18 An Empirical Study of Inventive Step in Japanese IP High Court Cases and Reconstruction of Its Test from a Functional View (*)

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The inventive step requirement is one of the most important requirements for patentability. This study firstly clarifies the functions of the inventive step requirement, which have not previously been fully studied in Japan, and then sets out a theoretical reorganization of the standards used in practice. According to the analysis in this study, the inventive step requirement, which evaluates the level of technical difficulty in creating the invention, functions as a means of sifting out inventions with low development costs but high protection costs, thereby ensuring that only inventions requiring an incentive for their creation are protected. The standards used in practice when judging the inventive step can be classified into two questions, which are whether it was sufficiently plausible to attempt to create the invention from prior arts and whether there was a reasonable expectation of success. Furthermore, this study includes a statistical analysis of recent Intellectual Property High Court cases and its comparisons with the US. It shows that the threshold of the inventive step requirement has changed dramatically in recent years, and that one reason for this change is that the reasoning in judging the inventive step has become more detailed than before. These changes demonstrate an interesting symmetry with recent changes after KSR in the US.

Ⅰ Introduction

The purpose of the Patent Act is stated to be the provision of incentives for creation via the granting of patent rights, thereby encouraging invention, but at the same time, the monopoly resulting from patent rights restricts access to inventions. The trade-off between incentives and access can be said to be the perpetual challenge for the Patent Act. The question of which inventions should be granted patent rights as inventions that satisfy the requirements for patentability is one of the most important issues in this area. Of these, the inventive step requirement prescribed in Article 29 (2) of the Patent Act is said to be the most important requirement for patentability.

Despite its importance, the inventive step requirement has not previously been subject to adequate study. In particular, there have been very few comprehensive, theoretical studies to date, which would appear to be due to the fact that judgments concerning the inventive step are highly individual. This study emphasizes the theoretical and comprehensive, in order to remedy this deficiency.

This study firstly examines the meaning and functions of the inventive step requirement in theoretical terms, and then collates and systematizes the current standards and techniques for judging the inventive step in practice based on this premise. In addition, this study provides an overview of evolution of case law in the Intellectual Property High Court and provides empirical and statistical analyses of the direction of changes therein, as well as the reasons for such changes. To date, there has been little empirical analysis of judicial cases in Japanese jurisprudence, so the analysis herein is one of the distinctive features of this study. Gathering data on judicial cases concerning the inventive step is comparatively easy, and it would appear to be of great benefit to use statistical analysis in order to ensure that one does not lose sight of the overall perspective regarding judgments on the inventive step, given that the cases concerned are highly individual in nature.

(*) This is an English translation of the summary of the report published under the Industrial Property Research Promotion Project FY2013 entrusted by the Japan Patent Office. IIP is entirely responsible for any errors in expression or description of the translation. When any ambiguity is found in the English translation, the original Japanese text shall be prevailing.

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Ⅱ The meaning and Functions of the Inventive Step Requirement

1 Conventional Arguments on the meaning of the Inventive Step Requirement

As to the purpose of the inventive step requirement in Japan, commentators points out that granting exclusive rights impedes activities by third parties, on the grounds that incentives to create inventions involving no inventive step are unnecessary[1]. This can be understood to mean that no incentives to creation are needed for inventions that do not satisfy the inventive step requirement, and that restricting access by users via protection has considerable adverse effects, but none of these comments are any more than remarks based on gut feeling, and there has been no detailed research in this area hitherto[2].

On the other hand, there are many detailed analyses in the USA. One study of note is provided by Merges, who advances the theory that the nonobviousness requirement (equivalent to the inventive step in Japan) is intended to provide an incentive to research institutes to carry out high-risk research and development[3]. This theory focuses on the standard for reasonable expectation of success[4], which is used in practice in the USA, and interprets the nonobviousness requirement as the question of the extent to which it was obvious in advance whether or not the invention would be successful, as well as proposing that nonobviousness should be affirmed when the uncertainty faced at the time of invention was such that there was a higher probability that the invention would not succeed. This theory can be said to be distinctive in that it focuses on the decision-making aspect of research and development. Another theory shows a similar analysis, which propounds that nonobviousness requirement functions to secure incentives to conduct research and development with a high social value[5].

Moreover, in Graham[6], the US Supreme Court says that nonobviousness requirement picks out "the class of those inventions which would not be disclosed or devised but for the inducement of a patent". This forms the cornerstone of a theory called the inducement standard of patentability[7], which is based on the premise that the nonobviousness of an invention depends on the cost of invention activities and the probability of success, and propounds that the protection of patent rights is required because the higher the cost and the lower the probability of success, the less likely it is that an invention will be created without an inducement in the form of patent rights.

2 The Analysis of the function of the Inventive Step Thereof

With reference to the foregoing, this study defines the inventive step as to assess " technical difficulty ex ante in the process of creating the invention." Moreover, it defines technical difficulty as the evaluation of whether or not "it is easy to devise how to create it from prior arts, and there is a high expectation of success of it." Technical difficulty serves as a proxy variable for both the scale of the anticipated cost faced before beginning the research project that led to the invention, and the social cost that would arise from granting protection in the form of patent rights (the restriction of access is a typical example of this). Thinking in these terms, the inventive step requirement can be understood as excluding inventions with low research and development costs but high protection costs from the scope of protection, thereby achieving a balance between incentives and access.

Consequently, the inventive step requirement offers patent protection only to those inventions which have at least a certain level of technical difficulty anticipated before creating the invention. Assuming that an invention is something that gives rise to some social value, it should be created under the protection of a patent only if the remaining value after the protection cost is deducted from the social value exceeds the research and development cost.. If the protection cost is not taken into account, there would be no disadvantage in granting patents to any invention, irrespective of the need for incentives for creation. However, in reality, the protection cost is so high (which means there is a trade-off between incentives and access) that it cannot be disregarded, so it is necessary to create the hurdle of the inventive step and grant patents only to inventions requiring the incentive of a patent, ensuring that access to inventions is not impeded. The hurdle of the inventive step requirement should not be so high as to deny protection to an invention that requires an incentive to its creation, nor should it be too low, taking into account the cost of protection.

3 The Role of the Inventive Step Requirement in the Patent System and its limitations

The most important function of the inventive

step requirement is sifting out inventions which do not require an incentive in the form of a patent, thereby eliminating the adverse effects of protecting such inventions. However, raising the hurdle of the inventive step when the adverse effects of protection are a problem will not solve the problem if even inventions which require an incentive are denied protection, as it will merely result in such inventions not being created. If the adverse effects of protection are a problem, other means should be employed to reduce the cost of patent protection[8]; if invention has a means to secure another incentive[9], there is the option of denying patent protection from the outset.

This is also consistent with debate in the USA. In the USA, the excessively high cost of patent protection in the software sector has been pointed out as one of the structural problems in the patent system[10]. Government reports have stated that the problem lies in the fact that the nonobviousness requirement is too lax[11], but in a paper that demonstrates the potential for using the nonobviousness requirement as a policy lever to deal with policy issues[12], Burk and Lemley point out that it is in fact a lack of incentives due to the nonobviousness requirement being too strict that is the problem in the fields of biotechnology and software[13], noting that the causes of the problems in the software sector include rights that are actually too broad and a lack of clarity concerning the scope of rights[14]. Moreover, Bessen and Meurer also stress the need to improve the clarity of the scope of patent rights (patent notice)[15].

If the inventive step hurdle is too strict, it will also sift out the inventions that do need incentives, so it will not provide a fundamental solution to the problem of the overly high cost of protection. In fields where patent protection is necessary in order to provide incentives, all that can be done is to strive to reduce the cost of protection by clarifying the scope of rights and promoting transactions.

Ⅲ The framework and Standards of the Inventive Step

Based on the observations concerning functions outlined in the previous chapters, this chapter summarizes current practice in Japan when making judgments on the inventive step. Due to the limitations of space, this summary concentrates on describing the basic approach; a detailed description of judicial precedent concerning each factor in judgments on the inventive step, approaches to allegations and evidence at each stage in examination, trial, and litigation, the inventive step in relation to special inventions, and comparisons with laws in other countries can be found in the main text of the report.

1 The Overall framework the Inventive Step assessment

In current practice, the inventive step requirement is assessed by the following steps: (1) finding of the claimed invention[16]; (2) finding of the (primary) cited invention; (3) finding of common ground and differences between them; and (4) judgment on differences (judgment on ease of arrival at the claimed invention). The judgment on ease of arrival is determined by whether or not it can be reasoned that a person skilled in the art would have easily arrived at the claimed invention based on the cited invention. The judgment on the inventive step is made in accordance with the aforementioned stages, based on the premise that the knowledge held by a person skilled in the art includes common general knowledge[17] and cited inventions (inventions listed in each item of Article 29 (1)). It is for the foreseeability of the inventive step judgments that common general knowledge and cited inventions are required to be the starting points of the judgments, though this framework could be regarded as formalistic. . Accordingly, stringent rules are required for findings and reasoning. For example, finding of the cited invention requires an enabling description or support of the invention[18]; this must be disclosed in a single publication and findings may not be made on the basis of a combination of multiple publications[19].

