THE TEST OF INVENTIVENESS IN CHINESE PATENT JURISPRUDENCE: RECENT HISTORY, CASES, AND ANALYSIS

Ada Yue Wang†

Abstract

Juristic effort to discern inventiveness or non-obviousness occupies the center of patent law's theoretical gravity. What kind of invention deserves a governmental grant of economic exclusivity often hinges on the purpose of the patent law as defined by the lawmakers. China enacted its first Patent Law in the 1980s and has experienced several doctrinal changes. How the inventiveness standard in the Chinese patent law developed poses at once a question of political history and legal theory. Current scholarship abounds in illumination of the historical and socio-economic factors driving the development of the inventiveness standard in Chinese patent jurisprudence. While this paper also sheds light on the political and economic history of the Chinese patent law legislation, it will try to stand apart from the current literature by means of its focus on the jurisprudential development behind the doctrinal changes in the Chinese inventiveness standard.

During the investigation of this issue, the paper identifies the two doctrinal systems from whom the Chinese patent jurists purported to borrow their ideas: the EU problem-solution approach and the U.S. non-obviousness approach. This paper makes the case that in recent years Chinese patent jurists have made the momentous choice for the EU approach. This choice must further be evaluated by mapping the profound philosophical differences between the two contrasting approaches. Ultimately, this paper argues that the choice reflects the Chinese patent jurists' confidence in the greater capacity for objectivity, juridical consistency and uniformity of the problem-solution approach to the inventiveness determination.

† Associate, White & Case LLP. J.D., University of Virginia School of Law, 2017. The author extends special thanks to Professor John F. Duffy for his project supervision, comments, and encouragement. The author also wishes to thank Jack Pace, Charles Larson, and David Tennant at White & Case LLP for their review and comments. The author also thanks Huina Xu, Principal Staff Member at CNIPA (China National Intellectual Property Administration) and Visiting Scholar at UIUC (University of Illinois at Urbana-Champaign) in 2019, for her editing and help on some translation in this article.

TABLE OF CONTENTS

INTRODUCTION

Since the publication of the first edition of the Patent Law of the People's Republic of China in 1984,[1] Chinese patent jurisprudence has undergone fundamental changes through three amendments in 1992, 2000, and 2008 as well as numerous regulations that followed and explained the amendments.[2] In three

1. Zhonghua Renmin Gongheguo Zhuanli Fa (中华人民共和国专利法) [Patent Law of the People's Republic of China] (promulgated by the Presidential Order No. 11, Mar. 12, 1984, effective April 1, 1985), WORLD INTELL. PROP. ORG., http://www.wipo.int/edocs/ lexdocs/laws/zh/cn/cn028zh.pdf [hereinafter Zuanli Fa].

2. Zhonghua Renmin Gongheguo Zhuanli Fa (中华人民共和国专利法) [Patent Law of the People's Republic of China] (promulgated by the Presidential Order No. 11, Mar. 12, 1984, amended by the Standing Comm. Nat'l People's Cong., Sept. 4, 1992), WORLD INTELL. PROP. ORG., June 1993, http://www.wipo.int/wipolex/en/text.jsp?file_id=138095; Zhonghua Renmin Gongheguo Zhuanli Fa Shishi Xizhe (中华人民共和国专利法实施细则) [Implementing Regulations of the Patent Law of the People's Republic of China] (promulgated by St. Intell. Prop. Off., Dec. 12, 1992), WORLD INTELL. PROP. ORG., http://www.wipo.int/wipolex/zh/text.jsp?file_id=336516; Zhonghua Renmin Gongheguo Zhuanli Fa (中华人民共和国专利法) [Patent Law of the People's Republic of China] (promulgated by the Presidential Order No. 11, Mar. 12, 1984, amended by the Standing Comm. Nat'l People's Cong., Aug. 25, 2000), WORLD INTELL. PROP. ORG., http://www.wipo.int/wipolex/en/text.jsp?file_id=125983; Zhonghua Renmin Gongheguo Zhuanli Fa Shishi Xizhe (中华人民共和国专利法实施细则) [Implementing Regulations of the Patent Law of the People's Republic of China] (promulgated by St. Council Decree No. 306, June 15, 2001, effective July 1, 2001), WORLD INTELL. PROP. ORG., http://www.wipo.int/wipolex/zh/text.jsp?file_id=131135; Zhonghua Renmin Gongheguo Zhuanli Fa (中华人民共和国专利法) [Patent Law of the People's Republic of China] (promulgated by the

decades, Chinese patent law transformed the regime's initial, categorical hostility towards private intellectual property rights to its current acknowledgement and full enforcement of these rights.[3] Partly under trade pressure by Western economies, the Chinese government initially adopted and sometimes mechanically copied foreign patent laws in return for a place in the world economy.[4] Meanwhile, decades of domestic trial-and-error processes with the foreign concepts not only accelerated China's fast adaptation to globalized patent law standards, but also prompted the legislative body to seek practical changes to patent regulations in embracing China's own technological growth.[5] While Chinese policymakers (and China's trade partners) focused on creating a patent enforcement regime in the 1980s and 1990s, the proliferation of domestic patents in the last two decades means that validating a patent claim rather than preventing patent infringements now constitutes the more important juridical task.[6] The determination of inventiveness is at the heart of this jigsaw puzzle for Chinese patent officers, judges, and jurists who have endeavored to devise and implement a cogent, coherent, and administrable test for inventiveness in patent applications.[7] This paper purports to scrutinize this endeavor and analyze its success.

This paper starts with an overview of the birth and development of the Chinese patent regime in the last three decades as well as an explanation of some of the key concepts relating to inventiveness determination in Chinese patent law and guidelines. I also wish to put this development into historical context and illustrate the economic, trade, and administrative reasons for the doctrinal changes made to the inventiveness test. Since the turn of the century, trade has been largely muted as a factor in the evolution of Chinese patent jurisprudence. China has adopted European inventiveness doctrines in recent years largely in search of greater intellectual clarity and better judicial discipline in eradicating subjectivity and inconsistency.[8] The next part of the paper, therefore, strives to shed light on the divergent understandings of "objectivity" in the European approach to testing inventiveness and in the American approach. In the remaining half of the paper, I will undertake a detailed examination of a few landmark cases in Chinese patent law to illustrate how the law and the patent

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Presidential Order No. 11, Mar. 12, 1984, amended by the Standing Comm. Nat'l People's Cong., Dec. 27, 2008), WORLD INTELL. PROP. ORG., http://www.wipo.int/wipolex/en/text.jsp?file_id=178664; Zhonghua Renmin Gongheguo Zhuanli Fa Shishi Xizhe (中华人民共和国专利法实施细则) [Implementing Regulations of the Patent Law of the People's Republic of China] (promulgated by St. Council Decree No. 306, June 15, 2001, rev'd Jan. 9, 2010), WORLD INTELL. PROP. ORG., http://www.wipo.int/wipolex/zh/text.jsp?file_id=182267.

3. *See* DOUGLAS CLARK, PATENT LITIGATION IN CHINA 3 (2nd ed. 2015).

4. *See* Luo, *infra* note 11, at 6.

5. *Id.*

6. *See* SHUDAN ZHU, trans., *Supreme People's Court Annual Report on Intellectual Property Cases (2012) (China)*, 23 WASH. INT'L. L. J. 151, 151–52 (2014) (referring to the increased percentage of intellectual property cases that pose difficult legal questions and the amount of administrative patent cases that entail inventiveness determination).

7. *See infra* Part I.B. (explaining the notable progress China has made in their inventiveness in patent applications).

8. *See infra* Part II (explaining the various similarities of recent Chinese patent jurisprudence and European patent jurisprudence).

office's guidelines were actually put to use in an inventiveness test. Recent cases highlight Chinese patent regime's distinct preference for the European approach. These cases emphasize an increasing convergence between Chinese patent jurisprudence and the legal doctrines that the European patent regime promulgated in relation to the latter's problem-solution approach in deciding inventiveness.

I. CHINESE PATENT REGIME: ITS SYSTEM, LAW, AND KEY CONCEPTS

The early version of the current patent regime in China was first established in 1984 through the enactment of the Patent Law of the People's Republic of China.[9] Many fundamental principles, including novelty, inventiveness, and utility, were affirmed in the 1984 Patent Law and still largely remain on the books today.[10] In the 1984 law, however, patentable subject matters were severely circumscribed: "pharmaceutical products, substances obtained by means of a chemical process and food and condiments were not patentable."[11] Driven by the negotiations between China and the U.S. on intellectual property rights and influenced by the resulting Sino-U.S. Memorandum of Understanding on Intellectual Property Rights, the first amendment of the Chinese Patent Law came into force in 1992, substantially broadening the scope of patentable subject matters, definition of infringement acts, patent terms, etc.[12] The second major patent amendment was effected in 2000 as part of the effort to comply with Trade-Related Aspects of Intellectual Property Rights Agreement ("TRIPS") of the World Trade Organization, to which China finally acceded that year.[13] Major changes included more enumerated patent rights as well as measures aiming to improve the predictability of utility models and design patents examinations.[14] The 2009 amendment proclaimed additional goals, including the fulfillment of "the national strategic goal of transforming China into an innovation-oriented country."[15] In addition, the amendment called for changes

9. Zhuanli Fa, *supra* note 1.

10. Zhuanli Fa (专利法) [Patent Law of the People's Republic of China] (promulgated by the Presidential Order No. 11, March 12, 1984 Mar. 12, 1984, effective April 1, 1985) Art. 22(2), WORLD INTELL. PROP. ORG., http://www.wipo.int/edocs/lexdocs/laws/zh/cn/cn028zh.pdf (promulgated by the Presidential Order No. 11, Mar. 12, 1984, amended by the Standing Comm. Nat'l People's Cong., Dec. 27, 2008).

11. SELECTED CHINESE PATENT CASES 5 (Dongchuan Luo ed., Haining Song & Seagull Haiyan Song trans., 2014).

12. *Id.* at 6.

13. *See* Joshua J. Galgano, *Patent Reform Under the America Invents Act: Does China's Success After the 2009 Chinese Patent Reform Predict Similar Success for the U.S. Patent Regime*, 23 TRANSNAT'L L. & CONTEMP. PROBS. 197, 200 (2014) (reviewing the history of the Chinese patent law).

14. *See* Luo, *supra* note 11, at 6 (noting these broad changes).

