On Issues Concerning Priority of Markush Compound Claims

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Introduction

For a new drug, the journey from research and development to market usually takes a very long time, including new compound structure development and screening, biochemical tests, animal tests, clinical trials, etc. To get a first-mover advantage in competition, patentees tend to apply for patents in the early stage of research and development, i. e., the phase of compound structure development and screening. In practice, it often occurs that patent applications go ahead of the completion of lead compound screening.

Applications of such kind have two characteristics: first, claims are drafted as Markush claims on the grounds that, based on the research on a limited number of specific compounds, compounds with similar structures can be included within the scope of protection of a patent; and second, a patent application for Markush compounds having a larger scope is submitted first and then a formal application claiming the earlier application as a priority is submitted within one year. On the one hand, there has been a controversy in the IP industry over whether a Markush claim involves an "overall technical solution" or "parallel technical solutions" by nature; and on the other hand, views are divided in the IP industry as to whether the right of priority system is originally to solve the problem of "physical application distance" or provide an applicant with an opportunity to supplement and improve an invention. Moreover, disputes over whether the Markush compound claim is allowed to be modified in the grant and invalidation proceedings have also been in progress. All of the above three issues render the right of priority issue of Markush compound claims to be a new hot topic in the field of pharmaceutical patents in recent years.

This article is going to parse through the following three issues.

I. How to understand the nature of Markush compound claims in the context of priority judgment?

There have always been two prevailing views in the IP industry on the nature of Markush compound claims, i. e., the "overall technical solution theory" and the "parallel technical solution theory". The former deems that a Markush compound claim is an overall technical solution composed of numerous variables and a great number of selectable elements in a general formula, and the latter holds that a Markush compound claim is a combination of multiple parallel technical solutions generalized thereby [1].

In view of the two different theories on the nature of Markush compound claims, there are also two views on the judgment of the priority of the Markush compound claims. The "overall technical solution theory" deems that the compounds covered by a Markush formula in the claim of a subsequent application shall be compared in entirety with those of the priority application [2]; and the "parallel technical solution theory" [3] holds that the specific compounds covered by the Markush formula of the subsequent application shall be compared with those of the priority application, and if they are the same, it can be determined that this portion of the technical solution can enjoy the priority of the earlier application.

The authors are of the opinion that the "overall technical solution theory" sounds more reasonable.

Firstly, the "overall technical solution theory" has gradually become a mainstream view. In principle, the Markush compound claim should be treated as an "overall technical solution", which is embodied in many reexamination and invalidation decisions issued by the China National Intellectual Property Administration (CNIPA) [4]. After the Administrative Judgment No. Zuigaofaxingzai 41/2016 issued by the

Supreme People's Court defines the nature of the Markush claims, that is, "the Markush claim should be regarded as the combination of Markush elements, rather than of various compounds, and the Markush elements will be manifested as a single compound only under specific circumstances", the "overall technical solution theory" has gradually been accepted by the IP industry.

Secondly, the determination of the nature of Markush compound claims should not differ irrespective of whether the determination is made on the basis of the novelty or inventive step assessment or of the establishment of priority. During examination, multiple legal provisions are applicable to decide whether a claim is patent-eligible. As required by the "systematic" interpretation, the nature and meaning of a claim shall be kept consistent and not differ because of examination under different legal provisions.

Thirdly, the Markush compound claim may enjoy a part of priority under specific circumstances, but it does not mean that the priority can be determined in accordance with the "parallel technical solution theory". According to the provisions in Part II, Chapter Three, Section 4.1.4 of the Guidelines for Patent Examination [5], a technical solution is a minimum unit claiming a right of priority. Therefore, under specific circumstances, it is possible that the Markush compound claim can enjoy a part of the priority where the Markush compound claim contains a limited number of parallel technical solutions that can be clearly separated [6]. However, this will not change the usual inseparable commonality of the Markush compound claims written as generalized claims.

Based on the above analysis, in the determination of the priority of the Markush compound claim, the Markush compound claim in the earlier application shall, in principle, be compared in entirety with that in the subsequent application. An exception is that where the Markush compound claim can be clearly divided into multiple parallel technical solutions, each technical solution shall be subject to comparison so as to determine whether the priority of each technical solution can be established.

II. How to determine whether the Markush compound claim enjoys a right of priority under the "overall technical solution theory"?

