

A Comparative Study of Means-plus-Function Claims in China and United States

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In recent years, the issue of means-plus-function technical features has been one of the focal points drawing great attention from the patent community in China after the issuance of the judicial interpretation in 2009 by the Supreme People's Court relating to patent infringement cases and the emergence of the precedents and practice in the local courts. Last year, so many important opinions and views were presented at symposiums and in treatises by the courts of various localities, the Patent Office and practicing lawyers on the manner of interpretation or construction of means-

plus-function technical features in patent prosecution, validity and infringement proceedings and ways of determining technical features as means-plus-function ones. The discussions and scrutiny of these issues reached an unprecedented height in terms of breadth and depth.

The case laws developed in these sixty years has gradually and constantly enhanced the associated specific provisions on means-plus-function technical features of the relevant US legislation ever since they were set forth therein in 1952. With special reference to the historical developments

of the relevant practice in the United States, this article will try to present a comparative study and close scrutiny of some specific issues in relation to means-plus-function technical features in China and in the United States, including the issues of determination of means-plus-function technical features, their interpretation or construction, and the specific issues related to the “specific-embodiments-plus-equivalent” construction of means-plus-function technical features, for example, how to determine that a means-plus-function technical feature covers a “sufficiently clear” structural limitation, difficulties in determining “step-plus-function” technical features/claims, how to look for “corresponding” structure in specifications when construing means-plus-function features, how to interpret such features if the specifications does not disclose such a structure, and how to understand the relations between the equivalents under paragraph six of the 35 United States Code 112 and that under the case law. Finally, advice is given in the article on the legislation relating to means-plus-function claims and on the ways to draft relevant claims.

Determination of means-plus-function technical features

1. US perspective

The provision concerning means-plus-function technical features, first set forth in 1952 in paragraph three (latter changed into paragraph six) of the 35 United States Code 112 reads as follows:

“An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof...”

That is, a means-plus-function or step-plus-function technical feature should be expressed in terms of function it performs, not the specified structure, material and acts thereof. Therein, the specified “structure” and “material” correspond to means technical feature, and “acts” to step technical features.

Later in 1994, in response to *In re Donaldson*, the US Patent and Trademark Office (USPTO) issued, in its prosecution procedure, the Guidelines for interpreting means-plus-function claims pursuant to section 112, making a definition thereof fundamentally the same as section 35 U.S. Code 112 as of 1952. The 1994 Guidelines said it was not necessary to use the specific phrases “means for” or “step

for” in order for a claim limitation to fall within the scope of section 112. It had only to be clear that the element in the claim is set forth, at least in part, by the function it performs as opposed to the specific structure, material, or acts that perform the function.

The USPTO issued the Supplemental Guidelines respectively in 1999 and 2011, providing therein for three conditions. Those set forth in the Supplemental Guidelines of the 35 United States Code 112 issued in 2011, are as follows:¹

(1) the claim limitation must use the phrase “means for” or “step for” or any other non-structural term having no structural feature;

(2) the “means for” or “step for” or any other non-structural term must be modified by functional language, that is, a specified function must be recited; and

(3) the phrase “means for” or “step for” or any other non-structural term must not be modified by structure, material, or acts for achieving the specified function.

Seen from the above sections, for the USPTO, in general, the standard is that in determining a means-plus-function technical feature as such, it must use “pure” functional expression, not structural expression. It should be noted, however, that the Supplemental Examination Guidelines as of 2011 do not stringently prohibit expressions of structure from occurring in means-plus-function technical features, rather they prohibit that such technical features are modified by (way of) structure, material or acts that are sufficient to achieve or perform said function. When determining whether the means “means for joining said pluralities [of link ends] to one another **so that the axes of said holes of said first plurality are arranged coaxially, the axes of said holes of said second plurality are arranged coaxially and the axes of respective holes of both pluralities of link ends are substantially parallel**” was a means-plus-function technical feature, particularly, whether the part written in boldface was an expression of structure so sufficient as not to be interpreted under 35 U. S. Code 112 with reference to *Laitram Corp. v. Rexnord, Inc.*² in 1991, the Court of Appeal for the Federal Circuit (CAFC) concluded that the mere inclusion of some expression of structure in the feature of functional limitation did not necessarily rule out the interpretation under of 35 U. S. Code 112. For example, while the feature of “the means for combining ...” in suit contained an expression of structure, it was only to further point out the function of said means, in other words, merely to describe what the means for combination is used for, without specifying what the specific structure of the

means is.³ This shows that even if a technical feature contains an expression of structure, determination must be made of the extent to which said structure is expressed and what said expression of structure is used for, with analysis made of whether it is merely a repeated, supplementary interpretation or explanation of the function, or it alone constitutes an explicit structural limitation.

It is made clear, from the 2011 Supplemental Examination Guidelines and a series of CAFC precedents, that if a technical feature is written as “means/step of ...”, it is presumed that it should be interpreted under section 112. But if said technical feature is not sufficiently connected to a function, such presumption is rebutted, and the feature cannot be interpreted under section 112. In *York Products, Inc. v. Central Tractor Farm & Family Center*⁴ (1996), regarding the technical feature “means formed on the upwardly extending liner sidewall portions including a plurality of spaced apart vertically extending ridge members protruding from the liner sidewall portions and forming load locks”, the CAFC pointed out that while the term “means” was used in the technical features in suit, said “means” was not sufficiently connected to a specified function; on the contrary, the expressions, such as “protruding from...” and “forming load locks” used for the technical feature were only structural descriptions, and the structures had implicitly suggested their function to lock load. Since said feature had a specified structure, and said “means” was not sufficiently connected to a function, the presumption of interpretation under section 112 was not tenable.

Thus, even if the term “means” is used, it is also possible for the feature not to be interpreted under section 112. If said technical feature clearly recites structure and position, the presumption under section 112 is rebutted. For example, in *Cole v. Kimberly-Clark Corp*⁵ (1996) which involved the claim limitation: “perforation means extending from the leg band means to the waist band means through the outer impermeable layer means for tearing the outer impermeable layer means, for removing the training brief. . . .”, the CAFC said that it should not be interpreted under section 112’s paragraph 6. Although the technical features used the phrase “means for ...” for initiating the application of section 112, paragraph 6, it clearly described the structures for the performance of the function of tearing “perforation”⁶ and the specific position of such means “extending from the leg band means to the waist band means through the outer impermeable layer means”.⁷

According to the Supplemental Examination Guidelines as of 2011, a term used in a technical feature that is a non-structural term having the structural feature would also render interpretation under section 112 inapplicable. In *Lighting World, Inc. v. Birchwood Lighting, Inc.*⁸ (2004), the CAFC noted that when a technical feature was found not to be a means-plus-function one, said technical feature was not required to recite a definite structure. So long as the relevant term in the claims referred to structure in its general usage or its structure was known to a person skilled in the art, it was sufficient to avoid the interpretation under section 112. As a case in point, In *Greenberg v. Ethicon Endo-Surgery, Inc.*⁹ (1996), regarding the technical feature “a radially enlarged wheel on said sleeve and said wheel and said one handle having a cooperating detent mechanism defining the conjoint rotation of said shafts in predetermined intervals”, the Federal Circuit held that the phrase “detent mechanism” described a particular structural device even though its dictionary definition was in functional terms, so it should not be interpreted under section 112.

