Misunderstanding and Misapplication of Equivalent Doctrine

Wei Zheng

It is argued in this article that, to date, quite a number of precedents of infringement by equivalents are cases in which rulings are made essentially according to "overall equivalents". This is an misapplication of the doctrine of equivalents. It is pointed out here that, like "identical infringement", for the "doctrine of equivalents" to apply, the requirement of the "full-coverage rule" should be first satisfied.

An overview

The "doctrine of equivalents", originating from the US case law, is a "law created by judges" in the common law system. This rule or doctrine has been widely applied in the judicial practice in China, which is a civil law country. The original legal basis of the doctrine could not be found in the "statute" within the patent legal system in China, at least before 2000. Only after the Chinese Patent Law was amended for the second time, did the Supreme People's Court provide in Article 17 of its No.21 Judicial Interpretation (2001) that the provision of Article 56, paragraph one of the Patent Law "the extent of protection of the patent right for invention or utility model shall be determined by the terms of the claims. The

求中的必要技術特徵來確定專利權保護範圍，判定被控侵權物（產品或方法）是否覆蓋專利權保護範圍的原則。

[19] 北京高院的《專利侵權判定意見若干問題的意見（試行）》中，將"多餘指定原則"置於"等同原則"一節中，也說明了這個問題。同樣，關於"變劣發明"也是如此。

[20] 北京市高級人民法院的《專利侵權判定若干問題的意見（試行）》第 41 條規定：於故意省略專利權利要求中個別必要技術特徵，使其技術方案成爲在性能和效果上均不如專利技術方案優越的變劣技術方案，而且這一變劣技術方案明顯是由於省略該必要技術特徵造成的，應當適用等同原則認定構成侵犯專利權。

[21] 儘管北京市高級人民法院在其《專利侵權判定若干問題的意見（試行）》第 38 條中規定："適用等同原則判定侵權，僅適用於被控侵權物（產品或方法）中的具體技術特徵與專利獨立權利要求中相應的必要技術特徵是否等同，而不適用於被控侵權物（產品或方法）的整體技術方案與獨立權利要求所限定的技術方案是否等同"，但只要是不堅持"全面覆蓋原則"下的等同，就是實質上的"整體等同"了。例如，該意見中的關於多餘指定及變劣發明的規定，明顯地破壞了該意見的理論架構。

[22] 業內普遍認爲中國《專利法》第一條所體現的專利制度的宗旨就是"鼓勵發明創造"，對此，筆者認爲，這是對專利制度的宗旨的誤讀。如果把專利制度比作一架戰車，則"鼓勵發明創造"和"保護公衆合法權利"就是這架戰車的兩個車輪。缺少了"保護公衆合法權利"這一車輪，這個專利制度的戰車只能原地不動地打轉，沒有任何實用價值。

description and the appended drawings may be used to interpret the claims" means that the extent of protection of the patent right shall be determined by the extent of the essential technical feature expressly contained in the claims, including that defined by the feature(s) equivalent to the essential technical feature. This provision is deemed to be the legal basis for the application of the "doctrine of equivalents" in adjudication of cases of patent infringement in China. However, it is undeniable that due to years of absence of express rules and methods for patent infringement adjudication and the adoption of de-centralised jurisdiction over patent-related cases in China, the "doctrine of equivalents" has been applied so inconsistently by the courts of the various regions that there do exist the circumstances of its misapplication. The extreme case of application of the "doctrine of equivalents" is one in which an intermediate court in Guangdong Province mixed an independent apparatus claim with an independent process claim,[1] and decided that the defendant committed infringement by equivalents. Regarding the issue, this writer will be presenting some of his views on the rules for adjudicating infringement, by equivalents, of patent and the application of these rules.

Prerequisite for applying the "doctrine of equivalents"

The prerequisite for applying the "doctrine of equivalents" is a very important issue, which has long been neglected in the judicial practice in China. Now, let's start with a comparison.

1. The U.S.: the "doctrine of equivalents" is the "equivalent" under the "all-limitations rule"[2]

It is known that the patent system has been in place in the U.S. for more than 200 years. The doctrine of equivalents is a doctrine created in the patent-related judicial practice in the U.S., and it was well established in the precedents, such as Winans v. Denmead in 1853 and Graver Tank & Mfg. Co. v. Linde Air Products Co. in 1950. Meanwhile, in the legal practice of patent claim construction, the early central-limitation doctrine constantly changed toward the peripheral-limitation doctrine. In particular, the Federal Supreme Court reiterated in the case Warner-Jenkinson Co. v. Hilton Davis Chem., Co. on 3 March 1997 that the "doctrine of equivalents" relates to equivalents where the "all-limitations rule" is satisfied, thus having established the basic modern concept of the doctrine of equivalents and the prerequisite to apply it in the U.S. the US Supreme Court made such wonderful comments in the ruling of the case as follows[3]:

"Each element contained in a patent claim is deemed material to defining the scope of the patented invention, and thus the doctrine of equivalents must be applied to individual elements of the claim, not to the invention as a whole. It is important to ensure that the application of the doctrine, even as to an individual element, is not allowed such broad play as to effectively eliminate that element in its entirety."

The above has made it clear that, in the course of application of the "doctrine of equivalents", any individual technical feature contained in the claims should not be neglected, and that the "equivalent" is one limited by the corresponding feature in the claims. Absence of a feature or element in the claims is not in conformity with the "all- technical features limitation rule", and, thus, infringement is not constituted.

