Study on Novelty of Invention Involving Numerical Ranges

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The criteria for assessing the novelty of a feature containing a numerical range are substantially consistent in different versions of the Guidelines for Patent Examination, which can be basically summarized as follows: (1) the values or numerical range disclosed in the reference document falling within the range of the claimed invention can destroy the novelty of the range of the claimed invention; (2) the numerical range disclosed in the reference document cannot destroy the novelty of the values or numerical range of the claimed invention that fall within the numerical range disclosed in the reference document; and (3) the numerical range disclosed in the reference document which partially overlaps with a numerical range of the claimed invention can destroy the novelty of the numerical range of the claimed invention. However, all of these provisions in the Guidelines for Patent Examination are premised on that "the rest features of the claimed invention are identical with those disclosed in the reference document", and the examples enumerated only involve one numerical range. The assessment of novelty of an invention defined by a plurality of numerical ranges is not explicitly specified in the Guidelines for Patent Examination, and is quite controversial in practice. This article is going to delve into relevant issues with reference to a specific case.

1. Case brief

In the Administrative Judgment No. Jingxingzhong 78/2017 recently issued by the Beijing High People's Court, the Beijing High People's Court upheld the Administrative Judgment No. Yizhongzhixingchuzi 5475/2014 issued by the Beijing No.1 Intermediate People's Court and reversed the re-examination decision No. 62543 for the Chinese Patent Application No.200580043075.7 made by the Patent Re-examination Board (PRB).

The dispute of the case focuses on the assessment of novelty of claim 1 of the patent application at issue. The PRB cited Reference 1 (US4199364A) to deprive the novelty of claim 1 of the patent application at issue. Claim 1 of the patent application at issue and Reference 1 both relate to a glass fibre composition with their components being given in Table 1 below in percentages by weight:

	claim 1 of the patent application at issue	relevant technical solution of Reference 1
SiO_2	58–63%	55–**61**%
Al_2O_3	12–20%	**12–18**%
CaO	12–17%	**14**–18%
MgO	6–12%	4–**10**%
CaO/MgO	1.3≤CaO/MgO≤2	undisclosed
Li_2O	0.1–0.8%	**0.1**–1.5%
BaO+SrO	0–3%	BaO: **0–1.0**%,SrO:**0**
B_2O_3	0–3%	**0**
TiO_2	0–3%	**0.2–0.8**%
Na_2O+K_2O	<2%	Na_2O: **0.1–1.5**%; K_2O: **0.1–0.5**%
F_2	0–1%	**0**
Fe_2O_3	<1%	**0.1–0.5**%
$Al_2O_3+MgO+Li_2O$	equal to or higher than 23%	undisclosed
specific Young's modulus of glass strands	greater than 36 MPa/kg/m^3	undisclosed

Note: Values in bold are the end points falling within the corresponding range of the patent application at issue.

Table 1

As seen in Table 1, Reference 1 discloses the same components as those in claim 1 of the patent application at issue. The dispute focuses on whether Reference 1 discloses the percentages of the components in claim 1, and further whether the novelty of claim 1 can be destroyed.

The PRB held that claim 1 and Reference 1 contain the same glass components, the percentages of which partially

overlap with each other or have the same end points. As a result, Reference 1 can be used to deprive the novelty of claim 1 [1].

Both the first-instance court and the second-instance court found it's factually groundless for the PRB to conclude that Reference 1 has disclosed all the technical solutions of claim 1 and thus claim 1 of the present application lacks novelty based on the fact that Reference 1 and claim 1 of the present application contain the same glass components, the percentages of which partially overlap with each other or have the same end points. The first-instance court and the second-instance court shared substantially similar views: first, in regard to a glass composition, the components thereof are integrally linked and mutually affected, the percentage of each component disclosed in Reference 1 does not fully fall within the range defined in claim 1 of the present application, and those skilled in the art are faced with many choices and combinations thereof when selecting specific components in percentage disclosed in Reference 1 to make a composition, and the technical solution of claim 1 cannot be obtained directly and unambiguously; second, claim 1 also defines $1.3 \leqslant CaO/MgO \leqslant 2$, the content of $Al_2O_3+MgO+Li_2O$ is equal to or higher than 23%, and the specific Young's modulus of glass strands is greater than 36 MPa/kg/m^3, the relationships between those components and the property of the glass strands are not disclosed in Reference 1, thus those skilled in the art certainly have to make a further selection on the basis of Reference 1 in order to arrive at the technical solution of claim 1 [2].