“Many devices take their names from the functions they perform. The examples are innumerable, such as ‘filter’, ‘brake’, ‘clamp’, ‘screwdriver’, or ‘lock’. ... ‘Detent’ (or its equivalent, ‘detent mechanism’) is just such a term. Dictionary definitions make clear that the noun ‘detent’ denotes a type of device with a generally understood meaning in the mechanical arts, even though the definitions are expressed in functional terms. See *Random House Unabridged Dictionary* 541 (2d ed. 1993) (‘a mechanism that temporarily keeps one part in a certain position relative to that of another, and can be released by applying force to one of the parts’); *Webster’s Third New International Dictionary* 616 (1968) (‘a part of a mechanism (as a catch, pawl, dog, or click) that locks or unlocks a movement’); *G.H.F. Naylor, Dictionary of Mechanical Engineering* (4th ed. 1996) (‘A catch or checking device, the removal of which allows machinery to work such as the detent which regulates the striking of a clock.’). It is true that the term ‘detent’ does not call to mind a single well-defined structure, but the same could be said of other commonplace structural terms, such as ‘clamp’ and ‘container.’ What is important is not simply that a ‘detent’ or ‘detent mechanism’ is defined in terms of what it does, but that the term, as the name for structure, has a reasonably well understood meaning in the art.”

It is made known in the above cases and the CAFC’s subsequent cases that whether the term “means for” or any

other term is used in a technical feature, the court will concentrate on the structure known in the art as introduced with the term itself. In *Apex, Inc. v. Raritan Computer, Inc.*¹⁰, (2003) the claims included several elements defined by the noun “circuit” and preceded by functional adjectives. Because each claim term recited sufficiently definite structure, each “circuit” was not under section 112, paragraph 6. The court noted that while “circuit” alone may or may not connote sufficient structure to be outside section 112, paragraph 6, the adjectival identifiers made the circuit elements structural. They included: “first interface circuit,” “on-screen programming circuit,” “first signal conditioning unit,” “computer-side interface,” “user-side interface,” and “analog video overlay circuit.” Similarly, in *Linear Technology Corporation v. Impala Linear Corporation*¹¹ (2004), the word “circuit” was coupled with the circuit operation giving that word sufficient structural meaning that section 112, paragraph 6 would not apply. The element was “a first circuit for monitoring a signal from the output terminal to generate a first feedback signal.” The court found that “persons of ordinary skill in the art would understand the structural arrangements of circuit components from the term ‘circuit’ coupled with the qualifying language of claim 1. ...” Thus, “circuit for” should not be interpreted under section 112, paragraph 6.

For process claims, the rules for determining “step-plus-function” are not materially different from those for “means-plus-function”. But it is revealed in the CAFC’s precedents that so far as a “step-plus-function” technical feature is concerned, disputes often arise on the issue of whether a modifying expression describing a step refers to function or a specific act *per se* (equivalent to the specific structure, *per se*, of a means technical feature). For example, in *Caterpillar, Inc. v. Detroit Diesel Corp.*¹², (1996) and some similar cases, the court took the view that the terms or words, such as “provide”, “determine”, “acquire” and “use”, described specific acts, not function; hence it was not proper for the corresponding technical features to be interpreted under section 112.

2. Chinese perspective

In the Chinese Patent Law and the associated Implementing Regulations thereof are not made special interpretation of, and provision on, means-plus-function technical features. In the Guidelines for Patent Examination of the State Intellectual Property Office (SIPO) as of 2001, 2006 and 2010 are set forth the following provisions concerning means-plus-function technical features: “usually, for product claims, fea-

tures of function or effect shall be avoided as much as possible to be used in defining the invention. It is only when a certain technical feature cannot be defined by a structural feature, or it is more appropriate to be defined by a feature of function or effect than by a structural feature, and the function or effect can be directly and affirmatively verified by experiments or operations as stated in the description or by customary means in the art, that definition by features of function or effect in a product claim is permissible.

The means-plus-function technical feature should be interpreted as covering all modes of performing said function”.¹³

In addition, the provision on technical features of Article 4 of the Supreme People’s Court’s Interpretation of Several Issues Relating to Application of Law to Trial of Cases of Dispute over Infringement of Patent, issued in December 2009, reads: “where a claim presents a technical feature expressed in terms of function or effect, the people’s court shall determine the contents of such technical feature on the basis of the specific embodiment and its equivalents of the technical feature as described in the description and the appended drawings”.

It is thus shown that in the Chinese laws and regulations, means-plus-function technical features are not expressly defined, nor are there words or terms similar to those triggering “presumption” of interpretation under section 112 of U.S. Patent Law. This situation gives, in judicial practice, courts accepting validity and infringement cases, more discretion. For lack of specialised courts like the US CAFC in China, and with as many as more than a hundred courts having jurisdiction over patent cases, and in the absence of uniformity in determination of means-plus-function technical features by courts at different levels and in various localities in the past cases, some courts, in looking for a means plus function technical features, focus their main attention on whether technical features are functional expressions, while others believe that structural and positional expressions must be excluded in means-plus-function technical features. In still some other cases, the courts avoided determining means-plus-function technical features. Determination made by courts in Beijing and Shanghai have drawn considerable attention. Following is an overview of the practice in China given on the basis of some typical cases heard in the past few years.

In *Zeng Zhanchi v. Hebei Zhenyu Industrial and Trading Co., Ltd. and Beijing Shuanglong Shopping Centre*¹⁴ (2006),

claim 1 of the patent in suit read: “a deodorant sweat-absorbent shoe pat, wherein it comprises two antiskid layers with a one-way permeable layer placed on the inner surfaces of the two antiskid layers facing each other, and a sticking sweat absorbing layer, a breathable layer and a deodorant layer between the two one-way permeable layers, with the sweat absorbing layer and the breathable layer adjacent to each other”. The Beijing Higher People’s Court clearly determined the “one-way permeable layer” as a means-plus-function technical feature. While not giving the reasoning on the determination in the judgment, the court latter commented that “the means-plus-function technical feature means that, in the claims of a patent, an invention or a utility model is not limited by a structural or step feature, but is limited by the role played, function performed, or effect produced of a part or step.”

In *Shenzhen Xigan Technology Co., Ltd. v. Shanghai Xianglong Electronics Technology Co., Ltd.*¹⁵, a case of dispute over infringement of an invention patent (2009), the trial court concluded that the technical feature of claim 1 “an interface module, used for connecting said scanner to a computing means and receiving power supply and system control signal from said computing means” was a technical feature with the interface module defined in a structure-plus-function way. In appeal, the Shanghai Higher People’s Court corrected the lower ruling, concluding: “according to the ascertained facts, claim 1 of the patent in suit only functionally defined the interface module. The scope of protection of a functionally expressed technical feature should be duly construed according to the description and appended drawings.”