2. Taiwan region: establishment of infringement should first meet the "all-limitation rule"[4] regardless of infringement by identical features or by equivalent features

Since the U.S. is a case law country, there is no systematic provisions set forth concerning the application of the rule for the patent infringement adjudication. Instead, provisions along the line can be found in various precedents. By contrast, the Taiwan region of China adopts a civil law system, and the Main Points in Patent Infringement Adjudication[5] promulgated by the Taiwan Intellectual Property Office in 2004 represented a systematic summery of the practice of patent infringement adjudication; hence, we can learn more from it. It is expressly defined in the part on the rules for adjudication of patent infringement that by the all-limitation rule is meant that all the technical features of the claims are correspondingly expressed in the subject matter to be adjudicated, including literal and equivalent[6] expressions. The Main Points in Patent Infringement Adjudication divide the workflow of patent infringement adjudication into two phases: the claim construction and the comparison between the construed extent of protection and the subject matter (article or process) to be adjudicated. Regarding the second phase, it is specified that:

"the comparison between the construed extent of protection and the subject matter to be adjudicated includes the following steps:

(1) interpreting the technical features covered by the patent application;

(2) interpreting the technical information of the subject matter to be adjudicated;

(3) determining whether the subject matter to be adjudicated complies with (the literal meaning) ... according to the all-elements rule/all-limitation rule; and

(4) judging whether the [doctrine of equivalents] applies to the subject matter on the basis of the all-elements rule/all-limitation rule ....

In the Main Points in Patent Infringement Adjudication, it is further provided for the elements of the so-called doctrine of equivalents: "relative to the technical features of the application for patent, when the change in, or substitution of, any element, component, step or their combination of the subject matter to be adjudicated does not make any substantial difference, the doctrine of equivalents shall apply. For the doctrine of equivalents to apply, the all-limitation rule should be satisfied. Only then, is it possible for any infringement by equivalents to be constituted".

The above provisions show the basic conception underlying the adjudication of patent infringement; the "all-limitation rule" is a major rule; if the "all-limitation rule" is not satisfied, infringement may not be established. Regardless of infringement by identical features or by equivalents, the "all-limitation rule" should be met, and then "literal infringement" and "infringement by equivalents" are differentiated.

3. Beijing Higher People's Court's provision on the prerequisite of application of "doctrine of equivalents"

What is the courts' attitude toward the prerequisite for application of the "doctrine of equivalents" in the judicial practice in China? The Beijing Higher People's Court has answered the question in its "Opinions on Several Issues Relating to Patent Infringement Adjudication"[7], in which it is provided on the "full-coverage" that:

"26. By the full coverage is meant that the alleged infringing article (product or process) reproduces all the essential technical features of said technical solution in the claims of the patent right, and the alleged infringing article (product or process) is in full correspondence and identical with all the essential technical features contained in the independent claim of the patent.

27. The full-coverage doctrine is the entire technical features coverage rule or the literal infringement doctrine. That is, if the technical features of the alleged infringing article (product or process) contain all the essential technical features of the claims of the patent right, then it falls into the scope of protection for the patent right.

31. In establishing patent infringement, where the alleged infringing article (product or process) does not constitute an infringement of the patent under the full-coverage doctrine, the doctrine of equivalents should apply to the infringement adjudication.

32. By the doctrine of equivalents is meant that one or more technical features of the alleged infringing article (product or process) appear literally different as compared with the claimed technical features in the independent claims of the patent, but the two can be established as containing equivalent technical features upon analysis. This being the case, it should be established that the alleged infringing article (product or process) falls into the extent of protection for the patent right."

As the above shows, by the "full coverage" is meant that "the alleged infringing article (product or process) and all the essential technical features contained in the independent claim of the patent right should be in one-to-one correspondence, and identical with each other". Limited by the requirement for "the one-to-one correspondence and identicalness of all the essential technical features", the full-coverage rule, namely the all technical features rule or literal infringement rule, or full-coverage rule applies only to the infringement by identical features, thus eliminating the prerequisite for application of the full-coverage rule as the doctrine of equivalents. Here, the "full-coverage rule" has been completely set apart from the doctrine of equivalents in that they are independent from each other, or application of the doctrine of equivalents does not necessarily require satisfaction of the prerequisite of the "all-technical features limitation" as discussed before. Even in case of non-satisfaction of the "full-coverage rule", application of the doctrine of equivalents is also considered. The above provision of the "one or more technical features of the alleged infringing article (product or process) appear literally different as compared with the claimed technical features in the independent claims of the patent" means a great deal. What are the "claimed technical features in the independent claims of the patent"[8]? Is it meant that these features must be identical with one or more than one technical feature of the alleged infringing article (product or process) "in a one-to-one correspondence"? With these questions unanswered, this provision has gone back to the track of "all-elements equivalent"[9].

To sum up, we may see that the Beijing Higher People's Court's provision on the application of doctrine of equivalents is different from that of the U.S. only in whether to stick to the "all-technical features limitation", i.e. establishing patent infringement under the full-coverage prerequisite. However,

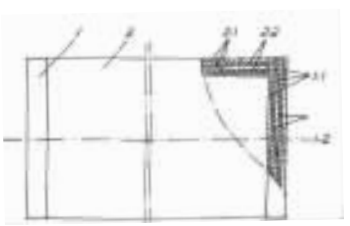
the more sensitive issue is whether the provision on the application of doctrine of equivalents is a right one? What is the Supreme People's Court's attitude toward it?[10] The following case study seem to have answered the questions.

