

16. Employee invention system: Comparative law perspective

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I. INTRODUCTION

Both European and East Asian countries went through major overhauls to further harmonization of patent systems and to remove obstacles for global trade since the enactment of WTO TRIPS in 1994.¹ In particular, European countries enacted the European Patent Convention ('EPC') in 1973² and completed harmonization in substantive and procedural aspects of patent procurement. They are enhancing their harmonization efforts in patent enforcement to create a uniform market within European Union ('EU') member states by issuing a number of EU regulations and directives. Since EU member states include both common law and civil law countries, EU regulations and directives are a unique amalgam of IP systems in both traditions.

East Asian countries' patent systems also represent another type of amalgam of IP systems in both common law and civil law traditions.

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¹ World Trade Organization ('WTO'), Trade-Related Aspects of Intellectual Property Rights ('TRIPS'), Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations, Apr. 15, 1994, THE LEGAL TEXTS: THE RESULTS OF THE URUGUAY ROUND OF MULTILATERAL TRADE NEGOTIATIONS 2 (1999), 1867 U.N.T.S. 14, 33 I.L.M. 1143 (1994) (http://www.wto.org/english/docs_e/legal_e/legal_e.htm)

² Convention on the Grant of European Patents, Oct. 5, 1973, 13 I.L.M. 270 ['European Patent Convention'].

These countries originally adopted the German patent system as the model for their own patent systems. After World War II, these countries adopted many aspects from the US patent system as a result of bilateral and multilateral trade negotiations to open their markets. More recently, this US influence is further enhanced because many of these countries adopted pro-patent policies and went through overhaul reforms by using the US patent system as a model for mobilizing the patent system as a form of economic stimulus.³ These reforms led to significant changes to key features adopted from the German patent system through patent legislation and judicial interpretation in East Asia.

In contrast, inventorship and ownership issues are left behind from these harmonization efforts both in Europe and Asia.⁴ European patent scholars and professionals found that the different approaches taken in common law and civil law traditions prevent EU member states finding common ground.⁵ However, inventorship is the starting point of the ownership and the ownership is a fundamental issue to give a basis to claim the right of intellectual property. In particular, allocation of the ownership of inventions resulting from the employment ('employee inventions') between the employee-inventor and the employer directly relates to a basic policy question for the patent system, promoting innovations through encouraging inventions and commercialization. Despite the necessity for harmonizing the ownership allocation rule, each jurisdiction adopts its own rule and mechanism to transfer the ownership to employers. In addition, the rule for employees' rights to compensate the transfer of ownership differs from one jurisdiction to another. Since the overwhelming majority of patent applications filed with patent offices in US, as well as EU and Asian jurisdictions are directed to employee inventions and filed by non-inventors, that is, employers of actual inventors, non-uniformity of ownership between the same employer and employee with respect to the

³ An example is a reform in Japan in introducing the basic IP Law. Toshiko Takenaka, *Success or Failure? Japan's National Strategy on Intellectual Property and Evaluation of Its Impact from the Comparative Law Perspective*, 8 Wash. U. Global Study. L. Rev. 379 (2009).

⁴ To promote discussions, EU has published a green paper in 1997. Promoting Innovation Through Patents: Green Paper on the Community Patent and the Patent System in Europe, COM(1997)314. However, there has been no progress in harmonization since the publication.

⁵ Christopher Heath, *Harmonizing Scope and Allocation of Patent Rights in Europe – Towards a New European Patent Law*, 6 Marq. Intell. Prop. L. Rev. 11 (2002).

same invention presents a serious challenge for multinational companies to manage global patent procurements.⁶

Accordingly, this article will examine employee invention systems in major countries representing common law and civil law countries and aim to propose the best practice for allocating rights in employee inventions for harmonization. It will first examine the employee invention systems under German and US legal systems. The German patent system is a paradigm of a patent system in civil law countries. Its influence on patent jurisprudence is very significant in both European and East Asian countries because these countries revised their patent laws to harmonize with the EPC, which is in principle based on the pre-EPC German patent system. Further, Germany has a most advanced legal system providing detailed rules for balancing interests between employers and their employee-inventors through the enactment of the Employee Invention Act ('EIA').⁷ Unlike many other jurisdictions, the German EIA is separate from the Patent Act.⁸ Reflecting an important public policy under German Labor Law, EIA makes it clear that any agreement between an employee and employer conflicting with a provision in EIA and detrimental to employee's rights is void, and thus extensively limits the freedom of contract between employers and employee-inventors.⁹

In contrast, the freedom of contract governs ownership of employee inventions under US Patent Law,¹⁰ which is paradigm of a patent system in common law countries.¹¹ There is no statutory provision to control the

⁶ For example in Japan, 95 percent of patent applications are filed by employers. *Supra* note 5, Heath at 18–19.

⁷ Arbeitnehmererfindungsgesetz, ArbEG (Employees' Inventions Act). English Translation is available in Helmut Reitzle et al., *Gesetz über Arbeitnehmererfindungen / Act of Employees' Inventions* (2007). For a most comprehensive treatise in German on German EIA, see Kurt Bartenbuch and Franz-Eugen Volz, *Arbeitnehmererfindungsgesetz* (4ed, 2002) ['Bartenbuch']. The ownership principle is discussed on page 254 seq. For treatises in English, see Michael Trimborn, *Employees' Inventions in Germany: A Handbook for International Businesses* (2009) ['Trimborn']; Helmut Reitzle et al., *Act on Employees' Inventions* (3ed, 2007) ['Reitzle'].

⁸ Patentgesetz of 1983 (Patent Act of 1983), English Translation is available at: http://www.jpo.go.jp/shiryoku_e/s_sonota_e/fips_e/pdf/germany_e/e_tokkyo.pdf

⁹ EIA §22.

¹⁰ 35 U.S.C. §§ 1-376 (U.S. Patent Act)

¹¹ Another important common law country is United Kingdom. UK employee invention system is based on the freedom of contract and share a lot of similar features with U.S. patent systems. For discussions on U.K. employee invention system, see Jeremy Phillips and Michael J. Hoolahan, *Employees' Inventions in the United Kingdom Law and Practice* (1982), and *supra* note 5, Heath at 22.

ownership of invention resulting from the employment relationship except for federally funded inventions under the Bayh-Dole Act.¹² The Bayh-Dole ownership rule governs only the ownership of invention resulting from the special relationship between the Federal Government and their employees and contractors. It does not govern any other employment relationship, including the Government's contractors and their employees.¹³ Instead, the terms of assignment contracts and state law govern the ownership of inventions resulting from any other employment relationship, the special relationship.¹⁴

On its face, US and German systems are so different that it seems impossible to reconcile their basic principles. However, some other jurisdictions in Asia and Europe have employee invention systems which are a hybrid in incorporating various features from both US and German systems. French and Japanese systems are good examples of such hybrid. Their rules of ownership and compensation for inventors share common features with the rules under US and German employee systems.

After reviewing the four systems, this article will propose a system which is based on a fine balance between interests of employers and inventors for giving inventors incentive to invent while guaranteeing their employers enough rewards for commercialization. It will take into account today's R&D environment where inventors interflow beyond the traditional notion of legal entity and propose an employee invention system, which will promote an information sharing culture and collaboration of researchers from academic and private sectors while facilitating IP professionals' patent portfolio management.

II. UNITED STATES

(i) Fundamental Rules

In the United States, only a natural person or plural natural persons can be the sole inventor or joint inventors, excluding the possibility for

¹² Bayh-Dole Act, Pub. L. No. 96-517, codified as 35 USC §§202-12 (Chapter 18). For detailed discussions of history and interpretation of Bayh-Dole Act, see SEAN O'CONNOR ET AL., *LEGAL CONTEXT OF UNIVERSITY INTELLECTUAL PROPERTY AND TECHNOLOGY* (2010) [hereinafter O'CONNOR ET AL.] available at http://sites.nationalacademies.org/PGA/step/PGA_058712 (last visited Aug. 21, 2011).

¹³ *Bd. of Trs. of the Leland Stanford Junior Univ. v. Roche Molecular Sys.*, 131 S. Ct. 2188, 180 L. Ed. 2d 1, 98 USPQ 2d 1761 (2011).

¹⁴ Some states enacted special legislations for employee inventions. See *infra*.

a non-human legal entity, such as a corporation, from inventorship. It is a fundamental rule that ownership of invention is originally vested in the inventor.¹⁵ This rule is subjected to a narrow exception for national security related inventions under the Atomic Energy Act¹⁶ and the National Aeronautics and Space Act¹⁷ in the United States where the ownership is vested to the US Federal Government.¹⁸ Thus, the examination of ownership always starts from the determination of inventorship.¹⁹ Although the ownership issue is often intertwined with the inventorship issue, it is important to note that the inventorship issue ‘who is a true and original inventor or inventors?’ is a separate question from the ownership issue, ‘who owns property rights in the invention made by the inventor(s)?’

The rule that the ownership of invention is assignable is another important rule. Although the patent statute applies to determine inventorship, federal law plays a very small role in the determination of ownership before filing a patent application with the US Patent and Trademark Office (‘USPTO’) when rights in the ownership of invention are transferred from the original inventor(s).²⁰ An inventor may contract to transfer rights in future inventions before completion of the inventions; nevertheless rights and obligations for the transfer under such contract is controlled by state law.²¹ Such transfer may occur before or after patent filing.

A patent may be issued to an applying inventor although a patent may issue to an inventor’s assignor if the inventor assigns rights in the invention to a third-party.²² This rule is codified in patent statute that applications can be assignable by an instrument in writing.²³ The statute makes

¹⁵ *Stanford*, 180 L. Ed. 2d. at 12. *Gayler v. Wilder*, 51 U.S. 477, 10 How. 477, 493, 13 L. Ed. 504(1851); *Solomons v. United States*, 137 U.S. 342, 346, 11 S. Ct. 88, 34 L. Ed. 667, 26 Ct. Cl. 620 (1980); *Beach Aircraft Corp. v. EDO Corp.*, 990 F.2d 1237, 26 USPQ2d 1572 (Fed. Cir. 1248). For a discussion of the ownership endorsed by the Supreme Court in *Stanford* in comparison with the ownership under the German EIA, see, Toshiko Takenaka, *Serious Flaw of Employee Invention Ownership under the Bayh–Dole Act in Stanford v. Roche; Finding the Missing Piece of the Puzzle of the German Employee Invention Act*, 12 Texas Intellectual Property L.J. 281 (2012).

