Relationships Between Patent Claim Terms and Competitiveness in Lawsuits

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Abstract

The mere acquisition of a patent does not guarantee success in a claim of patent infringement. The patent claim terms of a patent claim play a crucial role in patent enforcement or litigation, since they are the primary determinant of the scope of the patent right. This study quantitatively analyses patent claims involved in patent infringement lawsuits in Japan. On the whole, patent claims which have fewer terms functioning as limitations on the patent claims are advantageous in patent infringement lawsuits. Moreover, among patent claims that have more terms functioning as limitations of the patent claims, those which have more words specifying the relationships between the terms are more likely to be successful in lawsuits.

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1. Introduction

Since various technologies such as semiconductors and electronics are related to and depend on one other in several key industries, patents necessary to manufacture products are prone to be owned by multiple patentees. This situation is called a "patent thicket".[1] Market participants worry that their new products could infringe on patents issued after these products are designed and go on sale. Cross-licensing is a natural and effective method to cut through the patent thicket. Nagaoka and Kwon have found cross-licensing plays an important role especially in the electronics industry of Japan[2], where the number of patents has been emphasised.[3]

However, the rise of "fabless" industry in developing nations has brought fierce competition to manufacturing industries in particular.[4] This has had a major impact on the cross-license business approach. "Fabless", short for "fabrication-less", refers to a company that has no manufacturing facilities. The fabless industry has grown remarkably in the past decade by specialising in the design and sale of products and putting new products into markets quickly. The mobility of the fabless industry has been utilised together with competitive prices to great advantage. In fact, fabless industry has begun eating away at many Japanese companies' market shares. The fabless industry accords priority to the swift evolution of a product over the establishment of a patent portfolio, which requires many years. This has led to interference with the traditional cross-licensing model. Japanese companies are facing a greater need for enforcement of patent rights than ever before, in order to secure their business and profits in this emerging business environment. Enforcement of patent rights often leads to conflicts with other parties, so it is crucial for companies to own a so-called "competitive patent" rather than a great number of patents. The terms "competitive patent" or "competitiveness" refer to patents that provide the plaintiff with a high possibility of winning in a patent infringement lawsuit. A competitive patent enables the holder to dominate the maximum technological scope of the invention, and to exclude competitors from this scope. Recent fierce competition has shifted the emphasis in patenting from macro-perspectives, such as the number of patents, to micro-perspectives such as the competitiveness of a patent.

However, many previous studies have been concerned with patent value rather than this competitiveness.[5] In such studies, patent value is usually evaluated from an

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[1] C Shapiro, "Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting" in A B Jaffe, J Lerner and S Stern (eds), *Innovation Policy and the Economy Volume 1* (Cambridge: MIT Press, 2001) 119-150.

[2] S Nagaoka and H Kwon, "Unilateral vs. Cross Licensing: How Do Firm Characteristics Affect Licensing Decisions?" (2003) WP#03-02 *IIR Working Paper*.

[3] K Onishi and Y Okada, "Determining Factors in Agreement Modes of Patent Licensing-Company Size and Patent Thicket" (2005) 52 *Japan Economic Research* 44-66.

[4] L Lu, S Hung and C Yang, "Successful Factors of the Fabless IC Industry in Taiwan" (2004) 6 *International Journal of Manufacturing Technology and Management* 98-111.