Deducing from the functions of the inventive step requirement as understood in this report, an ease of arrival should be judged as follows: First, the person making the judgment set out the path leading from the cited invention to the claimed invention; then he should demonstrate in light of common general knowledge that “it was sufficiently plausible to attempt to follow that path” (plausibility to try) and that “that path cannot be said to have had little prospect of success without excessive burden” (reasonable expectation of success). As well as having a theoretical basis, this definition would seem to explain current practice in judgments on the inventive step.

2 The Approach to Ease of Arrival

In the foregoing summary, the first element in

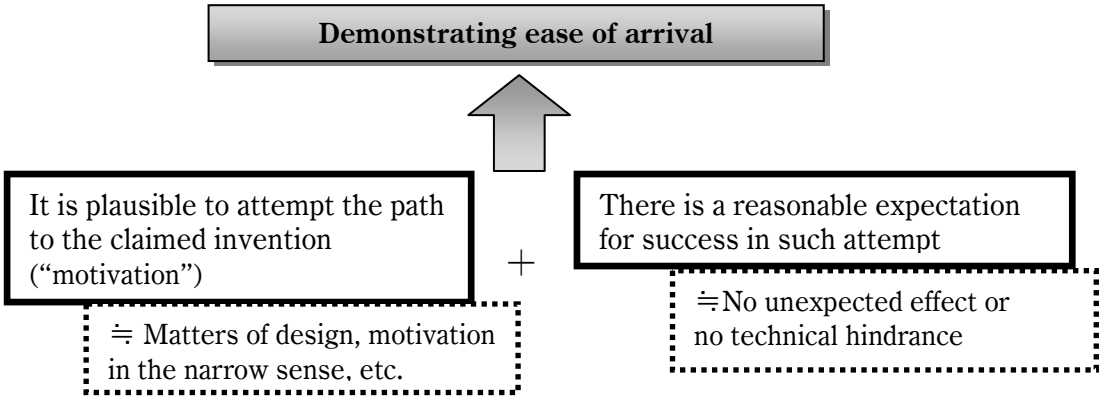
judgments on ease of arrival is the judgment on whether or not it can be demonstrated that it was sufficiently plausible to attempt to follow the path leading from the cited invention to the claimed invention. The question of what degree of plausibility is required to demonstrate this is a legal judgment and it is possible to use various criteria based on the fundamental stance. For example, suppose an invention is a means of solving a problem, one can consider how much detail should be provided regarding the inventive path from establishing the problem to reaching the means of solving it, in order to demonstrate the plausibility to try the invention[20]. If one takes the stance that a comparatively low level of inventive step is preferable, one should think in terms of requiring more detailed demonstration of the plausibility to try. A ruling of the Intellectual Property High Court dated January 28, 2009 stated that judgments concerning ease of arrival require "suggestion that the inventors would arrive at the invention, rather than an inference that they could have arrived at it"[21]; stressing the importance of understanding the problem of the invention when judging ease of arrival, it stated that the ease of arrival of the claimed invention should be considered in the view of the composition of the claim as a means of solving the problem[22]. This ruling can be understood as having adopted the stance that a detailed demonstration is necessary.

The Examination Guidelines cite "motivation" as a factor to demonstrate ease of arrival, which gives as specific examples the relevancy of technical fields, close similarity of problems to be solved, commonality of working or functions, and suggestions in the cited inventions[23]. Moreover, the Examination Guidelines state that choice of suitable material, mere design change, or mere aggregation are also factors in demonstrating ease of arrival[24]. These are also frequently used in case laws as facts establishing ease of arrival. The fact that combined secondary cited invention is a well-known art is often used in practice as well. All of these facts can be categorized as factors that demonstrate that the attempt was sufficiently plausible.

Moreover, if there is opposite facts from the facts above, it would be a factor that denies ease of arrival. These include lack of relevancy of technical fields and the fact that the cited invention focuses on a different direction from the claimed invention (teaching away). Some of the factors called "technical hindrance" in practice can be considered as one type of this.

This report takes the view that even if the plausibility to try can be affirmed ease of arrival is denied if this is not supported by a reasonable expectation of success. In practice, the fact that a claimed invention has an unexpected effect[25] and the existence of technical hindrance are used as factors affirming the inventive step. They can be understood to play a part in denying ease of arrival if there is no reasonable expectation of success. It would appear to be necessary for the existence of an unexpected effect to be disclosed on the specification, but there is no need to state on the specification itself that the effect was unexpected[26]. In this study, technical hindrance is defined as a factor that gives rise to a strong expectation that there is a technical obstacle or hindrance on the path from the cited invention to the claimed invention. There are a number of rulings in which the existence of an obstructive factor has been the decisive factor in affirming the inventive step[27].

The foregoing can be summarized in the form of the diagram below.



3 Summary

The framework based on the perspective of this study can provide a theoretical explanation of most of conventional practice. Factors used to demonstrate ease of arrival in practice include matters of design, well-known art, relevancy of technical fields, commonality with the cited inventions, obviousness of the problem, suggestions in the cited inventions, the fact that the cited inventions teach away from the claimed invention, technical hindrance, and unexpected effects. All of these factors can be classified and used as factors that affirm or deny either the plausibility of the path to arrive at the claimed invention or the fact of there being a reasonable expectation of success in the attempt. Although further details have been omitted from this summary of the full report, this approach would appear to be compatible with practice in Europe and the USA.

Ⅳ Empirical Analysis of the Inventive Step Case Law in Japan

The practice about the inventive step in Japan began to change its trends in around 2009 and it is said to have become easier to have a patent granted in recent years. This chapter conducts an empirical analysis of the development of case laws concerning the inventive step.

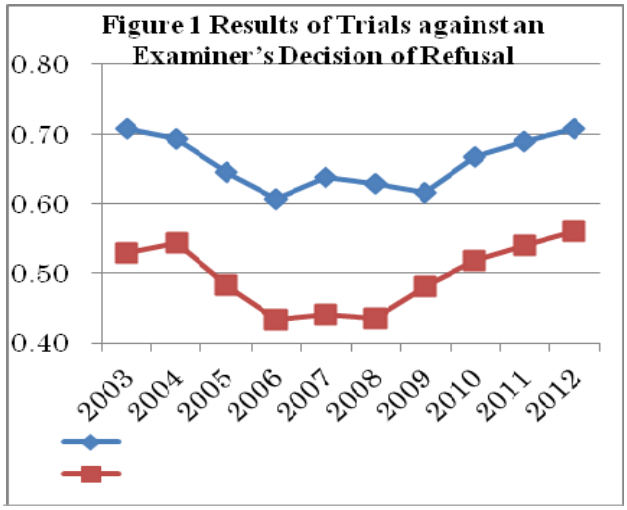
1 Background

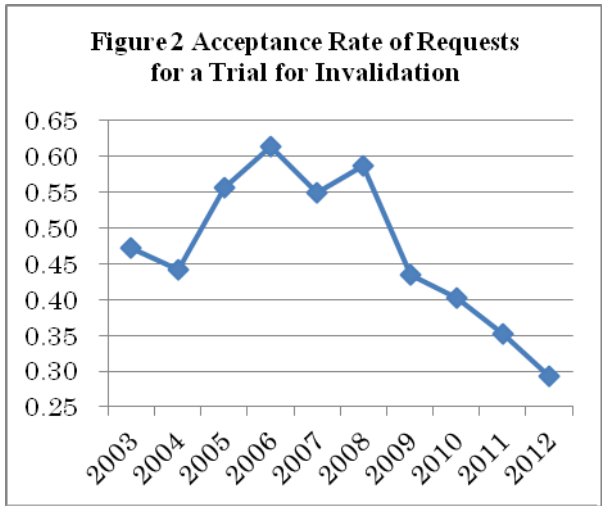
The way to judge ease of arrival in Intellectual Property High Court was criticized as denying the inventive step in too many cases, due to the "Same Technical Field Theory" and hindsight[28]. However, it is said to have become easier to have the inventive step accepted since the ruling of the Intellectual Property High Court dated January 28, 2009, Case No. 2043 at 117[29]. This ruling, employing the test which is some people say similar to the TSM test in the USA, seeks to increase the foreseeability of judgments on the inventive step by eliminating hindsight[30], and it has been pointed out that case laws thereafter have emphasized the problem to be solved by the invention, requiring detailed reasoning to affirm ease of arrival[31]. Some empirical studies have already showed this to some extent[32].

This study provides empirical evidence to prove the details, analyzing trends in trial decisions by the Japan Patent Office (JPO) in trials against an examiner's decision of refusal and trials for invalidation, and rulings by the Intellectual Property High Court in suits against an examiner's decision of refusal, and suits against the trial decision by the JPO in trials for invalidation. Furthermore, taking judgments by the Intellectual Property High Court in 2005 and 2012 as typical examples of rulings made at a time when judgments concerning the inventive step were strict and lax, respectively, the reasons for the change in trends in court judgments in each year are analyzed.