¹⁶ Atomic Energy Act (AEA) of 1954, P. L. 83-703,68 Stat. 944.

¹⁷ National Aeronautics and Space Act of 1958, P.S. 85-568, §102,72 Stat. 426 (NASA).

¹⁸ *Stanford*, 180 L. Ed. 2d. at 13.

¹⁹ Donald S. Chisum, *Chisum on Patents*, §22.02(1972, Supp. 2010).

²⁰ Mary LaFrance, *Nevada’s Employee Inventions Statute: Novel, Nonobvious, and Patently Wrong*, 3 Nevada L. J. 88 at 90.

²¹ *Supra* note 19, *Chisum on Patents*, §22.03.

²² *Stanford*, 180 L. Ed. 2d. at 12.

²³ 35 U.S.C. §261.

clear that a patent application must be filed by the inventor, even if rights in the invention are transferred to a third-party.²⁴ This rule is unique to the US patent system.

(ii) Employer's Rights in Employee Inventions

The US Supreme Court acknowledged that it is often true that property rights in fruits of labor belong to his employer.²⁵ This rule does not apply to patents because the Supreme Court made it clear that mere employment is not sufficient to transfer the ownership of employee invention to the employer.²⁶ In general, the ownership of inventions belongs to inventors and does not transfer to their employers unless the inventors expressly agree to assign the inventions.²⁷ As early as 1843, the US Supreme Court has always assumed ownership of employee inventions to the inventor.²⁸ However, it attempted to maintain balance with interests of employers by providing a royalty-free non-exclusive license.²⁹ From the first patent statute in 1790, the US patent system has been granting patents only to applications filed by the first and true and inventors.³⁰ The same first patent statute presumes an invention made by multiple joint-inventors.³¹ However, the employer of an inventor cannot be qualified for a co-inventor. Regardless of financial contribution or an instruction given by a natural person-employer, she cannot obtain any rights in the ownership of invention unless she is a joint inventor of the invention that resulted from joint labors with her inventor-employee.³² To qualify as a joint-inventor,

²⁴ 35 U.S.C. §111. PTO Rule 41(a). *Supra*, note 19, Chisum §11.02[2][a]. An application should be made by the actual human inventor or inventors even if the inventor or inventors assign all rights to the invention to another person or entity. 37 C.F.R. §1.46. This rule has been modified to enable assignee-employers to file an application when the revision under American Invents Act has become effective on September 16, 2012. 35 USC §118. America Invents Act, Pub. L. No. 112-29, 125 Stat. 284, Section 4, §118 (Sept. 16, 2011).

²⁵ *Stanford*, 180 L. Ed. 2d. at 14.

²⁶ *Stanford*, 180 L. Ed. 2d. at 14.

²⁷ *Stanford*, 180 L. Ed. 2d. at 12.

²⁸ *Supra* note 19, Chisum on Patents, §22.03.

²⁹ *Id.*

³⁰ Patent Act of 1790, §. 6. Since patent applications were not examined under 1790 Act, patentees needed to produce evidence that he is a first and true inventor for enforcing his patent at a court.

³¹ *Id.* §. 1. For a general discussion, *see supra* note 19, Chisum on Patents, §2.02[1].

³² *Steams v. Barrett*, 22 F. Cas 1175 (no. 13, 337)(C.C.D. Mass. 1816) cited in *supra* note 19, Chisum on Patents, §2.02

she must make a contribution to the conception of the invention.³³ This is a stark contrast to the ownership of authorship under US Copyright Law, which gives the ownership directly to employers under the work-for-hire doctrine.³⁴

An invention resulting from the performance of duty under employment does not change the fundamental rule that the ownership to inventions are exclusive to the inventor, unless there is an express agreement between the inventor and his employer to assign the rights. State contract law governs whether the agreement is valid and enforceable. Even if an employer fails to secure an express agreement from his employee, US courts developed common law rules to provide some rights; (1) if an employer is specially hired to make the particular invention (the specially hired to invent doctrine), or (2) if an employer is hired to make inventions in general (the hired to invent in general doctrine).³⁵ The former gives rise to a duty of assignment based on the contract to hire inventors for inventing a particular subject matter.³⁶ Therefore, an employer secures the ownership of employee invention under this implied license theory. The latter gives rise to a non-exclusive personal non-transferable license termed a 'shop right'.³⁷

It is important to note that this 'specially hired to invent' doctrine is an exception to the ownership rule exclusive to inventors. US courts repeatedly held that an employment contract to hire an employee for inventing something in general does not give rise to a duty of assignment.³⁸ In a leading case involving the ownership of employee invention, *Dubilier Condenser Corp.*, the US Supreme Court emphasized the distinction between the contract of hiring an inventor for conducting research and making inventions in general, and that of hiring an inventor for making a particular invention.³⁹ According to the majority in *Dubilier*, hiring an employee for making an invention gives rise to an ownership assignment duty with respect to an employee invention only if the invention is the precise subject of the employment contract. This follows that a term in

³³ *Stern v. Trustees of Columbia University*, 434 F.3d 1375, 77 USPQ2d 1702 (Fed. Cir. 2004). See also, *supra* note 19, Chisum on Patents, §2.02[2][a].

³⁴ 17 USC §101. For a discussion to compare the ownership rules between copy-right and patents see *supra* note 20, LaFrance at 100.

³⁵ *Supra* note 19, Chisum on Patents, §22.03[2][3].

³⁶ *Standard Parts Co. v. Peck*, 264 U.S. 52 (1924).

³⁷ *McChurg v. Kingslund*, 42 U.S. (1 How.) 202, 11 L. Ed. 102 (1843).

³⁸ *Supra* note 19, Chisum on Patents, §22.03[2]. See, e.g., *Aethna-Standard Engineering Co. v. Rowland*, 228 USPQ 292, 493 A. 2d 1375 (Pa, Super. Ct. 1985).

³⁹ *United States v. Dubilier Condenser Corp.*, 289 U.S. 178, 17 USPQ 154 (1933).

the contract must make clear what the employer paid for and what consequently belongs to the employer. The *Dubilier* Court highlighted the distinction between rights in the ownership of inventions and other types of properties resulting from regular labor. Only the former resulted from inventive activities exercising their unique creativity beyond ordinary skill. Due to this special nature of inventions, rights in the ownership of the invention do not transfer to employers unless employees specially bargained for and agreed to the compensation for the inventions when they entered into the employment contract.

The Supreme Court also used this special nature of invention to define the scope of 'shop rights.' Employers are in equity entitled only to a license to use the invention but have no equity to demand a transfer of the ownership of invention because the invention is the original conception of the employee-inventor; it should remain as the property of the employee.⁴⁰ Since the *Dubilier* Court found the nature of the employment contract to hire the inventor for conducting research in general, it refused the employer's request to transfer patents held by its inventor-employee.

This reluctance of implying a contract to assign rights in the ownership of invention is supported by the patent policy for promoting innovations through inventions. To preserve incentives to invent, US case law prevents employers from taking away property rights in the invention and secures inventor-employees bargaining opportunities with their employers for fair value of the invention.⁴¹ In other words, the patent policy of innovation promotion through a reward to inventors is implemented through the bargaining between inventors and their employers over a transfer of property right in the invention.

(iii) Employee's Rights in Employee Inventions

Despite the important role played by the pre-invention assignment contract in implementing a federal patent policy, US courts leave interpretation of contract terms and enforceability to the governance of state policies through the application of state contract law.⁴² The US Supreme Court empowered state courts to develop their own law governing a state question such as ownership and transfer of patents.⁴³ However, state courts in general acknowledge the significance of federal case law and

⁴⁰ *Id.*, at 188.

⁴¹ *Supra* note 20, LaFrance at 93; *Supra* note 19, Chisum on Patents, §22.03[2].

⁴² *Supra* note 19, Chisum on Patents, §22.03[4].

⁴³ *Erie Rr. v. Tompkins*, 304 U.S. 64 (1938).

follow the precedent of the US Supreme Court.⁴⁴ This led to a development of fairly uniform common law rules in ownership and assignment enforceability throughout state and federal courts in the United States. Under this uniform rule, an express agreement is necessary to transfer rights in the ownership of invention from an inventor to her employer.⁴⁵ The state law governs the agreement in general with some exceptions.⁴⁶

Accordingly, different state public policies, for the ownership of an assignment agreement in employment contracts, lead to non-uniformity of the scope of inventions, which employers can secure the ownership of inventions from their employees. Unlike many civil law jurisdictions, employers are not required to pay any additional compensation as consideration for a transfer of rights in the invention.⁴⁷ This is because US courts view the payment of salary, assistance of co-employees, and right to use an employer's facility constitutes sufficient consideration.⁴⁸ Since US Case Law requires such a pre-invention assignment agreement, being not only expressive but also clear, by giving notice to inventors with respect to what they give up in exchange for their salary and guarantees inventors bargaining opportunity, courts find inventor salary as sufficient consideration to enforce the agreement.⁴⁹

Although US courts favor to enforce an express assignment contract, if employees' duties of assignment are overbroad, they may decline to enforce an agreement literally.⁵⁰ Courts may reinterpret the overbroad agreement to limit the duties within a reasonable scope.⁵¹ In some states

⁴⁴ See, e.g., *Farmland Irrigation Co., Inc. v. Dopplmaier*, 48 Cal. 2d 208; 113 USPQ 88 (1957); *Aethna-Standard Engineering Cor. v. Rowland*, 343 Pa. Supr. 64,493 A.2d 1375,228 USPQ 2d 292 (1985).

⁴⁵ *Stanford*, 180 L. Ed. 2d at 12.