[5] H Ernst, "Patent Portfolios for Strategic R & D Planning" (1998) 15 *Journal of Engineering and Technology Management* 279-308; H Ernst, "Patent Applications and Subsequent Changes of Performance: Evidence from Time-Series Cross-Section Analyses on the Firm Level" (2001) 30 *Research Policy* 143-157; BH Hall and RH Ziedonis, "The Patent Paradox Revisited: an Empirical

economic or financial point of view. In contrast, we have studied patent competitiveness based on a quantitative analysis of claim structure. Claim structure is comprised of types of patent claim (e.g. independent claim, dependent claim) and numbers relevant to patent claims and claim categories. Claim structure is related to overlap among patent claims of a single patent, and operational breadth of patent claims. Analysis of claim structure using multiple parameters quantitatively visualises the overlap and operational breadth of the claims of a patent. It has been shown that there are close relationships between claim structure and patent competitiveness.[6] In patents which have been determined in court to have been infringed (i.e. winning patents), the total number of independent claims increased with the number of prior inventions, but this did not apply to losing patents. This implies that, in order to construct patents that will be successful in patent infringement lawsuits, patent practitioners must prepare independent claims based on the number of prior arts. To accomplish this, patent practitioners must have a complete view of the technological state of the invention by thoroughly researching prior art. Claim structure focussing on the number of claims, including independent claims, is a useful indicator for patent practitioners in obtaining patents that could be successful in patent infringement lawsuits.

2. Existing Research

Although a judge in a patent infringement lawsuit makes a decision based not only on each of the patent claims but also the specification of the patent, the scope of the patent right is determined primarily from the description of each single patent claim.[7] Therefore, patent practitioners must take great care in preparing a patent claim. A checklist for preparation of patent claims and specification has been proposed, to improve execution of patent rights.[8] The checklist includes the following characteristic features for preparation of patent claims and specification: target definition (1); verifiability of patent infringement (2); inevitability of utilisation (3); ease of royalty estimation (4); ease of comparison (5); non-ambiguity of technical terms (6); ability to be understood (7); thoroughness of embodiment description (8); logical consistency (9); clarity of technological description (10); fairness (11); appropriateness of disclosure of conventional technology (12); and ease of

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Study of Patenting in the U.S. Semiconductor Industry, 1979-1995" (2001) 32 (Issue1) *RAND Journal of Economics* 101-128; M Hirschey and VJ Richardson, "Valuation Effects of Patent Quality: A Comparison for Japanese and U.S. firms" (2001) 9 *Pacific-Basin Finance Journal* 65-82. M Hirschey and VJ Richardson, "Are Scientific Indicators of Patent Quality Useful to Investors?" (2004) 11 *Journal of Empirical Finance* 91-107. J Lanjouw and M Schankerman, "Patent Quality and Research Productivity: Measuring Innovation with Multiple Indicators" (2004) 114 *The Economic Journal* 441-465; JR Allison, MA Lemley, KA Moore and RD Trunkey, "Valuable Patents" (2004) 92 *Georgetown Law Journal* 435-474.

[6] T Miyazawa and H Osada, "Quantitative Indicators for Evaluating the Competitiveness of Patent" (2010) 5 *Journal of Intellectual Property Law & Practice* 192-199; T Miyazawa and H Osada, "Relationships between Claim Structure and the Competitiveness of a Patent" (2010) 5 *Journal of International Commercial Law and Technology* 132-141.

[7] A Kato, "Methods for Interpretation of Claims and Fundamental Considerations (1)" (2004) 57(No. 12) *Patent* 52-66.

[8] The Second Subcommittee of the Second Patent Committee, "Quality of Patent Specifications that Enable to Exercise the Rights" (2006) 56 *Management of Intellectual Property* 1547-1553.

implementation (13). All of the above characteristic features except (8) and (12) are related to preparation of patent claims, indicating how important it is to prepare a claim with attention to detail. However, the contents of this checklist are not based on empirical data, but seem more to reflect the attitude a patent practitioner should have in preparing claims.

There have been few quantitative studies on the relationship between a claim description and the outcome of patent infringement lawsuit. In one of them, Abiko found a tendency for patent claims which have fewer noun phrases to be successful in more patent infringement lawsuits.[9] By not overly limiting the claims with qualifiers like the noun phrases, a broader scope for the patent rights could be interpreted. This tendency has been clearly observed for section B (performing operations, transporting) of International Patent Classification (IPC). However, the tendency was comparatively less pronounced for patents in section G (physics). Furthermore, the tendency was not observed for those in section H (electricity) of the IPC. A strategy for obtaining a competitive patent applicable to a wide range of technologies has yet to be defined clearly.