2 Statistics of the Inventive Step

(1) Trends in trial decisions by the JPO (2003-2012)

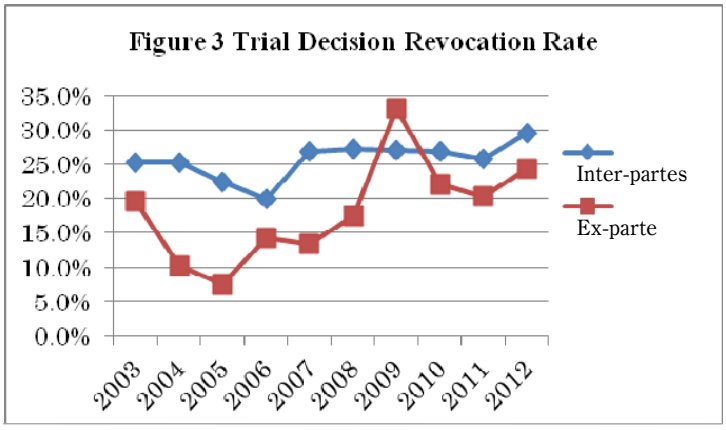




First, let us look at trends in JPO trials against an examiner's decision of refusal and trials for invalidation (Figures 1 and 2)[33]. These diagrams show that judgments by the JPO have been moving toward easier recognition of patents until around 2012 when compared to around 2006. As the major issues at trials are the inventive step requirements, it can be inferred that the JPO has tendency to lower the criteria of the inventive step since 2009[34].

(2) Trends in Intellectual Property High Court suits against the JPO trial decision (2003, 2005-2012)

(i) Overview of trends in suits against the JPO trial decision in the Tokyo High Court and the Intellectual Property High Court (2003-2012)



Next, let us look at trends in court judgments in suits against the JPO trial decision[35]. The revocation rate in inter-partes trials (trials for invalidation) has not changed a great deal throughout the period under analysis. On the other hand, the revocation rate in ex-parte appeals (≒ trials against an examiner's decision of refusal) was low in 2004-2005, but has been on the rise since 2009. In order to understand the disparity in trends between ex-parte appeals and inter-partes trials, I will analyzes suits against the JPO trial decision in which the inventive step was the issue in next section.

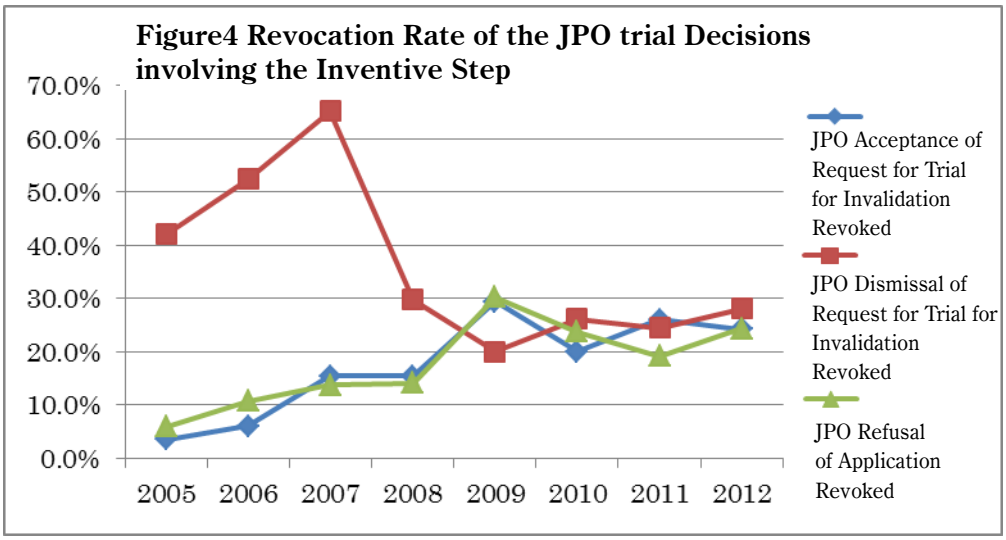
(ii) Detailed analysis of suits against the JPO trial decision in trials for invalidation (2005-2012)

I surveyed the rulings published on the Intellectual Property High Court's website in which the inventive step was the issue[36], with the results summarized in Table 1 and Figure 4.

2008 marked the watershed after which dramatic changes occurred in trends in judgments on the inventive step. Before 2008 there was a significant disparity in terms of the proportions revoked, between trial decisions that affirmed the inventive step and those that denied it. Among JPO decisions regarding invalidation trials which were later revoked by courts, the disparity between decisions in trials for invalidation where the request was accepted and those in which the request was dismissed must be attributed to the disparity in stances on the inventive step. Between 2005 and 2007, there was a tendency for the high court to deny the inventive step, but now it would appear to be eliminated.

Table 1 Number of Suits against the JPO Trial Decision per Year

	JPO trial decision accepting the request for invalidation		JPO trial decision dismissing the request for invalidation		P-value[37]	JPO trial decision dismissing the request against an examiner's decision	
	revoked	dismissed	revoked	dismissed		revoked	dismissed
2005	1	27	8	11	0.001	5	79
2006	3	47	11	10	0.000	11	91
2007	10	55	15	8	0.000	17	107
2008	6	33	11	26	0.134	18	110
2009	15	36	5	21	0.335	26	60
2010	6	24	11	31	0.542	23	74
2011	6	17	13	40	0.885	20	84
2012	8	25	16	41	0.692	28	87



(3) Summary

The tendency between 2005 and 2007 for a high proportion of rulings denying the inventive step and a low proportion affirming it to be upheld cannot be explained merely because the criteria of the inventive step was high[38]. In the sense that high courts had a bias to deny patentability at this time, they can be regarded as having been "anti-patent"[39] [40]. Now, at least, courts have returned to a neutral stance. Influenced by courts, the JPO has become more relaxed about recognizing patentability, and the courts are ratifying its decisions.

3 Analysis of factors used for Reasoning on Ease of Arrival (Comparison of 2005 and 2012)

(1) Principles and methods of analysis

To identify the causes of the change in judgments on the inventive step, I analyzed changes in the factors pointed out in judgments on ease of arrival.2005 was selected as a typical year during the period before the change in the overall trend in court rulings, while 2012 was selected as a typical year during the period after the change. This analysis focused on rulings in suits against the JPO trial decision made by the Intellectual Property High Court in 2005 and 2012 (for the period January 1 to March 31, 2005, the analysis focused on rulings by the Tokyo High Court)[41]. The survey focused on 173 rulings from 2005 and 207 rulings from 2012.

Table 2 Rulings Subject to Survey (2005 and 2012)

Trial Decision	Dismissed Prejudice on the Merits	(Partially) Approved	Total
Correction Rejected	5	0	5
Invalidation Rejected	11	8	19
Invalidation Accepted	27	1	28
Revoked (Objection)	30	7	37
Appeal Against Rejection Rejected	79	5	84
Total	152	21	173

Trial Decision	Dismissed Prejudice on the Merits	(Partially) Approved	Total
Correction Rejected	1	1	2
Invalidation Rejected	41	16	57
Invalidation Accepted	25	8	33
Revoked (Objection)	-	-	-
Appeal Against Rejection Rejected	87	28	115
Total	154	53	207

These rulings were collated and compiled into a database, classified according to the particular issue (a. Error in the finding of common ground and differences; b. Error in the judgment on differences (b-1. Error in the finding of the secondary cited invention; b-2. Error in the finding of facts used to establish ease of arrival (excluding facts relating to b-3.); b-3. Error in the finding of technical hindrance/unexpected effects); c. Procedural violation or others.), and the factors cited in rulings involving judgments on differences (rulings in which the issue was classed as b-2 or b-3) were recorded. More specifically, a record was made of whether or not the reason for the ruling "cites" or "does not cite" the following factors: i. Matters of design [42]; ii. Well-known art [43]; iii. Relevancy of technical fields; iv. No relevancy of technical fields[44]; v. Commonality with the primary cited invention; vi. No commonality with the primary cited invention [45]; vii. Obviousness of problem to be solved[46]; viii. Commonality with the secondary cited invention; ix. No commonality with the secondary cited invention[47]; x. Suggestions in the cited inventions; xi. No suggestions[48]; xii. Cited invention teaches away[49]; xiii. Technical hindrance; xiv. No technical hindrance [50]; xv. Unexpected effect; xvi. No unexpected effect[51]. As a result, 163 cases in 2005 and 203 cases in 2012 involving judgments concerning ease of arrival were recorded. Moreover, the number of cited inventions [52] used in the judgments was also recorded.

(2) Analysis of factors in judging ease of arrival

Table 3 shows the results. Figures 5-7 depict these results in the form of graphs.

