometimes difficult to figure out what technical problem exists in the prior art during the process for obtaining an invention-creation. In other words, the second step in actual accomplishment process of an invention-creation can not be completed easily, while the Three-step Method directly makes reference to the announcement from the applicant but avoids the ways to figure out the technical problem to be solved, and therefore is not applicable to evaluating the an invention-creation for which the technical problem to be solved per se is hard to be figured out and may result in wrong conclusions otherwise. Therefore, the authors believe that these are the natural defects existing in the Three-step Method.

Generally, in patent agency practice, an inventive step can be affirmed by arguing that the technical problem per se is hard to be figured out from the natural defects of the Three-step Method.

2) Confirmation errors in technical problems

Confirming the technical problem actually solved by an invention is related to determining whether a technical motivation is provided by the prior art in the third step of the Three-step Method. Different technical problems may lead to different inventive step conclusions. For example, if a confirmed technical problem is not related to the functions of the technical means as indicated in reference documents, it will contribute to the production of the conclusion that the prior art does not provide a technical motivation. Therefore, accurate confirmation of the technical problem actually solved by the invention is critical to the inventive step conclusion. In patent agency practice, technical problem confirmation errors may exist in some examination opinions, which will result in adverse conclusions accordingly. In such case, the patent agent can argue against the examination opinions from the perspective of technical problem confirmation errors.

Firstly, the technical solutions for an invention shall not be determined as the technical problem actually resolved by this invention after re-confirmation when confirming the technical problem actually solved by the invention. The technical means for solving the problem shall not be included in the technical problem actually solved. The Section 1.2.4, Chapter IV of Substantive Examination
Sub-volume under the Patent Examination Operating Procedures provides related examples. The reason for the requirement is that if a technical means is included in technical problem actually solved by an invention, a person skilled in the art will get the technical means with no efforts and obviously obtain the technical solutions for the invention. In such case, the third step of the Three-step Method will play no functions and it is unfavorable to the affirmation of the inventive step of an invention. In the event such issue exists in examination opinions, it shall be pointed out in the observations.

Secondly, when determining the technical problem actually solved by an invention, the following priorities shall be considered: (1) the technical problem corresponding to the distinguishing features recorded in the description is usually deemed as the problem actually solved by the invention; (2) in case the technical effect of the invention achievable by the distinguishing features rather than the technical problem corresponding to the distinguishing features is recorded in the description, the technical problem actually solved by the invention will be determined as per the achievable technical effect of the invention through distinguishing features if the technical effect can be confirmed; (3) the technical problem actually solved by the invention can be determined as per the technical effect predictable by a person skilled in the art if both the technical problem corresponding to the distinguishing features and the achievable technical effect of the invention achievable by the distinguishing features are not recorded in the description. If the technical problem actually solved by an invention is unfavorable to subsequent determination upon the provision of a technical motivation due to no consideration of the priorities above in examination opinions, it shall be pointed out in the observations.

For example, in the examination opinions, the technical problem solved by the distinguishing features, the functions and the effect made in the description of an application are neglected and the technical problem corresponding to the technical means of other reference documents (except for the reference documents closest to the prior art, for example, reference document 2) is confirmed, which lead to the conclusion that there is a technical motivation. In this case, the patent agent shall point out the technical problem actually solved by the invention in the observations as per the priorities above.

Thirdly, if the technical problem, function or effect corresponding to the distinguishing features fails to be recorded in the description, one distinguishing feature may correspond to various technical problems, functions or effects as predicted by a person skilled in the art. In this case, the technical problem actually solved by the invention shall be determined as per the standard of being favorable to subsequent determination of a technical motivation as possible. In patent agent practice, the more complicated and unusual the confirmed technical problem is, the smaller the chances are to get a technical motivation from the prior art.

Besides, the technical problem actually solved by an invention shall be determined based on the interactions between the distinguishing features in the whole invention and other technical
features but not limited to the inherent function or effect of the distinguishing features per se.