Typical case study shows misunderstanding of the doctrine of equivalents

Case 1: Dalian Xinyi Building Material Co., Ltd. v. Dalian New-type Wall Building Material Factory

This is a case of dispute arising from infringement of the patent ZL 98231113.3 for utility model entitled "concrete thin-wall barrel body member". The patent has only one claim and contains only one appended drawing as followings:

According to claim 1 and the drawing, said concrete thin-wall barrel body member comprises barrel pipe (2) and barrel base (1), wherein barrel base (1) is made of at least more than two layers of glass fibre cloth (1. 2), with one placed on top of the other; barrel pipe (2) is made of at least more than two layers of glass fibre cloth barrel pipe (2.2), with one placed inside the other. The alleged infringing article is different form the patent in suit in that compared with barrel pipe (2) of the patent in suit, the internal structure of the wall of its barrel pipe is made of one layer of glass fibre cloth placed in between the two layers of cement inorganic gelled material; compared with the barrel base (1) of the patent in suit, the wall of its barrel base does not contain any layer of glass fibre.



Under the premise that the alleged infringing product does not fully cover all the technical features of the claim, the courts at the two levels ruled that the defendant infringed the patent by equivalents. The courts of first and second instance pointed out in their analysis of the equivalents:

"The alleged infringing product differs from the patent in suit, but not in a substantial manner. The alleged infringing product also comprises barrel pipes and barrel bases covering both ends of the barrel pipes, which is identical with the preamble portion of the patent. The internal structure of the wall of its barrel pipe is made of one layer of glass fibre cloth placed in between the two layers of cement inorganic gelled material; the wall of its barrel base does not contain layers of glass fibre, which is literally different from the composition of the barrel pipe and barrel base of the patent, but the main part of the patent in suit is the barrel pipe which contains cement layer with glass fibre cloth placed at intervals to make the pipe wall strong and thin, and to enlarge the inner volume, so as to radically reduce the weight of each floor composed of it. In other words, it depends on the thinner barrel pipe wall of less weight for the larger inner volume and less weight of the wall. The barrel base plays only a minor role in preventing the cement-sand mortar permeation. Besides, it is illustrated that addition of glass fibre cloth to the wall of barrel pipe improves the strength and reduces the thinckness of the wall to increase the empty space" inside it.

This case further proves that the courts do not care about whether the all-technical features limitation rule is satisfied when applying the doctrine of equivalents in their adjudication. For that reason, it is alright not to differentiate the "two layers" from "one layer" of glass fibre cloth, nor even distinguish the "presence" and "absence" of it from each other. Instead, they divide the features in the claim into major and minor ones, that is "the barrel base plays only a minor role in preventing the cement-sand mortar permeation". This is, in fact, a case of moving away from the limitation of the technical features and judging the equivalents according to the technical solution in its "entirety". Although the first-instance court does not fall within the judicial jurisdiction of the Beijing Higher People's Court, it is guided by the Beijing Higher People's Court's the Opinions on Several Issues Relating to Patent Infringement Adjudication in its judgement.

With a view to protecting the patentees' interests, the doctrine of equivalents has been put in place to prevent any other person from sidestepping liability for patent infringement by making slight, non-substantial change or substitution of technical features of the claims. Since insurmountable difficulties do exist in defining the extent of protection for a patent with accurate language and complete description of the claims, the extent of protection for a patent needs to be extended to the scope of equivalents of the technical features of the claims, and it should not be so limited as to cover the literal meaning of the claims. But, we must guard against going from one extreme to the opposite extreme. That is, the doctrine of equivalents should not be applied in such an extended manner as to inhibit the public from the freedom to fairly use technologies. For this writer, this case shows that

the courts in China have gone too far in their application of the doctrine of equivalents. Evidently, the Supreme People's Court has noted the issue of the case, and decided to review the case on 27 December 2004 eight months after the final ruling of the case took effect[11].

Regarding the technical features as contained in the claims, the Supreme People's Court clearly notes that all the technical features a patentee puts in the independent claim should be deemed to be the essential technical features, which should not be neglected and should be put into comparison. This Supreme People's Court is against imprudent application of the so-called "extra-limitations rule".

The Supreme People's Court believes that the function of the claims to define the extent of protection for a patent. That is, making known to the public all the technical features included in the technical solution of an invention or utility model patent to enable the public to clearly know that what act they do will infringe the patent right at issue, so as, on the one hand, to effectively and fairly protect the patent, and, on the other, to ensure the public to enjoy the freedom to use technology. Only if all the technical features of the claims of a patent are given the full and sufficient respect is it possible the public not to be at a loss what to do due to any unexpected change in the claims, thus making it possible to maintain the legal certainty of the rights and fundamentally ensure the normal operation of the patent system and the realisation of the value of patents.

With the above basic concepts made clear, the Supreme People's Court analyses all the technical features of the claim of the patent in suit, and then compares, one by one, the features of the alleged infringing product with those of the claim.

When comparing the barrel base, the Supreme People's Court believes that the comparison with the essential technical feature of the wall-layer structure of the patent shows that there is no glass fibre cloth in the cement inorganic gelled material of the barrel base of the alleged infringing product; and the two were obviously different. They have not used the substantially same means since the glass fibre cloth is absent in between the cement inorganic gelled material of the barrel base of the alleged infringing product and there are at least more than two layers of glass fibre cloth in between the cement inorganic gelled material of the barrel base of the patent; hence they are not equivalent. The mere fact that the technical features of the barrel base of the alleged infringing product is neither identical with, nor equivalent to, the corresponding technical features of the patent is sufficient to support the ruling that the alleged infringing product has not fallen within the extent of protection for the patent right.