Table 3 Overview of Factors Cited in Judgments on Ease of Arrival

	2012		2005	
Ease of arrival	Yes	No	Yes	No
Matters of design	58	3	79	1
Well-known art	75	31	85	7
Relevancy of technical fields	23	7	34	1
No relevancy of technical fields	0	9	0	1
Commonality with the primary cited invention	22	3	11	0
No commonality with the primary cited invention	4	27	7	6
Problem is obvious	26	3	21	2
Commonality with the secondary cited invention	33	3	28	0
No commonality with the secondary cited invention	2	40	6	10
Suggestions in the cited inventions	49	2	27	0
No suggestions	2	41	0	9
Cited invention teaches away	1	17	6	6
Technical hindrance	0	11	0	3
No technical hindrance	35	1	41	0
Unexpected effect	0	11	0	1
No unexpected effect	66	0	83	1
Total	124	79	142	21

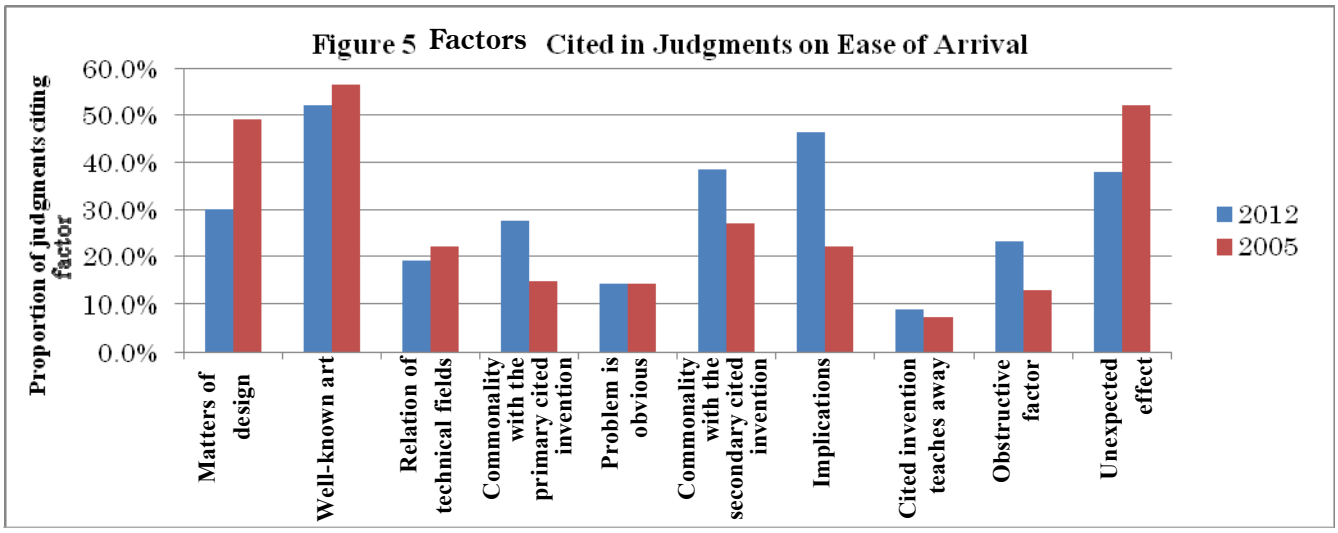


Figure 5 Factors Cited in Judgments on Ease of Arrival
Proportion of judgments citing factor
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Matters of design
Well-known art
Relation of technical fields
Commonality with the primary cited invention
Problem is obvious
Commonality with the secondary cited invention
Implications
Cited invention teaches away
Obstructive factor
Unexpected effect
2012
2005

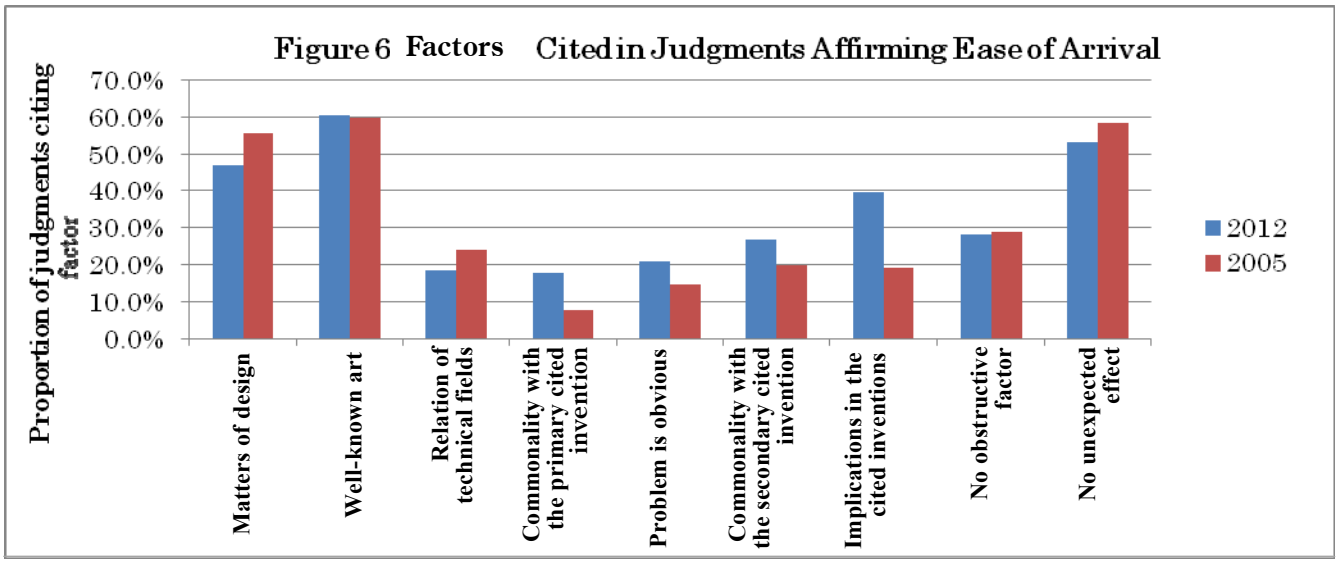


Figure 6 Factors Cited in Judgments Affirming Ease of Arrival
Proportion of judgments citing factor
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Matters of design
Well-known art
Relation of technical fields
Commonality with the primary cited invention
Problem is obvious
Commonality with the secondary cited invention
Implications in the cited inventions
No obstructive factor
No unexpected effect
2012
2005

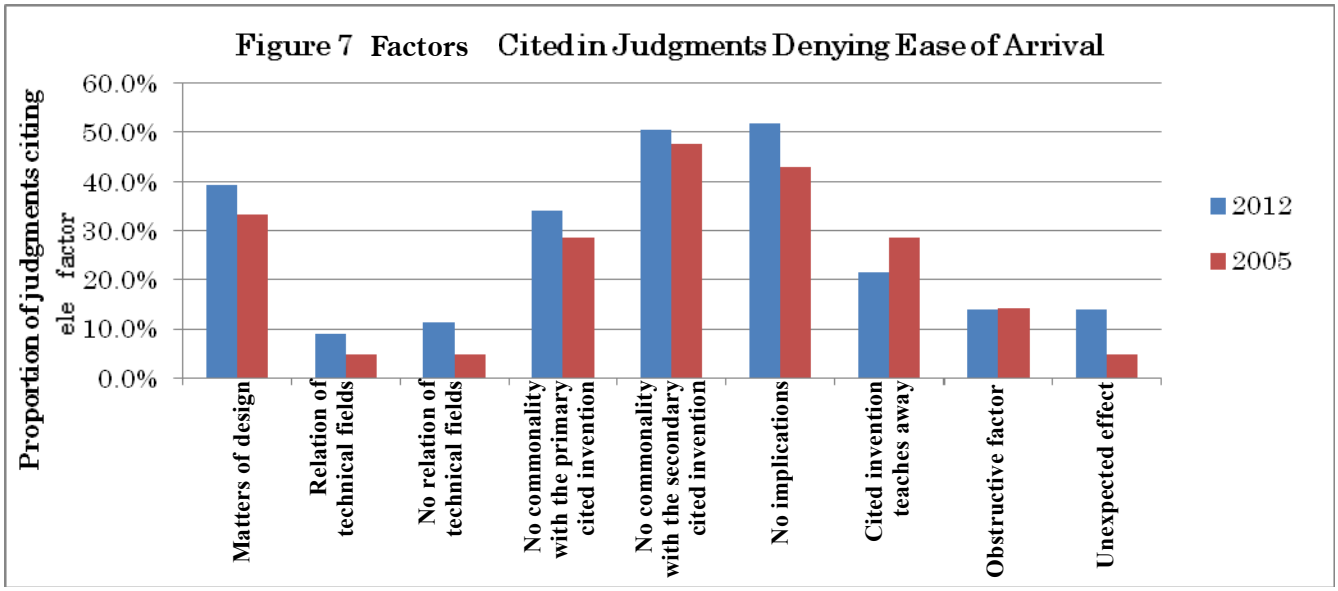


Figure 7 Factors Cited in Judgments Denying Ease of Arrival
Proportion of judgments citing factor
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
Matters of design
Relation of technical fields
No relation of technical fields
No commonality with the primary cited invention
No commonality with the secondary cited invention
No implications
Cited invention teaches away
Obstructive factor
Unexpected effect
2012
2005

The proportion citing suggestions in the cited inventions increased dramatically from around 20% in 2005 to almost half in 2012. It can be inferred that this stemmed from the fact that the ruling of the Intellectual Property High Court dated January 28, 2009emphasized the importance of suggestions. However, more than half of all judgments do not refer to suggestions at all, so it cannot be said that this ruling is playing a decisive role. Moreover, the proportion of rulings recognizing arguments for technical hindrances or unexpected effects has increased considerably. This too is understood to be a major factor contributing to the tendency to take a positive approach to ease of arrival.

