

SPC Guiding Case No. 277: Jiangsu Hong [X] Rotary Compensator Technology Co., Ltd. v. Jiangsu Yuan [X] Bellows Co., Ltd. et al. (Invention Patent Infringement Dispute)

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Unofficial English translation prepared for reference only. The official Chinese text prevails.

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Keywords

Civil / infringement of invention patent right / infringement comparison / product drawings / physical product difficult to obtain or disassemble

Holding

In patent infringement determination, where there are objective obstacles to obtaining or disassembling the physical alleged infringing product, making it impossible to use that physical product as the basis for technical comparison, but there is evidence proving that the drawings of the alleged infringing product are highly consistent with the physical product, the people's court may use those drawings as the basis for the technical comparison; with respect to the technical features that a product defined by the claims possesses in its normal working state, the comparison may be made using the technical features of the alleged infringing product in its normal working state that a person of ordinary skill in the art derives by analyzing the drawings.

Basic Facts

On August 11, 2006, Song [X]gen applied to the State Intellectual Property Office for an invention patent entitled "High-Pressure-Resistant Rotary Compensator for Pipelines," which was granted on October 17, 2007, with patent number ZL200610XXXXXX. On May 17, 2011, Song [X]gen assigned the patent right to Jiangsu Hong [X] Rotary Compensator Technology Co., Ltd. ("Jiangsu Hong [X] Technology"). The patent remained within its protection term at the time of the litigation. Claim 1 of the patent claims reads: "A high-pressure-resistant rotary compensator for pipelines, comprising a core pipe (1), a sealing gland (3), a sealing seat (5), and a connecting pipe (7), wherein one end of the core pipe (1) is inserted into the connecting pipe (7), the connecting pipe (7) is fixedly connected to one end of the sealing seat (5) and fitted over the core pipe (1), at least one annular outer boss (8) is provided on the end of the core pipe (1) extending into the connecting pipe (7), at least one annular inner boss (9) is provided on the inner surface of the sealing seat (5), the sealing gland (3) is fitted over the core pipe (1) and inserted into the other end of the sealing seat (5) so as to abut against an annular-face seal (4) installed between the inner surface of the sealing seat (5) and the outer surface of the core pipe (1), and the sealing gland (3) and the sealing seat (5) are connected by a connecting member (2); characterized in that at least one sealing cavity formed by the inner surface of the sealing seat (5), the outer surface of the core pipe (1), and the side faces of the annular outer boss (8) and the annular inner boss (9) is formed between the sealing seat (5) and the core pipe (1), an end-face seal (6) is installed in the sealing cavity, and the spatial size of the sealing cavity is substantially unchanged." Claim 3 reads: "The high-pressure-resistant rotary compensator for pipelines according to claim 1, characterized in that the seals (4, 6) are made of a high-temperature- and high-pressure-resistant sealing material." Claim 4 reads: "The high-pressure-resistant rotary compensator for pipelines according to claim 1, characterized in that the connecting pipe (7) is a reducer joint, the pipe diameter of the end fixedly connected to the sealing seat (5) being greater than the pipe diameter of the end connected to the pipeline." The background art stated in the patent specification reads: "At present, traditional sleeve-type, bellows-type, and

steel-ball-type pipeline compensators have gradually been replaced by rotary compensators due to reasons such as complex structure, high cost, inconvenient installation, and small compensation amount. The rotary compensators currently in wide use have the advantages of simple structure, convenient manufacture, and large compensation amount. However, in actual use it has been found that end-face leakage occurs due to problems in the sealing structure, especially when conveying high-temperature, high-pressure media, and therefore the sealing structure must be improved to meet the use requirements of high-temperature, high-pressure conveying pipelines." The content of the invention reads: "The objective of the present invention is to design a high-pressure-resistant rotary compensator for pipelines with a new sealing structure, aimed at the problem of poor high-temperature, high-pressure sealing of existing rotary compensators." The advantages of the invention read: "Since the expansion coefficient of the seal is greater than that of the cavity in a relatively sealed closed cavity, the higher the temperature and pressure, the better the fit between the seal and the end face, and therefore the better the sealing effect," and "it can be applied to the compensation of various high-temperature, high-pressure medium pipelines." The last paragraph of the patent specification states: "In summary, adding an end-face seal to an existing rotary compensator is the key of the present invention; anyone who solves the leakage of a rotary compensator by adding an end-face seal shall be deemed to fall within the present invention."

