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The Harmonization of International Patent Law: Introduction, 26 J. Marshall L. Rev. 437 (1993)

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ARTICLES

INTRODUCTION

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The articles in this issue concern international patent law harmonization. To put the articles in perspective, it may be useful to review what patent harmonization is and suggest a framework for policy assessment of the major reforms that harmonization would entail.

I. INTERNATIONAL TECHNOLOGY PRODUCTION AND EXPLOITATION AND THE PATENT SYSTEM

The primary mechanism for extending property rights to new technology is the patent system. Currently, there is great disparity between the process by which technology is developed and exploited and the process by which patent rights are obtained and enforced. The former (technology development and exploitation) flows relatively smoothly across national boundaries. Products that new technology makes possible are routinely distributed globally rather than nationally. Technology creation itself bridges nations. Even within a single company, research and testing activities may be spread among teams in different countries. Different stages of product manufacturing may occur in many different countries. For example, semiconductor chips may be designed and partially fabricated in the United States, completed in Thailand, and shipped to Japan for incorporation into an automobile, which, in turn, is exported to the United States, Australia, Canada, China, and Europe.

The latter (patent procurement and enforcement) proceeds awkwardly on a country-by-country basis.[1] There are treaties that facilitate multi-national patent procurement (the Paris Convention and the Patent Cooperation Treaty).[2] European nations have gone

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1. *See generally* R. Carl Moy, *The History of the Patent Harmonization Treaty: Economic Self-Interest as an Influence*, 26 J. MARSHALL L. REV. 457 (1993).

2. *See* Thomas F. Peterson & John J. Crystal, *How the Patent Harmonization Treaty Will Co-Exist with the Patent Cooperation Treaty and the Effects and Advantages in Harmonizing the Two Treaties*, 26 J. MARSHALL L. REV. 613 (1993) (discussing the multi-national patent treaties).

one step further, centralizing patent procurement in a single agency, the European Patent Office (EPO) in Munich, Germany. Nevertheless, Balkanization is the rule, not the exception, with patent rights, especially with regard to enforcement. National patent laws can vary to such an extent that a given invention may be patentable in one country but not another, be broadly protected in one country but only narrowly protected in another, or even be patentable to different persons in different countries. In the semiconductor chip to car example above, both the manufacturing processes and base, intermediate, and end products may be subject to varying patent protection in each country. This can lead to patent rights altering or even overriding economic efficiency considerations regarding where and at what price products should be made and marketed.

"Disharmony" creates trade barriers and friction at both the private and diplomatic level. To avoid similar disharmony between the states, the United States created unified national patent and copyright systems 200 years ago. For the same reason, in the 1960s and 1970s European nations implemented patent harmonization through the Strasbourg and European Patent Conventions.

Extended patent law harmonization, which would include the United States, Japan, and other nations, has been much discussed, debated, and analyzed in professional, academic, and governmental circles the past few years[3]—and for good reason: Harmonization would bring a sea of change in the United States' patent system and significant changes in other countries' systems—at least in theory.

II. HARMONIZATION: MODEL ADOPTION AND NATIONAL ADHERENCE

Patent harmonization is a two-stage process. First, representatives of patent granting countries must agree on a harmonization model. Agreement will require all countries to make substantial concessions because no harmonization model will conform exactly to the laws of any country. With world-wide harmonization bridging so many countries with such widely differing legal traditions, industrial conditions, and research and development practices, the task is inherently more difficult than the successful intra-European patent harmonization. It is possible that consensus cannot be reached.

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3. *See generally* R. Carl Moy, *Essay: Patent Harmonization, Protectionism, and Legislation*, 74 J. PAT. & TRADEMARK OFF. SOC'Y 777 (1992); Donald W. Banner, *Fleecing the Golden Fleece*, 74 J. PAT. & TRADEMARK OFF. SOC'Y 811 (1992); Charles R. B. Macedo, *First-to-File: Is American Adoption of the International Standard in Patent Law Worth the Price?*, 18 AIPLA Q. J. 193 (1990).