Table 4 Proportion of Rulings in Which Ease of Arrival was Affirmed and Denied, by Factor Cited

Affirmed	2012	2005
Matters of design	95.1%	98.8%
Well-known art	70.8%	92.4%
Relevancy of technical fields	76.7%	97.1%
Commonality with the primary cited invention	88.0%	100.0%
Problem is obvious	89.7%	91.3%
Commonality with the secondary cited invention	91.7%	100.0%
Suggestions in the cited invention	96.1%	100.0%
No technical hindrance	97.2%	100.0%
No unexpected effect	100.0%	98.8%

Denied	2012	2005
Well-known art	29.2%	7.6%
Relevancy of technical fields	23.3%	2.9%
No relevancy of technical fields	100.0%	100.0%
No commonality with the primary cited invention	87.1%	46.2%
No commonality with the secondary cited invention	95.2%	62.5%
No suggestions	95.3%	100.0%
Cited invention teaches away	94.4%	50.0%
Technical hindrance	100.0%	100.0%
Unexpected effect	100.0%	100.0%

Furthermore, Table 4 shows the degree to which each factor cited contributed to the final judgment on ease of arrival. In 2005, well-known art and relevancy of technical fields were strongly linked to the conclusion, whereas in 2012, the link got weaker. This implies that the practice that had previously been the subject of criticism, in which these factors lead to an immediate conclusion of ease of arrival without taking other factors into consideration are no longer employed. Nevertheless, the fact of being a well-known art or the existence of relevancy of technical fields still remain key factors for affirming ease of arrival.

Ease of arrival is denied in all cases in which there are found to be technical hindrance or unexpected effects. This may demonstrate that the model used in this study – that ease of arrival is denied if there is no reasonable expectation of success – can explain actual case laws. Moreover, the rate of ease of arrival being denied rises if there is recognition of the factors no commonality with the primary cited invention, no commonality with the secondary cited invention, and cited invention teaches away. This shows that, as a result of more detailed reasoning on ease of arrival, it has become more likely that ease of arrival will be denied even if there are only a few factors inconsistent with ease of arrival. In 2012, it can be seen that the party seeking to demonstrate ease of arrival has a burden of explaining their reasoning in more detail.

Table 5 Proportion of Rulings Citing Conflicting Elements *Excluding well-known art

	2012	2005	p-value
Easily arrived at	0.073(9/124)	0.141(20/142)	0.075
Not easily arrived at	0.544(43/79) (0.241(19/79)*)	0.429(9/21) (0.190(4/21)*)	0.345(0.628)

Table 5 shows that whereas few rulings affirming ease of arrival cite factors oriented toward denial of ease of arrival, rulings denying ease of arrival tend to refer to factors affirming it more frequently [53]. Furthermore, in judgments affirming ease of arrival, there is a statistically significant decline in the proportion citing factors oriented toward denial in the figures for 2012. This implies that in 2012, the principle that the burden to prove ease of arrival lies with the party claiming it was being put into effect, and that there was a stronger tendency for ease of arrival to be affirmed only in cases in which more persuasive reasoning could be established.

(3) Analysis of Intellectual Property High Court rulings in 2012: Analysis of the effects of each factor on the conclusion that the invention was easily arrived at

(i) Principles and methods of regression analysis

The foregoing analysis shows that judgments on ease of arrival in 2012 gave more detailed consideration to each factor than they did in 2005. Accordingly, a more detailed analysis of 2012 rulings will now be conducted using multiple linear regression analysis, taking into account studies by Beebe focused on case laws concerning copyright law and trademark law[54].

In this analysis, the explained variable is whether or not ease of arrival was affirmed (affirmed=1, denied=0). The explanatory variables are the various factor dummies in the judgments on ease of arrival (however, those concerning technical hindrances and unexpected effects are excluded). If the factor was found, it was assigned the value 1, and if not, it was assigned the value 0. Moreover, a model that includes the number of cited inventions and the selection invention dummy (selection invention=1, not a selection invention=0) was also formulated. Analysis was carried out using the probit model with a robust standard error.

(ii) Results and discussions

Table 6 Regression Analysis of Judgments on Ease of Arrival as a Function of Each Factor (2012)

	(1)	(2)	(3)
Number of cited inventions		0.4915	
Matters of design	2.707***	2.952***	2.647***
Well-known art	1.776***	2.024***	2.087***
Relevancy of technical fields	0.7938	0.8241	1.055
No relevancy of technical fields*	0	0	0
Commonality with the primary cited invention	0.8443	0.8510	1.111
No commonality with the primary cited invention	-2.578***	-2.463***	-2.863***
Problem is obvious	2.129***	2.143***	2.528***
Commonality with the secondary cited invention	2.350***	2.241***	2.651***
No commonality with the secondary cited invention	-2.755***	-2.757***	-2.676***
Suggestions in the cited invention	2.093*	2.006*	2.355*
No suggestions	-3.754***	-3.681***	-4.033***
Suggestion of teaching away / beyond expectations	-2.938***	-3.036***	-2.850***
Selection invention			2.868***
Constant term	-0.4822	-1.330	-0.8475
Number of observations	191	191	191
Pseudo R^2	0.8699	0.8699	0.8795
Log likelihood	-16.554	-16.174	-15.038
Correctly classified	96.34%	96.34%	96.86%

Significance level: * 10%, ** 5%, *** 1%

(2) With number of cited inventions (3) With selection invention dummy

The results of the analysis are shown in Table 6. These results sustain the model that ease of arrival is judged as a function of all factors. According to the results of this analysis, relevancy of technical fields and commonality between the primary cited invention and the claimed invention make no significant contribution to affirmation of ease of arrival. The practice in which ease of arrival is affirmed immediately if identity of technical fields is confirmed is no longer carried out. Suggestions in the cited inventions do make a significant contribution as a factor in the affirmation of ease of arrival, but this factor hardly plays a predominant role over the other factors. It is certainly the case that the presence or absence of suggestions in the cited inventions plays an important role, but this actually tends to work in such a way that ease of arrival is denied if there are no suggestions. The existence of facts that puncture the consistency of the reasoning are regarded sensitively in judgments on ease of arrival, as factors denying ease of arrival.

4 Discussions

(1) Changes in judgments by the Intellectual Property High Court

The following circumstances would appear to be the reason of the shift between 2005 and 2012 toward a more positive stance on the part of the High Court in regard to the inventive step.

This study understands that judgments on ease of arrival depends on whether it can be demonstrated that it was plausible to try based on all existing factors, and whether there was no reasonable expectation of success due to the

existence of an unexpected effect or a technical hindrance. Taking this framework as the premise, the increased tendency for ease of arrival to be denied can be explained by two factors. The first is that the existence of technical hindrances or an unexpected effect has become significantly more likely to be recognized. The second is that there seems to be a growing tendency to affirm ease of arrival only when persuasive reasoning in the judgment is established after having taken all of the factors into close consideration.

This means that the Intellectual Property High Court has revised its previous anti-patent bias and has shifted to a stance of thoroughly verifying its reasoning and scrutinizing the arguments of the parties. Moreover, since 2009, the JPO has lowered the criteria of the inventive step and the courts are ratifying these moves.

(2) Comparison with changes in judgments on nonobviousness in the USA

Let us compare the foregoing observations with trends in the USA.

In the USA, it was said to be a problem that nonobviousness is too easily found because of the TSM test established by the Court of Appeals for the Federal Circuit (CAFC)[55]. The TSM test was revised in the KSR decision[56] by the Supreme Court in 2007, and it is believed that the tendency of nonobviousness rulings changed thereafter.

Nevertheless, in reality, the TSM test was not rigidly applied in judicial precedent prior to the KSR decision. Empirical studies by Cotropia[57] and by Petherbridge and Wagner[58] suggested that the TSM test actually had a positive effect on the stability of judgments. However, one empirical study that examined CAFC decisions after the KSR decision[59] shows that it has clearly become more difficult to have nonobviousness recognized although it is not the case that the TSM test ceased to be used after the KSR decision. Another empirical study also corroborates this point[60]. There is no doubt that the KSR decision raised the standard for patentability.

How does this change in the USA compare with changes in Japan's Intellectual Property High Court? In conclusion, the judgment frameworks currently used in Japan and the USA can be said to be closer to each other than they were previously.

A bias could formerly be seen in the rulings of Japan's Intellectual Property High Court, in that trial decisions affirming the inventive step in JPO were t upheld in IP high court at extremely low rate, while decisions denying it were upheld at extremely high rate; however, this bias is now being eliminated, with the former rising and the latter falling. On the other hand, in the case of CAFC, while no major disparity in the proportion of lower court decisions upheld was seen before the KSR decision[61], it was observed thereafter that the proportion of rulings denying nonobviousness that were upheld rose substantially, while the proportion affirming it that were upheld remained unchanged[62]. Whereas the phenomenon seen previously in Japan cannot be explained without the existence of an inconsistent bias, the phenomenon in the USA can be explained as something observed immediately after the criteria of the nonobviousness was raised[63]. For the present, at least, there is no bias in judgments in either Japan or the USA.