3. Points of Study

This study analyses descriptions of patent claims for which courts in Japan identified the presence or absence of patent infringement. The paper is organised as follows: the following two sections outline the data and the parameters used to analyse the descriptions of the patent claims.

The parameters include the numbers of terms functioning as limitations of the patent claim (i.e. limitation terms), and the number of words like "the", "this", and "said" that denote a relationship between terms by specifying an aforementioned term in the patent claim (i.e. specifying words). It is of particular note in this study that a relationship between terms of a patent claim is taken into account. The above terms and words play key roles in determining the scope of a patent right. The fifth section presents results obtained by analysing descriptions of the patent claims. One of the main findings is that, among patent claims which have low numbers of limitation terms, patent claims having the fewest terms functioning as such are more likely to be declared infringed upon: i.e. win patent litigation. In contrast, among patent claims that have many limitation terms, patent claims having more specifying words are more likely to be declared infringed upon. The discussion section follows the results section, and the last section presents our conclusions.

4. Data for Analysis

In this study, patents involved in patent infringement lawsuits were collected using precedent information retrieval system websites offered by Japanese courts[10] and the database of patent precedents in Japan offered by Patent Bureau Co., Ltd,[11] which list

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[9] G Abiko, "The Quantification of Risk and Return in Infringement Suit Based on the Extent of Technical Scope" (2011) 8 *Journal of Intellectual Property Association of Japan* 88-99

[10] Courts in Japan, Precedent Information Retrieval System available at. http://www.courts.go.jp/search/jhsp0010?action_id=first&hanreiSrchKbn=01 (accessed 1 Aug 2012).

[11] Patent Bureau Co., Ltd. "Database of patent precedents" (last update) available at http://tokkyo.hanrei.jp (accessed 1 Aug 2012).

patent infringement lawsuits filed in trial courts in Japan during the period of 1967-2007. Patents whose applications had been filed after 1 January 1976 were extracted from the collected data. This was when the revised Japanese Patent Law, in which the original adoption of multiple claiming took effect, was enacted with the aim of clarification of patent right protection. In this way, 380 patents were extracted, excluding those patents judged to be invalid. The reason for excluding the invalid patents was that, properly speaking and in principle, validity is supposed to be already exhaustively examined by the Patent Office before a patent is litigated. The statuses (winning claim or losing claim) of the extracted patent claims were determined by reading the decision documents made by the trial courts with regard to the patent infringement lawsuits. We analysed 152 winning patent claims and 424 losing patent claims.

5. Parameters for Claim Description

Parameters used to analyse descriptions of the patent claims are as follows:

- the total number of terms functioning as limitations (limitation terms, **L**) of the patent claim;

- the total number of words used for specifying an aforementioned term (specifying words, **S**) in the patent claim; and,

- the total number of specifying words divided by the total number of limitation terms (**S/L**).

The following is a concrete example through which we explain limitation terms and specifying words.

Claim 1. A <device>, comprising:

a first <unit> that <detects> an <effective><value> of a < current> <supplied> to an <electrical>< machinery>;

a second <unit> that <memorises> a <value> of a <coil> <current> of [the] <electrical> <machinery> <corresponding to> a <maximum><torque> of [the] <electrical> <machinery>;

a third <unit> that <calculates> a <ratio> of [the] <effective> <value> <detected> by [the] first <unit> to [the] <value> of [the] <coil> <current> <memorised> in [the] second <unit>, [the] third <unit> <outputting> <data> <corresponding to> [the] <ratio>;

a fourth <unit> that <controls> a <voltage> <applied> to [the] <electrical> <machinery> <based on> [the] <data>< outputted>by [the] third <unit>; and

a fifth <unit>that <smoothes> a <waveform> of [the]<voltage>.