In practical examination, the following situations are usually prone to trigger disputes when determining whether the Markush compound claim enjoys a priority: (1) both the earlier and subsequent applications involve the Markush compound claims, but the scope of the earlier application is smaller than that of the subsequent application (Scenario 1); (2) the earlier application involves the Markush compound claim, whereas the subsequent application involves a specific compound claim (Scenario 2); and (3) both the earlier and subsequent applications involve the Markush compound claims, but the scope of the earlier application is greater than that of the subsequent application (Scenario 3).

1. Scenario 1

In the Venetoclax case [7], the Markush compound claim contains more than 10 substituents each having several variable alternatives. In the Markush formula of the priority application, the substituent R^{57A} is spiroalkyl. In the subsequent application, R^{57A} in Claim 2 is defined as spiroalkyl or hereto-spiroalkyl, and the description is added with four examples where R^{57A} is spiroalkyl, as well as six examples where R^{57A} is hereto-spiroalkyl. The Invalidation Decision found that the claimed right of priority cannot be established on the grounds that "where the claim in the earlier application is drafted as a Markush claim, if it is deemed that any specific compound falling within the scope of that claim or covered by any Markush formula that partially overlaps the scope of protection of that claim can enjoy the right of priority of the earlier application, it means that the content derived from further research can be continuously supplemented on the basis of the earlier application, which will harm the interests of other applicants and the public".

2. Scenario 2

In the Macitentan case [8], only two specific compounds, i.e., the compound 104 and macitentan, are retained in the subsequent application in the invalidation proceedings. The earlier application contains the general formula compound that is the same as that of the subsequent application, but does not recite the specific compound 104 and macitentan. It is stated in the Invalidation Decision that "if any specific compound falling within the scope of the Markush formula of the earlier application can enjoy the priority of the earlier application due to being covered by the formula, it means that the earlier application will become a 'reservoir' and the applicant can freely claim the priority for any new specific compound covered by the scope of Markush formula obtained through further research after the priority date, which

is apparently in violation of the original intention of the priority system. Under such circumstances, if the specific compound in the subsequent application is not clearly recited in the earlier application or cannot be directly or unambiguously derived therefrom, it shall not enjoy the priority."

3. Scenario 3

In the Benzothiophene case [9], Claims 1 to 3 of the subsequent application are related to a compound of a general formula, wherein R^1 to R^6 are independently selected from six alternatives a) to f) respectively. In the scope of Markush formula compounds of the earlier application, the definition of R^1 to R^6 includes "(i) C_{1-20} alkoxy, (m)-Y-C_{6-14} aryl", in addition to the six alternatives a) to f). That is to say, the subsequent application has deleted some substituent alternatives in the definition of R^1 to R^6 as compared with the earlier application. The Reexamination Decision held that "although Claim 1 of the subsequent application has a smaller scope of protection due to less substituent alternatives than those of the earlier application, the change in the scope of protection merely results from the deletion of some substituent alternatives from the earlier application, and no technical solution unrecited in the earlier application occurs, which means that there does not appear a new subject matter of an invention formed beyond the work done by the filing date of the earlier application. Hence, the earlier and subsequent applications belong to the same subject matter."

Similarly, in the Upadacitinib case [10], the earlier application recites the formula (Ic) of Markush compounds, and the subsequent application deletes multiple alternatives in R^1, R^2, R^4 and R^5 of the earlier application and only retains hydrogen. Similarly, multiple alternatives of A, D, E, G, R^e and R^a substituents in R^3 are deleted. The Invalidation Decision concluded that "in the substantive examination procedures of the patent application, the alternatives of some substituents of the original Markush claim are deleted or limited to form a new Markush claim with a smaller scope. If such a deletion or limitation does not generate a particular combination having a specific meaning or highlights a separate compound or compound group not particularly mentioned in the original application, such an amendment is allowed; and meanwhile, since such a change is made within the entire Markush scope and no new inventive kernel is created or the inventive entity remains unchanged, the subsequent application can be regarded as an invention with the same subject matter as that before deletion, and then be confirmed to still enjoy the right of priority of the earlier application."

In consideration of analysis of the above cases, it can be found that although the three scenarios are manifested in different forms, the essences thereof are the same, i.e., when judging whether the subsequent application is directed to an invention with the same subject matter as that of the earlier application and thereby enjoys the right of priority of the earlier application, efforts shall be made to mainly decide whether the subsequent application can be directly and unambiguously derived from the earlier application; and when judging the priority of the Markush compound claim, it is necessary to decide whether the changes of the subsequent application as compared with the earlier application create any content unrecited in the earlier application.