This writer very much appreciates the Supreme People's Court's meticulous analysis and reasoning: "the fact that the technical features of the barrel base of the alleged infringing product is neither identical with, nor equivalent to, the corresponding technical features of the patent is sufficient to support the ruling that the alleged infringing product has not fallen within the extent of protection for the patent right". But, it still too early to believe based on this that the Supreme People's Court sticks to the judgement and comparison of the technical features under the full-coverage rule. It is worth thinking deeply that now that it is known the feature of "the glass fibre cloth is absent in between the cement inorganic gelled material" in the barrel base of the alleged infringing product, the alleged infringing product does not fully cover the claim, why is the determination made as to whether the two are equivalent? With the "glass fibre cloth" missing, how could the comparison between the two be made?

As for whether there is "one layer of the glass fibre cloth" in between the cement inorganic gelled material in the barrel base of the alleged infringing product is equivalent to the feature of "at least more than two layers of the glass fibre cloth" in the claim, the Supreme People's Court believes:

"Since the clear words 'at least more than two layers' are used in the claim of the patent in suit when describing the layers of the glass fibre cloth, and the description has also clearly stated that the glass fibre cloth 'may be of as few as two layers'; hence the claim should not be construed beyond the expressly defined condition. ... otherwise, it amounts to the deletion of at least more than two layers' from the independent claim, thus rendering the extent of protection claimed unreasonable broadened and causing prejudice to the public interests.

As for whether "one layer of the glass fibre cloth" and "at least more than two layers of the glass fibre cloth" are simply quantitatively different, the Supreme People's Court makes the analysis:

"The difference in the layers of the glass fibre cloth in the patent in suit should not be simply believed to be a quantitative difference, rather it exhibits the different function, in a physical mechnic sense, of the barrel body member in pressure resistance, internal space and floor weight. The barrel pipe part containing "at least more than two layers" of glass fibre cloth achieves a technical effect superior to the

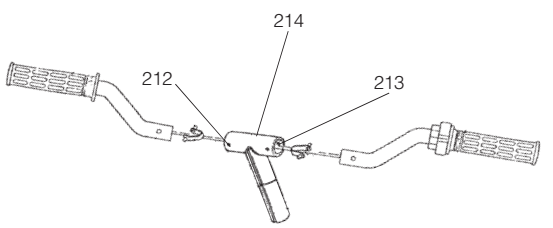
technical effect of the barrel pipe part containing only "one layer" of glass fibre cloth in pressure resistance, internal volume and floor weight. It should be held that "one layer of" glass fibre cloth cannot achieve an effect substantially the same as that of "at least more than two layers" of the glass fibre cloth. For this reason, the presence of one layer of the glass fibre cloth in between the cement inorganic gelled material" in the barrel pipe part of the alleged infringing product is a feature neither equivalent to, nor identical with, the corresponding technical features of the patent. Accordingly, the alleged infringing product does not fall within the extent of protection claimed for the patent right in suit.

This shows that with the clear words "at least more than two layers" used in the claim of the patent in suit, this quantitative difference *per se* has produced substantially different technical effect.

In conclusion, although the final ruling of the case has been reversed after the review by the Supreme People's Court, especially its emphasis on the rule of full respect for the features of the claim, the Supreme People's Court has failed to expressly point out that the doctrine of equivalents should be placed under the "full-coverage rule".[12]

Case 2: Yuanda Corporation v. Tianqi Corporation[13]

This is a case of dispute arising from infringement of the patent ZL 99233491.8 entitled "a detachable steering handlebar". In April 2002, Yuanda sued Qianqi. This case is similar to the above case 1 in that the patent in suit also has only one claim and one appended drawing illustrating the embodiment of the crooked pipe of the handlebar. (see the fig. below).



According to claim 1 and the drawing, it is clearly defined in the patent that "at the ends of the transverse pipe (214) of the handlebar frame are provided a ring of position-fixing holes (212) (213) each", while a straight handlebar is used in the alleged infringing product with only one position-fixing hole. The first-instance court believes, upon hearing the case, that the roller boards marketed by the defendant compared with the patent ZL 99233491.8, does not have the essential technical feature, "a ring with position-fixing holes is provided at both ends of the transverse pipe of the handlebar"; hence it cannot realise the technical effect of "a ring of position-fixing holes being provided at both ends of the transverse pipe of the handlebar as stated in the description of the patent. For that matter, the angle between the tail end of the left and right handlebars and the transverse pipe of the handlebar can be easily adjusted through adjusting the position for imbedding seizing up the position-fixing teeth in the position-fixing holes so as to help users to be in an optional position to hold and ride the board rollers." The two are neither identical, nor equivalent. Accordingly, the court rejected Yuanda's litigant claims on 9 September 2002. Dissatisfied with the ruling, Yuanda appealed to the court of second instance.

While the first-instance court decides that the essential technical feature of "at the ends of the transverse pipe of the handlebar frame are provided a ring of position-fixing holes each" is missing in the alleged infringing product, it is not bold enough to decide on non-infringement according to the "full-coverage rule", but proceeds with the equivalents comparison guided by the Beijing Higher People's Court's Opinions, and makes its ruling on the basis of non-constitution of equivalents.