⁴⁶ *Jim Arnold Corp. v. Hydrotech Sys.*, 109 F.3d 1567, 42 USPQ2d 1119 (Fed. Cir. 1997); *My Mail, Ltd. v. Am. On Line, Inc.*, 476 F.3d 1372, 81 USPQ2d 1832 (Fed. Cir. 2007); One of such exceptions is the question, whether a patent assignment clause creates an automatic assignment. *Stanford* 583 F.3d 832, at 841.

⁴⁷ D. Parker, Note, Reform for Rights of Employed Inventors, 57 *S. Cal. L. Rev.* 603, 608 (1984); Ann Bartow, Inventors of the World, Unite! A Call for Collective Action by Employee-Inventors, 37 *Santa Clara L. Rev.* 673 (1997).

⁴⁸ See, e.g., *Goodyear Tire & Rubber Co. v. Miller*, 22 F.2d 353 (9th Cir. 1927).

⁴⁹ *Aethna-Standard Engineering Cor. v. Rowland*, 343 Pa. Supr. 64,493 A.2d 1375,228 USPQ 2d 292 (1985); *Dempsey v. Dobson*, 174 Pa. 122, (1896), *appeal after remand*, 184 Pa. 588 (1898).

⁵⁰ Jay Dratler Jr. *Incentives for People: The Forgotten Purpose of the Patent System*, 16 HARV. J. ON LEGIS. 129 (1979).

⁵¹ *Guth v. Minnesota Mining & Manufacturing Co.*, 72 F.2d 385 (7th Cir. 1934)(discussed in *supra* note 50, Jay Dratler Jr., at 142); *Universal Winding Co. v. Clarke*, 108 F. Supp. 329 (D. Conn. 1952).

an employment contract including an overbroad assignment agreement is void and unenforceable.⁵² In general, special legislations for employee inventions enacted in these states prevent employers from enforcing a contract obligating a transfer of rights in the ownership of the invention which is developed entirely on the employee's own time unless; (1) the invention relates to employers' business or to the employer's actual or 'demonstrably anticipated' research and development; or (2) results from work performed by the employee for the employer.⁵³ In contrast to these legislations for protecting employees' rights, only one State, Nevada, enacted an Act which allows transfer of rights in the ownership of invention automatically without any express agreement if the invention is made during the term of employment and fell within the scope of the employee's job description.⁵⁴ In other states where no special legislation is enacted, a contract to transfer rights in the ownership of any invention made during the term of employment may be valid and enforceable regardless of the inventor's duty or employer's business as long as the invention resulted from work the employee conducted for his employer.⁵⁵ In short, the freedom of contract, assuming equal bargaining powers between employers and employees, is the key principle in implementing the US employee inventions system, although some states have some limitations on the principle for protecting employees or employers. If either party fails to take advantage of the bargaining opportunity, no protection is available through a federal legislation.⁵⁶

⁵² These states currently include California, Minnesota, North Carolina, Washington and Nevada. *Supra* note 12, O'Connor et al., at 85; Robert L. Gullette, *State Legislation Governing Ownership Rights in Inventions*, 62 J. Pat. & Trademark Off. Soc'y 732 (1980).

⁵³ *Supra* note 20, LaFrance at 96.

⁵⁴ *Supra* note 20, LaFrance at 88.

⁵⁵ *Cubic v. Marty*, 185 Cal. App. 3d 438, 1 USPQ2d 1709 (1986).

⁵⁶ In the 1970s, U.S. Congress introduced a series of bills to implement a federal policy for the employee invention ownership. H.R. 15512, 91st Cong., 1st Sess. (1969), reprinted in 116 CONG.REC. 744 (1970), reintroduced as H.R. 1483, 92d Cong., 1st Sess. (1971). These bills modeled German EIA. However, these bills failed to pass Congress due to strong opposition from U.S. industry for introducing a mandatory compensation for inventors with respect to the transfer of employee invention ownership. William Hovell, *Patent Ownership: An Employer's Rights to His Employee's Invention*, 58 Notre Dame L. Rev. 863 (1983); *Supra* note 12, O'Connor et al., at 29.

III. GERMANY

(i) Fundamental Rules

The fundamental rule that ownership of invention is exclusive to the inventor is common in the US and German patent systems. Under German Patent Law, a right for patent is initially vested only in the sole inventor or co-inventors who have made a creative contribution for the invention.⁵⁷ An employer cannot be an inventor or co-inventor unless he or she makes such contribution. Only a natural person can make such contribution and thus a legal entity cannot be an inventor.⁵⁸ This fundamental rule is universal to all branches of intellectual property including copyright under the German legal system. There is no exception to the rule such as the ‘work for hire’ doctrine under US Copyright law.⁵⁹

Like US case law, an examination of inventorship is the starting point for deciding ownership. Patent law applies to determine who is/are the inventor(s). However, it plays a very limited role in determining the ownership of invention before filing a patent application. In general, property and contract principles under civil codes govern an assignment of property rights including those in the ownership of invention.⁶⁰ Regarding the ownership of property rights resulting from the performance of duty under an employment contract, German labor and employment law may provide a special rule governing a contract between employers and their employees reflecting public policy.⁶¹ German courts made clear that fruits of employees’ labor belong to their employer.⁶² This ownership rule conflicts with the patent law rule of inventors as original owners when the invention resulted from the performance of employees’ duties. To remove this

⁵⁷ German Patent Act, § 6. BGH 2004 GRUR 50 – Verkranzungsverfahren.

⁵⁸ BGH 1978 GRUR 283 – Motorkettensäge; District Court of Nürnberg-Fürth 1968 GRUR 254; Peter Mes, Patent Act (Commentary), 2005 (2nd Edition), Section 6 Patent Act, Marginal No. 8.

⁵⁹ However, with respect to computer software German Copyright Law gives employers all usage rights if the software resulting from execution of employee’s duty. German Copyright Law § 69b. For a general discussion of lack of work for hire doctrine under German Copyright Law, see Robert A. Jacobs, *Work-For-Hire and the Moral Right Dilemma in the European Community: A U.S. Perspective*, 16 B.C. Int’l & Comp. L. Rev. 29, 53 (1993).

⁶⁰ Kraßer, Patentrecht, 2009 (6th Edition), § 40, III.

⁶¹ Kraßer, Patentrecht, 2009 (6th Edition), § 21, I a.

⁶² BAG (Federal Labour Court) 1961 NJW 1509; Münchener Kommentar zum BGB (Civil Code Commentary), Müller-Glöge, 2009 (5th Edition), Section 611, Marginal No. 1073.

conflict, while achieving the public policies involved in both patent law and labor and employment law, German legislators enacted a special law, the EIA, to govern an assignment of rights in the ownership of invention between employers and employees.⁶³

(ii) Employers' Rights in Employee Inventions

Under the German EIA, the patent law rule that inventors are original owners prevails over that of employment law. Thus, the German EIA rule is perfectly in-line with US law in making clear that rights in the ownership of invention originally vest in inventor-employees.⁶⁴ However, it differs from the US rule in guaranteeing employers a right to claim a transfer of the ownership of employees' inventions.⁶⁵ In other words, the German EIA limits the freedom of contract and makes void with respect to any contract conflicting with a provision of the EIA and being detrimental to employees.⁶⁶

Due to the mandatory rule reflecting strong public policies, the EIA makes clear the scope of inventions it governs. The scope covers any technical subject matter regardless of its patentability as long as it is made by an inventor-employee.⁶⁷ Under German Employment Law, an employee is a person who is bound by instructions on the grounds of an employment relationship and obliged in personal dependence on another, the employer.⁶⁸ The technical subject matter that EIA governs is classified into inventions and technical improvement proposals.⁶⁹ Inventions including utility model devices are distinguished from technical improvement proposals with respect to whether it is qualified for protection under German Patent Law or utility model registration.⁷⁰ Subject matter which is not qualified for patentability falls into the category of proposals for technical improvements and is not subject to various duties relating to patent applications.⁷¹

Patentable inventions are further classified into two types: service inventions and free inventions.⁷² An invention made during a term of employ-

⁶³ *Supra* note 7, Trimborn at 2; Reitzle, at 1.

⁶⁴ German Patent Act § 6. *Supra* note 7, Trimborn at 1.

⁶⁵ EIA § 6.

⁶⁶ EIA § 22.

⁶⁷ EIA § 1. *Supra* note 157, Harhoff and Hoisl.

⁶⁸ *Supra* note 7, Trimborn at 13.

⁶⁹ EIA § 2, §3.

⁷⁰ EIA §. 2.

⁷¹ EIA §. 3.

⁷² EIA § 4(1).

ment is a service invention if (1) it resulted from the employee's tasks in the employer's business or public administration or (2) it is essentially based upon the experience or activities of the employer's business or public administration.⁷³ Any other inventions that do not fall into the definition of service invention are free inventions.⁷⁴

With respect to a service invention, EIA guarantees employers a right to claim ownership of all property rights in the invention.⁷⁵ Before the 2009 Revision, an employer had to submit a document which met certain formality requirements under the Civil Code.⁷⁶ The assignment was not automatic and needed an additional step to consummate the right to claim transfer of ownership from the employee. This pre-2009 requirement of written instrument for executing an assignment is similar to the practice that US employers widely adopt by using the 'agree to assign' term in pre-invention assignment contracts.⁷⁷ The most significant difference from the US system is that even if employers failed to execute a pre-invention assignment contract at all, the ownership of employee invention transfers to employers in the operation of law if employers exercise their rights following the necessary procedure provided in the EIA.

A failure to exercise the claiming right may lead to a forfeiture of the employer's right in the ownership of service invention under the EIA. The German EIA has provided that inventor-employees could retain rights in the ownership if their employers did not exercise their claiming rights, within the 'four month from the receipt of proper report.'⁷⁸ It gave employees freedom to assign the ownership to a third-party including the employer's competitor. Employers who were not familiar with requirements under EIA may have failed securing the ownership of employee inventions. To remedy this problem, the German EIA was revised in 2009 to introduce a presumption to assume employers' exercise of their claiming right unless they send out a declaration to confirm that they would not exercise their rights and thereby release rights in the invention within four months from the receipt of report submitted by the employee.⁷⁹ This assumption made the German EIA's ownership transfer mechanism

⁷³ EIA §. 4(2).