15. *Id.* at 7; *see also* PETER WU, GOVERNANCE OF INTELLECTUAL PROPERTY RIGHTS IN CHINA AND EUROPE 27 (Nari Lee et al. eds., 2016) ("In the National Long-term Scientific and Technological Development Program released in February 2006, the State Council formally declared its commitment to turn China into an innovation-based economy within 15 years. Since then, top Chinese leaders have increasingly recognized the economic and strategic significance of a well-functioning intellectual property system.") (citing State Intellectual Property Office, *China's Intellectual Property Protection in 2008*, STATE INTELL. PROP. OFF. OF THE PEOPLE'S REPUBLIC OF CHINA (Apr. 27, 2009), http://english.sipo.gov.cn/laws/whitepapers/200904/t20090427_457167.html; Handong Wu, *One Hundred Years of Progress: The Development of the Intellectual Property System in China*, 1 WIPO J. 117, 120 (2009).

that included "stiffer requirements for granting patents, an absolute novelty standard, [and an] allowance for dealing with all foreign-related patents."[16]

To attain a substantive understanding of the Chinese patent system, a brief overview of the administrative and judicial processes of the patent validity determination is also in order. The law designates two enforcement venues: the administrative and the judicial.[17] While infringement enforcement can go through either the administrative or the judicial path, the administrative bodies assume the exclusive initial jurisdiction over the power to determine the validity of a patent and courts can only handle validity cases on appeal.[18] The China National Intellectual Property Administration (CNIPA) is supervised by the State Administration for Market Regulation (SAMR) and is responsible for examining patent applications and granting patents.[19] Under Article 41 of the Patent Law, an applicant whose patent application is rejected by CNIPA may "within three months from the date of receipt of the notification, file a request with the patent review board for review."[20] The Patent Reexamination Board (PRB) of CNIPA consists "of technical and legal experts appointed by [CNIPA];"[21] as such, petition to the PRB really amounts to a second-round administrative review by CNIPA. If again rejected by the PRB, the applicant will then have to take the PRB's decision to court.[22] Appeals from decisions of PRB are heard by Beijing Intermediate People's Court; subsequent appeals are possible with the Beijing Higher People's Court, whose decision is usually final unless one party successfully persuades the Supreme People's Court to review the case.[23]

Over the course of administrative review, both the CNIPA and PRB are bound by the Guidelines for Patent Examination, a set of rules for actual administrative proceedings on granting patents and also a persuasive authority for appellate judicial proceedings on patent validity.[24] Although courts are not bound to follow the Guidelines due to notional judicial independence,[25] in practice courts generally adhere to the Guidelines, especially in invalidation

16. Galgano, *supra* note 13, at 200.

17. *See* CLARK, *supra* note 3, at 13 (highlighting the two enforcement schemes).

18. *Id.* at 13–14.

19. *Id.*; Zhuanli Fa, *supra* note 1.

20. Zhonghua Renmin Gongheguo Zhuanli Fa (中华人民共和国专利法) [Patent Law of the People's Republic of China] (promulgated by the Presidential Order No. 11, Mar. 12, 1984, amended by the Standing Comm. Nat'l People's Cong., Dec. 27, 2008), Art. 41, WORLD INTELL. PROP. ORG., http://www.wipo.int/wipolex/en/text.jsp?file_id=178664 [hereinafter Patent Law].

21. Zhonghua Renmin Gongheguo Zhuanli Fa Shishi Xizhe (中华人民共和国专利法实施细则) [Implementing Regulations of the Patent Law of the People's Republic of China] (promulgated by St. Council Decree No. 306, June 15, 2001, rev'd Jan. 9, 2010), Chapter 4, Rule 58, WORLD INTELL. PROP. ORG., http://www.wipo.int/wipolex/zh/text.jsp?file_id=182267.

22. Patent Law, *supra* note 20, Art. 41.

23. *See* CLARK, *supra* note 3, at 18–19.

24. *See* Zhuanli Shencha Zhinan (专利审查指南) [Guidelines for Patent Examination] (promulgated by St. Intell. Prop. Off. Order No. 55, Feb. 1, 2010), Foreward, WORLD INTELL. PROP. ORG., http://www.wipo.int/wipolex/zh/text.jsp?file_id=298963, (showing that these Guidelines detail and supplement the provisions of the Patent Law and its Implementing Regulations, and thus serve as bases and standards for the Patent Office and Patent Reexamination Board to refer to and follow in enforcing the relevant laws and regulations).

25. XIANFA Art. 126 (1982) (China) ("The people's courts shall, in accordance with the law exercise judicial power independently and are not subject to interference by administrative organs, public organizations, or individuals.").

cases, as the Guidelines are much more elaborate on patent validity issues than the Patent Law.[26]

Requirement for inventiveness of patent claims is inscribed in the 1984 statute.[27] In contrast with other provisions that subsequently underwent dramatic changes, the statutory language of the inventiveness doctrine remains unchanged since 1984.[28] Nevertheless, guidelines and regulations that govern the concrete implementations of the patent law have gone through a series of revisions detailing the requisite steps in the inventiveness test, revisions that demonstrate the influence of both the U.S. and Europe's inventiveness doctrines and also reflect the Chinese patent regime's aspiration towards greater objectivity in conducting the inventiveness test.[29]

Article 22, Section 3 of the Patent Law states that:

> Inventiveness means that, as compared with the technology existing before the date of filing, the invention has prominent substantive feature and represents a notable progress.[30]

By its own language, the inventiveness requirement has two elements—prominent substantive feature and notable progress—that seem both abstract and unhelpful. The authoritative resource that the patent examiners and judges fall back on in their frustration with the abstractness of Article 22 is the Official Guidelines for Patent Examination, which names the necessary components of prominent substantive features and notable progress.[31]

A. "Prominent Substantive Features": A Stand-in for the "Non-Obviousness" Question

The first edition of the Guidelines for Examination in the 1980s introduced the concept of person of ordinary skill in the art.[32] The guidelines set a high bar for inventiveness, saying that invention was not "derived from available technology by persons of ordinary skill in the art without analysis and deliberation, or derived from logical analysis, inference, and experimentation."[33] Rather, the invention ought to reflect unique intelligence of the inventor.[34] Not only was the bar so high that it resembled the "ingenuity" standard of the United States Supreme Court rulings in the middle of the twentieth century,[35] but the

26. *Infra* Section IV, A & B pp. 34–48.

27. Zuanli Fa, *supra* note 1.

28. *See supra* note 2 (showing that the statutory language of the inventiveness doctrine remained unchanged until 1984).

29. *See infra* Part I.A. (describing the Guidelines for Patent Examination's core requirements of prominent substantive features and "notable progress" in relation to prior creations).

30. Luo, *supra* note 11, at 98.

31. *Id.*

32. He Yudong (和育东) & Fang Huicong (方慧聪), *Zhuangli Chuangzaoxing Keguanhua Wenti Yanjiu (专利创造性客观化问题研究) [A Study on the Problem of Objectification of the Patent Inventiveness Requirement]*, 2 ZHISHI CHANQUAN (知识产权) [INTELLECTUAL PROPERTY] 81 (2007) (Ch.).

33. *Id*.

34. *Id.* at 81.

35. ROBERT P. MERGES & JOHN F. DUFFY, PATENT LAW AND POLICY: CASES AND MATERIALS 621–23, (6th ed. 2013)

1984 Guidelines also scrutinized the process of the invention instead of the final product of the invention.[36]

In the second version of the Guidelines, which was published in 1993 in the aftermath of the Sino-U.S. Memorandum of Understanding on Intellectual Property Rights,[37] the concept of prominent substantive features was effectively equated with the word "non-obviousness": "That an invention has prominent substantive features, means that compared to prior arts, the invention is non-obvious to persons of skill in the art."[38] Still, concrete yardsticks that measure non-obviousness were wanting.

The third version of the Guidelines, issued in 2001, introduced the three-step test to determine non-obviousness.[39] First, "the closest prior art"[40] needs to be identified; second, the patent officer ought to determine the "distinguishing features of the invention and the technical problem actually solved by the invention;"[41] lastly, the patent officer must decide "whether or not the claimed invention is obvious to a person skilled in the art."[42]

The 2001 Guidelines further redefined the person skilled in the art.[43] The previous two versions of the Guidelines evoked a hypothetical individual who is aware of all the technologies in the technical field to which the invention pertained and who has ordinary skill and knowledge possessed by ordinary people skilled in the same technical field.[44] In 2001, the conception was changed into someone who possesses all ordinary knowledge of the prior art in the relevant field, is capable of obtaining knowledge about all prior art as well as ordinary skills and capabilities to conduct routine experiments but who lacks creativity.[45] Since the non-obviousness determination is predicated on how the person skilled in the art is defined, the 2001 Guidelines indirectly lowered the bar of the inventiveness requirement. The lowered requirement manifested itself in two aspects. First, the person skilled in the art is no longer omniscient about all prior arts in relevant fields and now possesses merely ordinary knowledge of the prior art. Second, in denying the person skilled in the art any trifle of creativity, technical innovations are more likely to be non-obvious to the person skilled in the art.

The 2006 Guidelines for Examination further elaborated the last step in the three-step test, i.e. whether or not the claimed invention is obvious to a person

36. Yudong & Huicong, *supra* note 32, at 81.

37. ZHU, *supra* note 6.

38. Zhuanli Shencha Zhinan (专利审查指南) *Guidelines for Examination* (promulgated by St. Intell. Prop. Off. Order No. 4, Apr. 1, 1993), Art. 4, § 2.2, http://www.cnpat.com/cn_pat/exam_guide_1993/ guide.htm [hereinafter Guidelines of 1993].

39. Zhuanli Shencha Zhinan (专利审查指南) *Guidelines for Examination* (promulgated by St. Intell. Prop. Off. Order No. 12, Oct. 18, 2001), Art. 4, § 3.2.1, https://code.fabao365.com/law_217324_1.html# [hereinafter Guidelines of 2001].

40. *Id.*

41. *Id.*

42. *Id.*

43. Guidelines of 2001, *supra* note 39, at Art. 4, § 4.3.2.1.

44. Guidelines of 1993, *supra* note 38, at Art. 4, § 2.2.

45. Guidelines of 2001, *supra* note 39, at Art. 4, § 2.2.

skilled in the art.[46] To arrive at a conclusion on the obviousness issue, a detailed test was mandated:

> what is to be determined is whether or not there exists such a technical motivation in the prior art as to apply said distinguishing features to the closest prior art in solving the existing technical problem (that is, the technical problem actually solved by the invention), *where such motivation would prompt a person skilled in the art, when confronted with the technical problem, to improve the closest prior art and thus reach the claimed invention.* If there exists such a technical motivation in the prior art, the invention is obvious and thus fails to have a prominent substantive features.[47]

The original phrasing in the 2001 Guidelines (replaced and superseded by the part in italics) was "where a person skilled in the art, when confronted with the technical problem, *could* improve the closest prior art and thus reach the claimed invention."[48] (emphasis added). The change in wording would seem trivial, but the practical effect is momentous. Whereas under the 2001 Guidelines an invention could be deemed obvious to the person skilled in the art if the latter could come up with the claimed invention, the same invention, under the 2006 Guidelines, is not considered obvious to the person skilled in the art if he would not see a clear reason to do so.[49] As a result, the non-obviousness standard seems to be further relaxed. Further, the emphasis seems to have shifted entirely from the capability of the person skilled in the art and to the technical problems presented by the prior art.[50]

B. Notable Progress

In addition to possessing prominent substantive features, a patent claim must also demonstrate notable progress from prior arts.[51] According to the 1993 Official Guidelines, "notable progress from prior arts means that it either overcomes the existing prior art's shortcomings and weakness, or represents certain technological trend; usually notable progress is reflected in its beneficial effects."[52] Sharing the ambiguity and imprecision of other statutory language in the patent law and the Official Guidelines in the 1980s, the notable progress requirement as stated in the 1993 Guidelines provided little assistance in clarifying the meaning of notable progress.

The 2001 Guidelines set out to salvage the unclear wording of "notable progress" in the previous editions. For instance, the 2001 edition listed examples of beneficial effects that can be considered indicative of notable progress:

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46. Zhuanli Shencha Zhinan (专利审查指南) *Guidelines for Examination* (promulgated by St. Intell. Prop. Off. Order No. 28, May 24, 2006), Art. 4, § 3.2.1.1 http://www.wipo.int/wipolex/en/text.jsp?file_id=299057 [hereinafter Guidelines of 2006].