Also based on the said facts, the second-instance court reverses the ruling of first instance. It argues that, in the present case, the claim does not define whether the left and right handlebars are straight or crooked, the embodiment as shown in the description and drawings should not be used to limit the claims to argue that only the technology of the crooked handlebar is claimed. Where both the handlebars of the alleged infringing product and those in the claim are straight, the "one position-fixing role" of the alleged infringing product and the claimed "a ring of position-fixing roles" are substantially identical, in terms of realising the function of detachability, in the means used, in the function performed and in the effect achieved. With position-fixing holes being at least more than two, the "a ring of position-fixing holes" only quantitatively differed from the "one position-fixing hole".

This writer agrees to the second-instance court's analysis of whether the handlebar is made of a straight or crooked pipe, which is reasonable because the title of the subject matter of the claim is not a decisive factor with regard to the extent of protection, and what is important is how the combination of the technical features contained in the claim limits the extent of protection. Evidently, the organic combination of all the technical features of the claim also limits the title of

the subject matter.[14] That is, what is crucial is to compare the technical features for differences, especially compare the features corresponding to the alleged infringing article. When comparing the "one position-fixing hole" of the alleged infringing product with the "a ring of position-fixing holes" of the claim of the patent in suit, why didn't the second-instance court compare the former with "one hole" of "a ring of position-fixing holes" of the latter? It did not explain this point. With the premise under which the comparison is made not clarified, what is the meaning of the conclusion made from the comparison?

In the hearing of the case 1 and case 2, the courts hold diametrically different views on the quantitative feature expressly defined in the like manner: in case 1, the Supreme People's Court believes that "one layer of cloth" and "two layers of cloth" are obviously different in effect; while in case 2, the court believes that a ring of position-fixing holes and one position-fixing hole are equivalent in effect. Such confusing views have resulted exactly from the absence of a consistent rule for adjudicting patent infringement in China.

Case 3: Xie Wenwu v. Qingdao Haier Communication Co., Ltd.

This is a case of patent infringement. On 3 December 2003, the plaintiff Xie Wenwu was granted the patent ZL 01802972.8 for the invention of "a method for realising automatic stealth dialing for reporting the loss of mobile phone (hereinafter referred to as the patent). After that, the plaintiff contacted the Haier Communication Co., Ltd. on the matter of licensing the patent, but in vain. In May 2004, the plaintiff discovered in the market that the Haier Colour Intelligent Star Z3100 mobile phone had the "intelligent anti-theft" function, which infringed the method for realising automatic stealth dialing for reporting the loss as defined in claim 1 of his patent. He then brought an action in the Beijing No.1 Intermediate People's Court.

Upon testing and comparison, the method for reporting loss the defendant used in the Haier Colour Intelligent Star Z3100 mobile phone was different from the patented method in that "when the tested data or the telephone number was not the same, the patent was in normal use, and automatically did the stealth dialing according to the pre-determined functional parameter; while the intelligent anti theft function of the Haier Colour Intelligent Star Z3100 mobile phone cannot be used normally when an unauthorised user card was inserted in, and did the visible dialing within the pre-determined time[15]".

Regarding this difference, Xie claimed that the unauthorised user's inability to normally use the phone was a deterioration of the patent; hence the intelligent anti-theft method of the alleged infringing product was equivalent to the technical features of the patent, and the infringement should be established by applying the doctrine of equivalents.

Although the first-instance court in the end applies the "estoppel doctrine" and decides on non-infringement with equivalents, its underlying logic is that the doctrine of equivalents is applied without the need for taking the "full-coverage rule" into consideration, that is, ignoring the absence of the whole feature in the defendants' product that "when the tested data or the telephone number is not the same, the patent is in normal use, and automatically does the stealth dialing according to the pre-determined functional parameter", and inflexibly comparing all the features present in the plaintiff's claim and absent in the defendant's product with the "visible dialing for reporting loss" of the defendant's product. The overall features mean both "normal use" and "automatic dialing". Such comparison is, in essence, "overall equivalents".

What the above three cases have in common are: failure to clearly understand the meaning of the full-coverage rule, and comparison of part of the features of the claim with a single feature of the alleged infringing product under the circumstances of non-fulfillment of the full-coverage rule. This has rendered the application of the doctrine of equivalents rather willful. By contrast, after decades of hesitation and debates, it is emphasized again in the Warner-Jenkison case in the U.S. that the application of the doctrine of equivalents should be placed under the "all technical features doctrine", i.e. the full-coverage rule. That is, the so-called all technical feature doctrine should mean that each and every technical feature contained in the claim should be covered, and they should not be mixed and judged together, say, to make judgment by putting "one ring of holes" and "one hole" together. The so-called "overall equivalent" is actually to make judgement by mixing up a plurality of the technical features contained in the claim. This is exactly where requires our careful reflections in application of the doctrine of equivalents in China.