⁷⁴ EIA §. 4(3).

⁷⁵ EIA §. 6(1).

⁷⁶ German Civil Code, §. 126b.

⁷⁷ *Arachnid, Inc. v. Merit Industries, Inc.*, 939 F.2d 1574, 19 U.S.P.Q.2d (BNA) 1513 (1991).

⁷⁸ EIA § 6.

⁷⁹ EIA § 6(2).

complete in protecting employers from loss of their rights in service inventions, which result from their negligent or ignorance of EIA provisions.

The EIA further protects employers' rights by making void any transactions of the ownership of service invention prior to exercise of claiming rights once an employer exercises the claiming right if the transactions negatively affect the employee's right.⁸⁰ After the 2009 revision, any prior transaction has become void when the four months for sending a declaration to release a service invention expires.⁸¹

(iii) Employee's Rights in Employer's Inventions

Under the German EIA, the transfer of rights through an exercise of claiming right also results in a variety of obligations on employers. These duties give rise to a variety of employees' rights for protecting their interests. The most important right for protecting employee-inventors' interests is a right for compensation, which resulted from the transfer of invention ownership to the employers. The EIA imposes a duty on employers to pay a reasonable remuneration or compensation.⁸² However, an employee cannot enforce this right unless the employer begins practicing the invention.⁸³ The EIA requires employers to take into account multiple factors including; (1) commercial applicability of the invention; (2) duties and position of the employee; and (3) contribution by the employer for calculating the compensation.⁸⁴ Due to the complexity of taking into account the multiple factors, the EIA suggests to consult guidelines for calculating the amount of remuneration.⁸⁵

To protect employees' rights for compensation, the EIA imposes a variety of duties on employers. The first of these duties is to file a German patent or utility model application without delay.⁸⁶ Since employees' right for compensation is based on the principle to share benefits resulting from an exclusive right in the employee invention through a patent grant (Monopoly Principle),⁸⁷ the compensation right is meaningless unless a patent application is filed to obtain an exclusive right. Employers are not

⁸⁰ EIA § 7(2).

⁸¹ EIA § 6(2).

⁸² EIA §. 9(1).

⁸³ *Supra* note 7, Reitzle et al., at 9.

⁸⁴ EIA §. 9(2).

⁸⁵ EIA §. 11.

⁸⁶ EIA §. 13(1). English translation of the guidelines are included in *supra* note 7, Reitzle et al., 45 seq.

⁸⁷ *supra* note 7, Trimborn at 32.

released from this duty unless their inventor-employees agree not to file a patent application or protect the inventions as a trade secret.⁸⁸ However, employers can choose the latter option only if they inform their employee-inventors their decision of trade secret protection while acknowledging patentability of the disclosed invention under German patent or utility model law.⁸⁹ To enforce the duty of patent filing, EIA guarantees employees a right to receive a copy of the patent application when an application is filed⁹⁰ and a right to file an application under the name of the employer at the expense of the employer if the employer fails to meet the duty.⁹¹

The EIA further protects employees' rights for compensation during the patent prosecution in requiring employers to communicate with employee-inventors about the progress of examination and correspondence with the patent office⁹² This communication is particularly critical if the employer decides to abandon the patent application or patent rights, which leads to a forfeiture of the right for compensation. To prevent employees' right for compensation from being eliminated through abandonment, the EIA guarantees employees a right to continue prosecution and maintain patents if their employers decide to abandon a patent application prior to the payment of compensation.⁹³

Employees' rights include compensation for sharing the benefits of exclusive right resulting from grants of foreign patents. The EIA provides a right for employers to file foreign applications based on the ownership of the invention transferred through the claiming of their rights in employee invention.⁹⁴ The Act also gives a right to employees to file a foreign application with respect to countries in which their employers are not interested in securing patent protection by requiring their employers to release the service inventions and enable their employees to file foreign applications.⁹⁵ For equity, the EIA provides a compulsory license for the

⁸⁸ EIA §. 13(2).

⁸⁹ EIA §. 17(1).

⁹⁰ EIA §. 15(1).

⁹¹ EIA §. 13(3). However, the Act does not give an option to return the ownership to employees so that they can file an application in their own name even if their employers fail to file an application. *Supra* note 7, Bartenbach at 700.

⁹² EIA §. 15.

⁹³ EIA §. 16. Employees can buy out this right to transfer the patent. Employers in major German companies often offer a lump-sum payment to their employees for compensating the right for continuing domestic patent application and the right for foreign patent applications under EIA §. 14. *Supra* note 7, Trimborn at 31.

⁹⁴ EIA §. 14(1)(2).

⁹⁵ EIA §. 14(2). Employers must inform their release early enough so that

employer if the employee obtains a patent on a service invention in foreign countries.⁹⁶

In short, the German EIA does not assume equal bargaining power between employees and employers. German Labor and Employment Law policy for protecting employees who have less bargaining power than employers and Patent Law policy for preserving inventors' incentive to invent, prevail in the ownership rules of employee inventions and limit the freedom of contract. These prevailing policies are in stark contrast to the strong policy of freedom of contract under the US system.

IV. FRANCE: AN EXAMPLE OF A HYBRID SYSTEM

(i) Fundamental Rules

In France, the ownership rules for inventions is provided in the French Intellectual Property Codes ('IPC').⁹⁷ The French system follows the same fundamental rule that the ownership of invention is in principle vested in the inventor.⁹⁸ However, this fundamental rule is significantly modified because the French IPC allows ownership of invention vested in employers if inventions made by an employee fall into the definition of 'mission invention.'⁹⁹ Although only a natural person or persons can be sole inventor or joint inventors and has a right to be named as the inventor,¹⁰⁰ employers including a legal entity can be the original owner of the invention made by their employees.¹⁰¹ In vesting the original ownership of invention to a legal entity, this French ownership rule is similar to the ownership rule for national security related inventions in the United States.¹⁰²

Unlike the US national security related inventions, where the starting point of ownership determination is the nature of invention, inventorship is the starting point for determining the ownership of French employee

employees can file a foreign application within the priority period under the Paris Convention Article 4.

⁹⁶ EIA §. 14(3).

⁹⁷ Intellectual Property Code (English Translation: http://www.jpo.go.jp/shiryou_e/s_sonota_e/fips_e/pdf/france_e/e_chiteki_zaisan.pdf).

⁹⁸ French IPC Article L. 611-6.

⁹⁹ French IPC Article L. 611-7, Paragraph 1.

¹⁰⁰ TGI Paris, 20 mai 1988, PIBD 1988, n° 442, III, p. 444.

¹⁰¹ French IPC Article L. 611-9.

¹⁰² *Infra* notes 16–17.

inventions because vesting of ownership depends on the nature of the employment contract between the employer and employee. Therefore, this French ownership rule functions in a similar manner as the ownership of invention under US common law, with respect to the invention specially hired to invent rule, in that the ownership transfers to employers without any express agreement.¹⁰³

Like the US and Germany, the ownership of invention is assignable before and after a patent application.¹⁰⁴ Property and contract principles under Civil Codes govern an assignment of property rights including those in the ownership of invention. Like Germany, French labor and employment law may provide a special rule to limit the freedom of contract to protect employee-inventors. French courts acknowledge a rule similar to German law to give the ownership of properties resulting from employees' labor. To remove a conflict of employee invention ownership with the labor law, French IP law provides a clear rule.

(ii) Employers' Rights in Employee Inventions

Ownership rules for employee inventions under French IP Codes (IPC) are a hybrid of the US and German systems because; (1) freedom of contract prevails with respect to mission inventions; while (2) the labor and employment law and patent law policy prevails with respect to beyond mission inventions. As discussed above, although the rules are provided as part of IP Codes, they apply only to the subject matter of inventions.¹⁰⁵ With respect to inventions, the rules apply only to patentable inventions.¹⁰⁶ The rules only control the ownership of inventions made by an inventor during the effective period of the employment contract with his employer.¹⁰⁷

The French IPC classifies inventions into three categories: (1) an inventive mission invention; (2) a beyond mission invention; and (3) free inventions.¹⁰⁸ An invention made by an employee is an inventive mission

¹⁰³ *Infra* note 35.

¹⁰⁴ French IP Code Article L. 611-6.

¹⁰⁵ French IPC Article L. 611-7.

¹⁰⁶ CA Paris, 9 mars 1972, *Ann. propr. ind.* 1973, p. 219; Cass. com., 22 févr. 2005, *Juris-Data*, n° 2005-027126.

¹⁰⁷ The employee invention ownership rules does not apply to students and trainees who are not employed by the universities and companies. Cass. com., 25 avr. 2006, *RCLIP-FR-54/2006*.

¹⁰⁸ French IPC Article L. 611-7. For a discussion of the three categories, see Thomas Bouvet, *Employee-Inventor Rights in France* (http://www.veron.com/publications/Colloques/Employees_inventions.pdf); Asako Hatanaka, *Employee Invention Compensation System in France*, 53 *AIPPI Japan* (No. 9) 34 (2008).

invention if the invention meets one of the following two conditions: (a) the invention results from an execution of an inventive mission included in the employment contract between the inventor and his employer where the inventive mission corresponds to the employee's effective function, or (b) the invention results from studies and research the employer expressly assigned to the employee as his duty.¹⁰⁹

The employee invention provision under the French IPC distinguishes a permanent mission which meets the condition '(a)' and a temporary mission which meets the condition '(b)'. A permanent mission must be supported by the terms of the employment contract between the inventor-employee and his employer. A temporary mission for assigning employees to conduct studies and research must be established by evidence other than the term of employment contract. To protect inventors, the law imposes on employers the burden for showing that an invention is qualified as a mission invention.¹¹⁰ The term of contract can define the inventive mission broadly and in general.¹¹¹ However, the term should specify the mission precisely to avoid a dispute whether an invention falls into the permanent inventive mission. If the term of contract is vague and does not define the mission clearly, courts refuse to find a mission invention.¹¹² In addition, the inventive mission must correspond to the function of the employee, that is, within the scope of authorities and abilities of the employee.¹¹³

The scope of the mission invention is narrower than the scope of service invention under EIA in requiring a specific mission in the employment contract. If the scope of inventive mission invention is interpreted to include only inventions that the employee and employer had an opportunity to bargain for, the transfer of ownership through employment contract negotiation, the scope of inventive mission invention corresponds to the scope of an invention under the specially hired to invent doctrine under US case law. This follows that the freedom of contract controls the ownership rules of invention with respect to inventive mission inventions. The French IPC

¹⁰⁹ French IPC Article L. 611-7 (1).