In the same year, in *ICU Medicine Co., Ltd. v. No. 1 Hospital afflicted to the PLA General Hospital*¹⁶, a case of dispute over patent infringement, finding the technical feature of claim 1 of the patent in suit a means-plus-function technical feature, “said cavity comprising a first liquid cavity, when sealed up at said first position, opening to said exit and a second liquid cavity, when sealed up at said second position, opening to said exit, so that change in the cavity inside said main part generates a forward directional liquid flow towards said exit”, the Beijing No.1 Intermediate People’s Court explained: “claim 1 does not limit the sealing up, and the specified structures of the first and second liquid cavities, nor limit the relations of the sealing up with the first and second liquid cavities in terms of position; it only limits the movement of the sealing up between the first and second

position; when it moves from the first to the second position, the first liquid cavity changes into a smaller second liquid cavity; and the change of cavity from the first liquid cavity into a smaller second liquid cavity is functional, not functional, and the forward directional liquid flow is an effect the functional change”.

Thus, the court concluded that the positional relationship of the first and second liquid cavities with the “opening” (“... first liquid cavity opening to said exit, and ... the smaller second liquid cavity opening to said exit”) is not a sufficiently clear expression of the structure or position.

As the preceding three cases show, the courts all concluded that the means-plus-function technical features should be limited in terms of function, not structure. Furthermore, the courts all took the view that the structural and positional relations explicitly and implicitly shown in the features in suit were not sufficiently clear for them to be determined as non-means-plus-function technical features.

In another case in 2009, namely *Beijing Yingtelai Muogen Co., Ltd. v. Beijing Deyuan Kuaijie Doors and Windows Plant*¹⁷, a case of dispute over infringement of an invention patent, regarding claim 1 “a refractory fibre composite blind surface for a fire-proof insulation rolling blind, made by multi-layer fire resistant fibre products sewed together, characterised in that said blind surface comprises refractory fibre blank core in the middle of which reinforcing high-temperature proof stainless steel wire or stainless steel wire rope is put, refractory fibre cloth woven with fire-resistant fibre yarn for fixing the core, and metal foil layer in the middle of it”, the Beijing No. 2 Intermediate People’s Court noted: “for a claim containing functionally limited feature, it should be determined as to whether the functional limitation is supported by the description. While claim 1 of the patent in suit covered such information as, “fire proof and insulation”, “fire resistant” and “high temperature resistant”, a means-plus-function technical feature is not used to limit the scope of protection for the patent in suit. Rather, it is expressed with a corresponding structural feature; hence the relevant information in the description should not be incorporated in the claims of the invention patent.”

This shows that even if the technical feature has the effects of “fire-proof and insulation”, “fire-resistant” and “high-temperature resistant”, if the technical feature also includes a structural limitation, the court will not deem it to be a technical feature defined by means-plus-function feature; hence it is not construed as such.

In *Qu Shengbo v. New World (China) Technology and Media Co., Ltd.*,¹⁸ a case of appeal involving dispute arising from infringement of a utility model patent in 2010, regarding claim 1 of the patent in suit “a bus stop e-signboard showing multiple bus line services, comprising a bus stop name display, electronic display screen announcing arriving buses, display panel showing the list of bus line services, and a support and fixation base, characterised in that a) the bus stop name display is put on top of the bus stop signboard; b) the electronic display screen announcing arriving buses in the upper part of the signboard and connected below the bus stop name display; c) the display panel showing the list of bus line services is affixed on the electronic display screen announcing arriving buses between the electronic display screen announcing arriving buses and the support and affixation base”, the Shanghai Higher People’s Court noted: “according to the description of said patent, the e-display screen of said electronic display screen announcing arriving buses was a multiple bus line display LED dot matrix display screen, but the claims and the description did not show or express what specific technical means were used to make it possible for said ‘electronic display screen announcing arriving buses’ using the multiple line display LED dot matrix display to scroll down the dynamic information of the time of the nearest arriving bus and distance of the bus to the bus stop. In the case, there was no relevant evidence to prove that there, in the art, was ‘electronic display screen announcing arriving buses’ scrolling down information of the time and distance of the buses of the various arriving bus lines that had a relatively fixed technical structure and was known to a person skilled in the art. The technical feature of the ‘electronic display screen announcing arriving buses’ of the claim only expressed the function of the feature to ‘announce arriving buses’ (it could be further determined according to the description that the function to ‘announce arriving buses’ referred to the function to announce ‘the time of the nearest arriving bus and distance of the bus to the bus stop’). However, the claim did not recorded the technical means for performing said function; hence said ‘electronic display screen announcing arriving buses’ is a means-plus-function technical feature.”

In the case, the Shanghai Higher People’s Court, besides reasoning that the technical feature only expressed the function, without recording the specific technical means, further pointed out, on the basis of it, that there was not any “electronic display screen announcing arriving buses that

had a relatively fixed technical structural and known to a person skilled in the art in the prior art.”

3. Comparative analysis

After the emergence of the legislation on means-plus-function technical features in 1952 in the United States, the situation was rather confusing with respect to determination of means-plus-function technical features for lack of express definition thereof. Especially, where a technical feature was expressed in both function and specific structure or position and where in a term possibly resided in a known structure, the courts and the USPTO were unable, for a time, to clearly find whether said technical feature should be interpreted or construed under section 112. Later, rich accumulation of the case law, in its turn, drove the USPTO to issue the supplemental guidelines, putting in place a set of relatively detailed, comprehensive system for determining means-plus-function technical features between the courts and the USPTO, in which means-plus-function technical features were explicitly defined as technical features defined or limited in pure functional terms, without recital of specified structure performing a specific function or positional information and the terms of said technical features should not express any structure known in the art, otherwise it should not be construed under section 112.

Similar to the situation in the early years of the US practice, China is yet to develop a clear-cut definition of means-plus-function technical features. The courts in China, however, have been making great efforts to find means-plus-function technical features in some cases in recent years. In particular, the courts pointed out, in the cases, such as *Zeng Zhanchi, Shenzhen Xigan Technology Co., Ltd., ICU Medicine Co., Ltd. and Qu Shengbo*, that in determining means-plus-function technical features, it should be found whether the technical feature is only functionally limited, without recital of structure or position; and in *Qu Shengbo*, the Shanghai Higher People’s Court has also specially considered the structure carried in by the term *per se* and known in the art.

Nevertheless, in general terms, for lack of a clear statutory definition in China, the court at all levels and in different regions have not developed a stable, wide-accepted system for determining means-plus-function technical features in cases involving such technical features. As a result, judges are given too much discretion in hearing individual cases, which is likely for such cases to end up with divergent trial outcome. As a means-plus-function technical feature is inter-

preted in a way different from the way an ordinary technical feature is interpreted, whether a feature is determined as a means-plus-function technical feature has direct impact on the determination of its scope of protection, and, accordingly, is likely to directly determine the possible result of a case.