The empirical studies above suggest that even before the KSR decision when the TSM test was sometimes considered absolute, there was still a tendency for the TSM test to be applied flexibly. Now that the KSR decision has warned against the rigid application of the TSM test, it seems that the USA is in transition toward placing greater emphasis on the flexibility of judgments, as although it has not completely abandoned the TSM test, which is a clear standard. I previously pointed out that Japan is shifting toward requiring more detailed reasoning, while maintaining the flexible framework for judgments employed hitherto, attaching importance to suggestions in the cited inventions, without rigidly applying this criterion. While employing in some cases the high standard for predictability that was used in the USA, Japan is maintaining the good parts of its conventional flexibility in judgments on ease of arrival (obviousness). In this sense, Japan and the USA share greater commonality in terms of the fact that they are both endeavoring to achieve a balance between clear standards and flexible judgments.

Ⅴ Conclusion

The function of the inventive step requirement is to exclude from the scope of patent protection inventions whose creation cost is so small that they would be created even without patent protection, and inventions whose protection cost is too high, by measuring the technical difficulty ex ante in the process of creating the invention. The ramification from this approach is that the standards for the inventive step requirement should be sufficiently lax to protect all inventions that lack an incentive for their creation.

The standards for judgments on the inventive step in current practice can be reorganized on the basis of this understanding. The two issues are the

major questions in the inventive step judgment; One is whether it was plausible to try the path that led from the cited invention to the claimed invention, and the other is whether there was a reasonable expectation of success in this attempt. The factors involved in such judgments can be summarized as follows: the existence or otherwise of suggestions in the cited invention and relevancy of technical fields are used as factors for judging the former, while the existence or otherwise of technical hindrance and unexpected effects are used as factors for judging the latter.

Moreover, an empirical analysis of trends in recent judicial precedents and the factors therein has been carried out based on this framework. Previously, decisions in the Intellectual Property High Court were negative to affirming the inventive step, but this tendency has now disappeared. The primary reason for this is the growing tendency to verify ease of arrival on the basis of detailed content of the inventions. Case laws on nonobviousness have been evolving in the USA as well in recent years, and the changes that have taken place in opposite directions in Japan and the USA can be regarded as having resulted in increased commonality between them.

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[1] Nobuhiro Nakayama, The Patent Act (2nd Edition) (2011) at 134 (in Japanese). Nakayama points out that one can expect inventions involving no inventive step to be created, even if no incentive for their creation is given. Also, Japan Patent Office (ed.), Point-by-Point Explanation of Industrial Property Law (18th Edition) (2010) at 90; and Yoshiaki Aita, The Inventive Step in Inventions, in Minoru Takeda (Editor-in-Chief), Legal Principles and Issues in Patent Examinations and Appeal Trials (Japan Institute of Invention and Innovation, 2002) at 217-218 (both in Japanese). Kazuhiko Takeda, Patent Knowledge 8th Edition (Diamond, 2006) at 3 (in Japanese) and others point out that protecting inventions involving no inventive step could have an adverse effect on society.

[2] Yoshiyuki Tamura, 'Muddling Through' of Patent System towards Innovation (2), Intellectual Property Law and Policy Journal Vol.36 at 153 (in Japanese) presents the view that the inventive step requirement can be used as a patent policy lever. More specifically, he introduces Burk and Lemley's "Policy Levers Theory" (see Dan L. Burk & Mark A. Lemley, Policy Levers in Patent Law, 89 Virginia Law Review 1575 (2003)) and points out that the non-obviousness requirement can be used as a policy adjustment tool (ibid. at 172).

[3] Robert P. Merges, Uncertainty and the Standard of Patentability, 7 High Tech. L. J. 1 (1993).

[4] The idea that obviousness should be affirmed when there is an incentive to modify and combine prior art and there is a reasonable expectation of success (Manual of Patent Examining Procedure (Rev.9 August 2012) (hereinafter referred to as MPEP) §2143.02). In re O'Farrell, 853 F.2d 894 (Fed. Cir. 1988) states that a reasonable expectation of success is required for an invention to be obvious. (See Anna C. Chau and Irving N. Feit, The Obvious to Try Doctrine: Its Use, Misuse, and Abuse, 91 J. Pat. & Trademark Off. Soc'y 89 (2009) at 92.) There are those of the opinion that this standard played a decisive role in many lower court decisions in the immediate aftermath of the KSR decision (Stephen G. Kunin & Andrew K. Beverina, KSR's Effect on Patent Law, Mich. L. Rev. First Impressions (2007)).

[5] Michael J Meurer and Katherine J. Strandburg, Patent Carrots and Sticks: A Model of Nonobviousness, 12 Lewis & Clark L. Rev. 547 (2008).

[6] Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966).

[7] Michael Abramowicz and John F. Duffy, The Inducement Standard of Patentability, 120 Yale L.J. 1590 (2011).

[8] There are various measures, for example, reducing the scope of rights so that the need for a transaction does not arise (making the disclosure requirements stricter reduces the scope of protection. The relationship between disclosure requirements and the scope of protection is examined comprehensively in Takeshi Maeda, The Role of Disclosure by Means of the Specification in the Patent Act (2012) (in Japanese)), clarifying rights (clarifying for the method for the claim interpretation, etc.), and facilitating patent rights transactions (promoting patent pools, legislation concerning licenses, etc.)

[9] Even without patent rights, it is possible to make a substantial profit due to such factors as first-mover advantage, trade secrets, the time for others to copy, and the use of brands. Yoshiyuki Tamura, 'Muddling Through' of Patent System Towards Innovation (1), Intellectual Property Law and Policy Journal Vol.35 at 27 (in Japanese) cites from 31 onwards such surveys as the Yale Survey, the Carnegie Mellon Survey, and the NISTEP Survey, pointing out that these demonstrate that mechanisms other than the patent system play a relatively important role in securing incentives (ibid. at 50).

[10] Bessen & Meurer, Patent Failure: How Judges, Bureaucrats and Lawyers Put Innovators at Risk (Princeton University Press, 2008) at 106-109, 138-142, 187-194, and Dan L. Burk and Mark A. Lemley, The Patent Crisis and How the Courts Can Solve It (The University of Chicago Press, 2009), point out that the software and IT industry faces a problem in that the cost of patent protection is too high.

[11] To address the problem that too many patent rights give rise to adverse effects on licenses and the like, two reports by government institutions – Federal Trade Commission, To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy (October 2003), and National Academy of Science, A Patent System for the 21st Century (2004) – have recommended controlling the "quality" of patents, by raising the standard of the non-obviousness requirement. Moreover, the issue of the quality of patents was being discussed not only from the issue of the standards set by courts, but also in the form of doubts concerning the examination capabilities of the Patent Office (see Bessen and Meurer supra note 10 at 160-161. However, they are skeptical about such discussions.)

[12] See Burk and Lemley supra note 10 at 114-116 and supra note 2.

[13] Regarding biotechnology, Burk and Lemley supra note 10 at 150 advocate the need to encourage investment by reducing the standards of nonobviousness, and conclude that the tragedy of the anticommons (Michael A. Heller and Rebecca S. Eisenberg, Can Patents Deter Innovation? The Anticommons in Biomedical Research, Science 280 (5364): 698–701 (1998)) is caused by too narrow a scope of rights. Regarding software patents on the other hand, based on the theory of cumulative innovation (Robert P. Merges and Richard R. Nelson, On the Complex Economics of Patent Scope, 90 Colum. L. Rev. 839 (1990). This is the theory that, as cumulative progress is made in inventions, the scope of protection should be restricted from the perspective of transaction costs, while granting sufficient protection to secure incentives), they state that the nonobviousness requirement should be reduced in order to protect software inventions, which are gradually evolving (ibid. at 159).

[14] Burk and Lemley supra note 10 at 158-160.

[15] In the opinion of Bessen and Meurer supra note 10, the problems in the current patent system were brought about by the decline in patent notice that occurred from the mid-1990s, specifically changes in the method of claim construction, overly broad rights in software and biotechnology inventions, and the continuing increase in the number of patents that began in the 1980s. Moreover, regarding software patents, see Mark A. Lemley, Software Patents and the Return of Functional Claiming, Stanford Public Law Working Paper, No. 2117302 (2012) (proposing the definiteness of the scope of rights based on the interpretation of functional claims.) The 2011 report by the FTC (2011 FTC Report: The Evolving IP Marketplace: Aligning Patent Notice and Remedies with Aligning Patent Notice and Remedies with Competition) also suggests that there is a need to strengthen patent notice.

[16] Also called "finding of the gist of the invention," this is carried out on the basis of the claim language; if there are special circumstances, the statements in the detailed description of the invention in the specification are to be considered (ruling of the Supreme Court on March 8, 1991, Minshu Vol.45, No.3 at 123).

[17] In practice, both the terms "well-known arts" and "commonly used arts" are used. Well-known arts is the term used to refer to those inventions listed in each item of Article 29 (1) that are widely known to a person skilled in the art (to put it another way, inventions that are listed in each item of Article 29 (1) and are common general knowledge), so commonly used arts can be understood to be a type of well-known art. Examination Guidelines, Part II, Chapter 2, 1.2 (3); Report on the Inventive Step Review Conference 2007, at 131 and 147.

[18] the Intellectual Property High Court on August 19, 2010, Case No. 2009 (Gyo-Ke) 10180.