¹¹⁰ An employment contract must explicitly or implicitly supports the inventive mission. Paris, 7 feb. 1991, PIBD 1991, n° 503, III, p. 394; TGI Paris, 17 feb. 2010, PIBD 2010, n° 919, III, p. 334. For a collective agreement, see Cass. com., 3 june 2008, PIBD 2008, n° 879, III, p. 460; TGI Paris, 17 feb. 2010, PIBD 2010, n° 919, III, p. 334.

¹¹¹ Cass. com., 13 oct. 1992, Juris-Data n° 1992-002229. The Court of Appeal, confirmed by the Court of Cassation on this point, retained that the functions of the employee had a general inventive mission in order to improve the technical used by the employers within the framework of the activity of the company.

¹¹² TGI, 3ème ch., 3ème sect., 16 oct. 2001, PIBD, 2002, n° 744, III, p. 265.

¹¹³ *Supra* note 108, Hatanaka at 34.

endorses the outcomes of bargaining between an employer and employee and allows the employer to secure the ownership as soon as an invention is completed. The French rule should be understood that the inventor ownership belongs to the inventor is a fundamental rule and giving the ownership to employers with respect to mission inventions is an exception to the rule.¹¹⁴ Accordingly, only under an exceptional circumstance where the term of contract or any other evidence expressly or implicitly indicates a bargaining over the transfer of ownership with respect to the invention in question, French courts allow employers to secure the ownership of inventions made by their employees.

However, there is a difference between US and French ownership rules. French law allows an employer including legal entities, to become an original owner of the invention. US law limits the original ownership to inventors who are natural persons and subjected the inventors to a duty of transfer to the inventor's employer. Despite this theoretical difference, in practice the mission invention and the invention under the specially hired to invent doctrine function in the same way by automatically securing the ownership of such inventions for employers.

Inventor-employees hold the original ownership of any invention that fails to meet the definition of an inventive mission invention.¹¹⁵ However, such invention may be subjected to a duty of transferring the ownership of invention to the employer or a duty of granting a license to the employer if the invention falls into the definition of a 'beyond mission invention' by meeting one of the following three conditions: (a) the invention results from an execution of employee functions or duty under the employment contract; (b) the invention falls into the field of the employer's business activities; or (c) the invention is made based on the knowledge or experience of the employer, or using technologies or specific means or data of the employer.¹¹⁶ With respect to beyond mission inventions, French IPC adopts an ownership transfer system similar to German EIA and

¹¹⁴ For long time, French courts vested in employers the ownership of service inventions which resulted from the duty of employees. The Patent Act of July 13, 1978 introduced the three categories of inventions and made clear that employers obtain the ownership to inventions made by their employees only when an invention falls into the categories of inventive mission invention. See Thomas Bouvet, *Employee-Inventor Rights in France*, at 3–4 (http://www.veron.com/publications/Colloques/Employees_inventions.pdf).

¹¹⁵ French IPC Article L. 611-7; R 611-7(2).

¹¹⁶ *Id.* French law also guarantees employers a right to claim a grant of license. German EIA also provided a similar right for employers. A recent revision eliminated the right because employers almost always exercised a right to claim ownership if they want to practice employee inventions.

provides employers a right to claim the transfer of invention ownership.¹¹⁷ It imposes on employees a duty of invention report, which must include enough information to determine which category the invention falls into.¹¹⁸

In general, the scope of the ‘beyond mission inventions’ is broader than the ‘scope of service inventions’ under the German EIA in that it includes any invention that falls into the employer’s business activities regardless of the employee’s task or duty. To be qualified for a service invention, the German EIA requires an invention meeting either conditions (a) or (c); conditions for ‘beyond mission inventions’ fall under the French IPC.¹¹⁹ Inventions which meet only the condition of (b), within the scope of employer’s business activities, falls into the category of free inventions under the German EIA.¹²⁰ German employers have only a right of first refusal for at least a grant of a non-exclusive license with respect to the free inventions under the German EIA.¹²¹

The scope of ‘beyond mission inventions’ is also broader than the scope of inventions under the US case law of the ‘hired to invent’ doctrine, which gives rise to a ‘shop right.’ US courts look to the totality of circumstance in determining whether an employer obtains a shop right.¹²² Therefore, the scope of inventions giving rise to a shop right is uncertain. They rely on one or more of the three underlying principles for justifying a shop right: (1) implied license, (2) estoppels, and (3) equity and fairness.¹²³ If an employee conceived and reduced the invention to practice at home and on his own time without using any facilities of his employer, none of the principles support a shop right even if an invention falls into the employer’s business.¹²⁴

Despite the broad scope of mission inventions, employers’ rights under the French IPC are not better than employers’ rights under US case law because the French IPC only provides employers a right of claim to transfer ownership. Like German employers, French employers have no shop right if they fail to exercise their rights. Once the prescribed period

¹¹⁷ French IPC Article L. 611-7; R 611-1.

¹¹⁸ French IPC Article L. 611-7; R 611-9.

¹¹⁹ German EIA §4(2).

¹²⁰ German EIA §4(3).

¹²¹ German EIA §19.

¹²² *McElmurry v. Arkansas Power & Light Co.*, 995 F.2d 1576, 27 U.S.P.Q.2d (BNA) 1129 (1993).

¹²³ *Supra* note 19, Chisum, §20.03[3].

¹²⁴ This scope is comparable to the scope in which U.S. state special legislations allow enforcement of pre-invention assignment contract between an employee and employer. See, *Infra* note 54.

for claiming ownership expires, a beyond mission invention becomes a free invention. French employers would then need a license from their inventor-employees if the employees obtain a patent and the employers want to use the invention.

An invention which fails to meet neither definition of an 'inventive mission invention' nor a 'beyond mission invention' is a 'free invention.' The employer of the inventor has no right or claim on the ownership of free inventions and thus the inventor is free to transfer the right to any party.

(iii) Employee's Rights in Employee's Inventions

French rules for compensating inventor-employees are also a hybrid of US case law and the German EIA. Like the German EIA, the French IPC limits freedom of contract and requires employers a payment of additional compensation for the ownership of invention with respect to mission inventions.¹²⁵ However, the French IPC respects the freedom of contract for setting the amount of compensation before invention through an individual employment contract, a company contract or a collective bargaining agreement.¹²⁶ Many such agreements adopt a method for calculating the compensation by simply multiplying a monthly salary with certain coefficients reflecting multiple factors including the significance of invention, the personal contribution by the inventor.¹²⁷ This is a stark contrast to the case-by-case analysis required by the German EIA, which require sharing the commercial profits resulting from the patent exclusivity.

French courts have long upheld the salary based calculation methods. However, the Court of Cassation made clear that the French IPC does not require a calculation to be based on a salary.¹²⁸ Thus, recent decisions

¹²⁵ French IPC Article L. 611-7(1).

¹²⁶ Id.

¹²⁷ See, M.-F. Marais, *La jurisprudence de la CNIS, in les droits de propriété intellectuelle sur les inventions et les créations des chercheurs salariés*, Actes de colloque, Paris, 5 décembre 2000, Ed. Tec & Doc, p. 19. Mr. Marais was the president of the national commission of the employees inventions, noticed that the assessment of the amount of the additional remuneration was made in the most of cases by reference of the salary of the employee. It usually accounted two or three months of salary. He noticed also that the additional remuneration was usually weak and rarely exceeded 100 000 Francs (15 000 euros) between 1994 and 1999.

¹²⁸ CA Paris, 19 déc. 1997, PIBD 1998, III, p. 157 confirmed by Cass. com., 21 nov. 2000, Rev. Lamy dr. aff. 2001, n° 34, n° 2133, obs. J. Haberer; JCPE 2001, p. 275, note J.-C. Galloux. See also, J.-P. Martin, *La rémunération des inventions de salariés: un tournant?* RDPI, 1998, n° 89, p. 9.

indicate an influence of the German EIA by adopting a case-by-case analysis for compensation calculation.¹²⁹ French courts make efforts for determining benefits resulting from the invention by taking into account multiple factors, particularly annual turnovers from the invention, profit margins, and R&D expenses spent for developing the invention.¹³⁰ The Court of Cassation endorsed such efforts in acknowledging the significance of turnover resulting from the invention in calculating the compensation for inventive mission inventions.¹³¹

With respect to ‘beyond mission inventions,’ the French IPC requires employers a payment of fair price if employers exercise their right of claim to transfer the ownership of invention or grant of license.¹³² An inventor-employee and his employer must agree on the amount of the fair price. If they fail to reach an agreement, the fair price is determined by the joint conciliation board consisting of representatives of employers and employees, if one of the parties requests arbitration.¹³³ If a party is not satisfied with the arbitration decision or either party does not request arbitration, a court of the first instance sets the fair price.¹³⁴

It is often very difficult to agree on the amount because parties need to foresee the degree of exploitation of the invention by the employer to determine the value of invention. Parties can take account an amount resulting from an average exploitation of invention by employers.¹³⁵ However, many inventions need further investment and development for commercialization. Thus, parties can agree to set a fair price amount via a two step process: (1) a payment of a preliminary lump sum amount, which the employer expects to be the profits resulting from the future exploitation of the invention when he exercises the right to claim the ownership of invention, and (2) adjustment of the preliminary amount at the end of a period that the parties agreed on to set the final amount by taking into account the exploitation of the invention during the period.¹³⁶

¹²⁹ See, TGI Paris, 3^e ch., 3^e sec., 24 sept. 2008, PIBD, n° 885, III, p. 651.