2. Case analysis

In the case, as regards the glass composition defined by a plurality of numerical ranges, the first-instance court and the second-instance court are basically of the view that "the components are integrally linked and mutually affected". Even if the prior art reference discloses the same components as those in the patent application at issue, and the percentage range of each component in the reference and that in the patent application at issue partially overlap with each other or have the same end points, the novelty of the patent application at issue cannot be destroyed.

The writers are in favor of the conclusions drawn by the first-instance court and the second-instance court. For better clarifying the mutual influence of those components, we will make further analysis of the case. As shown in Table 1 above, the numerical range of each component disclosed in Reference 1 indeed overlaps with the corresponding numerical range in claim 1 of the patent application at issue.

It is noteworthy, however, that claim 1 of the patent application at issue further defines the relationships between percentages of some components, namely, $1.3 \leqslant CaO/MgO \leqslant 2$ and the content of $Al_2O_3+MgO+Li_2O$ is equal to or higher than 23%, which are not disclosed in Reference 1 at all. For instance, when a certain value is taken for CaO, the selected value of MgO shall be in conformity with $1.3 \leqslant CaO/MgO \leqslant 2$ and within the range from 6% to 12% in terms of percentage by weight. A value that meets the latter requirement only shall not be selected. For instance, when 12% is taken for CaO, the value taken for MgO should not be 12% (though the range of MgO is literally allowed to be within 6% to 12%) due to the fact that CaO/MgO in such a case is 1, which does not meet the requirement of $1.3 \leqslant CaO/MgO \leqslant 2$. As another example, the contents of Al_2O_3, MgO and Li_2O mutually affect each other. If a certain value is selected for the content of a compound, the other two compounds must fall within their respective literal scopes and satisfy the requirement that the sum of the three compounds is equal to or higher than 23%.

In addition, the contents of the components in Reference 1 shall also be subject to an intrinsic limitation of the component contents in a composition, that is, the sum of all components may not be greater than 100%. Because of this limitation, the content of each component in Reference 1 cannot be selected at will.

If we select the end points of the numerical ranges of those components disclosed in Reference 1 to make a combination, it is impossible to arrive at a specific combination that complies with the limitations and falls within the scope of claim 1 of the patent application at issue. For example, if one selects 12% Al_2O_3, 10% MgO (the other end point 4% does not fall within the corresponding scope of claim 1 of the patent application at issue) and 0.1% Li_2O (the other end point 1.5% does not fall within the corresponding scope of claim 1 of the patent application at issue), $Al_2O_3+MgO+Li_2O$ is equal to 22.1% obtained by summing 12%, 10% and 0.1%, which does not fall within the corresponding scope of claim 1 of the patent application at issue. If one selects 18% Al_2O_3, 61% SiO_2 (the other end point 55% does not fall within the corresponding scope of claim 1 of the patent application at issue), 14% CaO (the other end point 18% does not fall within the corresponding scope of claim 1

of the patent application at issue) and 10% MgO (the other end point 4% does not fall within the corresponding scope of claim 1 of the patent application at issue), $Al_2O_3 + SiO_2 + CaO + MgO$ is equal to 103% obtained by summing 18%, 61%, 14% and 10%, which is beyond 100% and unlikely to be realized.

It can be seen that in the present case, the contents of the components mutually affect each other, and it is impossible to select the end points of the numerical ranges of the component contents disclosed in Reference 1 to make the particular composition falling within the scope of claim 1 of the patent application at issue. As a result, Reference 1 cannot deprive novelty of claim 1 of the patent application at issue. The first-instance judgment and the second-instance judgment were sufficiently supported.

3. Expanded discussion

In the present case, the first-instance court and the second-instance court both determined that the contents of the components affect each other, holding that Reference 1 which discloses the contents of components overlapping with those of the patent application at issue cannot destroy the novelty of the patent application at issue.

What is worth further study is how to apply the criteria for assessing the novelty of the present case to other inventions defined by multiple numerical ranges? For similar issues, reference can be made to U.S. and European practices for details.