Claim 2.   The *<device> according to Claim 1, further comprising:

a sixth <unit> that <discerns> a <torque> of [the] <electrical> <machinery><based on> [the] <effective> <value> of [the] <current> <detected> by [the] first <unit> and [the] <value> of [the] <coil> <current> <memorised> by [the] second <unit>.

Claim 3.   The *<device> according to Claim 1 or 2, wherein [the] <smoothed> <voltage> has <sinusoidal> <waveform>.

The terms in angle brackets "<>" are limitation terms while those in the square brackets "[]"are specifying words.

While Abiko had focused on the number of noun phrases,[9] this study also uses limitation terms in relation to predicates (e.g. verbs) and modifiers (e.g. adjectives, adverbs). This is because important terms or words are encountered not only in noun phrases, but also with predicates and modifiers, and they are the key to determining whether there is patent infringement or not. Since modifiers such as the "electrical" of "electrical machinery" and the "corresponding to" of "data corresponding to the ratio" add limitations to "machinery" and "data", respectively, we count such terms that modify or limit other terms as limitation terms. In contrast, terms such as "first" and "second" in the phrases "a first unit" and "second unit" are regarded as descriptive only, since "first unit" and "second unit" are actually limited by the sentences following the relative pronoun "that". Such terms employed for convenience in claim descriptions do not function as substantive limitations of the patent claims, and therefore are not counted as limitation terms in this study. In Claim 1 above, the total number of limitation terms is fifty-two.

The word "the" in phrases such as "the effective value" and "the ratio" specifies "an effective value" and "a ratio" – terms that have already appeared within the patent claim. In this study, in addition to the word "the" just explained, words such as "said", "this", and "that" are regarded as specifying words. All of the specifying words counted in the analysed patent claims were used for defining relationships between already-appearing terms and other terms. Claim 1 of the above example includes thirteen specifying words. The study of Abiko did not investigate specifying words.

The total number of specifying words divided by the total number of limitation terms (**S/L**) denotes the frequency of specifying words per limitation term. Therefore, **S/L** provides an indication of the frequency of the description of relationships between terms.

There are two types of claims: the independent claim and the dependent claim. The independent claim stands on its own and does not quote another claim, while the dependent claim quotes or depends on a single claim or several claims. An independent claim is broader than a dependent claim, which depends on independent claims. A dependent claim covers only part of the scope of its referred independent claim. With regard to the dependent claim, the total number of limitation terms and specifying words of its independent claim are added to those of the dependent claim itself. The number of limitation terms and specifying words in Claim 2 itself are sixteen and seven, respectively. For the summation of limitation terms within Claim 2, the word "device" in the phrase "The device according to Claim 1" is excluded since it overlaps with the "device" of "a device, comprising" within Claim 1, which is

quoted by Claim 2. The total number of limitation terms and specifying words for Claim 2 in the above example are sixty-eight and twenty, respectively.

If a dependent claim quotes multiple claims, as in Claim 3 of the above example, the total number of limitation terms and specifying words of the dependent claim are obtained by adding those of only the broadest claim among the quoted claims to those of the dependent claim itself. The **L** for Claim 3 itself would total four, because "device" is excluded for overlapping with the "device" of Claim 1, its broadest quoted claim. **S** would remain at one. Therefore, the totals for the parameters **L** and **S** for Claim 3 above, adding in the totals for Claim 1, are (5-1)+52=56 and (1-0)+13=14, respectively. The above parameters were counted manually for accuracy. The analysis below includes quantitative comparisons of the above parameters between winning and losing patent claims.