47. *Id.*

48. Guidelines of 2001, *supra* note 39, at Art. 4, § 3.2.1.1.

49. Guidelines of 2006, *supra* note 46, at Art. 4, § 3.2.1.1.

50. Yudong & Huicong, *supra* note 32, at 81.

51. Guidelines of 2001, *supra* note 39, at Art. 4, § 3.1.

52. Guidelines of 1993, *supra* note 38, at Art. 4, § 2.3.

> (1) where, as compared with the closest prior art, the invention produces a better technical effect, such as quality improved, output increased, energy saving, and environmental pollution prevented or controlled;
>
> (2) where the technical solution provided by the invention is of a different inventive concept and can produce a technical effect of substantially the same level as in the prior art;
>
> (3) where the invention represents a new trend of technical development; or
>
> (4) where, despite negative effect in some respect, the invention produces outstanding positive technical effects in other respects.[53]

Categories (2) and (4) were newly included by the 2001 Guidelines into the concept of notable progress.[54] By allowing an invention that has achieved the same level as in the prior art or even negative effect in some respect, the Guidelines were trying to bring down the bar for the notable progress requirement in the inventiveness test.[55]

In practice, the relaxed criteria of beneficial effects for proving notable progress in a claimed invention have all but eviscerated the notable progress requirement and rendered it toothless. For if the notable progress asks no more than a different technical solution that produces the same technical effect as in the prior art, the notable progress requirement is already implied in the analysis of prominent substantive features and is instantly and automatically satisfied in the second step in the "three-step test" where the distinguishing features of the claimed invention are supposedly highlighted.

C. Secondary Considerations

The Guidelines now encompass additionally a series of other factors to be considered during the inventiveness test. Similar in function and in substance with the U.S. concept of objective indicia,[56] the factors include "solving a long-felt but unsolved technical problem," "overcoming a technical prejudice," "producing unexpected technical effect," and "achieving commercial success."[57] The list of these secondary factors has stayed the same since its first appearance.[58] Like their U.S. counterparts, the secondary considerations in the Chinese text aim to prevent examiners from using hindsight bias.[59] However, secondary considerations rarely function as decisive factors in an inventiveness determination in the Chinese patent court.[60] The Guidelines only ask the examiners to take secondary considerations into account "and avoid making a

53. Guidelines of 2001, *supra* note 39, at Art. 4, § 3.2.2.
54. *Id.*
55. *Id.*
56. *See* MERGES & DUFFY, *supra* note 35, at 684–87 (outlining factors to use in the inventiveness test).
57. Zhuanli Shencha Zhinan (专利审查指南) [Guidelines for Patent Examination] (promulgated by St. Intel. Prop. Off. Order No. 74, Feb. 28, 2017), Art. 4, § 5 [hereinafter Guidelines of 2017].
58. *Id.*
59. MERGES & DUFFY, *supra* note 35, at 684–87.
60. Guidelines of 2017, *supra* note 57, at Art. 4, § 5.

rash determination that the invention does not involve an inventive step."[61] In other words, secondary considerations will be considered only if the "primary" considerations lean towards not granting the patent based on the lack of the inventiveness.

II. PARADIGM SHIFTS OF CHINESE PATENT JURISPRUDENCE AND HISTORICAL CAUSES

Although the statutory language about inventiveness has changed little in China's Patent Law since its promulgation in 1984 (although major revisions were made to the other parts of the law, mostly on ownership and transfer, on the scope of patent rights and on the financial scale of damage and penalty), the bare-bone phrasing about inventiveness in the law belies the drastically transformed landscape in Chinese patent administration and jurisprudence in the last three decades.[62] Some terms see their signification transformed; other terms see the change in the significance attached to them in actual patent review.[63] Most of these changes have taken place in the Guidelines, the handbook for the patent administrative bodies.[64]

A cursory audit of the key terms used in the Guidelines should already alert us to a few important changes in the inventiveness standard. We may note a few vital changes in the inventiveness standard in the 2000s. First, the non-obviousness test was substituted for the ingenuity requirement in 1993 in the patent inventiveness consideration.[65] When the meaning of non-obviousness was further dilated on in 2001, the official guidelines proposed a concrete three-part test that focused on the technical problems that the claimed invention must target and solve.[66] The proposed test of non-obviousness in fact bears substantial similarity to the European "problem-solution" approach in the inventiveness determination, and the adoption of the European test simultaneously reformed the concept of person skilled in the art.[67] Second, the statutory language of notable progress has unequivocally faded in practical importance since 2001.[68] In comparison to the abstract languages in the Patent Law, commentaries and decisions by the patent administrative organs have accrued, and those revisions to the inventiveness standard in the Guidelines are more than merely an attempt

61. *Id.*

62. *See* CLARK, *supra* note 3 (showing the drastic changes in Chinese patent jurisprudence since the 1984 patent law promulgation).

63. *See, e.g.*, Guidelines of 2001 *supra* note 39, at Art. 4, § 2.4 (showing the evolution of the interpretation of the term "notable progress").

64. *See generally* Guidelines of 1993, *supra* note 38, at Art. 4, § 2.3 (listing the guidelines for Chinese patent regulation); *Id.*

65. *Id.*

66. *See* Guidelines of 2001, *supra* note 39, at Art. 4, § 2.4 (introducing the three-part non-obviousness test).

67. *See generally* Guidelines of 1993, *supra* note 38, at Art. 4, § 2.3 (listing the guidelines for Chinese patent regulation); *Id.*

68. *See, e.g.*, Patent Law, *supra* note 20, at Art. 22 (showing the replacement of "notable progress" requirements with the more general "progress requirements").

at clarifying the statutory language in the Patent Law. They very much amount to fundamental paradigm shifts in inventiveness tests.[69]

Changes in the Chinese patent jurisprudence naturally prompt a question: what were the most important driving forces behind the changes in the inventiveness requirements? Through the reading of official comments, cases and legislative history, I have identified in this article several economic, trade, and administrative factors in different decades—each with a different share of influence that shaped the development of Chinese patent jurisprudence. The economic factor is first embodied in the government's effort to simplify the requirement for inventiveness for patent applications as a way to encourage technological innovation in China in pursuit of an innovation-driven economy. Then, the trade factor induced the more recent incarnation of the inventiveness standards that could also be seen as a transplant of western ideas. Last, one notices a determined effort backed by administrative considerations to inject objectivity into inventiveness tests and thereby ensuring standardization and predictability during the whole administrative and judicial process in granting patents. By surveying the contemporaneous debates among officials and jurists in the 1990s and 2000s, I believe these factors each played significant roles in the doctrinal changes in different periods. In particular, I argue that the need for a patent's economic viability weighed into the progressiveness requirement in earlier Guidelines prior to 2001, a need that has since turned into obsolescence thanks to the burgeoning market economy that could be relied on to distinguish economically viable patents from those that are not; that pressure from China's major trading partners caused it to emulate their patent systems and protect the interests of foreign patent-holders; and that more recently Chinese judges and legal scholars have started to push for intellectual rigor and the need of overall judicial "housekeeping" in eradicating ambiguities and incoherence in statutory language and previous editions of administrative guidelines.

A. The Inaugural Patent Law: Effort to Transition a Planned Economy into an Innovation-Driven Market Economy

When China first enacted its patent law in 1982, it had barely emerged from its decades-long ideological opposition to private property.[70] Patent seemed to be merely an obscure and distant offshoot of the alien concept of private property.[71] Largely due to numerous outreaching attempts made by the World Intellectual Property Organization (WIPO), China began in 1973 to send observers to the WIPO conferences and visitors to European patent offices to learn about patent systems.[72]

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69. *See generally* Guidelines of 1993, *supra* note 38, at Art. 4, § 2.3 (listing the guidelines for Chinese patent regulation); *see also* Guidelines of 2001, *supra* note 39, at Art. 4, § 3.2.1 (showing the shifts in the inventiveness test in the eight years since 1993).

70. *See* ZHAO YUANGUO (赵元果), ZHONGGUO ZHUANLI FA DE YUNYU YU DANSHENG (中国专利法的孕育与诞生) [THE ORIGIN AND BIRTH OF THE CHINESE PATENT LAW] 13 (2003) (showing how changes in China's government influenced changing approaches to patent law).

71. *Id.*

72. *See id*. at 15 (revealing that, in order to lure China to join the WIPO, the WIPO officials kept rejecting Taiwan's application to join).

Although China was generally isolated from international trade during the 1970s, there were sporadic international trade and technological exchange activities between China and the West.[73] Provisional patent authorities were created in 1977 when the question of whether and how to implement a patent system and whether to join the WIPO was brought onto the agenda in discussions and meetings between the Ministry of Foreign Affairs, the National Construction Committee, the Chinese Academy of Sciences, and the China Council for the Promotion of International trade.[74] The discussions revealed the various government organs' views about the economic advantages and disadvantages of creating a patent system.[75] On the one hand, due to the lack of patent protection in China, foreign companies usually insisted on factoring the cost of potential patent infringement into the price when selling technologies to China, leading to exorbitant fees that buyers from other countries easily avoided; also, uneducated about patent, the Chinese companies often paid a king's ransom for expired patents or even patent application documents filed with foreign patent offices, not knowing that these were publicly available.[76] On the other hand, policy makers recognized the monopolizing nature of patents and the superior innovative capacity of foreign countries compared to Chinese innovators;[77] they were wary of bringing in a patent forest of foreign patents that could impede the emergence of domestic technologies and stunt the growth of Chinese manufacturing.[78]

After 25 drafts and numerous discussions among various governmental agencies, the Patent Law was enacted in 1984.[79] It came with some unusual features not seen in the patent jurisprudence in the U.S. and Europe. These features were arguably the negotiated outcome of various legal, economic, and trade issues that the legislators tried to tackle.[80] To begin, in terms of recognizing patents, the officials called for the legal language to stay on the side of generality and to avoid too much specificity, citing as the reason of such generality—that is to say, purposeful vagueness—their lack of experience in writing patent laws and assessing patents at the time.[81] Such deliberate vagueness can be evidenced by the elusive standards of inventiveness defined by phrases like "prominent substantive feature" and "notable progress."[82] Secondly, it should be remarked that this law was inordinately elaborate on the patent enforcement mechanism even when relatively silent on the details of patent application and assessment.[83] The officials were conscious about the

73. *Id.* at 13.
74. *Id.* at 17.
75. *Id.*
76. *Id.* at 18.
77. *Id.* at 135.
78. *Id.* at 132.
79. *Id.* at 299.
80. *Id.*
81. *Id.* at 253, 265.
82. *But see* ZHAO, *supra* note 70, at 232 (revealing that drafters first considered it expedient to copy the foreign concept of non-obvious, but several committees responded that they had no clue as to the meaning of "nonobvious" in the determination of inventiveness).
83. *See* Zuanli Fa, *supra* note 1, at Art. 7 ("No entity or individual shall prevent the inventor or creator from filing an application for a patent for a non-service invention-creation.").

primary objective of the law: mainly reducing the cost of international trade and enabling transfer of foreign technologies.[84] The law set out to address foreign companies' anxiety about the lack of protection for intellectual property and was thus emphatic on enforcing the rights of patent holders.[85] Thirdly—and in another twist and in spite of the deliberate vagueness of the legal language—the drafters stressed the need for a high bar for inventiveness in order to prevent overpaying for foreign patents and stem a possible overflow of trivial foreign patent claims of less revolutionary technologies.[86] By the same economic calculation, and in order to protect the low-level domestic innovators and to avoid overly favoring foreign patent holders, the drafters added a lesser category of protected innovations, the "utility model," which afforded some limited recognition and protection to mostly inventors of new exterior or functional designs.[87] The patentable "utility model," with its lower standard of inventiveness, was commonly utilized to shield low-level innovators, who were mostly small to medium-sized domestic companies and individuals who were not yet capable of highly capitalized and organized research and development efforts,[88] from foreign patents by encouraging them to make small changes to existing technologies and to patent such changes. The drafters created a provision for "utility models" over objections from the WIPO Director General[89] and chose to defy common practices of other developed patent regimes.[90]

B. Evolution of the Inventiveness Standard: An Interplay of Trade, Economic, and Judicial Expediency Concerns

Later on, administrative guidelines afforded practicality and specificity to patent officers and judges in qualifying inventiveness. Of special concern to our study of the evolution of the inventiveness standards are the new definitions of a "skilled person in the art," the disappearance of the requirement of "notable progress," and the adoption of the European "problem-solution" approach in a series of Guidelines published in the 2000s, which have decisively reshaped the way patents are reviewed, assessed, and granted in China today.[91]

In 2001, the definition of "notable progress" in the Guidelines was changed from "substantial progress compared to the closest prior art" to "having

84. ZHAO, *supra* note 70, at 143–44.

85. Zuanli Fa, *supra* note 1, at Art. 7.

86. *See* ZHAO, *supra* note 70, at 290 (emphasizing that foreign patents should be under strict scrutiny to ensure that the patents embody genuine creativity).