3.1 Practice in the U.S.

According to the USPTO's MPEP (2015) Section 2131.02 "Genus-species situations", the species will anticipate the genus; and a generic disclosure will anticipate a claimed species covered by that disclosure when the species can be "at once envisaged" from the disclosure. Whether a generic disclosure necessarily anticipates everything within the genus depends on the factual aspects of the specific disclosure and the particular products at issue. How one of ordinary skill in the art would understand the relative size of a genus or species in a particular technology is of critical importance, which is different from China's practice that adopts Procrustean standards. For example, when a claimed compound is not specifically named in a reference, but instead it is necessary to select portions of teachings within the reference and combine them, e.g., select various substituents from a list of alternatives given for placement at specific sites on a generic chemical formula to arrive at a specific compound, anticipation can only be found if the classes of substituents are sufficiently limited or well delineated. In *In re Petering* [3], the prior art disclosed a generic chemical formula and preferred substituents. The court held that this formula, without more, could not anticipate a specific compound because the generic formula encompassed a vast number and perhaps even an infinite number of compounds. However, the more limited generic class consisting of about 20 compounds anticipated the specific compound.

According to the USPTO's MPEP (2015) Section 2131.03 "Anticipation of ranges", a specific example in the prior art which is within a claimed range anticipates the range. When the prior art discloses a range which touches or overlaps the claimed range, but no specific examples falling within the claimed range are disclosed, a case by case determination must be made as to anticipation. In order to anticipate the claims, the claimed subject matter must be disclosed in the reference with "sufficient specificity" to constitute an anticipation under the statute. What constitutes a "sufficient specificity" is fact dependent. The "sufficient specificity" is similar to "at once envisage" in the previous section called Genus-species situations. In *ClearValue Inc. v. Pearl River Polymers Inc.* [4], the claim at issue was directed to a process of clarifying water with alkalinity below 50 ppm, whereas the prior art taught that the same process works for systems with alkalinity of 150 ppm or less. In holding the claim anticipated, the court observed that "there is no allegation of criticality or any evidence demonstrating any difference across the range." In *Atofina v. Great Lakes Chem. Corp* [5], the court held that a reference temperature range of 100 - 500℃ did not describe the claimed range of 330-450℃ with sufficient specificity to be anticipatory, even though there was a slight overlap between the reference's preferred range (150-350℃) and the claimed range.

3.2 Practices in EU

Provisions regarding selection of individual elements, and novelty of numerical ranges and overlapping ranges are set forth in Part G, Chapter VI "Novelty", Section 8 "Selection inventions" of the EPO's Guidelines for Patent Examination (2016):

(1) A selection from a single list of specifically disclosed elements does not confer novelty. However, if a selection from two or more lists of a certain length has to be

made in order to arrive at a specific combination of features, then the resulting combination of features, not specifically disclosed in the prior art, confers novelty (the "two-lists principle"). Examples of such selections from two or more lists are the selection of compounds, mixtures, starting materials for the manufacture of a final product, and sub-ranges of several parameters from corresponding known ranges.

(2) A sub-range selected from a broader numerical range of the prior art is considered novel, if each of the following three criteria is satisfied: (a) the selected sub-range is narrow compared to the known range; (b) the selected sub-range is sufficiently far removed from any specific examples disclosed in the prior art and from the end-points of the known range; (c) the selected range is not an arbitrary specimen of the prior art, i.e. not a mere embodiment of the prior art, but another invention (purposive selection, new technical teaching).

The meanings of "narrow" and "sufficiently far removed" have to be decided on a case-by-case basis. However, a technical effect occurring in the selected sub-range, but not in the whole of the known range, can confirm that criterion (c) is met. The new technical effect occurring within the selected range may also be the same effect as that attained with the broader known range, but to a greater extent.

(3) In the case of overlapping ranges (e.g. numerical ranges, chemical formulae) of claimed subject-matter and the prior art, it has to be decided which subject-matter has been made available to the public by a prior art disclosure and thus forms part of the state of the art. In this context, it is not only examples, but the whole content of the prior art document which has to be taken into consideration. Matter that is "hidden" in a prior art document, in the sense of being reconditely submerged rather than deliberately concealed, is not considered to have been made available to the public.