¹³⁰ TGI Paris, 9 mars 2004, PIBD 2004, n° 787, III, p. 321. TGI Paris, 3^e ch., 14 sept. 2005, PIBD 2005, n° 819, III, p. 690, TGI Paris, 24 sept. 2008, PIBD, n° 885, III, p. 651.

¹³¹ Cass. com. 18 déc. 2007, Comm. com. élect. 2008, n° 3, comm. n° 35, obs. C. Caron. Insofar as it does not exist any legal provision allowing to calculate the additional remuneration, this question is left to the sovereign appraisal of the judges of first and second instance.

¹³² French IPC Article L611-7, 2.

¹³³ Id.

¹³⁴ Id.

¹³⁵ TGI Paris, 29 mai 2009, PIBD 2009, PIBD 2009, n° 903, III, p. 1340.

¹³⁶ See for example, CA Paris, 10 mai 2002, Prop. ind. 2002, n° 8, comm. n°

The additional compensation as well as the fair price under the French IPC sounds similar to the compensation for service inventions under the German EIA. However, they are different from the German EIA because an employee can enforce his rights of compensation and fair price even before his employer starts practicing the invention. Moreover, the French IPC does not impose any duty on employers for filing domestic and foreign patent applications. This follows that French employees' rights for compensation and fair price do not depend on a patent grant. These rights are not based on the monopoly principle for sharing benefits from an exclusive right, which is a stark contrast to the right of reasonable compensation under the German EIA.

V. JAPAN: ANOTHER EXAMPLE OF A HYBRID SYSTEM

(i) Fundamental Rules

The rule that the ownership of invention belongs to the inventor is also fundamental to the Japanese Patent Act ('JPA').¹³⁷ Like the US and German systems, only a natural person can be the sole inventor or joint inventor, thus a legal entity cannot be the original owner of an invention.¹³⁸

The JPA also provides a rule that the ownership of invention is assignable.¹³⁹ Such assignment may occur before and after filing of a patent application. However, when the ownership is assigned to an assignee before filing a patent application, the assignee cannot assert his ownership against a third-party unless he files a patent application with the Japan Patent Office (JPO).¹⁴⁰ Once an application is pending in the JPO, an assignment of ownership becomes effective only if the assignment is reported to the JPO.¹⁴¹

Like the German and French systems, Japanese labor and employment law may provide a special rule to limit the freedom of contract between

75, J. Raynard; *Propr. int.* 2002, n° 5, p. 73, obs. Warusfel. The judges decided in this case to set a price, half lump sum and half proportional in function of a future exploitation.

¹³⁷ JPA Article 29, Para 1. Kosaku Yoshifuji and Kenichi Kumagaya, *Tokkyoho Gaisetsu (Outlines of Patent Act)* 185 (13 ed, 2000).

¹³⁸ Judgment of Tokyo Dist. Ct. March 16, 1955, 6 *Kakyu Minshu* 479.

¹³⁹ JPA Article 33, Para. 1.

¹⁴⁰ JPA Article 34, Para. 1.

¹⁴¹ JPA Article 34, Para. 4.

employers and employees. Since Japanese law also adopts a rule similar to other jurisdictions, the fruits of employees' labor belong to employers,¹⁴² a provision for ownership rules is necessary for removing a conflict between the labor and employment law and patent law with respect to inventions made by employees.

(ii) Employers' Rights in Employee Inventions

In Japan such rules regarding employee invention ownership are provided as part of the JPA.¹⁴³ Utility Model Act and Design Act cite these rules and apply to the ownership of devices (petite inventions) and designs.¹⁴⁴ The ownership rules for inventions made by an employee under the JPA are another form of hybrid between US and German systems. The Japanese rules are much more in line with US case law than with the German EIA, because they are based on the freedom of contract and the transfer of ownership between employees and employers exclusively relies on an express assignment contract. The rule that employment alone is not sufficient to transfer the ownership of employee invention to the employer but may give rise to a royalty free nonexclusive license is common to the JPA and US case law.¹⁴⁵ The JPA adopts an aspect of the German EIA for limiting the freedom of contract in guaranteeing reasonable compensation for inventor-employees.¹⁴⁶ The JPA further limits the freedom of contract by preventing employers from executing a pre-invention assignment contract with respect to free inventions.¹⁴⁷

Like the German EIA, the JPA classifies employee inventions into two categories: (1) *Shokumu* (service or duty) invention, and (2) free invention. An invention by an employee is a service invention if the invention (a) falls into the field of employer's business activities, AND (b) resulted from an act which is included in the employee's duty.¹⁴⁸ Any invention, which fails to meet both or either conditions, falls into the category of free invention.

Without an express assignment contract, the JPA does not provide an employer any right in the ownership of invention made by an employee except for a shop right, a royalty free non-exclusive license.¹⁴⁹ In contrast,

¹⁴² Takashi Araki, *Labor Law*, 243 (2009).

¹⁴³ JPA Article 35.

¹⁴⁴ Japanese Utility Model Act, Article 11, Japanese Design Act, Article 15.

¹⁴⁵ JPA Article 35, Para. 1.

¹⁴⁶ JPA Article 35, Para. 3.

¹⁴⁷ JPA Article 35, Para. 2.

¹⁴⁸ JPA Article 35, Para. 1.

¹⁴⁹ JPA Article 35, Para. 1.

the JPA expressly prevents employers from executing a pre-invention assignment with their employees with respect to free inventions.¹⁵⁰ In other words, Japanese employers are prevented from securing the ownership of inventions made by their employee as soon as the inventions are complete, unless the invention falls into the category of service invention. This restriction on pre-invention assignment does not apply to a contract between an inventor and a party who has no employment contract with the inventor because an unbalanced bargaining power between inventors and their employees justifies an exception to the freedom of contract for protecting inventors.

Japanese scholars interpret the employee invention ownership rules to put emphasis on a rule that employers have no right except for shop rights unless there is an express assignment contract with their employees.¹⁵¹ Due to this strong policy for protecting inventor's interests and incentive to invent, Japanese courts are very reluctant to find an implied contract and impose a duty on the inventor to transfer the ownership.¹⁵² There is no established case law comparable to the specially hired to invent doctrine under US case law, which gives rise to an implied assignment contract. Courts may find an implied assignment contract without an express agreement only when an estoppel doctrine prevents an employee from asserting their ownership for failing to object to his employer's filing multiple applications on his inventions over a reasonable period, which gives rise to acquiescence of the employer's ownership of the employee's inventions.¹⁵³

Moreover, the scope of service invention under the JPA is much narrower than the scope of service inventions under the German EIA or the scope of 'beyond mission inventions' under the French IPC. Both the German EIA and French IPC guarantee employers a right to claim the ownership of invention, if an employee made an invention using tangible and intangible assets of the employer.¹⁵⁴ The scope of inventions giving rise to a right to claim ownership under the French IPC is broader

¹⁵⁰ JPA Article 35, Para. 2.

¹⁵¹ Tatsuki Shibuya, 1 Chiteki Zaisanho Kogi (Intellectual Property Law Lectures) 131 (2d, 2006); Nobuhiro Nakayama, 1 Chukai Tokkyo Ho (Detailed Explanation of Patent Law) 352 (3d, 2000).

¹⁵² *Supra* note 151, Nakayama at 352. A leading Japanese scholar criticizes a case in which Tokyo District Court found an implied contract to assign the ownership of an invention made by an employee. The employee filed a patent application in contrary to his employer's decision to keep the invention as a trade secret. Judgment of Tokyo Dist. Ct., July 14, 1959 10 Rodo Kankei Minji Saiban Reishu 645.

¹⁵³ Judgment of Tokyo Dist. Ct. Sept. 19, 2002; Hanrei Jiho No. 1802, 30.

¹⁵⁴ German EIA §4(2); French IPC Article L-117 (2).

than that of the German EIA by allowing employers claiming ownership of employee invention as long as the invention falls within the field of employers' business activities. In contrast, the JPA provides no basis for Japanese employers from preventing their employees from executing a pre-invention assignment contract and assigning the ownership of invention even if their employees used their assets to develop the invention as long as the invention does not relate to the employees' tasks.¹⁵⁵ The German EIA guarantees a right of first refusal for at least a grant of a non-exclusive license with respect to inventions related to the employer's business activities even if the inventions fall into the category of free invention as long as the inventor is employed by the employer.¹⁵⁶

Japanese employers have more protection in service inventions than German and French employers only with respect to a shop right. US employers are also protected by a shop right. Unfortunately, the scope of service invention under the JPA is narrower than the scope of inventions under the hired to invent in general doctrine, which gives rise to a shop right. Japanese employers are not entitled to any right for license or a right of first refusal with respect to inventions made by their employees unless the invention relates to the employees' tasks. In short, the JPA provides employers the least protection among the four jurisdictions.

(iii) Employee's Rights in Employee's Inventions

The JPA is in line with the German EIA in limiting the freedom of contract for guaranteeing a right of compensation for inventors. Once the ownership of invention is transferred or an exclusive license is granted to employers, employees are entitled to rights of a *taika* (fair price) for the transfer or a grant of an exclusive license.¹⁵⁷ Like the French IPC, employers can adopt a method of calculating this fair price through an individual contract or collective bargaining contract.¹⁵⁸ However, the JPA makes clear that the process of adopting a calculation method must be fair and

¹⁵⁵ *Supra* note 153, Judgment of Tokyo Dist. Ct. Sept. 19, 2002. Tokyo District Court interpreted the scope of employee's duty broadly and found that an invention falls into the category of service invention when an employee who worked in his employer's R&D department and made the invention in violating his employer's order with respect to his assignment of duty as long as the employee completed the invention by using the employer's facilities and assistance provided by other employees. However, if an employee is not hired to invent at all, it is unlikely that the court found that the invention resulted from the employee's duty.

¹⁵⁶ German EIA §19(1).