In 2013, a certain Group's Guangxi [X]wan Thermal Power Co., Ltd. ("Guangxi [X]wan Thermal Power") procured rotary compensators produced by Jiangsu Yuan [X] Bellows Co., Ltd. ("Jiangsu Yuan [X] Bellows") through public bidding for use in an oil-heating steam pipeline project. The purchase contract and supplementary contract concluded between the buyer and the seller stated: 122 rotary compensators were purchased at a unit price of RMB 43,640 (same currency hereinafter), and 3 bellows compensators at a unit price of RMB 33,997.5, with a total contract price of RMB 5,426,072.5. The detailed design drawings (installation design) and technical guidance plan proposed by the seller and confirmed at the liaison meeting between the parties could not be changed or modified without the buyer's prior written consent, but the buyer had the right to propose changes or modifications to suit on-site conditions and to notify the seller in writing, and the seller should give full consideration and endeavor to meet the buyer's requirements. The technical agreement on compensators concluded between the buyer and the seller stipulated: the rotary compensators must be high-temperature- and high-pressure-resistant, self-sealing, maintenance-free, leak-proof, and non-thrust type; the sealing structure of the products must have both annular-face and end-face double sealing; and the main structure of the products is composed of components such as the core pipe (rotary cylinder), sealing seat (outer sleeve), reducer pipe, sliding ring (sealing ring), packing flange, and packing material. The seller was required to provide, free of charge, a rotary compensator for on-site dissection or disassembly inspection, and the buyer would conduct on-site random inspection to verify whether it met the technical agreement requirements. The completed products should be consistent with the finally confirmed drawings. If the seller's technical personnel further modified the drawings during on-site installation of the equipment, the seller should recompile the drawings into a volume, formally submit them to the buyer, and guarantee that the installed equipment fully conforms to the drawings. Annex 11 was the attached drawing of the rotary compensator (the "Contract Drawing in Issue"), which stated that a red-copper high-pressure-resistant graphite composite gasket was installed in the sealing cavity, and that the sealing seat, core pipe, and the like were made of 15CrMoG material. After verification, Guangxi [X]wan Thermal Power confirmed that it had not received any document modifying the equipment drawings.

Jiangsu Hong [X] Technology also participated in the bidding for the compensators in the pipeline network project in issue. Its initial quotation was: a unit price of RMB 88,200 per rotary compensator and RMB 25,000 per bellows compensator.

In 2018, Jiangsu Hong [X] Technology sued Jiangsu Yuan [X] Bellows and Guangxi [X]wan Thermal Power in court for infringing its rotary compensator invention patent right, requesting an order that: (1) Jiangsu Yuan [X] Bellows immediately cease producing and selling the infringing products; (2) Guangxi [X]wan Thermal Power immediately cease using the infringing products; and (3) Jiangsu Yuan [X] Bellows compensate

Jiangsu Hong [X] Technology for economic losses of RMB 5 million.