Relations between division of technical features in the claims and infringement establishment

In the above case, the plaintiff and defendant disagree on the division of the technical features of claim 1 of the patents in suit. The former divides them into six technical features while the latter 30 essential technical features in ten groups[16] for the reason that, under the full coverage rule, the more technical features the claims contain, the less likely for the defendant to infringe a patent right. The first-instance court divides claim 1 into 4 essential technical features as follows:

1. When the mobile phone is used for the first time, the internal processing program inputs the authorised user's own data unique to his card that distinguish him from any other user or inputs the phone number corresponding to the authorised user and the functional parameter for automatic stealth dialing to report loss as pre-determined by the user and the functional code for automatically altering the functional parameter and for automatically changing the user card;

2. Each time the phone is turned on for use, the internal processing program automatically tests and compares as to whether the user data of the current user card and that pre-stored in the authorised user's card are the same, or tests and compares to find out whether the mobile number the current user card corresponds to and that the pre-store authorised user card corresponds to are the same;

3. If yes, the phone is put to normal use; and

4. If not, the phone is put to normal use and, at the same time, performs the automatic stealth dialing according to the pre-determined functional parameter.

According to the court division of the technical features, the court actual accepts that the first three features have been covered by the defendant's alleged infringing article; hence it is necessary only to find out whether the forth feature is equivalent (obviously not). For this writer, comparison of the kind is meaningless. The defendant has not, at all, used the feature of "performing the automatic stealth dialing according to the pre-determined functional parameter while the phone is in normal use"; it has only used the "visible dialing for reporting loss". Since the features are by no means correspond to each other, why should they be compared?

To answer the question, this writer tries to divide the technical features in the following way.

In case 1, the following features are divided for the "barrel base" contained in the claim:

Barrel base of the claim	Barrel base in the alleged infringing product
The 1st layer of cement inorganic gelled material	present
The 2nd layer of cement inorganic gelled material	present
At least more than two layers of glass fibre cloth in between the 1st and 2nd layers of cement Inorganic gelled material	No glass fibre cloth in between the 1st and 2nd layers of cement Inorganic gelled material

From the division of the features of the barrel base of the claim, it may be concluded that the full-coverage rule is not satisfied, so no infringement is constituted.

Likewise, the technical features of "barrel pipe (2) is made of at least two layers of glass fibre barrel (2.2) are analysed as follows:

Barrel pipe (2) of the claim	Barrel pipe in the alleged infringing product
A layer of glass fibre cloth	A layer of glass fibre cloth
Another layer of glass fibre cloth	Absent
Or still another layer of glass fibre cloth	Absent

From the analysis, we can clearly see that there are fewer features in the alleged infringing product than those in the claim of the patent; hence, the full-coverage rule is not satisfied.

It is worth noting that, for the Supreme People's Court, the description of "at least more than two layers" is an "express limitation". In fact, what it is made clear is that there are at least two layers, with the implication of expressly precluding "less than two layers" from the extent of protection for the patent in suit; there can be any layers above the "two layers"; all that is above "at least two layers" fall within the extent of protection for the patent in suit. For this reason, this expression is indeed "expressly limiting". In the later infringement lawsuit what the patentee cannot break through is exactly the "lowest number of layers he has determined by himself. It may be directly decided that anything containing fewer layers does not infringe the patent for failure to satisfy the "all technical features doctrine" or the "full-coverage rule". What is the need for applying the doctrine of equivalents?

This is also true with case 2.

Let the number of holes in "a ring of positing-fixing holes" be "N", i.e.

N =the number of holes in "a ring of positing-fixing holes", then N may be written as N=1+(N-1).

If there is only one hole in the handlebar of the alleged infringing product, then the remaining (N-1) cannot be covered. Now the question is: Can the (N-1) hole that cannot be covered be neglected in the claim? The answer is undoubtedly negative because each feature contained in the claim should be respected. No one (including the court) has the reason to respect one feature, but ignore the other, and asserts that some feature "plays a minor role.[17] Hence, the non-infringement conclusion is obvious.

The above analysis tells us that only by correctly dividing the technical features of the claims of a patent is it possible to make a correct one-to-one comparison of the technical features. Only under the premiss of full coverage, it is necessary to differentiate infringement by identical features from infringement by equivalents.

Doctrine of equivalents, extra-limitation and deteriorating invention

The Supreme People's Court expressly points out in its review of the rulings by the two courts by applying the doctrine of equivalents in connection with the patent for the "concrete thin-wall barrel member" that "this court is against imprudent application of the so-called "extra limitation doctrine"[18]. This has set us thinking about the relations between the doctrine of equivalents and the extra limitation doctrine.

On the surface, the doctrine of equivalents seems to have nothing to do with the extra limitation doctrine, why is the Supreme People's Court against imprudent application of the so-called "extra limitation doctrine". According to the Supreme People's Court's analysis, "all the technical features a patentee puts in the independent claim should be deemed to be the essential technical features that should not be neglected and should be put into comparison", and the "all technical features doctrine" is inevitably first met. But, when applying the doctrine of equivalents, the two courts did not declare to have neglected any one of the technical features. In other words, they did not deem any technical feature to be the extra. For this writer, in this case, the two courts have done no more than "packing" a plurality of features of the claim together, and then compared the packed technical features with one technical feature of the alleged infringing article; hence they are overall equivalent.

By contrast, the extra limitation doctrine exactly shows respect for "all technical feature doctrine". Suppose that if some technical feature of the claim is precluded as being extra, the remaining technical features happen to be exactly covered by the alleged infringing article. Will this be turned into "infringement by equivalents" or "literal infringement"? Therefore, in form, the "extra limitation doctrine" purports to seek full coverage, but, in essence, it is "over-all equivalents" of the technical solution. It is thus shown that the "extra-limitation doctrine" is no more than an extreme form[19] of the doctrine of equivalents.