[19] Examination Guidelines, Part II, Chapter 2, 1.5.4 (4); the Intellectual Property High Court on September 26, 2007, Case No. 2006 (Gyo-Ke) 10174; the Intellectual Property High Court on May 12, 2010, Case No. 2095 at 108.

[20] The Intellectual Property High Court on January 31, 2011, Case No. 2010 (Gyo-Ke) 10075 states that "When making judgments on ease of arrival, it is necessary and essential to accurately identify the problem to be solved (action/effect, etc.) that was the purpose of the invention in question, and then to make a comprehensive judgment concerning 'whether it was easy to establish the problem to be solved' and 'whether it was easy to adopt the specific composition to solve that problem' in relation to this." (For a commentary on this, see Naoki Koizumi, Finding of Problems to be Solved in Judgments on the Inventive Step, Jurist No.1431 at 106 (2011) (in Japanese).)

[21] The Intellectual Property High Court on January 28, 2009 Case No. 2043 at 117 states that "In order to judge that the invention in question is easily arrived at, when considering the nature of the prior art, it is not sufficient merely to support the inference that the inventor could have made an attempt that enabled him/her to arrive at the features of the invention in question; it stands to reason that an suggestion should be required that the inventor should have done so in order to arrive at the features of the invention in question."

[22] The Intellectual Property High Court on January 28, 2009 Case No. 2043 at 117 and the Intellectual Property High Court on September 28, 2010 Case No. 2097 at 125 state, "The question of whether or not a person skilled in the art was able to easily arrive at the invention claimed in the application based on prior art shall be judged on the basis of whether or not it was easy to arrive at the features (composition that differs from the prior art) of the invention claimed in the application in regard to prior art, taking that prior art as the point of departure. However, as the features (composition that differs from the prior art) of the invention claimed in the application are intended to solve the problem that was the purpose of the invention in question, in order to make an objective judgment on whether or not there was ease of arrival, it is essential to accurately identify the features of the invention in question; in other words, it is essential to accurately identify the problem that was the purpose of the invention in question." (underlining by author).

[23] Examination Guidelines for Patents and Utility Models, Part II, Chapter 2, 2.5 (2).

[24] Examination Guidelines for Patents and Utility Models, Part II, Chapter 2, 2.5 (1). These are positioned in the Examination Guidelines as specific examples of "demonstration", and are treated differently from motivation.

[25] Examination Guidelines for Patents and Utility Models, Part II, Chapter 2, 2.5 (3) I. The Examination Guidelines state that if the effect is "distinctively beyond the expectation" – in other words, if it has a different effect from the cited invention or has the same effect but is markedly better, and these facts cannot be expected from the state of the art – the inventive step shall be affirmed, even if other elements have demonstrated that it was easily arrived at.

[26] The Intellectual Property High Court on July 15, 2010, Case No. 2099 at 124 accepted as evidence certificates of experimental results compiled after application when judging effects in the inventive step judgment. While accepting the principle that the existence of the effect must be disclosed on the specification, this decision considers experimental results supplied after the

application, as long as these do not go beyond the descriptions in the specification. The reason given for this is the fact that it is not possible to predict beforehand the type of allegations that will be made against the application. The Examination Guidelines, Part II, Chapter 2, 2.5 (3) II also state that effects claimed or proven in written opinions, etc. may be considered when they can be presumed from the specification. The Report on the Inventive Step Review Conference at 131 states that requesting advantageous effects from the outset is unfair to the applicant and that such written opinions are permitted to the extent that they are used to provide greater clarity regarding the effects that a person skilled in the art could presume from the specification, etc.

[27] Rulings including Intellectual Property High Court on October 28, 2009, Case No. 2008 (Gyo-Ke) 10377; Intellectual Property High Court on July 19, 2011, Case No. 2010 (Gyo-Ke) 10357; Intellectual Property High Court on September 28, 2011, Case No. 2011 (Gyo-Ke) 10056; and Intellectual Property High Court on September 12, 2007, Case No. 2007 (Gyo-Ke) 10007.

[28] According to Tomokatsu Tsukahara, Are These the Dying Days of the Same Technical Field Theory? Considering New Developments in Judgments on the Inventive Step in Patents, Patent Studies No.51 at 2 (2011) (in Japanese), it previously used to be a predominant approach that ease of arrival shall be found just if the identity of the technical fields were found,. Moreover, Eiji Katayama, Comments from Practitioners Concerning the Intellectual Property High Court, Jurist No.1326 at 20 (2007) (in Japanese) states that in recent years, the Intellectual Property High Court has been criticized for its practice of denying the inventive step in cases in which two technologies belonging to the same technical field are combined, deeming that there is ease of arrival at the combination, unless it is proven that there are technical hindrance.

[29] Yoshiyuki Tamura points out that it was the 2009 decision that triggered changing trends in Intellectual Property High Court judgments (Yoshiyuki Tamura, Challenges Facing the Third Division of the Intellectual Property High Court: Preventing Hindsight in Judgments on the Inventive Step Requirement (Westlaw Japan, column dated March 7, 2011, http://www.westlawjapan.com/column/2011/110307/ (in Japanese)); Tsukahara supra note 28); Masato Tanaka and Hiromi Furukawa, Characteristics of Trends in Recent Judgments by the Intellectual Property High Court Concerning the Inventive Step in Inventions, Chizaiken Forum Vol.86 at 56 (2010) (in Japanese) also demonstrates a similar awareness.

[30] Seiji Ohno, Criteria for Judging the Inventive Step – The Circuit Connecting Component Case, Nobuhiro Nakayama et al. (eds.), The Top 100 Patent Rulings [4th Edition], at 34 (2012) (in Japanese). Moreover, Iimura, who was the presiding judge in the 2009 decision, compares Japan's flexible approach to the inventive step with the TSM test and points out that the TSM test is effective in eliminating hindsight, as it functions as a requirement (an element without which the inventive step cannot be denied). (See Toshiaki Iimura, Judging the Inventive Step in Patent Litigation, Daini Tokyo Bar Association Study Group of Intellectual Properties (ed.), A Comparison of Patent Law in Japan and the USA (2009, Shojihomu) at 195 (in Japanese).)

[31] Tsukahara supra note 28 points out that the Same Technical Field Theory was once predominantly used in practice in Japan, but that denial of the inventive step solely on grounds based on the Same Technical Field Theory has declined considerably over the last two or three years, and a renewed awareness of the importance of recognizing the problem is among the reforms that are occurring.

[32] Shin Tokii, The Current Status of Judgments on the Inventive Step and the Potential for Their Application (1), Intellectual Property Law and Policy Journal Vol.41 at 125 (2012), and The Current Status of Judgments on the Inventive Step and the Potential for Their Application (2), Intellectual Property Law and Policy Journal Vol.42 at 172 (2013) (both in Japanese). Tohru Kobayashi, Yushi Segawa, Toshiya Watanabe, et al., Changes in the Proportion of Trial Decisions Upheld in Rulings on Suits Against the JPO Trial Decision in Trials for Invalidation and the Background to This: An Analysis of Rulings between FY2006 and FY2008 on Suits Against the Trial Decision Concerning Patent Rights and Utility Model Rights, PARI Working Paper Series No.1 (2009) (in Japanese).

[33] All data gathered from the Japan Patent Office Annual Report (http://www.jpo.go.jp/shiryou/toukei/nenpou_toukei_list.htm). These data are all totals for each calendar year (January 1 – December 31).

[34] Assuming that there is no bias throughout the period under analysis in relation to which inventions are the subject of a trial against an examiner's decision of refusal or a trial for invalidation, the rates above represents the criteria of the inventive step. If one assumes that the lowering of the inventive step criteria results in proceedings for trials against an examiner's decision of refusal that petitioners would normally not have taken the trouble to initiate, and in petitioners giving up on trials for invalidation that they would normally have been expected to proceed with, the change of the rates above should be canceled out. However, the fact that there continue to be changes in these rates means that either such behavior does not occur or there is a pronounced tendency toward change that exceeds the effects of such behavior. In addition, at least in the case of trials against an examiner's decision of refusal, such changes in behavior appear to have no effect, with the number of proceedings being initiated rising from 22,000 cases in 2005 to a peak of 30,000 in around 2007-2008, and then holding steady at around 25,000 thereafter. On the other hand, trials for invalidation peaked at 358 in 2004 and have subsequently been on the decline, albeit only slightly, falling to 269 cases in 2011 and 217 in 2012; there are many conceivable factors behind this decline, so one cannot tell whether a change in behavior affected this trend.

[35] Data obtained from the Japan Patent Office Annual Report (supra note 33). Ex-parte refers to trials against an examiner's decision of refusal and trials for correction, while inter-partes refers to trials for invalidation.

[36] http://www.ip.courts.go.jp/search/jihp0010? The Intellectual Property High Court's "searchable database of judicial

precedents contains almost all decisions (in infringement lawsuits and suits against the JPO trial decision) made since the Intellectual Property High Court was established on April 1, 2005." For the period January 1 to March 31, 2005, the analysis also focused on decisions that could be obtained from the court website. In this survey, the search conditions were set to search for decisions made between January 1 and December 31 each year, in which the types of rights concerned were patent rights and utility model rights, the types of cases were suits against trial decisions (refusal), suits against trial decisions (invalidation/accepted), and suits against trial decisions (invalidation/rejected), and the rulings contained the keyword "inventive step". The results were then collated, with those that were not classed as "dismissal with prejudice on the merits" being regarded as a judgment of revocation.