As to overlapping ranges or numerical ranges of physical parameters, novelty is destroyed by an explicitly mentioned end-point of the known range, explicitly mentioned intermediate values or a specific example of the prior art in the overlap. It is not sufficient to exclude specific novelty destroying values known from the prior art range, and it must also be considered whether the skilled person, in the light of the technical facts and taking into account the general knowledge in the field to be expected from him, would seriously contemplate applying the technical teaching of the prior art document in the range of overlap.

The criteria mentioned in (2) above can be applied analogously for assessing the novelty of overlapping numerical ranges. As far as overlapping chemical formulae are concerned, novelty is acknowledged if the claimed subject-matter is distinguished from the prior art in the range of overlap by a new technical element (new technical teaching). If this is not the case, then it must be considered whether the skilled person would seriously contemplate working in the overlapping range and/or would accept that the overlapping area is directly and unambiguously disclosed in an implicit manner in the prior art. If the answer is yes, then novelty is lacking.

The concept of "seriously contemplating" is fundamentally different from the concept used for assessing inventive step, namely whether the skilled person would have tried, with reasonable expectation of success, to bridge the technical gap between a particular piece of prior art and a claim whose inventive step is in question, because in order to establish anticipation, there cannot be such a gap.

For instance, in the Decision T666/89 of the EPO's Boards of Appeal, the patent at issue was directed to a hair washing composition comprising 8 to 25% anionic surfactant and 0.001% to 0.1% cationic surfactant, whereas the prior art document disclosed a hair washing composition comprising 5 to 25% anionic surfactant and 0.1% to 5.0% cationic surfactant. In the Board's view, the patent lacks novelty basically because the skilled person would "seriously contemplate" applying the technical teaching of the prior art document in the overlapping range.

In T751/94, the patent at issue was directed to a method of producing a semi-conductor device, which involves the use of three parameters: the content of silicon, 1 to 2% nitrogen gas and a temperature of less than 500℃. The example in the method of the prior art document did not fall within the range recited in the claim of the patent at issue, but the content of silicon and the temperature respectively described in other parts of the description of the prior art document fall within the scope of the claims of the patent at issue, and the prior art document also discloses the nitrogen gas concentration is 1 to 20%. The Boards of Appeal stated that according to the prior art, about 1% nitrogen gas cannot realize the object of the prior art invention, so the skilled person would not carry out the overlapping range, namely, the technical solution comprising 1 to 2% ni-

trogen gas. Hence, 1 to 2% nitrogen gas cannot be considered as being disclosed in the prior art.

In T245/91, the Boards of Appeal held that where several ranges of parameters are to be considered, a careful comparison has to be carried out in order to assess whether or not the subject-matter of the claimed invention was available to the skilled person. In this case, the combination of features would not have been seriously contemplated by the skilled person and was not made available to him, because said features were not prominent in the cited reference and did not lend themselves, therefore, to an unambiguous, implicit disclosure. A further point to consider is the number of parameters. The number of parameters involved exceeds 10, the scope of the claimed blends is in reality quite narrow with regard to the breath of the definition of the known composition.

In T653/93, there is involved a combination of three process features. In the Board's judgment, the question of novelty cannot be answered by contemplating the ranges of the various parameters separately, because not the specified ranges of the three respective parameters or their agglomeration form the subject-matter, but the group of processes defined by the combination of these ranges.

3.3 Practice in China

Under local practice, for an invention defined by individual elements, the criteria for assessing the novelty of a compound claim are somewhat different from those for assessing the novelty of other types of claims.

In accordance with current patent practice in China, for assessing the novelty of a specific compound with respect to a generic chemical formula comprising a plurality of substituents with each having multiple parallel options, it is usually deemed that the specific compound is novel if the number of substituents in the generic chemical formula in the prior art is greater than 2, and there are more than 2 options for each substituent. For instance, in the Re-examination Decision No. 40895, the PRB held that "where the generic chemical formula in a reference comprises a broader scope of compounds and the skilled person cannot directly derive the specific compounds falling within the scope of the claim merely according to the generic formula and the selected substituents in the formula, even if the selected substituents in the generic formula in the reference are the same as those of the specific compounds falling within the scope of the claim, it cannot be concluded that the compounds in the claim have been disclosed in the reference, or in other words, the information disclosed in the reference is not sufficient to affect the novelty of the claim." [6] In *Gilead Sciences, Inc. v. the PRB*, the Beijing Intellectual Property Court concluded (in the Administrative Judgment No. Jingzhixingchuzi 1297/2015) "a Markush claim ……provides protection to a group of elements sharing some common characteristics. Respective properties of those elements and various technical effects resulting from combination of different elements are not technical contributions made by the patentee. Therefore, the specific compounds obtained by combining different elements in the Markush claim cannot be regarded as several separate technical solutions, and the Markush claim is not necessarily a collection of multiple parallel technical solutions……. Unless under special circumstances, the claim shall be in principle regarded as one technical solution……In addition, the tremendous number of compounds comprised in the Markush claim can also support the above conclusion from another perspective." [7] In the light of the Judgment, a Markush formula would not, in principle, destroy the novelty of the specific compounds.