It should be said that the deteriorating invention[20] and extra-limitation doctrine are twines. Suppose that some claims can be divided into four technical features marked A, B, C, and D; the alleged infringing article comprises the three technical features A, B, and C. From the perspective of the alleged infringing article per se, the technical feature D can be neglected according to the "extra limitation doctrine", then the alleged infringing article has "fully covered" the claim. But the deteriorating invention changes the way of thinking from the perspective of the alleged infringing article, it is believed that the alleged infringing article should contain feature D, which has been intentionally deleted. Technically, the deletion has resulted in the deterioration of the whole technical solution, and it is defined that the technical effect of "deterioration" is still better than that of the prior art before the date of filing of the patent; hence it is intentional deterioration.

As a matter of fact, we can see from the theory of deteriorating invention that it is based on the presence of the two pre-supposed disadvantages. It is argued in the first presupposition that one or some features D are intentionally deleted in the alleged infringing article; it is further decided in the second presupposition that after the deletion is made, the technical solution remains superior to the prior art before the date of filing of the patent. As for the first presupposition, who should be under the burden to prove the act of "intentional deletion", the patentee or the alleged infringer? If this feature can be deleted, why did it not occur to the inventor? As for the second presupposition, the assessment of technical height of the so-called deteriorating invention is in essence equivalent to that of its patentability, which is the statutory duty of the patent examination department. Limited by its patent examination resources and capability, the judicial authorities are not in a position to make a correct substantive assessment. As a result, it can do nothing but return to the track of "overall equivalent"[21]. This shows that the deteriorating invention theory is nothing but still another extreme

form of the doctrine of equivalents.

Conclusion

The patent system has been put in place, on the one hand, to encourage invention-creation, and, on the other, to ensure the public's fair use of the human technological achievements.[22] To prevent over-protection of the patent right and to protect the public against prejudice to their lawful rights should also be the purposes of the patent system. The the doctrine of equivalents should be applied with the balance kept between the above two purposes. However, since the doctrine of equivalents is not always applied under the full-coverage rule, with the balance of interests of the patentees and the public at large being neglected, things are more in the favour of the patentees. This phenomenon results from the lack of in-depth and close study of doctrines underlying the patent infringement adjudication to such an extent that a national uniform patent infringement adjudication rule is still missing to date, which is the cause of the varied understanding of the doctrine of equivalents by the different courts vested with the jurisdiction over patent-related cases.

It is urgent to work out as soon as possible a universally binding "patent infringement adjudication rule", under which the full-coverage rule is expressly deemed to be the prerequisite for the application of the doctrine of equivalents. Besides, the "extra limitation doctrine" and "deteriorating invention" doctrine that have nothing to do with the full-coverage rule should be discarded in an attempt to establish a solid, harmonious theoretic foundation for the patent infringement adjudication. ■

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[1] See Shenzhen Intermediate People's Court's Civil Ruling Paper No. Minsanchuzi 150/2002.

[2] The "all technical feature rule" corresponds to the "all-limitations rule" or "all-elements rule" in English. It is also known as the "all-elements rule" in the Taiwan region. For the purpose of this article, they all mean the same thing.

[3] See Warner-Jenkinson, 117 S. Ct. at 1054.

[4] The "all-elements rule", "all technical features rule" and "full-coverage rule" all mean the same thing in this article.

[5] In Taiwan, China, the "patent infringement adjudication" is known as the "patent infringement appraisal". The Key Points of the Patent Infringement Appraisal issued in August 2004 is the latest version of its kind. For the full text of it, visit www. tipo.gov.tw/patent/patent_org.asp.

[6] In Taiwan, the words "wenyi" means "literal", and "jundeng" "equivalent".

[7] The Opinions is a systematic statement on the practical issues of the patent infringement adjudication. Though it is not a judicial interpretation and it should not be directly referred to in legal instruments, it is a summery of the practice and experience of the court in hearing patent infringement cases, and serves as a frame of reference for judges in adjudicating patent infringement. The document also helps them better understand the relevant laws and regulations. Before the Supreme People's Court issues the Patent Infringement Adjudication Standards, the Beijing Higher People's Court first issued the Opinions as a court that is most experienced in, and has made the most rulings in connection with, the patent infringement case in China. This document is of tremendous influence in the judicial practice in connection with patent-related cases. Undoubtedly, it is a milestone in the practice in the community in China.

[8] The patent law principles tell us that the subject matter protected by a patent is a technical solution limited by its technical features; it is not the "technical features" of the technical solution that are under the patent protection. For example, a house, as a technical solution, is made of bricks and cement, but protection of the house does not mean protection of the bricks and the cement.

[9] For this writer, the Beijing Higher People's Court has actually understood the doctrine of equivalents as the doctrine of "overall equivalents". Any reader who does not think so may see it after reading the provisions of the Opinions on "deteriorating invention" and "extra limitation doctrine". This writer will elaborate the point later on.

[10] In fact, after the Patent Law was revised for the second time in 2000, the Supreme People's Court began to formulate specific provisions on patent infringement adjudication, and issued, in June 2003, the Provisions on Several Issues Relating to Cases of Dispute Arising from Patent Infringement (Draft), and, in October the Provisions on Several Issues Relating to Cases of Dispute Arising from Patent Infringement (for comments). For this, see http://www.chinaiprlaw.cn/show_News.asp?id=2462&key = for comments.