Convergence of two interpretations of means-plus-function technical features

1. US perspective

In the United States, means-plus-function technical features were used in drafting claims of patent application in as early as the 19th century, but such technical features had not been expressly recognised in legislation for a considerable period of time. During the period, the existence of means-plus-function technical features was once questioned or even denied in the US judicial practice. In the earlier *Holland Furniture Co. v. Perkins Glue Co.*¹⁹ (1928), the US Supreme Court noted that the feature expressed in terms of functional effect “as good as animal glue” covered a technical solution that could not be implemented with what was disclosed in the specification, and thus rendered the patent in suit invalid for lack of sufficient disclosure in the specification. Later, the US Supreme Court pointed out, in *General Electric Co. v. Wabash Appliance Co.*²⁰ (1938) and *Halliburton Oil Well Cementing Co. v. Walker*²¹ (1946), that the means-plus-function technical features could not clearly limit the claimed subject matter of invention, rendering the claim invalid for lack of clarity. During the time, most people held a negative attitude toward allowableness of means-plus-function technical features until 1952, when the Congress passed a law to accept means-plus-function technical features. Besides, to avoid disputes that occurred in the previous lawsuits, section 112 clearly provided that means-plus-function technical features should be construed only according to the embodiments and the equivalents thereof disclosed in the specification, thus avoiding the problems of over-broad scope of coverage and lack of clarity.

In 1952, the 35 U. S. Code was set forth, with paragraph three concerning means-plus-function technical features being added to section 112, which prescribed sufficient disclosure of the specification and clarity of the claims, (namely the current paragraph six of 35 U. S. Code 112):

“An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in sup-

port thereof. The claims of the nature shall be construed as covering the corresponding structure, material or acts and their equivalents recited in the specification.”

Thus, a means-plus-function technical feature is not interpreted as covering all technical means for performing the function, but is limited to the specific embodiments and the equivalents thereof described in the description. This is an statutory interpretation, and it would not cover the technical solutions that cannot be implemented by what is disclosed in the specification, so as to avoid the issue, pointed out by the US Supreme Court in previous cases, of unduly broad scope of coverage or ambiguous scope of protection that would otherwise render the claims invalid.

However, the aim of the legislation is not clearly recited, while it is widely believed that the provision allowing drafting of means-plus-function technical features is to overturn the *Halliburton* decision, and provides a clear, appropriate interpretation of the means-plus-function technical features. In the explanation of the amendment was only briefly mentioned that “a provision concerning means-plus-function claims has been added”, which later caused the debate on whether section 112 would solely apply to patent infringement lawsuits, or may to patent right grant and validity cases as well.

The specific interpretation under paragraph six of 35 U. S. Code 112 better applied to patent infringement cases, but incessant debates were going on around its applicability to cases involving patent right grant and validity for a long time. After the legislation in 1952, the USPTO still followed, in patent prosecution, the view for the rule of interpretation of full coverage of all modes performing the function, holding that paragraph 6 of 35 U. S. Code 112 applied only to patent infringement cases before courts, not to cases involving the grant and validity of the patent right. For example, in *In re Lundberg*²² (1957), the CCPA (predecessor of the CAFC) still applied the rule of interpretation of full coverage of all modes performing said function. However, the view that paragraph 6 of 35 United States Code 112 applies only to patent infringement cases is under constant challenge. In a concurring opinion in *In re Queener*²³ (1986), however, CAFC Judge Miller offered the opinion that the appellant had raised a meritorious point in complaining that the USPTO had not properly applied the provisions of paragraph 6 of Section 112. Judge Miller cited several opinions of the Federal Circuit and CCPA as well as some scholarly commentary in support of his view that it might be appropriate to reply upon the

function claims during reexamination as encompassing the disclosed means for performing the stated function and equivalents thereof. Judge Newman, in a concurring opinion intended specifically to rebut Judge Miller's view, characterized the effect of the last paragraph of Section 112 on *ex parte* prosecution as a "clock book."

Not until 1994 did the CAFC cool down the debate on the application of paragraph 6 of 35 United States Code 112 to all stages by way of the decision made in *In re Donaldson*²⁴, affirming that paragraph 6 of 35 United States Code 112 should uniformly apply to construction of means-plus-function technical feature in both patent prosecution and patent infringement cases. In the decision, the CAFC pointed out:

"One construing means-plus function language in a claim must look to the specification and interpret that language in light of the corresponding structure, material, or acts described therein, and equivalents thereof, to the extent that the specification provides such disclosure ... Because no distinction is made in paragraph six of 35 U.S.C. 112 between prosecution in the PTO and enforcement in the courts, or between validity and infringement, we hold that paragraph six applies regardless of the context in which the interpretation of means-plus-function language arises, i.e., whether as part of a patentability determination in the PTO or as part of a validity or infringement determination in a court."²⁵

In response to the *Donaldson* decision, the USPTO issued, on 20 April 1994, the provision of paragraph 6 of 35 United States Code 112 concerning means or step-plus-function features, noting: "... to date, the USPTO should not disregard a structure described in the specification and appended drawings, and examiners should interpret description or expression of means or step plus function in the claims as specified structure, material or acts and their equivalents of the specification and appended drawings".

It is worth noting that while *Donaldson* affirmed a uniform interpretation in patent prosecution, validity and infringement proceedings, it failed to give any process of reasoning for us to fall back on. The afore-cited reasoning in the case ("Because no distinction is made in paragraph six of 35 U.S.C. 112 between prosecution in the PTO and enforcement in the courts, ...") only showed that in the absence of distinction made in the provision when making the law amendment in 1952, the interpretation was presumably consistent.

2. Chinese perspective

In the Chinese Patent Law and its associated Imple-

menting Regulations have not been set forth express precisions on how means-plus-function technical features should be interpreted. It is provided, in the Guidelines for Patent Examination as of 2001, 2006 and 2010, that "a means-plus-function technical feature in the claims shall be interpreted as covering all modes for performing the said function", namely, the "cover-all" interpretation. But, the Supreme People's Court provides, in the Judicial Interpretation issued in 2009, that the People's Court should determine the content/term of technical features, in a claim, expressed as means for performing a function or achieving an effect according to the specific embodiment for said function or effect and their equivalents described in the description and appended drawings", namely, the "specific embodiments-plus-equivalent" interpretation. This shows that the Judicial Interpretation issued in 2009 has provided for the application of the "specific-plus-equivalent" interpretation to interpretation of means-plus-function technical features. But the Guidelines for Patent Examination as of 2010 still follow the "cover-all" interpretation. As a result, there are two ways to interpret means-plus-function technical features in the patent prosecution, validity and infringement proceedings, and to date, they are yet to be converged.

Before the Judicial Interpretation was issued in 2009, the courts came to realise, in their hearing patent infringement cases involving interpretation of claims of means-plus-function technical features, that the means-plus-function expression could not cover all the modes for performing a specified function, and as such a means-plus-function technical feature covered a too broad scope, very much exceeding the true contribution an invention made to the prior art in some cases, or even covered all modes for performing the function, thus causing prejudice to the public interests.