87. *See* Patent Law, *supra* note 20, at Art. 2 ("'Utility model' refers to a new technical solution proposed for a product's form, structure, or the combination thereof, that is suitable for utility.").

88. *See* Patent Law, *supra* note 20, at Art. 22 (lowering the inventiveness standard for utility model by replacing the "prominent substantive features" and "notable progress" requirements for the "substantive features" and "progress" requirements).

89. *See* ZHAO, *supra* note 70, at 28 (pointing out that Árpád Bogsch, Director General of the WIPO, consistently played a key role in assisting and advising China's implementation of the patent law).

90. *Id*.

91. GUOJIA ZHISHI CHANQUANJU ZHUANLIJU (国家知识产权局专利局) [PATENT OFFICE OF THE STATE INTELLECTUAL PROPERTY OFFICE], SHENCHA ZHINAN XIUDING DAODU (审查指南修订导读) [READING GUIDES FOR THE AMENDED GUIDELINES FOR EXAMINATION] 79 (2002) (China).

beneficial technical effect compared to the closet prior art."[92] According to the CNIPA, which made the changes, the new definition of "notable progress" would make the "notable progress" test much easier to pass; as such, the test for inventiveness was irrevocably reduced to and made tantamount to the non-obviousness test (which, as mentioned before, was labeled "substantive features" by the statutory language).[93] "Notable progress" remains in the statute, but in practice it is no longer the vital test to which new inventions are subject.[94]

In assessing the non-obviousness question, we see a significant change in the 2001 Guidelines, which started to adopt the European standard of a "problem-solution" test.[95] Prior to 2001, only four types of prior art reference document combinations were illustrated as obvious, depending on factors such as the difficulty of the combination, relevant technical field, and the number of the prior art reference documents, without an overarching guiding principle.[96] The authors of the 2001 Guidelines introduced the EPO "problem-solution approach" and lauded this approach as elegantly simple and operable.[97] Also, the definition of person skilled in the art was updated in the 2001 Guidelines.[98] First, the knowledge and capability of the person skilled in the art would have to be date-stamped, which is now the application date or the priority date.[99] The time stamp on accessing the knowledge and capability of the person skilled in the art provides clear, operable and certain guidelines for patent officers. Second, it is assumed that the person skilled in the arts would not seek to improvise or improve on existing technologies *unless motivated to do so*, an assumption that appears to undercut the requirement for non-obviousness.[100]

Comments by Chinese officials and jurists allude to several possible intellectual frames to analyze these momentous changes in the 2001 Guidelines.[101] One impetus for the changes in 2001 may have come from intense trade pressure from foreign countries.[102] To the same extent that the Patent Law was first created to address concerns of trade partners, a number of 1993 and 2000 amendments to the Patent Law were driven primarily by external influences exerted by trade partners—the former to honor the Sino-U.S. Memorandum of Understanding on Intellectual Property Rights and the latter to facilitate China's admission to the World Trade Organization.[103] The lifting of the notable progress requirement was seen partly as a way to reconcile China's inventiveness standard with international standards and to lower the level of required inventiveness for foreign patents to be recognized in China—amid an

92. *Id.* at 79.
93. *Id.* at 80.
94. *See* Patent Law, *supra* note 20, at Art. 22 (providing for "notable progress" within the statute).
95. *See generally* Guidelines of 2001, *supra* note 39 (providing for a "problem-solution" test).
96. *See* ZHUANLIJU, *supra* note 91, at 82 (listing the four types of prior art reference documentation).
97. *Id.*
98. *See generally* Guidelines of 2001, *supra* note 39 (noting that the invention ought to reflect the unique intelligence of the inventor).
99. *See* ZHUANLIJU, *supra* note 91, at 80 (conforming with the European "problem-solution" approach).
100. *Id.*
101. *See* ZHUANLIJU, *supra* note 91, at 82; *see also* ZHAO, *supra* note 70, at 135.
102. *See* Luo, *supra* note 11, at 6 (referring to select Chinese patent cases).
103. *See* ZHU, *supra* note 6 (referring to the increased percentage of intellectual property cases between the two countries).

array of other legislative and regulatory maneuvers that expanded the rights of patent holders and broadened the scope of patentable subject matters.[104] In addition, officials expressed confidence that bringing China's inventiveness requirement into similar terms of that of the EPO and the U.S. would ensure smoother international transfer of technologies, which was seen as beneficial to China as a late-comer and beneficiary in field of high technology.[105] The desire to have an interoperable standard with western patent authorities was also evident in the adoption of the definition of the skilled person in the art as well as the "problem-solution" approach.[106] According to the drafter of the Guidelines in 2001, both changes would bring the Chinese patent system closer to the EPO.[107]

However, it is arguable that the doctrinal changes that diminished the weight of notable progress in the inventiveness determination also derived from the historical structural changes in China's economy between the 1980s and 2000s. Foreign patentholders understandably commended the extenuation of the notable progress requirement, but remarkably this change was also enthusiastically espoused by political and economic constituencies in China that represented the residual forces of large state-owned manufacturers, according to Han Bing et al.[108] These former economic behemoths often designed and built products that were commercial failures.[109] I am tempted to argue that the notable progress requirement was added into the Patent Law in the first place as a surrogate for an economic viability test. Such a test would be superfluous in most other countries with mature markets in which all patents naturally face economic ruin if they are technologically innovative but are economically nonviable. Even if a patentee could acquire a patent, he or she would have no incentive to. By contrast, when China first implemented its patent system in the 1980s, the country was only slowly casting off a command economy where no market existed to filter out economically unproductive patents.[110] As a result, the notable progress test became an indispensable surrogate for an economic viability test whose true purpose was to examine the cost-benefit of a new invention claimed by a state enterprise.[111] It served as an important gatekeeper

104. *See supra* Part I (explaining that the 1993 and 2000 amendments to the Patent Law broadened the scope of patentable subject matter and expanded the term of the patent protection).

105. Yin Xintian (尹新天), *Meiguo Zhuanli Zhengce de Xinjinfazhan ji dui woguo zhishi chanquan zhidu de Youguan Sikao* (美国专利政策的新近发展及对我国知识产权制度的有关思考) [*Recent Development in the American Patent Policies and its Implication to China's Patent System*], ZHUANLIFA YANJIU (专利法研究) [PATENT LAW RESEARCH] 43 (2007) (China).

106. *See infra* Part III.A (adopting the "problem-solution" in order to align with the European standard).

107. GUOJIA ZHISHI CHANQUANJU ZHUANLIJU, *supra* note 94, at 81; *see also* ZHUANLI FUSHEN WEIYUANHUI ANLI QUANSHI – CHUANGZAOXING (专利复审委员会案例诠释 – 创造性) [THE PATENT REEXAMINATION BOARD'S SELECT CASE ANALYSES – INVENTIVENESS STANDARD] 3 (2006).

108. Han Bing (韩冰) & Sun Ping (孙平), *Dui Chuangzaoxing Panduan Zhong Xianzhuxing Jinbu de Sikao* (对创造性判断中"显著性进步"的思考) [*Thoughts on the "Notable Progress" Requirement in the Inventiveness Determination*], ZHUANLIFA YANJIU (专利法研究) [PATENT LAW RESEARCH] 135 (2012).

109. *Id*.

110. *Id*. The authors listed several factors that helped to distort patent applicants' economic incentive to apply, such as monetary rewards from local governments and individual professional promotion opportunities associated with valid, but commercially worthless patent applications.

111. *See generally* Peter K. Yu, *Intellectual Property, Economic Development, and the China Puzzle*, *in* INTELLECTUAL PROPERTY, TRADE AND DEVELOPMENT: STRATEGIES TO OPTIMIZE ECONOMIC DEVELOPMENT, IN

against economically unviable inventions that could otherwise enter mass production.[112] By 2000, only with an increasingly robust and mature domestic market economy were the reformers in Beijing confident enough to drop the requirement of notable progress in patent review.[113] The fact that the two authors who analyzed the importance of the notable progress test were opposed to its virtual elimination demonstrated that, even in 2000, remnants of the command economy still posed a powerful reactionary threat to the development of a market economy in China.[114]

Another contributing factor that motivated some of the changes is not economic or trade-related but juristic in nature and almost mundane. Contemporary discussion among legal scholars and officials in the 2000s pointed to the simple but urgent need of juridical "housekeeping."[115] Some of the phrasing in the Patent Law and the earlier Guidelines was simply too outdated or equivocal for patent officers and applicants to use.[116] In getting rid of the "notable progress" test and changing the definition of a person skilled in the art and the non-obviousness approach, as well as making the choice to model the Chinese inventiveness rule after the EPO's, the CNIPA demonstrated a determined and sustained house-keeping effort to make the inventiveness test more operable and non-subjective. The choice to follow the European "problem-solution" approach and not the U.S.'s approach is perhaps an even more curious matter: no particular foreign parties, market forces, or industrial sectors lobbied for the change, and the government made no economic arguments for or against the adoption of the EPO approach.[117] Rather, the sole champions of the adoption of the EPO approach seemed to be a group of Chinese legal scholars and CNIPA mandarins who clamored for greater operability of the rules, which was another important concern for the CNIPA.[118]

III. THE TRANSATLANTIC DIVIDE ON OBJECTIVITY AND CHINA'S PREFERENCE FOR THE EUROPEAN APPROACH

If historically the primary driver of China's adoption of a patent system with comprehensive regulations and enforcement mechanism was the economic pressure from trading partners, then its persistent interest in constantly revising and rewriting the Patent Law is now propelled by a different motive. Whereas the country was pressed into making patent law and creating an enforcement

A TRIPS PLUS ERA, 173–220 (Daniel J. Gervais ed., 2007) (discussing implementation of a modern intellectual property system in China in the 1980s).

112. *Id*.

113. Han Bing (韩冰) & Sun Ping (孙平), *Dui Chuangzaoxing Panduan Zhong Xianzhuxing Jinbu de Sikao* (对创造性判断中"显著性进步"的思考) [*Thoughts on the "Notable Progress" Requirement in the Inventiveness Determination*], ZHUANLIFA YANJIU (专利法研究) [PATENT LAW RESEARCH] 135 (2012).