However, under other circumstances similar to compounds, no similar rules are provided for the subject-matters of inventions concerning, e.g., compositions and processes. For instance, in the Re-examination Decision No. 12500, for a composition defined by several numerical ranges, the PRB cited a reference relating to a composition which comprises the same components as the patent application at issue, and the content ranges of the components overlap with those of the components of the patent application at issue. Accordingly, the PRB found the patent application at issue lacked novelty with respect to the reference [8]. In the Invalidation Decision No. 20149, the patent at issue claimed the use of a compound in the preparation of a medicament for treating a certain disease. The prior art disclosed the use of the compound, the isomer for the compound, the salt of the compound or the salt of the isomer for the compound for the treatment of various diseases, which are listed in five pages and amount to hundreds of types that almost cover all common diseases including the one mentioned in the patent at issue. The PRB decided that the reference disclosed the use of the compound for the treatment of the disease recited in the patent at issue. "Although Exhibit 1 also disclosed that dapoxetine can also treat other diseases, it is obvious that these technical solutions are parallel". The first-instance and second-instance courts also

adopted the same viewpoint [9].

3.4 Analysis and discussion

3.4.1 Assessment of novelty: Blending of fact-finding and value selection

Novelty is a basic prerequisite for grant of patent, and the assessment of novelty fundamentally lies in whether the prior art discloses a technical solution identical with that of the patent, i.e., the determination of the contents disclosed in the prior art. The understanding of the skilled person should prevail in deciding the contents disclosed in the prior art. According to the Guidelines for Patent Examination (2010), the contents disclosed in the prior art include not only those technical contents expressly described in the prior art reference but also those implied technical contents that can be derived directly and unambiguously from the disclosure by the skilled person. The contents which can be obtained by the skilled person through analysis, inference, or limited experimentation can only be used to assess inventive step, rather than novelty. It can be seen that the essence of the novelty assessment is to determine the skilled person's understanding of the technical solution disclosed in the prior art, which is first of all the issue of fact-finding.

It should be noted that, just like most patent-related issues, the assessment of novelty is not purely a matter of fact-finding, but involves value selection. The extent of strictness of novelty criteria will have an impact on the balance of interests between the patentee and the general public, so the assessment of novelty of a patent is not completely the same as that in scientific research. This can also be proved by the fact that the criteria for assessment of novelty in the countries/regions worldwide are never exactly the same. For instance, in regard to assessment of novelty of compound inventions, numerical range inventions and selection inventions, there is a great discrepancy between practices at the EPO and in Germany. EPO has adopted a narrow concept of novelty, requiring that a compound which is specifically and explicitly described should be regarded as possessing no novelty; whereas the German Federal Court of Justice has adopted a broad concept of novelty, stating that the contents that can be directly envisaged and obtained by the skilled person after reading the reference can be used to destroy the novelty [10]. For instance, in a case examined by the German Federal Patent Court in 1986, the substituents X, Y in the generic formula XOCOOOCOOY disclosed in the reference can be the same, namely C_{5-20} alkyl, the typical examples of which include dilauryl (dodecyl) and distearyl (octadecyl). The court decided that dicetyl (cetyl) possessed no novelty as it can be directly envisaged by the skilled person[11]. In another case, the German Federal Court of Justice held that a numerical range delimited by an upper limit and a lower limit is a simplified notation of all the values lying within the range, so the disclosure of a numerical range takes away novelty from all individual values falling within the known range. If a reference discloses a catalyst containing less than 50ppm of metal, then a catalyst containing 10ppm of metal, though being not mentioned, does not possess novelty [12]. This means the assessment of novelty isn't just a technical issue, and cannot be made under uniform standards. Different countries may adopt different novelty criteria in various phases, which result from different value selections and are subject to influence by many factors such as legal notions and industrial policies.