[11] See the Supreme People's Court's Civil Ruling Paper No. Minsantizi 1/2005 at http://www.chinaiprlaw.cn/file/200509135721.html

[12] Article 15 of the Provisions on Several Issues Relating to Cases of Dispute Arising from Patent Infringement (for comments) provides for the "all technical features rule" in which paragraph one provides that if an alleged infringing article contains all the technical features of the claims or if one or some technical features of it are ones equivalent to the technical features contained in the claims according to the doctrine of equivalents though they are different from the corresponding technical features of the claims, the People's Court shall decide that the alleged infringing article has fallen within the extent of protection for the patent, and the alleged infringer has committed the infringement". In

this provision, we cannot see the logic relations between the "all technical features rule" and the "full-coverage rule" highlighted in this article.

[13] For the details of the case, see Meng Fanxin, Application of Equivalent Doctrine in Utility Model Patent Infringement Lawsuit, the China Patents & Trademarks, 2006 No.1, Pp.15-20.

[14] Although the title of the subject matter of the claim does not show that the pipe is crooked, the technical feature of "at the two end of transverse handlebar pipe are provided a ring of position-fixing holes" has revealed everything. Under Article 26, paragraph four of the Chinese Patent Law, the claims should be supported by the description; in particular, in the presence of only one embodiment and only one appended drawing in the description, the handlebar as limited by the "a ring of position-fixing holes" must be crooked.

[15] See the Beijing No.1 Intermediate People's Court's Civil Ruling Paper No. Yizhongminchuzi 3254/2005.

[16] Presumably, the term of "essential technical feature" is typically Chinese. For this writer, it is used as a provisional tool in the course of patent examination. That is, it is only meaningful where the technical solution as shown by the claims does not reach the "minimum extent" of completeness to compared with the technical problem to be resolved by the invention. But if the technical solution as shown by the claims does reach the "minimum extent" of completeness, the examiner is not under the statutory obligation to assess whether some technical feature is essential or not. Once an invented is patented, the claims are made known to the public. According to the contractual doctrine of the patent law, the patent claims are a contract concluded between the authorities concerned (representing the public) and the patentee, and each technical feature contained in the claims is limitation on the extent of protection for the patent, and is a "essential technical feature" accepted by the patentee. Therefore, it is now no longer necessary to distinguish the "essential technical feature" from "non-essential technical features". The concept of "essential technical feature" happens to be the theoretical prerequisite of the "extra limitation doctrine". Anyway, it is meaningless to discuss or distinguish the essential technical feature after grant of the patent. Correspondingly, it is believed in the US patent practice that "no minimum or maximum number of features must be included in the body of a patent claim. But in any cases, a sufficient number of elements must be included to recite an invention that is novel, non-obvious, and useful." (see the An Overview of the Patent Law, CITIC Publishing House, 2003, P. 49).

[17] "Talbert argues that the claims contain an unnecessarily exact boiling limit; if so, the court is without power to make such a correction. See Autogiro Company of America v. United States, 384 F.2d 391, 396 (Ct. Cl. 1967) ("Courts can neither broaden nor narrow the claims to give the patentee something different than what he has set forth." avai
lable at : http://www.ll.georgetown.edu/federal/judicial/fed/opinions/99opinions/99-1421.html)

[18] Article 47 of the Beijing Higher People's Court's Opinions on Several Issues Relating to Patent Infringement Adjudication provides that "the extra-limitation doctrine is one whereby, when interpreting the independent claims of the patent and determining the scope of protection of the patent right in adjudicating patent infringement, the obviously added technical features (i.e. extra features) in the independent claims of the patent are deleted, the scope of protection for the patent right is determined and whether the accused infringing article (product or process) covers the scope of protection of the patent right is established on the basis of the necessary technical features in the independent claims of the patent".

[19] In the Beijing Higher People's Court's Opinions on Several Issues Relating to Patent Infringement Adjudication, the "extra limitation doctrine" is placed in the section on "doctrine of equivalents", which is also a proof of the issue, so is the "deteriorating invention".

[20] Article 41 of the Opinions on Several Issues Relating to Patent Infringement Adjudication provides that "where some individual essential technical feature in the claims of the patent is intentionally omitted, so that the resulting technical solution becomes an altered technical solution representing an deterioration of the patented technical solution in performance and effect, and it is obvious that this altered deteriorated technical solution results from the omission of the essential technical feature, the doctrine of equivalents should apply, and infringement of the patent right is established".

[21] While Article 38 of the Opinions on Several Issues Relating to Patent Infringement Adjudication provides that "in applying the doctrine of equivalents to the establishment of infringement, the principle is applicable to whether the specific technical features of the accused infringing article (product or process) are equivalent to the corresponding essential technical features as claimed in the patent, but not to whether the entire technical solution of the accused infringing article (product or process) is equivalent to the technical solution as defined in the independent claims". However, as long as one does not insist on equivalent under the "full-coverage rule", it is essentially "overall equivalents". For example, the provisions on the extra limitation doctrine and deteriorating invention have obviously ruined the theoretical framework of the Opinions.

[22] It is widely believed in the community that the aim of the patent system as embodied in Article 1 of the Patent Law is to "encourage invention-creations". For this writer, this is misunderstanding of the aim of the patent system. If the patent system is compared to a chariot, the "encouragement of invention-creations" and the "protection of the legitimate rights of the public" are the two wheels of it. With the wheel of the latter missing, the chariot of the patent system can do nothing but revolve around itself at one place: having no practical value of its own.