6. Results

Table 1 shows averages of the total number of limitation terms (**L**), the total number of specifying words (**S**), and the value of **S/L** for the extracted winning and losing patent claims, and results of two-sided *t*-tests used to find statistically significant differences between the averages of two groups. It was observed that the winning patent claims had significantly fewer limitation terms than the losing patent claims, while statistically significant differences between the winning and losing patent claims were not observed for **S** or **S/L**. This seems to indicate that patent claims with broader scopes tend to have success in patent infringement lawsuits.

Table 1

Averages of the parameters **L**, **S**, and **S/L** for winning and losing patent claims

	the number of patent claims	parameters		
		L	**S**	**S/L**
winning patent claims	152	70.22	6.19	0.68
losing patent claims	424	81.33	6.12	0.67
p-value	-	0.017*	0.925	0.797

Note: * significant at $p \leq 0.05$ (two-sided *t*-test).

We consider the parameter **L** to correspond to the level of complexity in the description of the patent claim, which in turn may be a reflection of the technological complexity of the invention. Inventions which are described in a complicated manner use more specifying words such as "the", and in doing so give more importance to descriptions of relationships between terms within the patent claim(s). Correlation analyses between **L** and **S** were performed for the winning and losing patent claims.
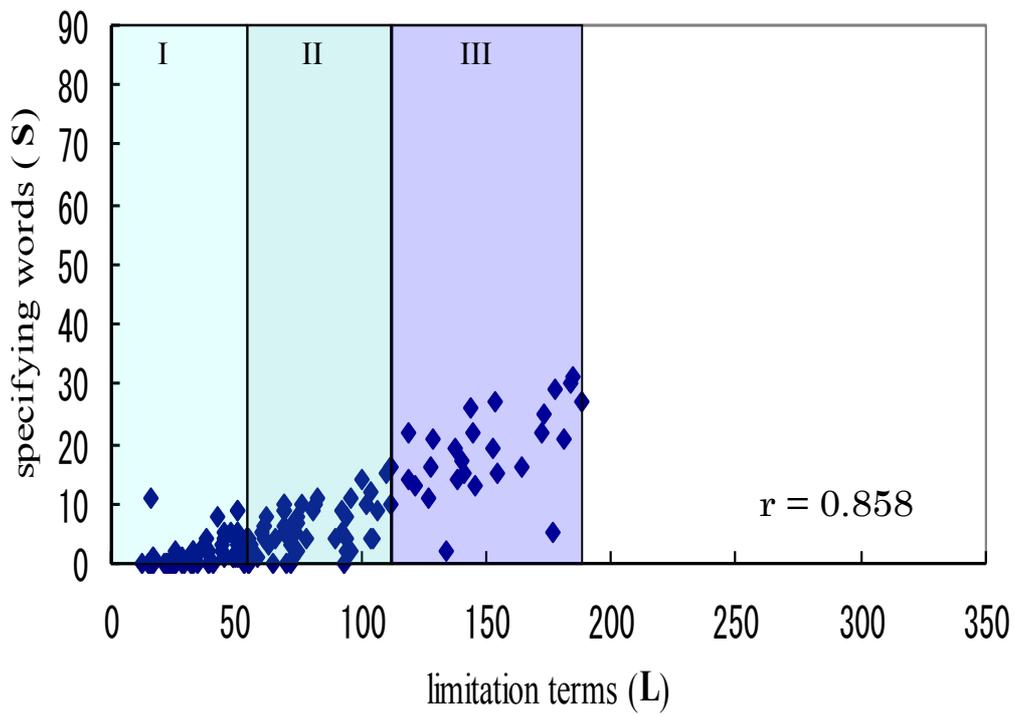
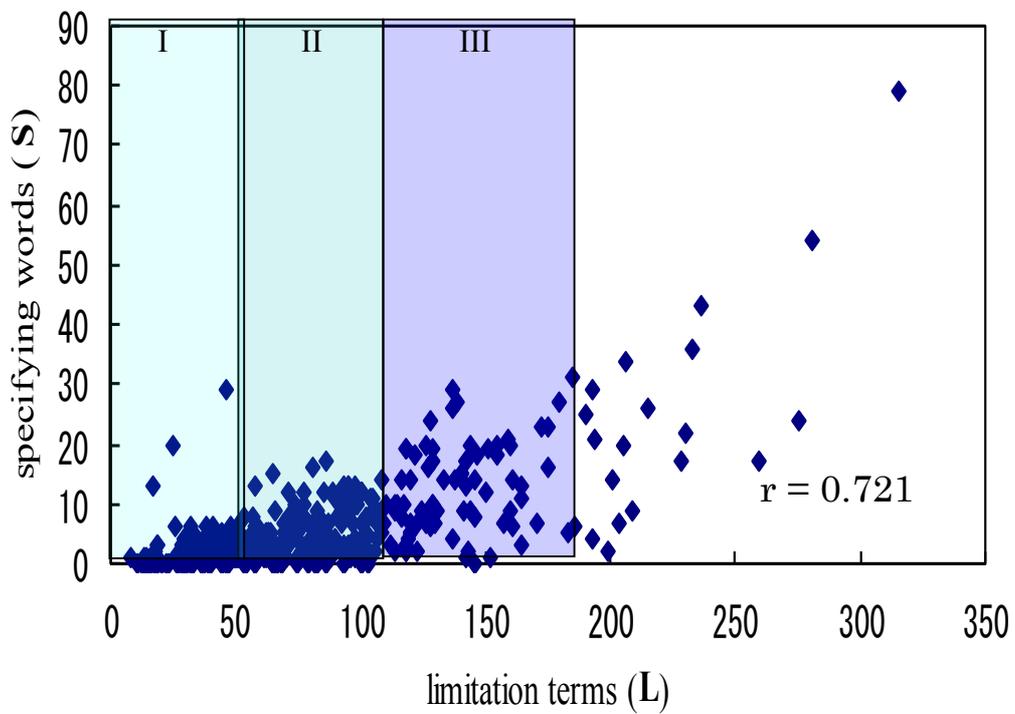Figure 1. Plot of limitation terms (**L**) versus specifying words (**S**) for winning patent claims.