As in the above-mentioned *Zeng Zhanchi* case (2006), the Beijing Higher People's Court concluded when deciding to reverse the former decision: "a claim reciting a means-plus-function technical feature should not be literally interpreted as covering all modes of performing the specified function, but should be limited to the specific modes, as expressed in the description of the patent, to perform the specified function. To be specific, in finding an infringement, a means-plus-function technical feature should be construed as covering the embodiments or their equivalents expressed in the description for performing the specified function ...". It is clearly said in the description of the patent in suit that the unidirectional penetrating layer "is a funnel-shaped canvas

with pores, while the allegedly infringing product used non-woven fabric as the unidirectional penetrating layer, which is not a technical feature identical with or equivalent to the funnel-shaped canvas with pores; hence the allegedly infringing product does not fall within the scope of protection for the patent in suit.”

Around the issuance, in 2009, of the Judicial Interpretation as the Interpretation was governing the courts in all parts of China, the courts in various regions began to uniformly apply the “specific-plus-equivalent” interpretation.

In the above-mentioned *ICU* case (2009), the Beijing No.1 Intermediate People’s Court concluded: “technical features expressed in a claim as a means for performing a function or achieving an effect should not be literally construed as covering all modes for performing said function. Instead, its content should be determined by the specified embodiments and their equivalents described in the description and appended drawings. In the case, the description described 14 embodiments, and in all the embodiments the seal-up had a passageway running through it, and at least part of the passageway limited the cavity, so that the function was performed for the cavity to change from the first liquid cavity into the smaller second liquid cavity when moving from the first position to the second seal-up, achieved the effect of forward-directional liquid flow. By contrast, the allegedly infringing product had a solid seal-up, having no passageway running through it, nor limiting the cavity, nor were there technical features identical with or equivalent to the embodiments of the patent in suit for performing said function. Accordingly, the allegedly infringing product did not fall within the scope of protection for claim 1 of the patent in suit.”

Likewise, in *Qu Shengbo* case, (2009), the Shanghai Higher People’s Court also tried to look for the corresponding structure performing the specified function in the description strictly according to the Supreme People’s Court’s Judicial Interpretation, a matter to be elaborated in latter sections.

To date, the Patent Office and the Patent Reexamination Board (PRB) generally apply the Guidelines for Patent Examination in the patent prosecution and validity cases, but there are exceptions. The PRB does not interpret the means-plus-function claims by the “cover-all” method under the Guidelines for Patent Examination, but by way of “specific embodiments-plus-equivalent interpretation”. For example, in *Shenzhen City BAK Battery Co., Ltd.*, a case involving in-

validation of a patent, regarding the technical feature “said lower model mainly comprising the oblique wedge-shaped slider and positioning means”, the PRB noted that the description of the patent in suit only described a specific embodiment, and said part in the claims should be interpreted as one having a specific structure and the “positioning means” in claim 1 should be interpreted as a specific embodiment in the description, namely, “having a fixed structure of the u-shaped structure, the inner wall of the two arms with the u-shaped structure can restrict the limit position of movement of the oblique wedge-shaped slider”. Thus, the reference from the invalidation requester did not disclose the specified structure of the description, and claim 1 possessed novelty and inventive steps. In the trial of first instance, the court made the determination under the Guidelines for Patent Examination²⁶:

“The defendant construed the ‘position-limiting means’ as a ‘fixated part’ in the lower model, and further interpreted it as the “fixed structure of U-shape structure” according to the recital of the appended drawings of the description. Such construction went beyond the scope of claim construction based on the description and appended drawings, and limited the claims according to the description and the appended drawings, which was contrary to the relevant provisions of the Patent Law and the Guidelines for Patent Examination.”

The court of appeal, when remanding the case, pointed out²⁷ that “construction of a means-plus-function technical feature in the claims should be subject to the specified mode for performing the function according to the disclosure of the description of the patent, and the means-plus-function technical feature should not be construed as covering each and every mode for performing said function.”

3. Comparative analysis

In the United States, interpretation of means-plus-function technical feature has evolved from scratch, with the old and new interpretation methods, co-existing for a time and converging through the *In re Donaldson*. By contrast, in the law and practice in China, the two methods of interpretation are still in the stage of co-existence, and whether to unify the two divergent methods is one of the issues of great importance and concern in the community.

It is worth noting that while it was made clear to adopt the same interpretation method in the patent prosecution, validity and infringement lawsuits in the *Donaldson*, the case offered no inspiring reasoning. The reasoning recited above

(“since paragraph six made no distinction between the prosecution by the Patent Office and the hearing of infringement by the courts ...”) only shows that since no distinction was made in provision in the legislation in 1952, the interpretation method is presumably consistent. Unfortunately, the key US judgment did not offer any process of jurisprudential reasoning.

As for whether methods for interpreting means-plus-function technical features should converge in China, the writers believe that the matter should be considered from the jurisprudential perspective. If the interpretation methods should not be jurisprudentially different due to the variation of the prosecution and validity procedure from the infringement proceedings, then they should converge with respect to means-plus-function technical features. In the U.S., some judges and experts advance the view that the way of claim construction by the court after grant of a patent (e.g. in the patent infringement proceedings) should vary from that of claim construction by the Patent Office.²⁸ The CAFC commented on the view in *In re Zletz*²⁹ as follows:

“The Board erred in its interpretation of claims 13 and 14, the error apparently flowing from the Board’s choice of inapplicable legal premise. The Board applied the mode of claim interpretation that is used by the courts in litigation, when interpreting the claims of issued patents in connection with determinations of infringement or validity. That is not the mode of claim interpretation that is applicable during prosecution of a pending application before the PTO. During patent examination, the pending claims must be interpreted as broadly as their terms reasonably allow. When the applicant states the meaning that the claim terms are intended to have, the claims are examined with that meaning, in order to achieve a complete exploration of the applicant’s invention and its relation to the prior art. The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognised, scope and breadth of language explored, and clarification imposed. An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process.”³⁰

As the above shows, in 1989, the CAFC judges advanced the view that claim interpretation during the patent prosecution should be different from that after the patent is issued for the reason that by virtue of adopting a method of wider interpretation during the patent prosecution, appli-

cants were compelled to define a more clear and precise scope of protection sought by way of amendment. For the writers, the scope of protection examined and eventually approved by the Patent Office is the scope of protection a patentee legitimately deserves, and also the final scope of protection within which the patentee can enforce his or its patent. The Patent Law is fundamentally to strike a balance between the interests of the general public and those of the patentees for the purpose of stimulating technological innovation and disclosure. If claim interpretation during the patent prosecution is broader than that in the patent infringement proceedings, the lawful scope of protection granted by the Patent Office would imperceptibly be partly “invalidated”. Since the patent prosecution before the Patent Office is to keep a balance between the interests of the public and those of the rightholders, the scope of protection approved upon the substantive examination should be viewed as the legitimate scope compatible with a patentee’s monopoly and public interest. Adopting a narrower claim interpretation during the infringement proceedings would knock the interests of the public and the patentee out of balance, which is not compatible with the aim of the Patent Law. From this perspective, unifying the modes of claim interpretation during the prosecution process and infringement litigation is a fundamental requirement to accord effective protection to patents. Meanwhile, the reasoning made in *Zletz* on claim construction is merely for procedural convenience (for applicants to have more opportunities to make amendment during patent prosecution), not to make a conclusion that claims should be interpreted in a mode different in jurisprudence. That is, without considering the convenience in making the amendment, the mode of claim interpretation in the patent prosecution, validity and infringement proceedings should maintain consistent to ensure a true balance between the interests of the public and those of the applicants. In another aspect, under the impact of the stringent limitation on amendment in China (as shown in the practice in connection with Article 33 of the Patent Law), it is still difficult for an applicant to seek the most clear, precise scope of protection by virtue of amendment even during the patent prosecution; it is impossible to obtain the most appropriate scope of protection in the patent invalidation proceedings as a result of the limited ways for making amendments. In this context, it is difficult for the reasoning made in *Zlets* that there should be different mode of claim interpretation to be applicable in China. If it is hoped for the above US reasoning to apply in Chi-

na, these writers believe that it is necessary for the Chinese Patent Office to correspondingly adjust its limitation on amendment during the patent prosecution process and invalidation proceedings.