The criteria for assessing novelty of compounds covered by a Markush formula typically reflect the value selection. Where a generic Markush formula disclosed in the prior art contains a plurality of substituents with each having several options, most people would understand, from the pure viewpoint of the person who engages in development of technology, that the prior art has disclosed the specific compounds composed of specific options for the elements, and a compound in the Markush form is just a special expression and is much simpler in form as compared with the one having the specific compounds enumerated, and makes no difference in terms of the disclosed technical contents. Nevertheless, if such a pure technical viewpoint is adopted, the prior art references, especially the patent document which discloses a large number of compounds in the form of Markush formula, can destroy the novelty of each specific compound composed of various elements. These prior art references usually do not make efforts to prepare and study those specific compounds, and it is easy to cover the specific compounds by enumerating the substituents in the form of a Markush formula. In doing so, even if a subsequent inventor prepares and studies a specific compound to make crucial contributions to the invention relating to the specific compound, the invention cannot be afforded patent protection due to lack of novelty, which is apparently unfair to the subsequent inventor and will definitely pose an obstacle to the development of the industry. Due to this fact, each country adopts special criteria for assessing the novelty of Markush compounds. As stated in Item 3.1, the

criterion adopted by the USPTO is that anticipation can only be found if the classes of substituents are sufficiently limited or well delineated. As stated in Item 3.2, the criterion adopted by the EPO is that if a selection from two or more lists of a certain length has to be made in order to arrive at a specific combination of features, then the resulting combination of features, not specifically disclosed in the prior art, confers novelty. As stated in Item 3.3, a similar criterion can be found in China: a specific compound is novel if the number of substituents in the generic chemical formula in the prior art is greater than 2, and there are more than 2 options for each substituent. The above criteria sound reasonable only when consideration is given from the perspectives of balance of interests and value selection.

As stated above, the distinction in effect is used by various countries as one of the bases for determining the novelty criteria in practice. Some practioners in China also put forward a way to make the distinction according to the technical fields to which inventions belong. According to their opinions, where a reference discloses a plurality of technical features defined by numerical ranges, and the numerical ranges overlap with those defined in the patent claim, it can be usually deemed that the reference destroys the novelty of the claim in a technical field where a technical effect is highly predictable, and the reference cannot destroy the novelty of the claim in a technical field where a technical effect is hardly predicatable [13]. In this regard, the writers are of the view that the assessment of novelty involves the skilled person's understanding of the contents disclosed in the prior art document, rather than the evaluation of the technical effect. The evaluation of the technical effect shall be the issue taken into account when assessing the inventive step, and the inventive step and novelty should not be mixed up.

3.4.2 Criteria for assessing novelty of a combination of specific numerical values

In regard to an invention defined by a plurality of numerical ranges, if numerical ranges overlapping with the numerical ranges defined in the invention are disclosed in the prior art, the novelty of the invention can be assessed by the combination of the specific numerical values.

To be specific, when the numerical values disclosed in the prior art that fall within the numerical ranges of the claimed invention are mutually affected and cannot be selected at the same time, it implies that the prior art does not disclose a combination of specific numerical values falling within the scope of the claimed invention, the prior art does not disclose a specific technical solution falling within the scope of the claimed invention, and therefore the prior art cannot destroy the novelty of the claimed invention. For instance, in the case introduced at the beginning of this article, the numerical values disclosed in the prior art that fall within the scope of the claimed invention do not comply with the numerical relationships defined in the claimed invention, or the sum of those values exceeds 100%, which is infeasible in practice. Thus, the prior art does not disclose any specific technical solution falling within the scope of the claimed invention and cannot destroy the novelty of the claimed invention.

The fundamental provisions for assessing the novelty of the genus and species and the novelty of a numerical range as set forth in the Guidelines for Patent Examination in China can be expressed as follows: a specific technical solution can destroy the novelty of a generic technical solution, but a generic technical solution cannot destroy the novelty of a specific technical solution, which is consistent with the criterion specified above for judging whether the prior art discloses a combination of numerical values falling within the scope of the claimed invention.