Figure 2. Plot of limitation terms (**L**) versus specifying words (**S**) for losing patent claims.

Figure 1 shows the plotting of limitation terms (**L**) against specifying words (**S**) for the winning patent claims. A considerably strong correlation between **L** and **S** was observed, with a correlation coefficient of 0.858. This figure corresponds to significance at the $p \leq 0.001$ level. With regard to the winning patent claims, **S** increases with increasing **L**.

A similar result was obtained for the losing patent claims. Figure 2 shows a plot of limitation terms (**L**) against specifying words (**S**) for the losing patent claims. The correlation coefficient between **L** and **S** here is 0.721, which corresponds to significance at the $p \leq 0.001$ level. **S** of the losing patents also increases with increasing **L**.

Table 2

IPC and group classifications of winning patent claims

	group		
International Patent Classification (IPC)	I	II	III
A (Human Necessities)	36	16	4
B (Performing Operations, Transporting)	23	16	10
C (Chemistry, Metallurgy)	14	3	0
D (Textiles, Paper)	1	1	0
E (Fixed Construction)	2	5	3
F (Mechanical Engineering, Lighting, Heating, Weapons, Blasting)	1	0	2
G (Physics)	4	12	3
H (Electricity)	0	8	4

Table 3

IPC and group classifications of losing patent claims

	group		
International Patent Classification (IPC)	I	II	III
A (Human Necessities)	34	31	9
B (Performing Operations, Transporting)	42	35	18
C (Chemistry, Metallurgy)	29	16	4
D (Textiles, Paper)	5	3	0

E (Fixed Construction)	31	26	5
F (Mechanical Engineering, Lighting, Heating, Weapons, Blasting)	7	16	7
G (Physics)	26	34	13
H (Electricity)	10	15	13

In order to examine **L**-dependent changes in parameters **S** and **S/L**, similar quantitative analyses were carried out for three subgroups (group I, II, and III) categorised as follows: group I, for $1 \leq L \leq 59$; group II, for $60 \leq L \leq 119$; and, group III, for $120 \leq L \leq 190$. In other words, a quantitative analysis was conducted to determine whether a change in the importance of descriptions of relationships between terms is observed as the degree of complexity in the description of the patent claim increases or decreases.