Besides, it is worth noting that while in the *Zlets* was advanced the view of divergent claim interpretation in the patent prosecution, validity and infringement proceedings, it is directed only to claims expressed with means-plus-function technical feature, and modes of claim interpretation in the patent prosecution, validity and infringement proceedings which eventually converged after 1994 in the United States.

Specific issues with “specific embodiments-plus-equivalent” interpretation

1. On requirements for disclosing structure in specification or description

1.1 US perspective

In the United States, since the scope of coverage of a means-plus-function technical feature is determined with reference to the specification, inventors are required to disclose, in the specification, the structure corresponding to all the “means” defined in the claims or the means that perform said function.³¹ Meanwhile, it is unnecessary for the specification to predict any means that might perform said function³².

Paragraph 6 of 35 United States Code 112 provides: “... an element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, wherein a ‘structure’ is ‘corresponding’ only when the specification or the patent prosecution history clearly associates a structure with the function mentioned in the claims. The responsibility for associating structure with function is quid pro quo with the convenience brought in paragraph 6 of 35 United States Code 112”³³.

For example, In *Chiuminata Concrete concepts, Inc. v. Cardinal Indus, Inc.*³⁴ (1999), the court studied the specification and drawings of the patent to find those elements of the disclosed product that satisfied “means connected to the saw for supporting the surface of the concrete. . . .” The court found that to be a skid plate, and the court expressly excluded other features of the skid plate which, while present, did not cooperate in performing the function. Structure

disclosed in the specification is “corresponding” structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim. This duty to link or associate structure to function is the *quid pro quo* for the convenience of employing paragraph 6 of 35 U.S. Code 112.

Furthermore, in *In re Dossel*³⁵ (1997), the CAFC held that, if a specification in which a claim setting forth a means-plus-function limitation appears to have failed to set forth any corresponding structure sufficient to determine equivalency, the claim may be rejected for indefiniteness under Section 112’s second paragraph rather than for inadequate description under Second 112’s first paragraph³⁶. In the subsequent *Biomedino, LLC v. Waters Technologies Corp*³⁷ and other cases, failure to set forth the structure performing the function in the specification rendered the claims invalid for lack of clarity under second 112’s second paragraph.

1.2 Chinese perspective

While, in China, the law and regulations do not expressly provide for the circumstance, in *Qu Shengbo* (2009), the Shanghai Higher People’s Court pointed out, when studying the description and appended drawings for claim construction after determining the means-plus-function technical feature, that “the description does not present the specific mode for performing said function; hence under the Supreme People’s Court’s Judicial Interpretation, it is impossible to determine the content of the technical feature ‘of the electronic display screen for announcing arriving buses’ in claim 1, so it is impossible to determine the scope of protection of claim 1 of the patent in suit. Since the scope of protection of claim 1 of the patent in suit is uncertain, the appellant’s infringement claim does not stand whatever the alleged infringing technical solution of bus stop is.”

This shows that the Shanghai Higher People’s Court interpreted the means-plus-function technical feature involved in the case by strictly following the Supreme People’s Court’s Judicial Interpretation, that is, claim 1 was interpreted as covering the specific embodiments or their equivalents disclosed in the description. In the case, since the description does not disclose the specific modes for performing the corresponding function, it is not possible to clearly define the scope of protection of the technical feature. Unlike in the U. S., there is no law provisions in China that enable the courts to directly declare a claim invalid on the ground that it is impossible to determine the scope of protection. In situation like this, the court closed the case with a decision that it was

impossible to find infringement as it was impossible to determine the scope of protection.

2. Relationship between equivalents under means-plus-function technical features and doctrine of equivalents

2.1 US perspective

First of all, with all other defining features corresponding to one another, with respect to a means-plus-function technical feature, if the structure contained in an allegedly infringing means is equivalent to the structure disclosed in the specification, it is a literal infringement, but not an infringement by equivalents³⁸.

Next, literal infringement by a means-plus-function technical feature should be distinguished from an infringement by equivalents. While the equivalent analysis under paragraph 6 of 35 United States Code 112 is basically the same as analysis under the doctrine of equivalents in the case law, both requiring that there is no substantial difference, the equivalence determination under section 112 is a restrictive application of the doctrine of equivalents, narrowing down the use of claim feature of broad literal meaning³⁹, embodied mainly in the following two aspects:

1) The equivalent analysis under section 112 requires complete functional identicalness while the analysis of doctrine of equivalents only requires basic functional identicalness. In *Kemco Sales Inc. v. Control Papers Co.*⁴⁰, the CAFC discussed the method for determining equivalents under section 112: one, the allegedly infringing structure is required to perform the identical function; and two, there exists insubstantial difference in terms of structure; and

2) The time in relation to the equivalent analysis under section 112 is the filing date of the patent in suit while that in relation to the analysis of doctrine of equivalents is the date of infringement. In *Al-Site Corp. v. VSI Int'l, Inc.*⁴¹, the CAFC pointed out: “an equivalent structure or act under section 112 cannot embrace technology developed after the issuance of the patent because the literal meaning of a claim is fixed upon its issuance In other words, an equivalent structure or act under § 112 for literal infringement must have been available at the time of patent issuance while an equivalent under the doctrine of equivalents may arise after patent issuance and before the time of infringement.”⁴² Along with the interpretations made in subsequent cases, the date of grant was further changed into the date of filing.

In *IMS Technology, Inc. v. Haas Automation, Inc.*⁴³, however, the CAFC's determination of equivalents under section 112 was not limited to structural equivalents. The CAFC not-

ed that in finding the equivalents between the floppy disc driving means and cartridge transmission system, while the two were different in terms of physical structure, IMS produced evidence to prove that a person skilled in the art knew about the functional interchangeability between the two. Furthermore, the CAFC took into account of the importance of the means-plus-function technical feature to the entire invention, namely, with regard to means less important to the invention, equivalent applied to a wider scope:

“Indeed, the statute requires two structures to be equivalent, but it does not require them to be ‘structurally equivalent’, i.e., it does not mandate an equivalency comparison that necessarily focuses heavily or exclusively on physical structure...