114. *Id*. at 135.

115. *See generally* Wei-Ning Yang & Andrew Y. Yen, *The Dragon Gets New IP Claws: The Latest Amendments to the Chinese Patent Law*, INTELL. PROP. & TECH. L.J (discussing necessity of the 2009 update to the Patent Law).

116. *See* Guidelines of 2001 *supra* note 39, at Art. 4, § 3.2.1.1.

117. *See* Yang & Yen, *supra* note 115 (noting the broad history underpinning the adoption of the problem solution approach).

118. *Id*.

mechanism for patent infringement in the 1980s and was further made to show toughness and broad-scoped patent protection in trade negotiations and its accession to the World Trade Organization in 2000, foreign trade representatives were less likely to take a direct interest in China's choice of a non-obviousness standard as long as they saw evidence of stringent patent protection.[119] In updating Chinese patent regulations, we see rather that Chinese lawmakers and jurists were trying to reckon with new insights they learned from mature Western patent systems to guarantee objectivity and consistency in determining inventiveness.

There are, of course, crucial differences in methodologies that are used in the two leading patent jurisdictions in Europe and the United States. Chinese patent officers and judges showed an undisguised preference for adopting the EPO's problem-solution approach to non-obviousness and aligned themselves theoretically much closer with the Europeans than with the Americans.[120] In making this choice, Chinese patent officers and scholars often spoke of what they saw as the judicial objectivity that the problem-solution approach promotes.[121] To appreciate the Chinese impression of objectivity in determining inventiveness, it becomes necessary to examine the doctrinal differences between the American and the European approaches.

A. The Scholarly Debate on Objectivity in the European Problem-Solution Approach Versus the American Non-Obviousness Test in the Inventiveness Assessment

The problem-solution approach is widely adopted outside the United States.[122] A 2015 WIPO study found that countries that practice variations of the problem-solution approach include most European countries, China, Colombia, and Chile.[123] While some variations exist among the countries that subscribe to this method, the so-called problem-solution approach in the determination of inventiveness typically involves the following steps, as demonstrated by the EPO methodology:

(i) determine the 'closest prior art';

(ii) establish the "objective technical problem" to be solved; and

119. *See* Joshua J. Galgano, *Patent Reform Under the America Invents Act: Does China's Success After the 2009 Chinese Patent Reform Predict Similar Success for the U.S. Patent Regime?*, 23 TRANSNAT'L L. & CONTEMP. PROBS. 197, 200 (2014) (describing China's admission to the World Trade Organization upon improving its patent system).

120. *See* Guidelines of 2001 *supra* note 39, at Art. 4, § 3.2.1.1.

121. Chen Changhui (陈长会), *Geguo Guanyu Chuangzaoxing Panduan De Juti Bijiao* (*各国关于创造性判断的具体比较*) [*Comparison between the inventiveness determination in various countries*], ZHONGHUA GUANGUO ZHUANLI DAILIREN XIEHUI CHENGLI ERSHI ZHOUNIAN JI XUESHU LUNTAN HUIYI LUNWEN JI (中华全国专利代理人协会成立 20 周年庆祝大会暨学术论坛会议论文集) [ACADEMIC JOURNAL OF THE CHINESE PATENT AGENT ASSOCIATIONS] 11 (2008).

122. *See generally* Study on Inventive Step, at 15–16, SCP/22/3 (Standing Committee on the Law of Patents, Twenty-Second Session, Geneva, WIPO) (July 27-31, 2015), http://www.wipo.int/edocs/mdocs/scp/en/scp_22/scp_22_3.pdf (discussing countries that have adopted the problem-solution approach).

123. *Id.*

> (iii) consider whether or not the claimed invention, starting from the closest prior art and the objective technical problem, would have been obvious to the skilled person.[124]

The United States, which exerts much influence in global patent jurisprudence in general, is notably absent on the list of countries that subscribe to this approach. In short, under the non-obviousness standard set out in 35 U.S.C. § 103, "[a] patent for a claimed invention may not be obtained . . . if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made."[125] The U.S. Supreme Court further announced the relevancy of secondary considerations in *Graham v. John Deere Co.*, stating that in addition to satisfying conditions set forth in 35 U.S.C. § 103, "[s]uch secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or non-obviousness, these inquiries may have relevancy."[126] After the Court of Appeals for the Federal Circuit developed the "'teaching, suggestion, or motivation' test (TSM test), under which a patent claim is only proved obvious if 'some motivation or suggestion to combine the prior art teachings' can be found in the prior art, the nature of the problem, or the knowledge of a person having ordinary skill in the art," the Supreme Court in *KSR v. Teleflex* rejected the rigid TSM approach, reaffirming *Graham*'s more expansive and flexible approach to the obviousness question.[127]

The intellectual debate about the divergence between the American and the European approaches—apparently in the common pursuit for a "widely accepted test for inventive step" that provides reliable and inexpensive benchmarks for patent validity determination[128]—sheds important light on the claim of and aspiration for the objectivity that Chinese patent authorities wished to emulate in EPO's methodology, in an area that often involves much vaguer and more qualitative criteria.[129] On the one hand, we find authors such as Jochen Pagenberg who see objectivity in the American approach that pragmatically considers all secondary or circumstantial factors in a patent application before deciding the question of non-obviousness.[130] On the other hand, some European voices argue that the objectivity of the European method proves itself in the greater legal consistency and predictability and in the administrative

124. *Id.* at 17 (quoting The EPO Guidelines for Examination, Chapter G-VII, 5).

125. 35 U.S.C. § 103 (2018).

126. Graham v. John Deere Co., 383 U.S. 1, 17 (1966).

127. KSR Int'l Co. v. Teleflex Inc., 550 U.S. 398, 407, 415 (2007).

128. *See* Paul G. Cole, *Inventive Step: Meaning of the EPO Problem and Solution Approach, and Implications for the United Kingdom: Part 1*, 20(6) E.I.P.R. 214, 214 (1998) (discussing the need for a widely applicable test for determining inventive step).

129. *See* ZHAO, *supra* note 70, at 4.

130. Jochen Pagenberg, *The Evaluation of the 'Inventive Step' in the European Patent System–More Objective Standards Needed*, 9 INT'L. REV. OF INTELL. PROP AND COMP. 121, 127 (1978).

convenience the European method produces.[131] Further, it seems the EPO has insisted on the problem-solution approach even when it may be shown to put European innovators at an economic disadvantage.[132]

Paul Innocenzi also alleges that the EPO's current inventiveness test is partly to blame for a long backlog of applications and diminishing qualities of them.[133] The adverse economic consequences of the problem-solution approach adds to the impression that the problem-solution approach affords a level of objectivity and certainty that is *judicially* compelling for the Europeans. Insofar as China eventually chose the European kind of "objectivity," students of Chinese patent jurisprudence must scrutinize the claim of objectivity in the problem-solution approach.

In a 1978 article concerning the European practice, Pagenberg expressed frustration with the lack of uniformity and certainty among major European patent offices, especially the German patent system.[134] He set out to identify several procedural and theoretical issues that he blamed for "the lack of uniformity in the tests for non-obviousness used by the German Patent Office and the Chambers of the Federal Patent Court . . . with respect to the evaluation of evidence of non-obviousness."[135] To begin with, Pagenberg appeared to deem the question of "non-obviousness" as fundamentally ambivalent and could be decided only through auxiliary tests and through deliberation of all secondary and circumstantial factors like commercial success or cost saving in production, *et cetera*.[136] In his opinion, the German Federal Patent Court put the cart before the horse by deciding on the question of non-obviousness first before proceeding—quite pointlessly and disingenuously—to conduct such secondary tests while preemptively binding itself to dismiss the results of these auxiliary tests for being irrelevant.[137]

Pagenberg further noted that, although the German Supreme Court was more open to considering circumstantial factors such as commercial success, procedural and operational limits put on the Federal Supreme Court allowed lower patent chambers to outright contradict or ignore the high court's emphasis on circumstantial factors.[138] In response, Pagenberg called on Europeans to

131. *See generally* Brian Cronin, *The Quest for Patent Quality: European Inventive Step and US Obviousness*, IP WATCHDOG (Dec. 21, 2016), https://www.ipwatchdog.com/2016/12/21/patent-quality-european-inventive-step-us-obviousness/id=75860/ (arguing that the European problem-solution approach systematically and objectively assesses inventive step and produces more consistent patent quality).

132. *See generally* Hazel V.J. Moir, *An Inventive Step for the Patent System?* 35(3) E.I.P.R.125, 125–26 (2013) (complaining that "[t]he Examination Guidelines of the European Patent Office leave no doubt that the test of non-obviousness will present an obstacle to patentability only in exceptional cases"). According to Hazel V.J. Moir, the EPO's substitution of the question of non-obviousness for the question of inventiveness has uneconomic consequences for Europe that include the proliferation of low-quality patents and giving away economic advantage to Indian and Chinese companies who have filed for a great number of patents in recent years.

133. Paul Innocenzi, *Patent Application Backlogs, Diminishing Patent Quality and the Patent Paradox*, 33(5) EUR. INTELL. PROP. REV. 271, 271 (2011).

134. *See* Jochen Pagenberg, *Examination for Nonobviousness – A Critical Comment on German Patent Practice*, 12 INT'L REV. OF INTELL. PROP AND COMPETITION 2, 2 (1981).

135. *Id.*

136. *Id.* at 4.

137. *Id.*

138. *Id.* at 10.

follow the example of American Supreme Court in taking into account the technological obviousness of a claimed invention as well as secondary indicia relating to the case that are typically associated with a genuine invention.[139] Pagenberg even took the trouble of exhaustively listing all such indicia or objective secondary factors that he asked European patent offices and courts to consider.[140] A comprehensive review of all such factors, he believed, is how we arrive at true objectivity.[141]

The problem-solution approach could be seen as EPO's own attempt to address the problem of legal inconsistency between the high and low courts and from case to case. Importantly, the EPO's own remedy is decidedly different from Pagenberg's recommendation, (and from the American Supreme Court's methods). The preponderance of consideration now given to the framing of the "problem" that each patent ought to tackle and the effect the patent must have suggests a very different judicial doctrine in operation behind the problem-solution approach than Pagenberg's prescription of just exhaustively reviewing all the "facts" surrounding a patent claim. The problem-solution approach seems to stem from the dogmatic belief that objectivity can be achieved only by eradicating ambivalence rooted in the question of non-obviousness itself and not by endorsing an ever-expanding list of non-related tests of circumstantial factors, no matter how much faith we can put in the factuality and objectivity of these factors.[142]

The European distaste for circumstantial evidence is historical.[143] When Pagenberg wrote his paper in 1978, the German patent court was of the opinion that "[s]econdary considerations could not be regarded as an independent issue to be dealt with since they only embraced a set of facts which *per se* did not provide a legal basis for the final decision of inventive step."[144] The same insistence was demonstrated by the EPO when Paul Cole wrote his article in 1995,in the influential case T24/81, the EPO opined that "a mere investigation for indications of the inventive step [from the fact that the industry has overlooked the invention despite its significant economic contribution] is no substitute for the technically skilled assessment of the invention *vis-à-vis* the state of the art, pursuant to Art. 56 EPC."[145] The diminished weight assigned to secondary factors, however, should not be taken to mean that the EPO continued to ignore some of the factors that Pagenberg listed as vital to the confirmation of inventiveness of a claimed patent. In fact, the problem-solution approach incorporated many of the factors that the Federal Supreme Court had urged the

139. *Id*. at 14–15.