Moy describes the model formulation process that has led to the current World Intellectual Property Organization (WIPO) draft treaty.[4] Wilder describes the basic provisions of the treaty.[5] The treaty awaits the second stage of a Diplomatic Conference, which was originally scheduled for July 1993, but which will be delayed at the request of the United States.[6]

Second, each country must decide whether to adhere to the model by changing its domestic laws. Given the sensitivity of fundamental changes in the law relating to valuable patent rights, and the diversity of opinion in the past on such major patent law issues as a grace period versus absolute novelty and first-to-invent priority versus first-to-file priority, domestic implementation cannot be guaranteed. Indeed, a somewhat comparable international agreement, the Trademark Registration Treaty (TRT), was signed by the United States at a 1973 diplomatic conference but has never been adopted because of domestic political opposition.[7]

Moy underscores the interrelation between the two stages (model formulation and domestic adoption). If, during the latter, domestic ratification stage, there is a lack of confidence in how the nation's interests were represented in the former, multi-national negotiation stage, adoption is politically jeopardized. Moy asserts that United States participation in the harmonization negotiations, which have all been under WIPO auspices in Europe, has not included representation of the entire national interest but rather has been influenced, perhaps unduly, by the interests of "patent-owning industry."[8]

During the harmonization discussions in Geneva, an official government delegation represented each country, including the United States. Most delegations consisted primarily, often exclusively, of government officials, particularly patent office administrators. In evaluating Moy's assertion, it will be important to assess the extent to which the government officials assimilated the range of interests affected by the patent system. With whom did they consult? Were the consultations publicized and open to all? Complicating these process questions is the fact that the United States' participation during the series of harmonization meetings leading to

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4. Moy, *supra* note 1.

5. *See* Richard C. Wilder, *An Overview of Changes to the Patent Law of the United States After the Patent Law Treaty*, 26 J. MARSHALL L. REV. 497, 499-501 (1993) (describing the basic provisions of the WIPO draft treaty).

6. The reason for the United States' request undoubtedly lies in the change from a Republican to a Democratic administration after the first Diplomatic Conference session, which was held in June 1991. The Clinton administration will need time to assess the policy dimensions of patent harmonization.

7. *See* JEROME GILSON, TRADEMARK PROTECTION AND PRACTICE § 9.02 (1992).

8. Moy, *supra* note 1.

the Diplomatic Conference occurred during Republican administrations. Final negotiations are in the new Democratic administration's hands.

Partisan politics aside, debate over domestic implementation will be more robust than in any other country because the United States would be required to make the most fundamental changes. Wilder lists 19 changes that the United States would be required to make if the current draft WIPO treaty is implemented and six further changes that "*may* have to be made to United States law, depending upon the outcome of the negotiations on" the treaty.[9]

The extent of the change in United States law is apparent from five of the model's elements.

1. "First-to-File"

The United States would alter its first-to-*invent* priority system to conform to the first-to-*file* system virtually every other country uses. In case of multiple applicants claiming substantially the same invention, priority would go to the applicant with the earliest filing date (including foreign priority dates).

2. Publication of Applications

The United States would alter the current rule that requires the United States Patent and Trademark Office (PTO) to hold pending patent applications secret until the patent issues. In Japan, Europe and various other countries, patent applications are published 18 months after their effective filing date. Early publication may force some United States inventors to choose between abandoning their pending application and losing trade secrets through publication before they know whether they will receive a patent and what its scope will be.[10] But early publication can alert others to pending property claims in technology and provide a means for third parties to bring relevant prior art to the PTO's attention, thereby improving patent examination quality.

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9. Wilder, *supra* note 5, at 541.

10. The number of inventors in this category (*i.e.*, with protectable trade secrets in their pending applications) is probably quite limited. About a half of the United States applications are from foreign entities whose applications are published under their home countries' patent procedures. Of the 50% of applications by United States inventors, a large percentage can have no continuing trade secret claims because the inventors have filed corresponding applications in other countries that will be published. Finally, of the remaining "U.S. only" applicants, many will have disclosed their inventions in other forms, for example, in publications or commercial embodiments.