Table 2 shows the extracted winning patent claims divided by International Patent Classification (IPC) and group, while Table 3 shows the same for the losing patent claims. From Tables 2 and 3, we can note that patent claims in sections F, G, and H include more limitation terms, while patent claims in sections A, B, and C have fewer.

Table 4 shows averages of the parameters **L**, **S**, and **S/L** for group I of the winning and losing patent claims. The results for group I are similar to those obtained for all winning and losing patent claims taken together, seen in Table 1. There is a statistically significant difference between the winning and losing patent claims at the $p \leq 0.05$ level for **L**, while no such differences were observed for **S** or **S/L**. Group I of the winning patent claims was established as having significantly fewer limitation terms than group I of the losing patent claims.

Table 5 shows averages of the parameters **L**, **S**, and **S/L** for group II of the winning and losing patent claims. The results for group II are different from the results described thus far. No statistically significant difference between the winning and losing patent claims was found for **L**. However, significant differences between them were observed for **S** and **S/L**. That is, group II of the winning patent claims had more specifying words on average than group II of the losing patent claims. The ratio of **S** to **L** for winning patent claims is also significantly higher than that for losing patent claims.

Table 4

Averages of the parameters **L**, **S**, and **S/L** for group I of the winning and losing patent claims

	the number of patent claims	parameters		
		L	**S**	**S/L**
winning patent claims	77	35.22	1.60	0.042
losing patent claims	177	39.37	2.20	0.057

p-value	-	0.026*	0.097	0.262

Note: * significant at *p*≤0.05 (two-sided *t*-test).

Table 5

Averages of the parameters **L**, **S**, and **S/L** for group II of the winning and losing patent claims

	the number of patent claims	parameters		
		L	**S**	**S/L**
winning patent claims	51	83.61	7.10	0.083
losing patent claims	166	85.98	5.53	0.063
p-value	-	0.379	0.029*	0.011*

Note: * significant at *p*≤0.05 (two-sided *t*-test).

Table 6

Averages of the parameters **L**, **S**, and **S/L** for group III of the winning and losing patent claims

	the number of patent claims	parameters		
		L	**S**	**S/L**
winning patent claims	24	154.04	19.00	0.112
losing patent claims	63	145.50	13.16	0.090
p-value	-	0.071	0.0021***	0.0081**

Note: ** significant at *p*≤0.01 (two-sided *t*-test); *** significant at *p*≤0.005 (two-sided *t*-test).

Table 6 shows the averages of the parameters **L**, **S**, and **S/L** for group III of the winning and losing patent claims. Similar to group II, a statistically significant difference was discovered between the winning and losing patent claims for **S** and **S/L**. There was no such difference observed for **L**.

The *p*-values for **S** and **S/L** of group III are 0.0021 and 0.0081, respectively, while the comparable *p*-values for **S** and **S/L** of group II are 0.029 and 0.011. These *p*-values show that the statistical preference for higher **S** and **S/L** in winning versus losing patents observed for group II is even more remarkable for **S** and **S/L** of group III. In other words, among patents having more limitation terms (**L**), those having more specifying words (**S**) are more likely to be successful in patent infringement lawsuits.