140. Pagenberg, *supra* note 130, at 127–42 (including nineteen objective indicia, such as commercial success, overcoming of difficulties, satisfaction of long-existing need, failure and unsuccessful attempts of experts, increased performance, greater productivity, *et cetera*).

141. *See id*. at 127–43 (discussing the application of objective criteria).

142. Pagenberg, *supra* note 134, at 4 (pointing out that "[i]t was not until the end of its opinion that the Court discussed secondary considerations, whose recognition by this time was ostensibly 'without effect.' What it apparently meant is that the subtests had become irrelevant in light of the conclusion already reached.").

143. *Id.* at 10.

144. *Id.*

145. Cole, *supra* note 128, at 217.

lower court to include in the non-obviousness test.[146] The list Pagenberg compiled of the secondary factors would seem to be an instance of misclassification that includes not only criteria that are incorporated into the non-obviousness test in the problem-solution approach and are held to be vital to the determination of the existence of a genuine technical problem, but also, unfortunately, factors that are circumstantial and continue to be relegated to irrelevance by the European and German patent offices.[147] This is especially the case with historical prejudices or long felt needs, now held to be symptomatic of an objectively extant technical problem and challenge and is made part of the primary test the EPO applies to patent applications.[148]

The problem-solution approach—the methodic steps that the EPO now takes to confirm an objective problem as well as the concrete effect the innovation would have—thus indicates a discriminating attitude between facts that lend themselves to the detection of an objectively extant problem and facts that do not (e.g., commercial success that can be engineered with modern marketing after the product is designed and manufactured). Indeed, according to George Szabo, in the era before the problem-solution approach the question of non-obviousness was akin to a "jury question" for the people skilled in the art with "no generally applicable quasi-logical methodology;"[149] although some principles were developed in the United States, they were "developed for specific situations, which then acted as rare precedents."[150] When there is an abundance of facts, even the lack of any methodical elimination of irrelevant facts harms objectivity. A consistent approach with a single criterion, instead of enumeration of all facts, is called for to make the assessment objective.[151]

Szabo, a prominent proponent of the problem-solution approach, began his analysis of the approach by distinguishing the two kinds of effects of a claimed product or process: the so-called "internal effect" and "external effect" of an invention.[152] The internal effects include "simplification of the method," "elimination of a certain reagent or condition," "reduction of hazards," etc.[153] While the internal effect—the inner structure—represents the technical problem underlying the product or process, it also "represent[s] a need for a certain function or result when compared to the closest state of the art."[154] This "need" must be seen in the desired external effect, which is the solution to a problem

146. Jochen Ehlers et al., *The Patentability Criterion of Inventive Step/ Non-obviousness*, 2011 INT'L ASS'N FOR THE PROT. OF INTELL. PROP., § 24 (2011) ("According to German law as well as in the practice of the European Patent Office, secondary considerations can be considered for assessing the inventive step. In fact, they may offer an indication against obviousness in individual cases, but they cannot substitute the evaluation of the content of the state of the art.").

147. Cole, *supra* note 128, at 217.

148. *See id*. at 215–17 (discussing the German practice and development of the inventive step, and continued use of technical factors and the dismissal of circumstantial factors).

149. George Szabo, *The Problem and Solution Approach in the European Patent Office*, 26(4) INT'L REV. OF INTELL. PROP AND COMPETITION 457, 459 (1995).

150. *Id*.

151. *Id*.

152. George Szabo, *The Problem and Solution Approach to the Inventive Step*, 8(10) EUR. INTELL. PROP. REV. 293 (1986).

153. *Id.* at 295.

154. *Id.* at 296.

and whose advantage or disadvantage could manifest itself more objectively.[155] The "external effect" might be to "provide . . . clean shirts, less noise or more coherent light emission, a smoother or faster ride for a machine etc., in use."[156] As a result, Szabo is of the opinion that "the conceptual separation of [external] effects from the invention . . . could assist the assessment of the inventive step."[157] Some internal effects easily translate into an external effect (reduction of hazards to workers, significant cost savings, *et cetera*.), while other internal effects do not. Szabo holds that although a technical improvement may be expressed in terms of such internal effects, it is hard to discern whether the improvement has an inventive edge unless the product or process interacts with "external entities and conditions to produce their problem-solving effect."[158] Simply put, internal effects that do not readily render external effects pose a question about their structural obviousness that are impossible to judge objectively—it is neutral to the question of problem-solution effect, since "the recognition of the problem is not yet an invention."[159]

Questions of obviousness concerning strictly internal effects are again reduced to a matter of judgment—a juried judgment—of structural variations and differences that cannot be objectively assessed as a matter of external effect.

The focus on the problem that an invention supposedly confronts and serves as the technical solution for not only furnishes an objectively ascertainable standard but also takes into consideration some of the factors whose inclusion in the deliberation of European and German patent courts Pagenberg vociferously advocated.[160] But the requirement for the non-obviousness test to start with a suitably framed problem also helps us differentiate those "secondary" factors that Germany's Federal Supreme Court always regarded as crucial to the non-obviousness question and those factors that are likely marginal in European patent courts' deliberation.[161] The problem-centric framework thus marks the hermeneutic gap between the kind of objectivity of Europe's problem-solution approach and the kind of objectivity that Pagenberg associated with the American approach that sanctions a sweeping review of such circumstantial facts as those pertaining to the inventive process as well as market conditions.[162]

For Szabo and the EPO, only those considerations about external effects that can be ostensibly evidenced, such as the overcoming of preexisting prejudices, satisfaction of long-existing need, failure and unsuccessful attempts of experts, increased performance, greater productivity, cheaper and more economical production,[163] really help us understand the nature of the technical problems that the patentable technology claims to solve; considerations about

155. *Id*.
156. *Id*.
157. *Id.* at 298.
158. *Id.* at 296.
159. *Id.* at 298.
160. *Id*.
161. *Id.* at 302.
162. *Id.* at 293.
163. *See* Cole, *supra* note 128, at 215.

external effects render the impact of the invention demonstrable. Pagenberg was right to complain that the (pre-EPO) German Chambers had unwisely limited primary consideration to an uncertain and juried judgment of structural obviousness of the invention, namely the internal effect that Szabo spoke of.[164] But I argue that the remedy to the mistakes of the Chambers and the lower courts in Germany would be sought not in prioritizing all the secondary considerations over the primary test of non-obviousness but in decisively reframing the question of non-obviousness and changing it from one of penumbra (on the degree of structural changes of "internal effects") to one of functionality and ostensible verification and certification (i.e., external effect that purports to solve an existing problem). From Szabo's perspective, Pagenberg may be said to have conflated the two kinds of factual indicia in his criticism of the German patent system in the 1970s: some of the indicia were indeed relevant and central to our appreciation of the "problem" that the innovation sets out to address, while others would still be quite tangential to the primary test of non-obviousness.

Thus, two notions of objectivity stand far apart between the European approach and the American approach. If Pagenberg commends the latter for its pragmatic and comprehensive consideration of all indicia of inventiveness in individual cases, Szabo and Cole's defense of the problem-solution approach seems to stem from the conviction that objectivity derives from the unwavering adherence in all cases to a primary test with the same frame and steps of inquiries that permit the consideration of only those indicia directly related to external effects. And Chinese patent officers and jurists, with their professed aversion to any "juried" judgments, appear to have adopted the problem-solution approach out of judicial instinct and intellectual temperament.[165]

IV. CHINESE PATENT LAW IN ACTION: DETERMINATION OF INVENTIVENESS IN PRACTICE

In absence of any legislative interest in recasting the statutory language about inventiveness standards in the Patent Law, decisions written by the Chinese patent offices and patent courts are our most authoritative guide as to how patent doctrines actually evolve in China and how they are construed and applied; they are also the best proof of the Chinese adherence to the European problem-solution approach since 2000.[166] A comparative study of patent cases from the last three decades gives the most convincing testimony to the evolving inventiveness standards in Chinese patent jurisprudence, and the drastic contrasts between the early cases and the more recent cases are especially instructive if we hope to comprehend how the European inventiveness doctrines took hold in China and are regularly rehearsed in Chinese courts.

It is worth noting that the Chinese judicial system does not adhere to the *stare decisis* principle: a court is not obliged to follow past decisions of its own, of other courts, or even of higher courts, with the exception of the cases decided

164. *See* Sbazo, *supra* note 152, at 295.
165. ZHU, *supra* note 6, at 151.
166. *See generally* Zhuanli Fa, *supra* note 2.

by the Supreme People's Court.[167] Fortunately, the issue of case inconsistency is alleviated, to some extent, in patent validity cases, because only two courts—Beijing Intermediate People's Court and Beijing Higher People's Courts—and a small number of patent-specific judges can hear appeals from invalidation decisions and therefore are persuasive authorities on patent validity issues, e.g. inventiveness determinations.[168] Moreover, in a bid to improve judicial transparency and certainty, the Supreme People's Court issued an order in 2010 that mandated periodic publication of guiding cases that ought to be respected by lower courts.[169] (In a parallel move, the PRB also selected and published series of representative cases on the topic of inventiveness.)[170] The Supreme Court published the first guiding cases involving intellectual property in 2013 and has demonstrated lasting interest in this area.[171] For analysis and comparison, this section will focus first and foremost on cases that are considered illustrative by the CNIPA/PRB or by the courts and are included in the official publications from CNIPA/PRB and from the Supreme Court; of the more recent cases, we will draw on those cited by leading Chinese patent scholars as typical of the non-obviousness doctrine.

A. Early Cases in the 1980s and 1990s

To the same extent that the definition of inventiveness in the Official Guidelines of the 1980s was tentative and rudimentary, the administrative cases at that time also appeared to lack clear and substantive analysis of inventiveness.

The uncertainty and subjectivity showed in the frequent clashes between the administrative and the judicial branches, demonstrated by an influential case at the Beijing Higher People's Court from 1992, the significance of which may be seen by its inclusion in the annual report to the People's Congress delivered by the Chief Justice of the Supreme People's Court that year.[172] The disputed patent was a "lazy-tong type door" whose claimed prominent substantive feature was a series of H-shaped sections connecting the tilting bar and the post, which supposedly achieved "a simpler structure of the device jointing the tilting bar and the post, the improvement of door rigidity, the swift open and close of door and the minimal noise."[173] Based on two different prior arts most closely related

167. CLARK, *supra* note 3, at 11.

168. *Id.*

169. *See* Zuigao Renmin Fayuan Guanyu Anli Zhidao Gongzuo de Guiding (最高人民法院关于案例指导工作的规定) [Regulations issued by the Supreme People's Court on the Guiding Case Project] (promulgated by Sup. People's Ct., Nov. 26, 2010, effective Nov. 15, 2010) https://cgc.law.stanford.edu/wp-content/uploads/sites/2/2015/10/guiding-cases-rules-20101126-chinese.pdf.

170. *See* Zuanli Fa, *supra* note 1 (discussing large manufacturing firm approval of these changes).

171. *See* Mei Gechlik, *Guiding Cases Analytics*, STAN. LAW SCH. CHINA GUIDING CASES PROJECT, Guiding Cases Analytics, Jan. 2015, at 5 (discussing Chinese interest in releasing cases with relevancy to foreign businesses).