A claim includes part A, part B, and ‘means for securing parts A and B together in a fixed relationship.’ The written description discloses that parts A and B are made of wood and are secured together by nails. For purposes of the invention, it does not matter how parts A and B are secured; nails are not a critical part. A screw is not a nail, but for purposes of §112, P6, it is of equivalent structure in the context of the invention, though it is not the ‘structural equivalent’ of a nail”.⁴⁴

As for another important issue, namely, whether the equivalents under section 112 can co-exist with the doctrine of equivalents in the case law, the CAFC pointed out in *Valmont Industries Inc. v. Reinke Manufacturing Co.*⁴⁵ (1993): “in sum, section 112, p 6, and the doctrine of equivalents have separate origins and purposes. Section 112, paragraph 6, limits the broad language of means-plus-function limitations in combination claims to equivalents of the structures, materials, or acts in the specification. The doctrine of equivalents equitably expands exclusive patent rights.”⁴⁶

Furthermore, the CAFC pointed out, in *Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus. Inc.*⁴⁷ (1999), that “we held that a finding that a component of an accused product is not a structure ‘equivalent’ to the corresponding structure of a means-plus-function limitation for purposes of literal infringement analysis precludes a finding that the same structure is equivalent for purposes of the doctrine of equivalents, unless the component constitutes technology arising after the issuance of the patent. However, when a finding of non-infringement under 35 U.S.C. 112, paragraph 6, is premised on an absence of identical function, then infringement under the doctrine of equivalents is not thereby automatically precluded.”

2.2 Chinese perspective

Article 17 of the Several Provisions of the Supreme People's Court on Issues Relating to Application of Law to Trial of Cases of Patent Disputes as of 2001 provides: "the extent of protection of the patent right for invention or utility model shall be determined by the terms of the claims. The description and the appended drawings may be used to interpret the claims' as mentioned in the first paragraph of Article 56 of the Chinese Patent Law means that the extent of protection of the patent right should be determined by the essential technical features clearly expressed in the claims, including the extent as determined by the equivalents of the essential technical features. The equivalent features refer to the features which perform a function and produce an effect substantially identical with the expressed technical features by substantially identical means and which can be contemplated by a person of ordinary skill in the art without undue burden."

Article 4 of the Judicial Interpretation as of 2009 provides: "where a claim presents a technical feature in terms of function or effect, the people's court shall determine the contents of such technical feature according to the specified embodiments and their equivalents of the technical feature as expressed in the description and the appended drawings."

As the provisions of the preceding Judicial Interpretations show, first of all, the doctrine of equivalents is an independent infringement finding doctrine, while equivalents apply only when interpreting the scope of means-plus-function technical features as features limited to specific equivalents in the description and features equivalent to them. Next, the equivalent in the doctrine of equivalents refers to the equivalent features in the claims and the equivalents to features of specific structure in the description. Finally, it is the court that applies the doctrine of equivalents while, when construing means-plus-function technical features, the Patent Office, the PRB and the courts hearing patent infringement civil lawsuits all have the power to make the interpretation at various stages.

However, the rules for finding or determining whether literal infringement or infringement by equivalent, of claims expressed as means-plus-function technical features are not so well developed in China as in the United States. The US courts, in finding infringement, take the view that, if an allegedly infringing technology is found not only performing the same function (note that it is not an equivalent function),

but also the mode for performing the function being identical with or equivalent to that described in the patent specification, it is a literal infringement. As for whether to go on to find infringement by equivalents if it does not constitute a literal infringement, the US courts hold the opinion that where a literal infringement is not found, the doctrine of equivalents is still allowed to apply to claims expressed in means-plus-function technical features to find infringement by equivalents, but the circumstances where it is possible to find infringement by equivalents are limited to equivalents a person skilled in the art cannot realise when the patent in suit is granted. While the CAFC held the view, in *Dawn Equip. Co. v. Kentucky Farms Inc.*⁴⁶ (1998), that applying equivalence twice would allow the patentee to have two bites at the apple. For these writers, however, interpretation, made under section 112, should be viewed as one in its totality, that is, an interpretation more narrow than the conventional literal interpretation (be narrowed down to what are disclosed in the description and the equivalent thereof), without isolating the equivalents therein to be viewed as a single bite at the apple. When one observes the interpretation under section 112, it is not one bite at the apple, but a "loss" of it. With no bite at all, there is no issue of "two bites at the apple" mentioned in the case. Just the opposite, as the comments on the *Valmont Industries and Chiuminatta*, the two equivalents had different motivation and purpose. Even if determination is made of the equivalents under section 112, it cannot replace the role of application of the doctrine of equivalents in the case law for making up for the inadequacy to generalise all and future new embodiments to be brought forth by the technological developments due to literal limitation.

Conclusion

To conclude, ever since the law revision in 1952, the existence of means-plus-function technical features has been affirmed in the U.S., and in the subsequent sixty years of practice, relatively stable, clear rules for determining means-plus-function technical features have been gradually put in place through rich accumulation of case law. In addition, associated claim interpretation rules were set forth in 1952, but they were controversial, and had not been uniformly applied in all validity cases until 1994. Thanks to *In Re Donaldson*. Meanwhile, a variety of issues are likely to arise around the interpretation under section 112, such as application of equivalents and the corresponding requirements of the de-

scription, which have been gradually clarified or addressed through a lot of subsequent case law and practice after 1952, and make it possible for the United States to have in place a relatively well-developed associated measures.

In recent years, great progress has been made in the practice of patent law in China. While the Patent Law and its Implementing Regulations do not set forth any express provisions concerning means-plus-function technical features, there has been practice along the line similar to *Donaldson* in the U.S. as embodied in the provisions of the Guidelines for Patent Examination of the Patent Office and the Supreme People's Court's judicial interpretation, and the constant exploration by the courts in all regions. For lack of express law provisions, some courts act under no clear guidance, and there exist the circumstances where the ways of interpretation in patent prosecution, validity, and infringement cases are not unified, and there are no uniform standards established for determining means-plus-function technical features. To change the situation, we recommend summing up experience from practice in the past and introducing a whole set of clear rules along the line at an earliest possible date. In particular, we would like to recommend that, for the purpose of keeping a balance between interests of the public and those of patentees, the mode of "specific embodiment-plus-equivalent" interpretation of claims should be adopted consistently in all the patent prosecution, validity and infringement proceedings as early as possible, so that it is easy for patent applicants to predict the outcome of these proceedings and develop their corresponding strategy for drafting applications in the light of the established rules for determining and interpreting means-plus-function technical features.