3.4.3 Whether the criteria for assessing the novelty of Markush compounds are applicable to the assessment of novelty of an invention defined by numerical ranges?

It is worth studying whether the prior art can destroy the novelty of the claimed invention if the numerical values disclosed in the prior art that fall within the numerical ranges of the claimed invention can constitute a specific technical solution. The answer is usually positive under the current Chinese practice. However, there obviously exists a great discrepancy between the criteria for assessing the novelty of Markush compounds and the criteria for assessing the novelty of an invention defined by numerical ranges. A prior art reference which discloses numerical ranges can be understood as containing a plurality of variants, for each of which there are at least two options, i.e., two end points. According to the criteria for assessing the novelty of Markush compounds, it is deemed that the prior art does not disclose any combination of these end points and therefore the prior art cannot destroy the novelty of the claimed invention. It can be seen that the crucial issue is whether the criteria for assessing the novelty of Markush compounds are applicable to other subject matters, such as an invention defined by numerical ranges?

If the criteria for assessing the novelty of Markush compounds are based on the balance of interests as stated in Item 3.4.1, then the balance of interests should not be limited to compounds as the same issue also exists in other fields. For instance, in the Invalidation Decision No. 20149 as stated above, the prior art enumerated some compounds which can be used for the treatment of hundreds of diseases without providing any experimental data to prove them, which is obviously in violation of common sense because there is no such a medicament that can treat hundreds of diseases. If such a disclosure can be used to destroy the novelty of the claimed invention, it would undoubtedly pose a great hindrance to subsequent inventions. This issue would become more prominent especially in China which sets no requirement for sufficiency of disclosure of the prior art cited for assessing inventive step and novelty.

From the viewpoint of the comparative law, as stated above, neither the USPTO nor the EPO limits the above criteria to Markush compounds. The USPTO's MPEP sets Markush compounds as an example under the genus-species situations; and the EPO's Guidelines for Patent Examination definitely stipulate that examples of such selections from two or more lists include compounds, mixtures, starting materials for the manufacture of a final product, and sub-ranges of several parameters from corresponding known ranges. In contrast, China's Guidelines for Patent Examination do not explicitly provide for such a provision, but the provision is only applicable to compounds in practice. And as far as the writers know, there is no detailed explanation about that rule. It seems that the rule is not well founded.

Apparently, it would be in favour of subsequent inventions if the criteria for assessing the novelty of Markush compounds are applicable to other inventions containing several variants, including inventions defined by numerical ranges. Furthermore, if the criteria for the assessment of novelty are relatively lenient, an invention will be likely to be subject to substantial assessment under other provisions, such as whether the invention makes creative contributions, and whether the scope of the invention complies with the contributions it made. This seems to be fairer to inventors and would be better in line with the purpose of the patent law of encouraging invention-creations. Of course, whether or not to adopt such criteria should be further studied in combination of the value orientation of China's patent policies in a specific time period. ■

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[1] The Reexamination Decision No.62543 issued by the PRB.

[2] The Administrative Judgment No. Yizhongzhixingchuzi 5475/2014 and the Administrative Judgment No. Jingxingzhong 78/2017.

[3] 301 F.2d 676, 133 USPQ 275 (CCPA 1962).

[4] 668 F.3d 1340, 101 USPQ2d 1773 (Fed. Cir. 2012).

[5] 441 F.3d 991, 999, 78 USPQ2d 1417, 1423 (Fed. Cir. 2006).

[6] The Reexamination Decision No. 40895 issued by the PRB.

[7] The Administrative Judgment No. Jingzhixingchuzi 1297/2015.

[8] The Reexamination Decision No. 12500 issued by the PRB.

[9] The Invalidation Decision No. 20149, the Administrative Judgment No. Yizhongzhixingchuzi 3245/2013, and the Administrative Judgment No. Gaoxingzhongzi 1706/2014.

[10] Zhang Qingkui (2002). On novelty of inventions, especially those in the chemical field. Patent Examination Practice. Intellectual Property Publishing House.

[11] Blatt fur Patent -, Muster - und Zeichenwesen (B1. F. PMZ), 1987, pp. 131-132. Quoted from note 10.

[12] GRUR, 1992, pp. 159-161. Quoted from note 10.

[13] Shi Jixian & Zhu Ke (2012). Numerical ranges in novelty assessment. *China Invention & Patent, 2*.