172. Xianggang Meiyi Jinshu Zhipinchang Su Zhongguo Zhuanliju Zhuanli Fushen Weiyuanhui Queren Duoqianshimen Faming Zhuanli Jiufen Shangsuan
(香港美艺金属制品厂诉中国专利局专利复审委员会确认"惰钳式门"发明专利权纠纷上诉案) [Hong Kong Meiyi Metal Products Factory v. Patent Reexamination Board of the Patent Office of China], 1992 SUP. PEOPLE'S CT. GAZ. 2 (Higher People's Ct. of Beijing Municipality, Mar. 4, 1992), http://en.pkulaw.cn/display.aspx?cgid=117507217&lib=case.

173. *Id*.

to the invention, the PRB declared the patent invalid due to its lack of inventiveness.[174] Solely focusing on technical features of the invention in dispute and its two prior arts, the PRB found that Prior Art No.1, a folding door, disclosed all the technical features except for the H-shaped sections and that Prior Art No.2 had a H-shaped section that shared the same structure, the same relationship with other components of the door, the same operative principle, and the same objective technical effect with the H-shaped section in the patent in dispute.[175] The PRB noticed that, compared to Prior Art No.2, the bigger number of H-shaped sections used in the disputed invention did not constitute a substantive technical feature.[176] Since both prior arts were in the same technical field, the disputed patent failed to show the substantive prominent features.

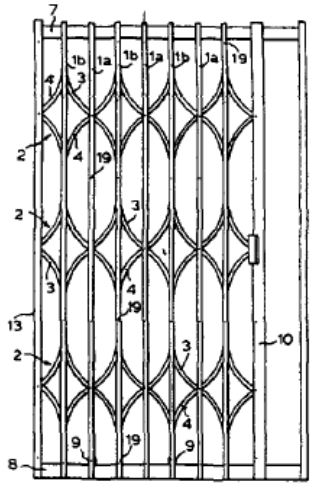

Figure 1[177]

In reversing the decision of the PRB, the Higher People's Court held that the inventiveness determination must take a holistic view of the inventive purpose, technical solution, and technical effect.[178] In this case, although Prior Art No.2's H-shaped section shared the same technical feature as the invention in dispute, the purpose of the former's H-shaped section was to provide mechanical support to the spring in the door, to reduce the load on the door and to smooth the opening of the sliding door, all in order to increase the longevity of the wheels on the door; the new technology, by contrast, aimed at improving the rigidity of the door and minimizing noises and thus made different use of the H-shaped section.[179] Due to the distinct objectives and the technical means to achieve the objectives, the invention in dispute and the combination of Prior Arts

174. *Id*.
175. *Id*.
176. *Id*.
177. 吴松威. Door (folding door). China Patent Application No. 85101517, filed Apr. 1, 1985.
178. Meiyi, *supra* note 172.
179. *Id*.

Nos.1 and 2 were substantively so different that ordinary people skilled in the technical field could not obtain technical teachings from the prior arts that would suggest the invention in question.[180] This case marked the drastic difference in approaching the technical problems and solutions in the administrative and judicial branches at the time: whereas the administrative branch, i.e. the PRB, depended on the comparison of the physical, objective technical features of the patent and prior arts, the judicial branch reviewed the technical features only in light of a reading of the purpose of the invention. We may argue that the judicial approach can more meaningfully mitigate the risk of hindsight bias: using this case exactly as an example of the PRB's hindsight bias, the court forcefully argued against the suggestion that ordinary people skilled in the field would have been alerted to Prior Art No. 2's side effect of improving the rigidity of the door and minimizing noise in that the prior art targeted a totally different technical problem.[181]

The landmark status of this decision derives from the unprecedented eminence that the Beijing Higher People's Court gave to the consideration of advertised objectives of a new patent.[182] This consideration now took on greater weight, giving an intimation of the weight attached to the framing of the technical problem in European patent application (although the court's call for a "holistic view" of comparative analyses of both technical features and technical effect still muddled the matter, not giving clear precedence to either). The Supreme Court included this case into the Supreme Court Gazette, thereby resolutely bringing the PRB into the doctrinal fold.[183]

The PRB delivered in the following year a decision that may signal its own acceptance of the EPO's teaching on "could/would approach."[184] According to the EPO in its landmark case in 1984 T02/83, "[i]n a case where the applicant had supplemented a known [process] by [new process], the Board held that the proper question to be asked was not whether the skilled man *could have provided [the new process] but whether he would have done so* in expectation of some improvement or advantage."[185]

The claimed invention in the 1993 PRB case was a production method for thermo-bonded polyester.[186] The method was a combination of bonding methods using chemical agents and heat.[187] Specifically, both surfaces of the polyester fabric were sprayed with cohesive latex, and the main fiber body was filled with fusible fiber, which would melt when heated and result in multi-dimensional intersecting structure.[188] The product of the method was polyester

180. *Id*.
181. *Id.*
182. *Id.*
183. Meiyi, *supra* note 172.
184. *See* Zhuanli Fushen Weiyuanhui Anli Quanshi – Chuangzaoxing (专利复审委员会案例诠释—创造性) [The Patent Reexamination Board's Select Case Analyses—Inventiveness Standard] (2006) (discussing Patent Reexamination Decision No. 358 regarding Patent Application No. 86100722 in 1993).
185. EUR. PAT. OFF., *T 0002/83 (Simethicone Tablet) of 15.3.1984*, (last visited Aug. 27, 2019) http://www.epo.org/law-practice/case-law-appeals/recent/t830002ep1.html.
186. *Id.*
187. *Id.*
188. *Id.*

fiber with a voluminous and fluffy body with good thermal insulation.[189] Another example of the combination of bonding methods using both chemical agents and heat in a production of non-move fabric was disclosed in Prior Art No.1.[190] The two technical differences between the prior art and the claimed invention are (1) the former heats the fiber on the surface but the latter heats the whole body, and (2) the former will attach the fabric to another piece of thin fabric after the heating process, but the latter does not involve attachment to other fabrics.[191]

Given the differences between the prior art and the claimed innovation, the issue dwelled on the technical suggestions provided by the prior art, i.e. whether people skilled in the art would be induced by the prior art to arrive at the claimed invention.[192] Here, Prior Art No.1's method did not limit the heating of the fabric to its surface, meaning that technologically a person heating the surface of the fabric could easily heat the entire body of the fabric.[193] This is where consideration of mere technical features would yield only highly contentious and subjective answers to the question of non-obviousness to the people skilled in the art.[194] To avoid such subjectivity, the right question to ask becomes whether it *would* be non-obvious to people skilled in the art to adopt one technically possible variation of a known prior art.[195]

The PRB took into consideration the purpose of both the prior art and the claimed invention as well as the technical effects achieved.[196] In this case, Prior Art No.1 was a method for producing bra bases thought to be superior to the older technique of using chemical agents to attach layers of polyester fabric to another piece of thin fabric.[197] The older method ran the risk of hardening the surface of the fabrics and reducing their quality as skin-touching apparel, and Prior Art No.1 solved the problem by heating the surface of the polyester fabric, making the surface adhesive without hardening it.[198] The prior art was thus a superior technical method compared to the traditional use of chemical agents.[199] The claimed invention, however, proposed to heat the entire body of the fabric and not just the surface of it, and the patent applicant demonstrated that in heating the entire fabric the latter would be voluminous and fluffy enough to be a thermal insulation agent.[200] It may certainly be argued that a person skilled in heating the surface of the fabric could as well heat the entire strip of the fabric. The PRB concluded, however, that the applicant would not have done so.[201] In a line of reasoning that was a direct echo of the EPO's decision in T02/83, the

189. *Id.*
190. Fushen, *supra* note 184, at 229.
191. *Id*. at 231.
192. *Id.*
193. *Id.*
194. *Id.*
195. *Id.*
196. *Id.*
197. *Id.*
198. *Id*. at 232.
199. *Id.*
200. *Id.*
201. *Id.* at 234.

PRB distinguished what the person skilled in the art could and would have done in the scenario.[202]

Of course, the could-would distinction has its root in the problem-solution frame, and in 1993 the PRB was yet to adopt the problem-solution frame.[203] The PRB formulated its opinion only as preemption against hindsight bias.[204] Prior Art No.1 would not have led a skilled person to heat the whole strip of the fabric because this person would not see the advantage of heating the whole fabric as new methods advertised.[205] The prior art was purported to provide a solution to a different problem, and the PRB was convinced that prior art did not provide technical suggestions that would enable people skilled in the art to heat the whole body of the fabric to achieve voluminous and fluffy effect.[206] Without the problem-solution approach, any inquiry into whether a person skilled in the art might find one of many technologically feasible method suggested by existing art would be an exercise of pure speculation that invites a retroactive mentality. For the assumption that it was obvious for a person skilled in the art to come up with the idea to heat the entire fabric because he was already familiar with the method to heat the surface of the fabric is tantamount to saying that someone could have done something that she did not in fact do, which is precisely the kind of hindsight bias that patent officers must avoid.[207]

B. Cases in the 2000s

The 2001 Official Guidelines prescribed the three-step test for the prominent substantive features—the equivalent of non-obviousness determination—and reconciled the last few disagreements between the CNIPA/PRB and the courts.[208] The courts' persisting emphasis on the purpose of the invention was incorporated in the second step of the three-step test, which calls for both the technical problem that is targeted and the distinguishing features of the invention in question and prior arts to be determined.[209] Further, in order to offer some clarity on the otherwise highly subjective nature of the word "purpose" used by the courts, the Guidelines elaborated on the specific situations that may suggest the existence of the technical motivation:

> The said distinguishing feature is a technical means related to the closest prior art, such as a technical means disclosed in other part of the same reference document, the function of which in the other part is the same as the function of the distinguishing feature in the claimed invention in solving the redetermined technical problem.[210]

In line with the new Guidelines, the PRB was able to approach cases similar to the 1992 "lazy-tong type door" case quite differently. One instance of this

202. *Id.* at 234.
203. Guidelines of 1993, *supra* note 38.
204. *Id.*
205. Changhui, *supra* note 121, at 232.
206. *Id.*
207. Guidelines of 2017, *supra* note 57.
208. Guidelines of 2001, *supra* note 39.
209. *Id*.
210. *Id.* at 182.

new approach is the decision of Reexamination No. 5674 decision in regards to Patent Application No. 97191168.1.[211] The No. 5674 Reexamination decision recognizes that the claimed technical features of the invention were disclosed by prior arts Nos. 1 and 2, but the combination of the prior art technical features did not provide any technical motivation for the technical solution provided by the invention in question—this is essentially the final court holding in the 1992 case.[212] The PRB was now on the same page with the judicial branch that, when deciding on the issue of non-obviousness, the consideration of technical features should not be separated from the technical problems that the former are meant to solve.[213]

Here, the patent claim in question is:

> a glow switch that (i) is equipped with a capacitator (1), which is air-sealed in a cell (2), through part of which (2b) are a pair of electric conductors (3a, 3b); (ii) is equipped a bimetal element (4a), which is connected with one of the electric conductors (3a); (iii) is filled with iodizable filling; and (iv) has the feature that the part of the captor (2b), through which the electric conductors go, is composed of glass that contains at least 5% barium oxide (BaO).[214]