Given the present situation in China, patent applicants, when drafting means-plus-function technical features, are more uncertain about the patentability and scope of claims of their patents. But, we still have reason to expect that over time, a set of rules for determining, and a uniform principle for interpreting, means-plus-function technical features will be gradually developed in the judicial practice in China. To this end and to seek sufficient protection for future patents, the writers would like to advice the applicants to make a proper use of means-plus-function technical features when drafting their applications, especially where many embodiments are to be disclosed in description, to make it more convenient to better generalise all the embodiments disclosed in the description, and, meanwhile, secure a clear and precise scope of protection in infringement proceed-

ings. Also, the specific structure, material and acts performing the specified function are clearly highlighted or expressed in the description, and explicit language used to rule out other structure, material and acts to secure wider scope of protection. For example, when the description points to a specified structure, it is advisable to narrow it down to a part of the whole means, not the entire means (e.g. the upper surface of a table for supporting ..., not the entire table), so that it corresponds to the relevant structure and its equivalents of an allegedly infringing product in infringement finding (e.g. it is OK just corresponding to the upper surface). Besides, given the present uncertainty, a patent applicant may also draft another set of claims expressed as specific structure⁴⁹, so as to avoid the defective lack of support by the description which would otherwise be caused by use of means-plus-function technical features, particularly if the description only discloses one or a few embodiments, and other problems caused by application of the "specific embodiment-plus-equivalent" interpretation, such as challenge on what the "corresponding" structure disclosed in the description is and disputes over whether two-time equivalent should apply. ■

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¹ Accessible at <http://www.uspto.gov/patents/law/notices/2011.jsp>.

² *Laitram Corp. v. Rexnord, Inc.*, 939 F.2d 1533, 19 USPQ2d 1367 (Fed. Cir. 1991).

³ 939 F.2d at 1536, 19 USPQ2d at 1369.

⁴ *York Products, Inc. v. Central Tractor Farm & Family. Center*, 99 F.3d 1568 (Fed. Cir. 1996).

⁵ *Cole v. Kimberly-Clark Corp.*, 102 F.3d 524, 41 USPQ2d 1001 (Fed. Cir. 1996).

⁶ The majority opinion of the panel is that it is a regular structure. But the minority opinion is that "perfovation" does not provide sufficient evidence to reverse the structure presumed under of section 112.

⁷ 102 F.3d at 531, 41 USPQ2d at 1006.

⁸ *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354 (Fed. Cir. 2004).

⁹ *Greenberg v. Ethicon Endo-Surgery Inc.*, 91 F.3d 1580, 39 U.S.P.Q.2d (BNA) 1783 (Fed. Cir. 1996).

¹⁰ *Apex Inc. v. Raritan Computer, Inc.*, 325 F.3d 1364 (Fed. Cir. 2003).

¹¹ *Linear Tech. Corp. v. Impala Linear Corp.*, 371 F.3d 1364 (Fed. Cir. 2004).

¹² *Caterpillar, Inc. v. Detroit Diesel Corp.*, 41 U.S.P.Q.2d (BNA) 1876 (N.D.Ind.1996).

¹³ Section 3.2.1, Chapter 2 of Part 2 of the Guidelines for Patent Examination issued by the State Intellectual Property Office in 2010.

¹⁴ The Beijing Higher People's Court's Civil Judgment No. Gaominzhongzi 367/2006.

¹⁵ The Shanghai Higher People's Court's Civil Judgment No. Hugaomin-san (zhi) zhongzi 13/2009.

¹⁶ The Beijing No. 1 Intermediate People's Court's Civil Judgment No. Yizhongminchuzi 1966/2009.

¹⁷ The Beijing No. 2 Intermediate People's Court's Civil Judgment No. Erzhongminchuzi 08543/2009.

¹⁸ The Shanghai Higher People's Court's Civil Judgment No. Hugaomin-san (zhi) zhongzi 89/2010.

¹⁹ *Holland Furniture Co. v. Perkins Glue Co.*, 277 U.S. 245 (1928).

²⁰ *General Electric Co. v. Wabash Appliance Co.*, 304 U.S. 364 (1938).

²¹ *Halliburton Oil Well Cementing Co. v. Walker*, 329 U.S.1 (1946).

²² *In re Lundberg*, 244 F.2d 543, 113 USPQ 530 (CCPA 1957).

²³ *In re Queener*, 796 F.2d 461, 230 USPQ 438 (Fed.Cir.1986).

²⁴ *In re Donaldson Co.*, 16 F.3d 1189 (Fed. Cir. 1994).

²⁵ *Id.* at 1193.

²⁶ The Beijing No. 1 Intermediate People's Court's Civil Judgment No. Yizhongminchuzi 607/2005.

²⁷ The Beijing Higher People's Court's Civil Judgment No. Gaominzhongzi 179/2006.

²⁸ *Burlington Industry v. Quigg*, 822 F.2d 1581, 1583 (Fed. Cir 1987).

²⁹ *In re Zletz*, 893 F.2d 321 (Fed. Cir. 1989).

³⁰ *Id.* at 321-322.

³¹ *In re Hayes Microcomputer Prods. Inc.*, 982 F.2d 1527, 1535, 25 USPQ 2d 1241, 1246 (Fed. Cir. 1992).

³² *DMI, Inc. v. Deere & Co.*, 755 F.2d 1570, 1574, 225 USPQ 236, 238 (Fed. Cir. 1985).

³³ *B. Braun Med. Inc. v. Abbott Laboratories*, 124 F.3d 1419, 1424 (Fed. Cir. 1997).

³⁴ *Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus. Inc.*, 145 F.3d 1303, 46 U.S.P.Q.2d 1752 (Fed. Cir. 1998).

³⁵ *In re Dossel*, 115 F.3d 942, 42 USPQ2d 1881 (Fed. Cir. 1997).

³⁶ "The question in this case before us is not whether there has been compliance with some aspects of §112 P1, but whether, in utilizing the authority of §112 P6 to claim in means-plus-function form, the drafter has adequately described structure, material, or acts which satisfy the claiming requirement of §112 P2", 115 F.3d at 946-47, 42 USPQ2d at 1885.

³⁷ *Biomedino, LLC v. Waters Technologies Corp.*, 490 F.3d 946 (Fed. Cir. 2007).

³⁸ *Data Line Corp. v. Micro Techs., Inc.*, 813 F.2d 1196, 1201, 1 USPQ

2d 2052, 2055 (Fed. Cir. 1987).

³⁹ *Warner-Jenkinson Co. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 28 (1997).

⁴⁰ *Kemco Sales, Inc. v. Control Papers Co.*, 208 F.3d 1352 (Fed. Cir. 2000).

⁴¹ *Al-Site Corp. v. VSI Int'l, Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).

⁴² *Id.* at 1320.

⁴³ *IMS Technology, Inc. v. Haas Automation, Inc.*, 206 F.3d 1422, 54 USPQ2d 1129 (Fed. Cir. 2000).

⁴⁴ 206 F.3d at 1436, 54 USPQ2d

at 1138.

⁴⁵ *Valmont Industries Inc. v. Reinke Manufacturing Co.*, 983 F.2d 1039, 25 USPQ2d 1451 (Fed. Cir. 1993).

⁴⁶ 983 F.2d at 1043, 25 USPQ2d at 1454.

⁴⁷ *Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus.Inc.*, 145 F.3d 1303, 46 U.S.P.Q.2d 1752 (Fed. Cir. 1998).

⁴⁸ *Dawn Equip. Co. v. Kentucky Farms Inc.*, 140 F.3d 1009 (Fed. Cir. 1998).

⁴⁹ For example, it is possible to draft another set of independent claims (and their dependent claims) corresponding to the means-plus-function claims, or draft them into dependent claims of the independent means-plus-function claims.