3. Common knowledge

Under the following circumstances, there exists a technical motivation due to a common knowledge: a technical means is a customary means in the art to resolve the redetermined technical problem or a technical means disclosed in a textbook or reference book to resolve the redetermined technical problem. It is prone to be neglected that a common knowledge also develops with the redetermined technical problem. It is understandable that a technical means being a common knowledge and a technical means being a common knowledge to resolve a certain technical problem are different. It is possible that a technical means is common and general but not the common and general technical means to resolve the technical problem. There are cases that a common knowledge is recognized without considering the technical problem in the examination opinions. In patent agency practice, an agent shall judge whether the technical means is the common knowledge to resolve the technical problem at the same time and then carry out related argumentation. Especially when the deviations exist in the technical problem per se confirmed to be actually solved by an invention, the determination and argumentation for a common knowledge shall be performed in combination with the accurate technical problem actually solved by the invention.

4. Problems in technical field in reference documents

The closest prior art (commonly called reference document 1) is seldom argued against from the perspective of technical field considering that an inventor can start the invention process based on any of the known prior art in the same or similar field, or even in the field with greater difference in terms of the actual accomplishment of the invention-creation. However, if the invention process is started on the basis of the closest prior art in the field with greater difference, it actually transfers the hardships in obtaining the invention-creation to the resolution state, namely the third step of the Three-step Method. As for the third step therefore, more considerations will be given to the technical field problems in other reference documents (commonly called reference document 2).

In patent agency practice, the argumentation can be carried out from the perspectives of different or even dissimilar field and the technical problem to be solved never prompting a person skilled in the art to look for technical means from other technical fields.

5. Different functions of reference documents

The difference in functions of technical means in reference documents is a usual perspective used in inventive step argumentation. It shall be realized that the functions of technical means in reference documents which can provide a technical motivation include: 1) the functions clearly
recorded in reference documents and the functions corresponding to the technical problem and effect clearly recorded; 2) the functions available for prediction or confirmation (realization) by a person skilled in the art. However, the functions objectively played by a technical means of reference documents are not definitely included. In examination opinions, there are many expressions such as “the reference documents have an objective function that …, which provide a technical motivation accordingly”. It is actually ignored that the objective functions are not equal to the functions available for recognition by a person skilled in the art under the state of the prior art on the application date. Theoretically, the same technical features would have definitely played the same functions. However, the capability to realize the functions is the key to determine whether there is a technical motivation. Therefore, in patent agency practice, if the functions and corresponding technical problem and effect are not clearly recorded in reference documents, the similar examination opinions can be argued against in term of an inventive step from the following perspectives: a person skilled in the art fails to realize the functions played by the technical means of the reference documents under the state of the prior art on the application date or the realized functions are for other purposes rather than this invention, and thus the reference documents do not provide a technical motivation accordingly.

V. Conclusion

The inventive step determination methods in Group 2 mentioned herein have the top effect priority, which can be used to directly and positively affirm the inventive step at any time. The inventive step determination methods in Group 1 have the second top effect priority, which can be used for the argumentation on the grounds that “the excuse to negate the inventive step is untenable”. When the inventive step determination methods in Group 1 are adopted to refute the inventive step examination opinions, the determination method identical to the specific determination method adopted in the examination opinions shall be selected for refuting. The common perspectives of inventive step argumentation based on the Three-step Method include: 1. fact finding; 2. technical problem actually solved by an invention; 3. common knowledge; 4. problems in technical field in reference documents; 5. different functions of reference documents. The argumentation points likely to be neglected include: technical problem per se is hard to be figured out; several cases with errors in confirmation of technical problems; a common knowledge is not the one to resolve a specified technical problem; the same functions played objectively do not inevitably lead to a technical motivation.

In conclusion, the authors intend to arrange and summarize the aforesaid common perspectives of inventive step argumentation based on the Three-step Method in order to provide in particular the proposals with respect to perspectives of inventive step argumentation prone to be neglected by the patent agents in practice.