Jiangsu Hong [X] Technology asserted a scope of protection consisting of Claim 1, Claims 1 and 3, and Claims 1 and 4 — three technical solutions in total — and asserted that the objects of comparison were the Contract Drawing in Issue and the content of the patent claims. Jiangsu Yuan [X] Bellows argued that there were differences between the Contract Drawing in Issue and the rotary compensators it actually supplied. Therefore, the Contract Drawing in Issue should not be used as the object of comparison for determining whether the alleged infringing product constituted infringement. Even if the Contract Drawing in Issue were compared with the content of patent Claims 1, 3, and 4, the alleged infringing product adopted a connection method in which the core pipe and the connecting pipe directly abut against each other, which differed in structure from the technical feature of the patent in issue — "one end of the core pipe is inserted into the connecting pipe, and the connecting pipe is fitted over the core pipe" — and also had multiple functional differences, so the two did not constitute equivalent features. The end-face seal of the alleged infringing product was a red-copper high-pressure-resistant graphite composite gasket, and due to its material flexibility and thermal expansion characteristics, the sealing cavity would shrink in spatial size under high-temperature, high-pressure working conditions, which differed from the technical feature of the patent in issue — "the spatial size of the sealing cavity is substantially unchanged."

Judgment

On August 2, 2018, the Nanjing Intermediate People's Court of Jiangsu Province rendered Civil Judgment (2018) Su 01 Min Chu No. 366: (1) Jiangsu Yuan [X] Bellows shall, from the date the judgment takes effect, immediately cease the acts of producing and selling products infringing Jiangsu Hong [X] Technology's invention patent right in Patent No. ZL200610XXXXXX for the "High-Pressure-Resistant Rotary Compensator for Pipelines"; (2) Jiangsu Yuan [X] Bellows shall, within 15 days from the date the judgment takes effect, compensate Jiangsu Hong [X] Technology for economic losses of RMB 4 million; and (3) the remaining claims of Jiangsu Hong [X] Technology were dismissed. After the judgment was pronounced, Jiangsu Yuan [X] Bellows was dissatisfied and appealed to the Jiangsu Higher People's Court. On June 15, 2020, the Jiangsu Higher People's Court rendered Civil Judgment (2018) Su Min Zhong No. 1267: the appeal was dismissed and the original judgment affirmed. Jiangsu Yuan [X] Bellows was dissatisfied and applied to the Supreme People's Court for retrial. On December 17, 2021, the Supreme People's Court rendered Civil Ruling (2021) Zui Gao Fa Min Shen No. 3831, dismissing Jiangsu Yuan [X] Bellows' retrial application.

Reasoning

The main focal points of dispute in this case were: whether the Contract Drawing in Issue could serve as the basis for the technical comparison in this case; and whether the alleged infringing product possessed the technical feature of the patent in issue — "the spatial size of the sealing cavity is substantially unchanged."

I. Whether the Contract Drawing in Issue could serve as the basis for the technical comparison in this case

In patent infringement determination, the technical features possessed by the physical alleged infringing product should generally be compared with the technical features of the patent claims. However, where there are difficulties in obtaining or disassembling the physical alleged infringing product, if there is sufficient evidence proving the technical features that the alleged infringing product should possess, the technical features established by evidence may be compared with the technical features of the patent claims. In this case, the alleged infringing product was used in a pipeline for conveying fluid media, and disassembling the product from an operating conveying pipeline entailed technical difficulties and would cause significant losses to the public interest or the interests of third parties. Under the purchase contract and technical agreement for the product in issue, the detailed design drawings (installation design) and technical guidance plan proposed by the seller and confirmed at the liaison meeting between the parties could not be changed or modified without the buyer's prior written consent; the completed products should be consistent with the

finally confirmed drawings; and if the seller's technical personnel further modified the drawings during on-site installation of the equipment, the seller should recompile the drawings into a volume, formally submit them to the buyer, and guarantee that the installed equipment fully conforms to the drawings. After verification, Guangxi [X]wan Thermal Power confirmed that it had not received any document modifying the equipment drawings. The working environment of the product in issue was high temperature and high pressure, and it was special equipment; the design and construction of such equipment are subject to strict industry standards, and any unverified design change could bring serious safety hazards. Although Jiangsu Yuan [X] Bellows claimed that it had confirmed with the user in issue a change to the technical drawings, it did not adduce evidence to prove this. Therefore, the existing evidence in this case could prove that the Contract Drawing in Issue was highly consistent with the physical alleged infringing product, and the Contract Drawing in Issue — that is, the drawings of the alleged infringing product — could serve as the basis for the technical comparison in this case.