¹⁵⁷ JPA Article 35, Para. 3.

¹⁵⁸ JPA Article 35, Para 4.

reasonable and gives courts power to examine the process by taking into account, a) the appropriateness of negotiation between employers and employees for adopting the calculation method, b) the degree of disclosure to employees with respect to factors to be used in the calculation, and c) feedback from employees to support the calculation method.¹⁵⁹ If a court finds the payment according to the calculation method unreasonable, it can set a fair price on a case-by-case basis by taking account of profits that the employer expects to receive, expenses and contribution that the employer has made, the employee's employment condition and other factors.¹⁶⁰ Courts can also set a fair price if there is no agreement for the fair price between employers and employees.¹⁶¹

Since the rule giving employers power to negotiate with their employees for adopting a method to calculate a fair price is introduced in a recent revision, Japanese courts have not found any calculation method unreasonable.¹⁶² It is not clear from the text of the JPA whether courts can find a fair price resulting from a calculation method unreasonable even if it finds the process for adopting the method is reasonable and fair. Legal commentators support a view that courts can find the price unreasonable regardless of a reasonable process.¹⁶³ This view is contrary to the Japanese industry's view that courts should uphold the fair price paid by an employer as long as the process adopting the method resulting in the fair price is reasonable.¹⁶⁴

Due to the fact that the JPA does not impose on employers duties of domestic and foreign patent applications, the fair price is distinguished from the compensation under the German EIA because it is not based on the monopoly principle to share profits resulting from an exclusive right. Instead, the fair price under the JPA is comparable to the fair price for 'beyond mission inventions' under the French IPC, and thus should be decided at the time of transfer of the ownership by foreseeing the value of invention. If an invention provides turnovers and profits that an ordinary employer or employee would not have been able to expect, courts should

¹⁵⁹ *Id.*

¹⁶⁰ JPA Article 35, Para. 5.

¹⁶¹ *Id.*

¹⁶² This new rule was introduced in 2004. The new rules under the 2004 Revision apply to a transfer of employee invention ownership which is executed on and after April 1, 2005.

¹⁶³ Japanese scholars support that an employee can request adjustment if his invention brings unexpected profits.

¹⁶⁴ Project Team on Employee Invention System, Analysis of Cases on Employee Invention Disputes, 59 Chizai Kanri 701 (2009) ['Analysis of Cases on Employee Invention Disputes'].

not grant a request of additional adjustment for employees. In short, courts should uphold the amount of fair price resulting from the calculation method which is adopted by a fair process through: a) negotiations with employees; b) disclosures of a calculation method adopted through the negotiations; and c) feedbacks from employees to support the calculation method as long as the amount resulting from the calculation reflects the fair value of invention at the time of ownership transfer.

VI. ANALYSIS: THE BEST PRACTICE

(i) Fair Bargaining v. Mandatory Compensation

The four jurisdictions adopt different approaches in transfer of ownership and compensation for the transfer. The German system is clearly distinguished from the US system because it assumes a lack of equal bargaining power between employers and their employees. A serious flaw of the German approach is ignoring today's research and development environment and employment arrangements in Germany. Unlike employees who were strongly controlled by labor unions at the time the German EIA was enacted, some German employees negotiate their employment contracts freely and move from one employer to another if they are unhappy with their employment conditions.¹⁶⁵ Although the size of the group which moves to improve their employment class may vary, one jurisdiction to another, depending on the welfare structure, employment protection legislation and the transfer-oriented labor market policies and the high degree of occupational specificity of the schooling system in each jurisdiction,¹⁶⁶ employees who made inventions that have significant value to employers have enough bargaining power to negotiate for their employment conditions and compensation. Applying the same compensation rule for these employees and other employees is unfair for not only employers but also employees who do not have bargaining power, and thus did not negotiate an employment contract. Although the practice under the German EIA takes into account the status of employees, and thus the salary and

¹⁶⁵ A report indicates that approximately 50 percent of German employees changed their employers and secured a new job which requires more or different skills than the previous job, assuming that the higher skills requirement are reflected in higher pay and extended responsibilities. Danish Technical Institute, Job Mobility in the European Union: Optimising its Social and Economic Benefits – Final Report, 35 (<http://ec.europa.eu/social/images/icons/lang/en.gif>).

¹⁶⁶ *Id.*, at 75.

benefits paid through the employment contract,¹⁶⁷ it is unfair and a waste of time for German employers because the German EIA requires a case-by-case analysis to compensate each employee for each invention regardless of an employee's salary, which already included compensation for the entire project.¹⁶⁸

The US system, assuming equal bargaining power between employers and employees, also has a serious flaw because many employees do not have equal bargaining power with their employers, particularly those who are fresh from their schools and immediately begin working for their employers. Despite obvious disparity in bargaining power, US courts modify or rescind a pre-invention assignment contract only in the most egregious situations where the employers' bad faith is obvious.¹⁶⁹ However, many US employers provide intra-firm reward plans including promotions and privileges to bonus' employees who provide great value to the employers.¹⁷⁰ If employees are unhappy with the plans, employees with a good record of performance have ample opportunities to move to another employer with a better plan or start their own business by taking a high risk in R&D.¹⁷¹ In short, the US system encourages innovations through a high mobility of bright employees¹⁷² by letting employers compete with each other through a variety of reward options for such employees instead of government operated compensation.¹⁷³ The system does not protect employees who prefer to take a relatively low risk reward for their inventions from their current employers instead of high risk rewards from new employers or their own entrepreneurship.

This great social mobility is considered unique to the United States.¹⁷⁴

¹⁶⁷ *Supra* note 7, Trimborn at 53.

¹⁶⁸ *Supra* note 5, Heath at 21. A study indicates German employers spend twice as much administrating employee inventions than the economic gain resulting from these inventions.

¹⁶⁹ Robert Merges, *The Law and Economics of Employee Inventions*, 13 Harv. J. Law & Tec 1(1999).

¹⁷⁰ *Id.*, at 38.

¹⁷¹ *Id.*, at 30.

¹⁷² David Cooper, Innovation and Reciprocal externalities: Information Transmission via Job Mobility, 45 Journal of Economic Behavior & Organization 403 (2001).

¹⁷³ *Supra* note 169, Merges at 37.

¹⁷⁴ Joseph Ferrie, History Lessons: The End of American Exceptionalism? Mobility in the United States since 1850, 19 Journal of Economic Perspectives, 199 (2005). U.S. has a high mobility country with large share of workers in short-term jobs, and small share in long-term jobs. Hiroshi Ono, *Life Time Employment in Japan, Concept and Measurement*, SSE/EFI Working Paper Series in Economics

Thus, the US system may not work in other jurisdictions, particularly those with low job mobility and limited opportunities to voluntarily job transition to a better position.¹⁷⁵ For such a jurisdiction, the French system works more effectively than the German and US systems because it reflects today's employment arrangement in distinguishing some employees who have bargaining power from others. The former group can engage a fair negotiation based on equal bargaining power when their employers hired them to engage a specific project or assign them to engage a special project. Inventions resulting from these projects give rise to inventive mission inventions. In such a circumstance, salary and other benefits reflect a compensation for the entire project including inventions resulting from the project. Therefore, the compensation for inventive mission inventions under the French IPC should be viewed comparable to employee reward plans provided by US employers instead of a compensation for the ownership of mission inventions. Recent French IPC revision limits employers' freedom to select reward options by making an additional compensation mandate.¹⁷⁶ Recent case law emphasizes efforts to share value of inventions between employers and employees for calculation of compensation.¹⁷⁷ Instead, the best practice should encourage job mobility of bright employees who have bargaining power by letting their employers, who are familiar with the industry, the technology and employees, choose the best reward option and compete to attract them.¹⁷⁸

With respect to those who do not have a bargaining power and are hired to engage research and development in general, the French system protects their interests and preserves their incentive to invent by guaranteeing a right of compensation for the fair value of invention. The French system also protects employers from a risk of unexpected additional payment for compensation, and thus encourages investment for commercialization by requiring determination of the compensation amount at the time of own-

and Finance No 624, 24 (2007) (<http://swopec.hhs.se/hastef/papers/hastef0624.pdf>)

¹⁷⁵ *Supra* note 165, EU Job Mobility Report, at 118. Germany is listed as one of out of balance job mobility countries where voluntary job transitions are scarce compared to the Anglo-Saxons, the Scandinavians and the Baltic countries and Slovak Republic.

¹⁷⁶ French IPC was revised in 1990 to make the payment of compensation for mission inventions mandatory. Thus, an agreement is not enforceable if a compensation for mission invention depends on exploitation of such invention. TGI Paris, 3e ch., 1re sect., 15 déc. 2009; CA Paris, 8 déc. 2010, Juris-Data n° 2010-027274.

¹⁷⁷ *Supra* notes 128-131.

¹⁷⁸ *Supra* note 169, Merges at 44.

ership transfer.¹⁷⁹ Moreover, in the age of the patent thicket, a calculation of such compensation must be simple to minimize transactional costs to employers. The French system allows a rump-sum payment based on the expected annual turnovers and profits. In contrast, the transaction cost of the German system is tremendous because it requires a case-by-case analysis and annual payment based on turnover and profits for compensating service inventions.¹⁸⁰ A survey indicates that many German employers face serious challenges to provide the compensation under the German EIA.¹⁸¹ Therefore, in practice many German employers adopt rump-sum payments for compensation, although such payments may be in conflict with the German EIA.¹⁸²

In contrast to US, German and French systems, which are explained in the context of bargaining, the Japanese system is very confusing if it relies on a fair bargaining between employers and employee. The US influence is clear from its requirement of express assignment contract for the transfer of ownership and a grant of shop right to employers. The new rule for encouraging negotiation and adopting a calculation method supports that the system presupposes a bargaining between employers and employees. However, the JPA also makes clear the strong policy of inventor protection in restricting pre-invention assignment contracts with respect to free inventions. Japanese courts interpreted the ownership rules under the Pre-2004 Revision JPA more in line with the German EIA than the US system in awarding the amount of fair price to share the profit resulting from the exclusivity of the patent.¹⁸³ This interpretation subjects Japanese employers who have already paid compensation to a risk of litigation for additional payment from their employees, which led to the adoption of new rules under the 2004 Revision based on a fair bargaining between employers and employees.¹⁸⁴ Despite the new rules, Japanese courts are keenly

¹⁷⁹ *Supra* notes 136–6.