3. Twenty-Year from Filing Date Patent Term

The United States would alter the current rule that sets a patent's term at 17 years measured from the date the patent *issues*. In most other major patent granting countries, the term is 20 years measured from the *filing date* in the country in question. The change would curtail the incidence of United States patents issuing many years, even decades after a given industry adopts the technology covered by the patent, which results from PTO application prosecution delays. These delays are caused by (1) PTO interference proceedings over conflicting invention priority claims,[11] (2) the filing of divisional applications necessitated by PTO examiner

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11. A famous and extreme example is the polypropylene patent interference. The following excerpt explains how a company could be issued a basic 17-year patent claiming crystalline polypropylene on March 15, *1983*, when it filed the application in January 27, *1953*, a thirty year delay.

> The first application leading to [Phillips Petroleum's] '851 patent was filed on January 27, 1953 ('the 1953 application') and was assigned Serial No. 333,576 by the U.S. Patent Office. Phillips filed another application, Serial No. 476,306 on December 20, 1954 ("the 1954 application") as a continuation-in-part application. On January 11, 1956, Phillips filed application Serial No. 558,530 ("the 1956 application") as a continuation-in-part of both the 1953 and the 1954 applications. . . . On September 9, 1958, the Patent Office declared an interference. At least five groups of inventors and their corporate assignees were contending that they were the first to discover crystalline polypropylene. The Patent Office Board of Patent Interferences ("Board") issued an opinion on November 29, 1971, awarding priority of invention to Montedison, S.p.A. ("Montedison") which claimed the benefit of U.S. Application No. 514,099 filed by Guillo Natta, et al., on June 8, 1955. Phillips, E.I. Du Pont de Nemours & Co. ("DuPont") and the Standard Oil Company (Indiana) ("Standard") sought review pursuant to 35 U.S.C. s 146. The actions were consolidated and tried before The Honorable Caleb M. Wright, United States District Judge for the District of Delaware. The Court resolved the priority issue in favor of Phillips. *Standard Oil Company v. Montedison*, 494 F.Supp. 370 (D. Del. 1980), *aff'd*, 664 F.2d 356 (3d Cir. 1981). Phillips was then granted the '851 patent after proceedings before the United States Patent and Trademark Office ("PTO").

Phillips Petroleum Co. v. United States Steel Corp., 673 F. Supp. 1278, (D. Del. 1987), *aff'd*, 865 F.2d 1247 (Fed. Cir. 1989).

After a further round of litigation, in 1989, the Federal Circuit held the Phillips patent valid and infringed. *Id.*

The supreme irony of the polypropylene interference is that Phillips won, not by establishing a pre-filing date invention, but rather by showing that its earliest *filed* patent application inherently, though not expressly, disclosed crystalline polypropylene. Perhaps proving that in traditional U.S. patent prosecution, unlike opera, "it is *never* over!," other inventors of aspects of polypropylene technology in the early 1950's are *to this day* carrying on the fight to obtain new patents. *See In re* Ziegler, No. 91-1430, 1993 U.S. App. LEXIS 8604 (Fed. Cir. 1993) (PTO had suspended prosecution of parent patent application due to a pending interference).

The PTO substantially revised interference practice in 1985 to curtail delays and expand the issues an interference actually resolves. *See In re* Van Geuns, 946 F.2d 845 (Fed. Cir. 1991) (denying parties' motions to stay appeal until completion of district court litigation and to enjoin parallel litigation in district court). Interferences continue to be complex, resource-consuming proceedings.

restriction requirements,[12] and (3) other delay factors, some attributable to the PTO, some to the applicant.[13]

4. Absolute Novelty with a Grace Period

"Prior art" is critical in determining what technology is patentable, but it is extremely complicated under current United States law.[14] The model treaty would include in "prior art" all information publicly available before the patent application filing date—with the exception of the grace period discussed below, and possibly with a further exception excluding "from the prior art matter made available to the public, by oral communication, by display or through use" when it occurs outside the jurisdiction's territory.[15] Countries, which now have an "absolute novelty" provision under which an inventor's public disclosure of his or her invention before filing a patent application operates to bar a patent, would provide a one-year "grace period." The grace period would only extend to the inventor's disclosures and disclosures derived from him or her—not to independent third party disclosures after the inventor's invention date, as is now the law in the United States.[16]

Murashige addresses one part of harmonization that is of major importance and, because of its intricacy, has created much confusion. This is the question of how to define prior art for novelty and nonobviousness, especially, how to treat the disclosures of previously-filed ("senior") patent applications that have not yet been published.[17] This would likely have more practical impact on determinations of what inventions are patentable than the first-to-file versus first-to-invent aspect. The three largest patent systems—United States, Japan, and the European Patent Convention—resolve this set of issues in quite different ways. Finding common

12. *Cf.* Studiengesellschaft Kohle mbH v. Northern Petrochemical Co., 784 F.2d 351, 356-57 (Fed. Cir. 1986), *cert. dismissed*, 478 U.S. 1028 (1986).