In the Venetoclax case under Scenario 1, R^{57A} is hetero spiroalkyl that is not recited in the earlier application, and since the compound of general formula has variables with each having multiple substituents, the entire general formula can hardly be divided into several parallel technical solutions precisely. Therefore, the addition of the unrecited content results in that the priority of the entire claim cannot be established. In the Macitentan case under Scenario 2, the compound 104 and macitentan have never appeared in the priority application and therefore cannot enjoy the priority of the earlier application. Under these two scenarios, there is not much controversy in practice over whether the priority can be established under the "overall technical solution theory" in the grant procedures or invalidation proceedings.

But the co-existence of Scenarios 1 and 3 makes people confused. In the two cases under Scenario 3, where the scope of protection of the subsequent application is narrowed down by deleting some substituent alternatives in the compounds covered by the Markush formula of the earlier application, it seems that the subsequent application cannot enjoy the right of priority under the "overall technical solution theory"? However, why is an opposite conclusion drawn in the above cases? Is the conclusion drawn under Scenario 3 in contradiction with that drawn under Scenario 1? The authors intend to make them logically consistent in the following part.

III. How to make Scenarios 1 and 3 logically consistent?

The earlier and subsequent applications under Scenarios 1 and 3 all involve Markush compound claims. In strict adherence to the "overall technical solution theory", the subsequent application should never enjoy the right of priority of the earlier application irrespective of whether the scope of the general formula is narrowed down or broadened. This conclusion seems to be too harsh for patent applications in the grant procedures, and is inconsistent with the practice of allowing selective deletion for Markush compound claims in the grant procedures so as to overcome the defect of lack of support by the description or lack of novelty or inventive step.

The authors think that to make the two scenarios logically consistent, consideration shall be given to the characteristics of the grant procedures and invalidation proceedings, coordination between the identification of the right of priority and the rules for amending application documents, as well as the balance of interests between patentees and the public.

Firstly, from the perspectives of the public's reliance interests and the rules for claim amendment, it is reasonable to treat the cases in invalidation proceedings and grant procedures in different ways under the "overall technical solution theory".

Claims in the invalidation proceedings are the objects for which patents are granted after examination by the administrative authority. The public has reliance on its authoritativeness and the scope of protection of the claims, and consciously evades the "fence" of patent rights. Such reliance also decides that claim amendment in the invalidation proceedings should be treated more prudently so as to prevent claim amendment from going beyond the expectation of those skilled in the art, which may harm the public's reliance interest. As for complicated claims defined by Markush elements, selective deletion of substituent alternatives will artificially divide the scope of the Markush claim into different subsets. The division may be done depending on the prior art and the patent in suit or according to the patentee's subjective will. If the standards and boundaries of such division are unanticipated by those skilled in the art, it is usually not allowed to selectively delete substituents in the Markush claim in the invalidation proceedings. Of course, the Markush compounds amended in such a manner cannot enjoy the right of priority.

In contrast, claims in the grant procedures are still under examination, and the public has not yet formed a stable expectation about the scope of protection of the claims. When generalizing the Markush formula, a patent applicant may inevitably "exaggerate" and "enclose a larger scope" in a bid to maximize the right. "The process of substantive examination is actually a procedure to modify the patent right to a suitable scope of protection through communications between the examiner and the patent applicant in consideration of the contribution made by the patent applicant to the prior art. In this process, if the claim written in the Markush manner is not allowed to be narrowed down by amendment, such as selectively deleting some alternatives (which are usually substituent alternatives) of the Markush elements, a heavier burden may be imposed on the patent applicant or agent when drafting application documents, so that the benefits obtained by the patent applicant are obviously inconsistent with the contribution made by the patent applicant to the prior art. Hence, when the rights of the patent applicant have not yet been fixed, allowing the deletion of some 'exaggerated' content is a compromise approach, which is beneficial to both the applicant and the public from the perspective of reasonableness." [11] This is the fundamental reason for selective deletion of substituents in Markush claims in the grant procedures.

In summary, it is reasonable to treat and deal with amendment to Markush claims in the invalidation proceedings and grant procedures differently as a result of the selection of examination policies in view of the main goals and tasks of the two processes, but it does not mean that there is a difference in the identification of the nature of Markush compound claims between the invalidation proceedings and grant procedures.