[37] The chi-square test was used to verify whether there was a statistically significant difference between trial decisions in which the invalidation was accepted and trial decisions in which the invalidation was rejected, in terms of whether or not dismissal with prejudice on the merits was approved in suits for revocation.

[38] This is because of the following reasoning. Assuming that the inventive step criteria will not change unless the courts take the lead, then in a stable situation, it is assumed that trial decisions will be revocated only if there has been an error which occurs in fixed rate in judgment. In this situation, it is likely that the proportion of decisions upheld will not differ between lower court judgments affirming the inventive step and those denying it, no matter how harsh an approach is taken to the inventive step. Moreover, if the courts raise the standard after the JPO has been judging the inventive step on the basis of a low standard for a long time, it is likely that the increased standard will reduce the necessity of revocationg decisions denying the inventive step and the proportion of decisions upheld will rise, but assuming that the error rate in lower courts does not change, there should be no change in the proportion of rulings upheld in regard to decisions affirming the inventive step. If the criteria is lowered, one should observe the converse phenomenon. The imbalance in the proportion upheld hitherto cannot be explained by either of these, so one can only conclude that either the JPO tended to be inconsistent in affirming patentability, or the courts tended to be inconsistent in denying it.

[39] Here, the term "anti-patent" is used in the sense of "a tendency to try to deny patentability without consistent criteria, which goes beyond merely having a high standard to patentability. The same applies to the term "pro-patent".

[40] As stated in supra note 38, one strong possibility is that the high courts are merely in the position of rectifying the trial decisions of the JPO, so it is actually possible to interpret this as the courts having done no more than rectify errors made by the JPO, which was systematically and disproportionately pro-patent at that time. However, in light of the relationship between the JPO and the courts in Japan, it seems natural to take the view espoused in this paper.

[41] Of the decisions published on the court website, the survey focused on those that were shown in the results of a search using the keyword "inventive step". All of these were read and those in which no judgment was actually made on the inventive step were excluded.

[42] If the reason for the decision stated that there was no particular technical significance in the differences between the claimed invention and the cited invention, or that they were design-related matters that the party could shape as they wished, the decision was classed as citing this element; if it did not, it was classed as not citing it.

[43] If, in the reason for the decision, it was found that the technical matters applied to or combined with the cited invention in order to arrive at the claimed invention were already well known in the technical field in question, the decision was classed as citing the fact that it was a well-known art; if not, it was classed as not citing it.

[44] If, in the reason for the decision, it was found that the cited invention and secondary cited invention belonged to the same technical field or a closely related one, or that the cited invention and the claimed invention belonged to the same technical field or a closely related one, the decision was classed as citing relevancy of technical fields; if a party's assertion to this effect was rejected or the matter was not discussed, it was classed as not citing it. Moreover, if, in the reason for the decision, it was actively found that the cited invention and secondary cited invention belonged to different technical fields, or that the cited invention and the claimed invention belonged to different technical fields, the decision was classed as citing no relevancy of technical fields; if a party's assertion to this effect was clearly rejected or the matter was not discussed, it was classed as not citing it.

[45] If, in the reason for the decision, it was found that the claimed invention and primary cited invention had commonality in their technical concepts, or that there were facts indicating commonality in the problem, purpose, action, or function, the decision was classed as citing commonality with the primary cited invention; if a party's assertion to this effect was rejected or the matter was not discussed, it was classed as not citing it. Moreover, if, in the reason for the decision, it was found that the claimed invention and primary cited invention had different technical concepts, or that there were facts indicating a different problem, purpose, action, or function, the decision was classed as citing no commonality with the primary cited invention; if a party's assertion to this effect was rejected or the matter was not discussed, it was classed as not citing it.

[46] If, in the reason for the decision, it was found that the problem addressed by the claimed invention was obvious to a person skilled in the art, or that there were facts indicating that it was a general problem well known to a person skilled in the art, the decision was classed as citing obviousness of the problem; if not, it was classed as not citing it.

[47] If, in the reason for the decision, it was found that the secondary cited invention and primary cited invention or claimed invention had commonality in their technical concepts, or that there were facts indicating commonality in the problem, purpose, action, or function, the decision was classed as citing commonality with the secondary cited invention; if a party's assertion to this effect was rejected or the matter was not discussed, it

was classed as not citing it. Moreover, if, in the reason for the decision, it was found that the secondary cited invention and the claimed invention or primary cited invention had different technical concepts or technical content, or that there were facts indicating a different problem, purpose, action, or function, the decision was classed as citing no commonality with the secondary cited invention; if a party's assertion to this effect was rejected or the matter was not discussed, it was classed as not citing it.

[48] If, in the reason for the decision, it was found that the cited invention contained facts indicating the existence of suggestions that should allow the claimed invention to be arrive at, such as cases in which the cited invention suggested the existence of the problem addressed by the claimed invention, or in which suggestions of a specific means of improvement could be identified in the cited invention, the decision was classed as citing suggestions in the cited inventions; if the existence of such suggestions was clearly denied, it was classed as citing no suggestions; and if neither matter was touched upon at all, it was classed as not citing it.

[49] If, in the reason for the decision, it was found that there were facts indicating that not only were there no suggestions, but also that the cited invention actually pointed in a different direction from the claimed invention, such as cases in which the content of the cited invention was such that the path leading to the claimed invention was far beyond the expectation, or implied a different path, the decision was classified as citing the fact that the cited invention teaches away; if not, it was classed as not citing it.

[50] If, in the reason for the decision, it was found that there was a strong expectation of a technical obstacle on the path from the disclosed cited invention to the claimed invention, it was classed as citing the existence of an technical hindrance. If the decision itself used the term "technical hindrance," but it could clearly be understood to have cited teaching away from the cited invention, the decision was classified into the teaching away category, but if both could be understood from the decision, the wording of the decision was respected and it was classed as citing technical hindrances. If the decision clearly denied the existence of an technical hindrance, it was classed as citing no technical hindrance, and if neither matter was touched upon at all, it was classed as not citing it.

[51] If, in the reason for the decision, it was found that the claimed invention contained a distinctive effect that could not be expected from the cited invention, the decision was classed as citing an unexpected effect; if the existence of such an effect was clearly denied, it was classed as citing no unexpected effect; and if neither matter was touched upon at all, it was classed as not citing it.

[52] The primary cited invention and number of secondary cited inventions that are not well-known art. If only the primary cited invention and well-known art are cited, this figure is 1.

[53] The proportion of decisions affirming ease of arrival that cited elements negating the affirmation of ease of arrival (no relevancy of technical fields, no commonality with the primary cited invention, no commonality with the secondary cited invention, no suggestions, cited invention teaches away) and the proportion of decisions denying ease of arrival that cited elements supporting its affirmation (matters of design, well-known art, relevancy of technical fields, commonality with the primary cited invention, problem is obvious, commonality with the secondary cited invention, suggestions in the cited inventions, no technical hindrance, no unexpected effect) were compiled. Furthermore, the chi-square test was used to verify whether there is a statistically significant difference between the two proportions. As shown in the table, in judgments affirming ease of arrival, there is a statistically significant difference between 2012 and 2005 at the 10% level, but there is not a significant difference between them in judgments denying it. Stata IC 13.0 was used to compile the data and apply the chi-square test. Figures in brackets indicate cases in which well-known art was excluded as a positive element.

[54] Barton Beebe, An Empirical Study of U.S. Copyright Fair Use Opinions, 1978–2005, 156 University of Pennsylvania Law Review 549 (2008) and Barton Beebe, An Empirical Study of the Multifactor Tests for Trademark Infringement, 94 California Law Review 1581 (2006). (Hereinafter cited as Beebe (2008) and Beebe (2006), respectively.)

[55] Federal Trade Commission, supra note 11.

[56] KSR International Co. v. Teleflex Inc. 550 U.S. 398 (2007).

[57] Christopher A. Cotropia, Nonobviousness and the Federal Circuit: An Empirical Analysis of Recent Case Law, 82 Notre Dame L. Rev. 911(2006-2007).

[58] Lee Petherbridge and R. Polk Wagner, The Federal Circuit and Patentability: An Empirical Assessment of the Law of Obviousness, 85 Tex. L. Rev. 2051 (2007).

[59] Jennifer Nock & Sreekar Gadde, Raising the Bar for Nonobviousness: An Empirical Study of Federal Circuit Case Law Following KSR, 20 Fed. Cir. B.J. 369 (2010-2011).

[60] Jason Rantanen, The Federal Circuit's New Obviousness Jurisprudence: An Empirical Study, available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2210049.

[61] Petherbridge and Wagner, supra note 58.

[62] Nock and Gadde, supra note 59 at 398. The affirmance rate of obviousness in infringement suits on appeal rose from 40.4% before KSR to 78.9% after, whereas the affirmance rate of nonobviousness on appeal declined slightly, from 56.1% to 52.5%.

[63] See the explanation in supra note 38. While CAFC undeniably raised the nonobviousness standard, it is not the case that it is biased in favor of affirming obviousness.