II. Whether the alleged infringing product possessed the technical feature of the patent in issue — "the spatial size of the sealing cavity is substantially unchanged"

On this issue, a main point of dispute between the parties was whether the alleged infringing product possessed a technical feature identical or equivalent to the technical feature defined in Claim 1 of the patent in issue — "the spatial size of the sealing cavity is substantially unchanged." Because this case used the drawings of the alleged infringing product as the basis for the technical comparison, and drawings can generally reflect only the form of the product in a static rather than working state, full attention should be paid to this when comparing the relevant technical features.

First, based on the objective of the patent invention, it could be found that the positional relationships between the relevant components defined in the patent claims are the relationships of the protected product in its working state. Second, the alleged infringing product and the patent in issue realize end-face sealing by the same principle; in the normal working state, the greater the medium pressure in the pipeline, the stronger the mutual squeezing action among the inner and outer annular bosses of the sealing cavity, the end-face seal, the outer surface of the core pipe, and the inner surface of the sealing seat, and the better the sealing effect; whereas once the pressure generated by the medium or other external forces is excessive and causes irreversible deformation of the solid seal, this would lead to damage to the end-face seal and a non-normal working state, which is a state that a person of ordinary skill in the art should avoid when using a rotary compensator. Therefore, it is meaningful to consider the spatial size of the sealing cavity only in its normal working state. Third, the sealing cavity in the Contract Drawing in Issue has the same structure as the patent sealing cavity; although it can be seen from a partial view of the drawing that the cavity is not sealed, the boss on the core pipe does not contact the inner surface of the sealing seat, and the boss of the sealing seat does not contact the outer surface of the core pipe, this is clearly the state of the rotary compensator when not in operation. A person of ordinary skill in the art can, based on the drawing, analyze the trend of change in the spatial size of the sealing cavity in the normal working state. Finally, with respect to the mechanical squeezing action, it is precisely because the alleged infringing product selected the solid seal of a red-copper high-pressure-resistant graphite composite gasket that, in the normal working state below the critical pressure, it would maintain a relatively stable volume and shape, so that the seal, under the squeezing of the inner and outer annular bosses, would undergo only very slight deformation, keeping the spatial size of the sealing cavity substantially unchanged. Even considering the thermal expansion characteristics of the materials, both metals and graphite have thermal expansion coefficients on the order of $10^{-6}/^{\circ}\text{C}$, and their effect on the change in the spatial size of the sealing cavity is very slight. Jiangsu Yuan [X] Bellows claimed that, due to the softness of the graphite material and the thermal expansion characteristics of the sealing cavity material, the sealing cavity would shrink in spatial size under high-temperature, high-pressure working conditions, which both contravenes the normal working principle of the product and lacks effective evidentiary support. Therefore, the sealing cavity of the alleged infringing product should maintain a substantially unchanged spatial size in the normal working state and possesses

the technical feature of Claim 1 of the patent in issue — "the spatial size of the sealing cavity is substantially unchanged."

In sum, the alleged infringing product possessed all of the technical features of the corresponding claims of the patent in issue, and the alleged acts of Jiangsu Yuan [X] Bellows constituted infringement.

Relevant Legal Provisions

Article 11(1) and Article 64(1) of the Patent Law of the People's Republic of China (2020 Amendment) (the case applied Article 11(1) and Article 59(1) of the Patent Law of the People's Republic of China, 2008 Amendment).

Article 13 of the Several Provisions of the Supreme People's Court on Issues Concerning the Application of Law in the Trial of Patent Dispute Cases (Fa Shi [2001] No. 21, 2020 Amendment) (the case applied Article 17 of the Several Provisions of the Supreme People's Court on Issues Concerning the Application of Law in the Trial of Patent Dispute Cases, 2015 Amendment).

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