¹⁸⁰ *Supra* note 169, Merges at 43. Christopher Leptien, *Incentives for Employed Inventors: An Empirical Analysis with Special Emphasis on the German Law for Employees' Inventions*, 25 R&D MGMT. 213, 214–15 (1995).

¹⁸¹ *Supra* note 180, Leptien at 213

¹⁸² Erich R. Franke and Lothar Steiling, *Novellierung des ArbEG – Kein Ende in Sicht Die Industrie reagiert mit Inventive-Systemen* (Revision of German EIA – No End of the Industry Reacts with Inventive System), Einsele and Franke ed, VPP 50th Anniversary Festschrift 281 (2005).

¹⁸³ See, e.g., Judgment of Tokyo District Court, June 8, 2008. For a general discussion of Japanese courts' calculation of fair price, see *supra* note 164, Analysis of Cases on Employee Invention Disputes, at 707.

¹⁸⁴ Yuki Yoshi Takayama, Employee Invention System, Tokugikon No. 238, 23 (2005).

aware of a lack of employee bargaining power due to low job mobility in the Japanese industry¹⁸⁵ and may not change the practice based on the German monopoly principle. Such a clear conflict between the rules in the JPA based on fair bargaining and the reality of Japanese society, which lacks fair bargaining, may introduce a lot of uncertainty with respect to what extent courts give value to the agreement for calculating a fair price.

(ii) Ownership Transfer Mechanism

Among the four jurisdictions, the German and French systems adopt a mechanism for employers to secure the ownership of employee invention through a right of claim to transfer the ownership with respect to service inventions and beyond mission inventions. Such mechanisms effectively prevent holdup problems in employer–employee transactions.¹⁸⁶ Employers should secure ownership of inventions made by their employees through such mechanisms as long as the invention falls within the scope of the employers' business activities, which effectively promotes innovation by taking advantage of employers' facilities that are very likely complementary to such inventions.¹⁸⁷ It is useful to resolve the ownership dispute early and well address the challenge for managing intellectual property in today's research and development environment where researchers and innovations inter-flow beyond the boundaries of firms.¹⁸⁸ Interaction of researchers from multiple-firms and the high mobility of such researchers enhance information diffusions and inter-firm relation among firms in regions where research universities and their spin-offs concentrate, such as Silicon Valley.¹⁸⁹

In such a region, a variety of arrangements are made between researchers and firms where the researchers engage R&D. Many such arrange-

¹⁸⁵ Japan has the lowest job mobility among the OECD states. *Supra* note 174, Hiroshi Ono at 24.

¹⁸⁶ *Supra* note 169, Merges at 12.

¹⁸⁷ *Supra* note 169, Merges at 16. A shop right, a non-exclusive license also prevents holdups in employer-employee transactions. Therefore, it makes sense that German EIA provides employers a right of refusal for free inventions which fall within the scope of employers' business activities.

¹⁸⁸ Reder, Margo E.K., *Board of Trustees v. Roche Molecular Systems Inc.: Negotiating the Web of Competing Ownership Claims to Inventions Arising from Government-Funded Academic-Industry Collaboration* (November 2, 2010). *Business Law Review*, Vol. 44, at 16, 2011. Available at SSRN: <http://ssrn.com/abstract=1701706>

¹⁸⁹ Walter W. Powell, Trust-Based Forms of Governance, in *Trust Organization: Frontiers of Theory and Research*, 51.

ments are informal and may not fall into the traditional notion of employment. Relying on a private contract for transfer of ownership will subject employers to a risk of falling into a technical contract drafting trap. This is particularly true in the case of SMEs and non-profit organizations such as universities because of their limited resources to hire legal professionals.¹⁹⁰ Since researchers may execute inconsistent assignment contracts without bad faith, sophisticated legal professional teams at large firms may face due diligence problems.¹⁹¹

The mechanism under the German EIA can effectively protect employers' rights in ownership with respect to an invention made by an inventor under a contract, which falls into a traditional notion of employment. An obligation is imposed on employees to report their inventions to employers by operation of law. An expiration of a prescribed period after the reception of report automatically transfers the ownership to his employer. The French system uses a pre-2009 revision German EIA mechanism and requires an employer to exercise his right for transfer of ownership. It may not fully protect employers who are unfamiliar with the mechanism. German employers, particularly SMEs, failed to secure ownership by failing to exercise their rights within the prescribed period, which led to the current system that adopts a presumption of exercising a right to claim transfer of ownership unless the employer notifies his employee to release the service invention within the prescribed period.

However, even the current system may not fully address the challenge in intellectual property management in today's R&D environment. It is possible to expand the notion of employment to include innovative and informal relationships between inventors and firms. Expansion of the notion of employment may result in multiple employment relationships with different firms for the same inventor. Setting up an ownership transfer mechanism will at least help inventors and firms who associate with the inventors in determining at an early stage to which firm the ownership is entitled.

(iii) Shop Right

Only US and Japanese employers are entitled to a shop right. This is because employers need a shop right for protection as a defense against an infringement claim of a patent issued to their employees or assignors

¹⁹⁰ Even a university as sophisticated as Stanford fell into a trap. *Stanford*, 180 L.Ed. 2d 1.

¹⁹¹ *Supra* note 188, Reder at 16.

in case they failed to secure ownership of the employee invention through an express assignment contract. It is not necessary for the German and French systems to give a shop right to employers because employers were given an opportunity to secure the ownership through a right of claiming ownership transfer. German experience indicates that employers want a full ownership or at least exclusive license if they are interested in inventions. Thus, German employers seldom select an option for claiming limited right such as non-exclusive license. Thus, a recent revision eliminated the option. The French IPC still offers an option to claim a limited right, such as a non-exclusive license. Unlike a shop right under US and Japanese Systems, French employers may pay a royalty if they select the option and secure a grant of non-exclusive license.

It is likely that US and Japanese employers may not need a shop right once they can secure ownership through a right to claim the ownership by adopting an ownership transfer mechanism. They should be estopped from asserting a shop right once they indicated their disinterest in practicing an invention and releasing service inventions. Otherwise, employees are not able to find a party who is willing to commercialize their inventions.

In contrast, firms who are associated with the inventor by providing knowledge and/or facilities etc., but were not qualified for the entitlement of ownership should receive a shop right. As discussed above, multiple firms may contribute in different ways for inventions. Through an ownership transfer mechanism, these firms may negotiate an ownership arrangement such as sharing the ownership among them or choosing one firm for the ownership while granting exclusive licenses to other firms. A shop right not only protects these law firms but also encourages them to reach an agreement for the ownership.¹⁹²

(iv) Employers' Rights on Inventions in Scope of Employers' Business Activities

A review of four jurisdictions revealed that systems, other than the Japanese system, guarantee employers an access to use an invention made by employees if the invention falls into the scope of the employer's business. The US system allows such access through a pre-invention assignment contract, the German system provides a right of refusal for a license

¹⁹² As a split entitlement in the form of the shop right also prevents holdups in employer–employee transactions for inventions related to employer's business, it will also address holdups in transactions among different firms who contributed to the invention made by an employee. *Supra* note 169, Merges at 18.

and the French system provides a right to claim transfer of ownership. It is unlikely that an employee can transfer ownership of his invention to a third-party for commercialization or start his own business by securing a patent on his own without violating a company rule. Such transfer or business creates a conflict of interest with his employer if the invention is within the scope of employer's business. Giving employers the opportunity to take the ownership or license makes sense because it effectively prevents the possible conflict of interest.

In contrast, the Japanese system expressly prevents employers from executing a pre-invention assignment contract with an employee with respect to an invention within the scope of business activities unless the invention results from the employee's current and past duties through pre-invention assignment contract, and thus falls into the category of service invention. Although this restriction aims to protect employees, the JPA encourages possible conflict of interests by allowing a pre-invention assignment contract with a party other than employers. This restriction does not apply to an assignment from an employee to his employer after completion of invention. It may be too late for an employer to secure the ownership if its employee transfers the ownership to a competitor through a pre-invention assignment contract or starts his own business based on the invention. To encourage commercialization of inventions by employers, the JPA should guarantee employers a right of refusal or at least a grant of a non-exclusive license.

VII. CONCLUSION

A review of ownership rules for inventions made by employees under the US, German, French and Japanese systems revealed that the French system adopts the best practice in maintaining a fine balance between the interests of employers and employees by preserving an employees' incentive to invent while minimizing employers' transactional cost for intellectual property management. The French system also properly reflects the reality of today's R&D environment, where employees with different bargaining powers work for employers under a variety of employment arrangements. The US system is based on an employees' bargaining power supported by job mobility. It works well in the US but may not work well in other jurisdictions where job mobility is limited. It may be improved by adopting an ownership transfer system from the German and French systems for early resolution of ownership disputes resulting from interflow and collaboration of researchers from multiple firms. Through the scope of inventions the Japanese system allows employers secure ownership

is much more limited than any scope of inventions employers in other jurisdictions can secure. Japanese courts have interpreted the ownership rule under the JPA with an emphasis of employees' rights. A recent revision introduced a new rule based on a fair bargaining position between employers and employees. Because the bargaining power and job mobility of employees in Japan are much less than those in the US, it is unclear how Japanese courts will interpret the new rules. Therefore, a further revision may be necessary to clarify if the JPA relies on fair bargaining between employers and employees.

Interflow and collaboration of researchers expand beyond borders. Conflicting employee invention ownership rules present a serious challenge in managing intellectual property to multinational firms and public research institutions. To try to cope with this challenge, legal professionals use a choice of law provisions in employment contracts. Courts may not enforce the choice of law provisions because of the public nature of the intellectual property. Only a global harmonization of ownership rules can effectively address the challenge of intellectual property management.