7. Discussion

This statistical study shows that, as a whole, winning patent claims have fewer limitation terms (**L**) than losing patent claims. The results overall correspond with previous findings that patent claims that have fewer noun phrases are more likely to have success in patent infringement lawsuits than those with more.[9] This is consistent with the belief commonly held in the field: a patent covering a broader scope than its targeted invention is less likely to lose in a patent infringement lawsuit. However, after dividing all patents into three subgroups by quantity of limitation terms (**L**) and conducting statistical analyses on **L**, **S**, and **S/L** of each subgroups, we found that, although the winning patent claims for group I ($1 \leq \mathbf{L} \leq 59$) had significantly fewer limitation terms than the corresponding losing patent claims, for groups II ($60 \leq \mathbf{L} \leq 119$) and III ($120 \leq \mathbf{L} \leq 190$), the winning patent claims had significantly more specifying words (**S**) than the losing patent claims. The ratios of **S** to **L** (**S/L**) for the winning patent claims in groups II and III were also higher than those for the corresponding losing patent claims. Furthermore, this characteristic difference was statistically much more significant in group III than in II. All words counted as specifying words (**S**) in the analysed patent claims defined relationships between a term and ones already appearing in a claim. This indicates that describing relationships between limitation terms in greater detail is very important for improving the competitiveness of a patent, as opposed to adding new limitation terms (**L**) thoughtlessly and increasing their count. In the event that adding many limitation terms is required to confer novelty and inventive step(s) to an invention because of severely restrictive prior art, the patent practitioner can communicate a more exact and proper understanding of the criteria for inventive step(s) by focusing on the relationship between limitation terms, rather than by simply adding new limitation terms. This helps the description of a patent claim become better suited for patent litigation, more competitive, and victorious in any eventual patent infringement lawsuits.

Patent claims within IPC sections F (mechanical engineering; lighting; heating; weapons; blasting), G (physics), and H (electricity) include the most limitation terms, as shown in Tables 2 and 3. In such high-tech fields, including liquid crystal display (LCD) and semiconductor development, it often takes such a long time from the creation of a basic invention to the commercialisation of products utilising it, that the patent right of the basic invention may have expired by the time a fully-fledged business is launched. LCD technology is a great example for such time-consuming products. It took almost twenty years from 1962, when a patent application for the basic invention of LCD technology was filed, for the LCD business to flourish. This means, from a practical standpoint, that it is difficult to exercise rights of so-called "basic patents" in high-tech fields. In addition, in these high-tech fields, single products tend to be constituted of various technologies and these technologies relate to and depend on one other. This often results in multiple patents relevant to a single product being owned by multiple patentees but used within a single product. In this situation, within an industry where technology is deepened, intensified and accumulated, it is crucial to differentiate each patent clearly from others. In cases of patent claims with more terms limiting their scope, it is important to focus on the relationships between terms, in order to be successful in patent infringement lawsuits. It is more difficult to describe the relationships between terms rather than simply adding a new term because patent practitioners must understand the invention more firmly to grasp the relationships. Such complete view of the invention will enable the

preparation of a patent claim which has an appropriate scope, which then leads to success in the patent infringement lawsuit.

8. Conclusion

Patent practitioners have inherited the longstanding belief that the fewer patent limitation terms a patent claim has, the more competitive it becomes in patent infringement lawsuits. Our study, a quantitative, text-based analysis of descriptions of patent claims confirms that such intuitions are essentially correct. The study also suggests that for patent claims that have more scope-limiting terms, those having more words such as "the" and "said"—which denote and explain relationships between terms—tend to be successful in lawsuits. The results of this study can be used to advise patent practitioners in how to be successful in patent claims. Patent practitioners should minimise the number of terms functioning as limitations within a patent claim through a thorough survey of prior art, thus reducing the number of terms required to put forward the novelty and inventive step(s) of the patent. Also, the patent practitioners should make an effort to clarify the relationships between the terms using specifying words, if the total number of limitation terms seems large. This will help prepare a description of a patent claim ideally suited for defence against patent litigation, even if many limitation terms are required for conferring novelty and inventive step(s) to an invention because of severely restrictive prior art.