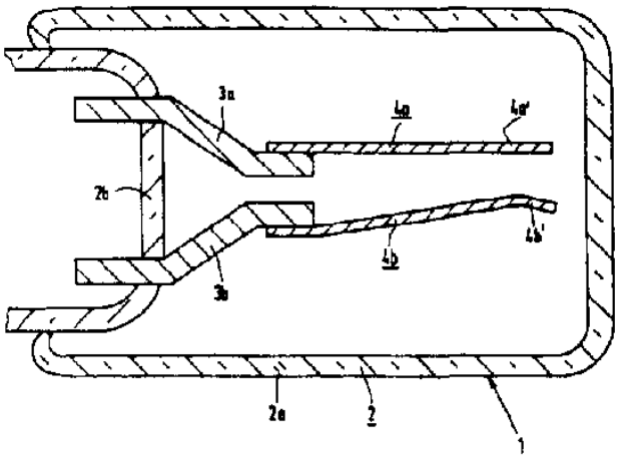

Figure 2[215]

The patent office rejected the application for the lack of inventiveness, based on disclosures made by two prior arts.[216] Prior Art No. 1, a U.S. patent, discloses all features of the claim in question, except for subsection (4), i.e., the

211. Changhui, *supra* note 121, at 142.
212. *Id.* at 145.
213. *Id.* at 147.
214. *Id.* at 143.
215. Patent Application No. 971911681 (filed July 1, 1997).
216. *Id.*

part of the capacitator composed of glass that contains at least 5% BaO.[217] Prior Art No. 2, a Chinese patent, discloses a glass compound with 7% to 11% BaO, which is used as an electric bulb component.[218] The patent examiner reasoned that the combination of both prior arts disclosed all features of the patent claim in question and rendered the latter uninventive.[219]

When the applicant appealed to the reexamination board, the board overruled the patent examiner's decision.[220] According to the PRB, although Prior Art No.2 and the claim in question shared the same technical features, "Prior Art No.2's BaO content is a technical solution meant to increase the resistance value of the glass and reduce its softening point without increasing the percentage of lead."[221] By contrast, the claimed invention's BaO content served an entirely different purpose: to shorten the ignition time for the glow switch.[222] Therefore, the existence of BaO in Prior Art No.2 and the disputed claim had different technical effects.[223] Because people skilled in the art would not receive technical suggestions on increasing the emission activity of glass through increasing the resistance value and reducing softening point of glass, and because whether there was a necessary connection between those features was unknown to people skilled in the art, the patent claim possessed inventiveness.[224]

The PRB's decision in overruling the patent examiners' invalidity decisions underscores the crucial convergence between Chinese and European jurisprudence in inventiveness analysis. Like the EPO's problem-solution approach, Chinese patent regime has moved the focal point of the inventiveness analysis from a comparison of technical features to a comparison of technical effects.[225] In this particular case, the significant overlap between the prior arts and the claimed invention of technical features notwithstanding, the PRB chose to grant the patent mostly on the account of the distinctive purpose and effect claimed by the new glow switch.[226]

The problem-solution approach stipulates that review of a patent application starts with the identification of a pre-existing problem against which the invention in question may objectively be said to have solved and, in veering towards the EPO methodology, Chinese patent system now permits and even encourages patent applicants to phrase their applications thusly (or rephrase in a resubmitted application).[227] There may be no objective answer to the question of just how much change in the barium oxide content in the glass should be deemed non-obvious, but the PRB refocused the analysis on the effect of the claimed invention, and this focus on the product's effect framed the

217. U.S. Patent No. 4,843,282 (filed Feb. 16, 1988).
218. Changhui, *supra* note 121, at 143.
219. *Id.*
220. *Id.* at 145–46.
221. *Id.* at 145.
222. *Id.*
223. *Id.*
224. *Id.*
225. *Id.*
226. *Id.*
227. *Id.*

inventiveness question in a way that made a consensus among patent officers and among judges more attainable.

There is yet another recent case, an influential case settled in 2014 by the People's Supreme Court, that can shed light on the Chinese requirements on how the technical problem must be framed in a patent application; [228] these requirements are further evidence of Chinese patent jurisprudence's increasingly close alignment with the EPO doctrines. The patent in dispute was a gland hyperplasia treatment medicine and its method of production.[229] To make the case for the inventiveness of the method, the applicant framed the technical problem the invention was meant to address as the increase of the amount of salvianolic acid B. [230] The patent application omitted any mention of the relationship between high amount of salvianolic acid B and any possible medicinal effect.[231] The People's Supreme Court held that mere change of certain active ingredient's percentage alone could not be accepted as a technical problem to be solved unless the change of percentage was associated with effect of the medicine.[232]

The People's Supreme Court then dismissed a piece of evidence submitted by the applicant: an academic paper published after the application date.[233] The paper delineates the correlation between certain methods of manufacturing and the expected amount of salvianolic acid B content, which, according to the applicant, would prove the difficulty of attaining high percentage of the salvianolic acid B and the non-obviousness of its invented method to accomplish this feat.[234] The evidence was dismissed on the ground that it was beyond the knowledge of people skilled in the art before or on the date of application; the court still engaged the applicant's argument and rebutted that, even if the academic paper could be included as evidence, the fact that the patent application documents did not associate the increased percentage of salvianolic acid B in the product with any treatment effect on gland hyperplasia rendered the applicant's characterization of technical problem illegible.[235]

The court's reasoning here runs a close parallel to the arguments advanced by the PRB in its decision on the glow switch case discussed above. The EPO's problem-solution approach, by its very nature, must privilege the external, overall technical effect of the invention; mere characterization of the technical problem as an internal function or structure without resulting technical effect

228. *See* (2013) Zhixingzi No. 77 ((2013)知行字77号) [IP Case No. 77], Zuigao Renmin Fayuan Zhishi Chanquan Shenpanting (最高人民法院知识产权审判庭) [IP Chamber of The Supreme People's Court], *reprinted in* ZUIGAO RENMIN FAYUAN ZHISHI CHANQUAN SHENPAN ANLI ZHIDAO (最高人民法院知识产权审判案例指导) [Guiding Cases By the IP Chamber of the Supreme People's Court] 151 (2014) (describing an influential case regarding requirements about how technical problems should be framed).

229. *Id.* at 152.

230. *Id.* at 159.

231. *Id.*

232. *Id.*

233. *Id.*

234. *Id.*

235. *Id.* at 159–60.

cannot be defined as a technical problem.[236] Much like what George Szabo spoke about the theoretical contradistinction between internal and external effects that underlies the doctrinal evolution behind EPO's problem-solution approach since the 1980s,[237] in addition to the disclosure of the technical details that can allow peers, competitors, and other persons skilled in the arts to make or replicate the device to be patented, the patent applicant in China is now expected to explicitly state the external effect of the invention—be it an effect on the manufacturing process (e.g., enhanced safety or efficiency in production and assembly) or an effect felt in the product's use (improved economy, a new functionality or just improved functionality, as was the case with the reduced ignition time in the glow switch or the medicinal effect on gland hyperplasia)—and the patent office and courts correspondingly pivot from the scrutiny of small variations in technical details (for instance, the microscopic amount of BaO in the glass or the percentage of one peculiar kind of acid in a pill) to the verification of the external effects (that is, whether a device really reduces ignition time and whether a new medicine can be produced that can more effectively or perhaps more cheaply battle gland hyperplasia).[238]

C. Cases on "Secondary Considerations"

The primacy given to the consideration of the problem and effect necessarily comes at the expense of all the "secondary considerations." This is one more dogmatic concurrence between the Chinese patent regime and the EPO. Despite their place in the Guidelines for a long time, secondary considerations such as commercial success were explained in detail and then quickly set aside by the Supreme People's Court in 2012 in the decision of *Huying v. The Patent Reexamination Board*.[239] The Court vacated a decision by the Beijing Higher People's Court that confirmed the inventiveness of a patent application solely based on evidence of commercial success despite its failure to show substantive prominent feature, i.e. non-obviousness to people skilled in the art.[240] The Supreme People's Court ruled that "commercial success should only be considered when it is not possible to determine whether the technical solution involves an inventive step or not, or it can be determined that there is no inventiveness at all, through the three-step approach."[241] In one sweeping gesture, the Court set up a restrictive standard for commercial success: only if the commercial success is a direct result from the technical solution presented by the patent application may we consider that the technical solution involves

236. *See* Changhui, *supra* note 121 (discussing the problem-solution approach's focus on technical effect).

237. G.S.A. Szabo, *The Problem and Solution Approach in the Inventive Step*, 8(10) E.I.P.R. 293, 296–99 (1986).

238. *See* Fushen, *supra* note 184 (discussing what a patent applicant is required to state regarding the external effect of the invention).

239. Wu Rong (吴蓉), *Zhuangli Chuangzaoxing Panduan Zhong De Shangye Chengdong* (*专利创造性判断中得商业成功*) [*Commercial Success in the Inventiveness Determination*], *Keguanhua Wenti Yanjiu(专利创造性客观化问题研究)[A Study on the Problem of Objectification of the Patent Inventiveness Requirement]*, 9 ZHISHI CHANQUAN (知识产权) [INTELLECTUAL PROPERTY] 44 (2013) (Ch.).

240. *Id.*

241. *Id.* at 46.

an inventive step.[242] Most importantly, commercial success must not be measured by sales performance alone, burdensome proof is now required; the applicant must be able to provide evidence regarding the market share of the pending patent compared to products in the same technical field and demonstrate the technical superiority of the pending patent over similar products.[243]

The Supreme People's Court's decision to limit the applicability of the commercial success test in the inventiveness determination reflects what the Court takes to be the overarching purpose of the creation and enforcement of the Chinese patent system; that is, incentivization of technical improvement must take precedence over pursuit of commercial interests.[244] This purpose can be served only by subsuming considerations about commercial success under the three-step test for technical advancement. In this vein, the importance of secondary considerations in Chinese patent law would bear greater resemblance to that in European patent jurisprudence, which also gives only ancillary role to factors such as commercial success, than to that in the U.S. courts, which would take those factors into account at the very beginning of inventiveness determination.[245]

V. CONCLUSION

While the Chinese patent regime had limited itself by and large to being an enforcer of patent infringement in the 1980s in response to trade and economic motives, its patent jurisprudence in the new century has taken the inventiveness and non-obviousness standards as the center of its theoretical gravity and has sought to generate uniformity and objectivity among its patent officers and judiciary.

In inventiveness-centric cases, China has largely adopted the EPO's problem-solution approach, as a result of which we have witnessed radical changes to the conception of inventiveness in the recent editions of the Official Guidelines as well as in the opinions and decisions issued by the Chinese patent offices and courts, even when these changes have not been reflected in the statutory language of the Patent Law.[246] I have called attention to several of these doctrinal changes, such as the priority now given to the framing of technical problems and effects of the claimed invention, the reimagination of the person skilled in the art, the effort to eradicate hindsight bias through the analysis of the could/would dichotomy, and the diminution of secondary considerations.

It is safe to speculate that Chinese patent authorities no longer see international trade and the need to access foreign technology as a dominant factor in their legislative and regulatory efforts, having already put in place a

242. *Id.*
243. *Id.*
244. *Id.*
245. *See id.* (comparing Chinese patent law as relating more closely to European countries than the United States).
246. *See* Renmin, *supra* note 2 (explaining the statutory language of inventiveness has not been altered to reflect these radical changes).

fairly zealous enforcement regime in the 1990s and early 2000s.[247] Rather, we should expect to see patent scholars and officers in China increasingly preoccupied with good judicial administration and discipline in imposing uniformity and objectivity in the notoriously treacherous terrain of non-obviousness standards.

247. *See* ZHU, *supra* note 6 (discussing changes in the Chinese patent regime throughout the 1980s, 1990s, and 2000s).