Secondly, the same standards should be adopted in the invalidation proceedings and grant procedures in view of commonality and coordination between priority identification and claim amendment.

The root and original intention of the priority system determine that if the content of the subsequent application cannot be directly or unambiguously derived from the earlier application, the subsequent application cannot enjoy the priority of the earlier application. For Markush claims, the separation of priority identification from claim amendment may lead to logical inconsistency. For instance, in the grant procedures, if the selective deletion of some substituents of Markush elements is allowed so as to overcome the defect of lack of support by the description or lack of novelty or inventive step, and meanwhile the "overall technical solution

theory" is strictly followed in the identification of the priority as mentioned in the Rejection Decision in the Benzothiophene case, there will appear the contradiction between opinions on whether the claim is dividable in the same case. Only by unifying the rules for identifying a right of priority and the rules for claim amendment can such a contradiction be resolved.

Thirdly, for the sake of balancing the interests between patentees and the public, patent applicants are provided with an opportunity to modify Markush claims, which are difficult to divide into several parallel technical solutions, in the grant procedures in adherence to the "overall technical solution theory", in such a manner to protect the interests of the patentees and meanwhile avoid improper harm of the public interest.

To sum up, the authors opine that under Scenarios 1 and 3, where the Markush claim is difficult to divide into several parallel technical solutions, the following manners can be adopted in practice:

Under Scenario 1 where the subsequent application broadens the scope of protection of the Markush claim, the Markush claim shall be considered as an overall technical solution in the invalidation proceedings and be determined not to enjoy the priority of the earlier application due to the structural difference between the earlier and subsequent applications; and in the grant procedures, the examiner can issue an office action first, deciding that the subsequent application does not enjoy the priority under the "overall technical solution theory" and allowing the applicant to make amendment by deleting the added substituent alternative. As for the technical solution containing the deleted substituent alternative, the applicant can protect it by drafting a new independent claim, which however does not enjoy the priority of the earlier application.

Under Scenario 3 where the scope of protection of the subsequent application is narrowed down due to the deletion of some alternatives from the Markush compound claim, if the deletion does not generate a new inventive kernel, the priority shall be deemed to be established in the invalidation proceedings or grant procedures because the deleted content is clearly recited in the earlier application. ■

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[1] Chen Wenping, et al. (2019). Amendment to Markush claims in invalidation proceedings. *China Invention & Patent, 2, 91-96*.

[2] Zhang Zhanjiang (2020). Rules for judging the priority of Markush claims. *China Invention & Patent, 10, 98-103*.

[3] The Administrative Judgment No. Jingxingzhong 1806/2017.

[4] The Invalidation Decision No. WX48183 issued by the CNIPA.

[5] If A and B as mentioned above are two alternative technical solutions and the applicant recites "A or B" in a claim of the subsequent Chinese application, the subsequent Chinese application can also enjoy multiple priorities, i.e., have different priority dates. However, if one technical solution of the subsequent Chinese application is composed of different technical features respectively recited in two or more first foreign filings, the subsequent application cannot enjoy priority.

[6] The Invalidation Decision No. WX22284 issued by the CNIPA, the Administrative Judgment No. Jingzhixingchuzi 1297/2015, the Administrative Judgment No. Jingxingzhong 1806/2017, and the Administrative Ruling No. Zuigaofaxingshen 5793/2018.

[7] The Invalidation Decision No. WX58684 issued by the CNIPA.

[8] See supra note 4.

[9] The Reexamination Decision No. FS103348 issued by the CNIPA.

[10] The Invalidation Decision No. WX562232 issued by the CNIPA.

[11] Ren Xiaolan (2011). On definition and examination of "parallel technical solutions" in the sense of patent law. *Studies on Patent Law*.

Chinese-Made Innovative Drugs Hit 100-Billion-Yuan Market Scale

According to a report released during the China Pharmaceutical Industry Development Conference, Chinese authorities have approved 113 domestically developed innovative drugs for market entry since 2021, with the scale of the market now at 100 billion yuan. 165 innovative devices have been approved in the medical device sector during China's 14th Five-Year Plan (2021-2025) period. Many of these devices incorporate cutting-edge technologies, including deep learning, magnetic levitation and magnetic resonance monitoring. The report also notes significant progress in China's industrialization of biological drugs, in its advancement of intelligent manufacturing, and in the green development of the active pharmaceutical ingredient industry.

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