13. *See* DONALD S. CHISUM, PATENTS § 13.05 (1993).

14. *See* DONALD S. CHISUM & MICHAEL A. JACOBS, WORLD INTELLECTUAL PROPERTY GUIDEBOOK: UNITED STATES § 2C[5] (1992).

15. Currently, United States law includes in the definition of prior art publications and patents *anywhere* but matter "known or used" or "in public use" or "on sale" only if it is "in this country." 35 U.S.C. § 102(a), (b) (1988). The draft harmonization treaty's Article 11(2)(b) is geographically neutral, but Article 11(2)(c), which may or may not be adopted, would allow countries, such as the United States and Japan, to retain geographic limitations on prior art.

If countries retain different prior art definitions, a major purpose of harmonization, to reduce the disharmony and trade barriers caused when an invention is patentable in one country but not another, will be diluted. As Wilder notes, this provision will be retained only if the United States insists upon it.

16. *See, e.g.*, Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367 (Fed. Cir. 1986), *cert. denied*, 480 U.S. 947 (1987).

17. *See* Kate H. Murashige, *The Hilmer Doctrine, Self-Collision, Novelty and the Definition of Prior Art*, 26 J. MARSHALL L. REV. 549 (1993) (defining prior art for previously filed, but not yet published, patent applications).

ground in the model formulation process has proven to be difficult, and harmonization discussion within the United States has failed to reach consensus.

5. Prior User Rights

The United States would have the option whether to adopt a "prior user" right similar to that in other countries, under which a person or company who, before a patent owner filed his or her application, began to use an invention, could continue commercial use of the invention without a license from the patent owner. Griswold and Ubel argue in favor of adopting a "prior user" right if the United States converts to a first-to-file priority rule.[18] The prior user right issue has polarized interest groups. Harmonization proponents view prior user rights as a partial accommodation of the equities of a person or company that invents and makes preparations to commercialize technology but either fails to file a patent application or is not the first to file. Griswold and Ubel argue that prior user rights arise only in a narrow category of cases, when pre-filing date uses are not sufficiently public to constitute patent-precluding prior art. They cite other countries' experiences to show that prior user right recognition does not lead to extensive controversy or litigation. Groups speaking for universities and small inventors express concern about a prior user right because it would introduce a new exception to a United States patent owner's exclusive rights and because universities and small inventors, who tend to license rather than directly utilize technology, would rarely benefit from a prior user right against other patents.

Both Griswold, Ubel and Moy agree that it would be in the national competitive interest of the United States to recognize a prior user right because the right can be based only on pre-filing activity in the United States and, consequently, only favors United States industry and workers in relation to United States patents, a significant percentage of which are held by foreign companies.

III. UNTANGLING DOMESTIC REFORM FROM HARMONIZATION AND NATIONAL BARGAINING JUSTIFICATIONS

Discussion of harmonization, especially by its proponents, often intertwines three quite different lines of justification for changing the patent system to conform to a harmonization model. One evokes solely domestic interests and is founded on the assertion or assumption that there are serious flaws in the current United States system itself that increase its costs and retard achievement of the

18. Gary L. Griswold & F. Andrew Ubel, *Prior User Rights—A Necessary Part of a First-to-File System*, 26 J. MARSHALL L. REV. 567 (1993).

patent system's fundamental purposes. Under this line of justification, change is appropriate without regard to harmonization interests.

A second line of justification evokes solely transnational interests and is founded on the assertion or assumption that it is desirable to harmonize for harmonization's sake. Just as many economists believe that free international trade will increase the welfare of persons in all nations, harmonization proponents believe that all will benefit by making the international patent system match the international technology production and distribution system, eliminating incongruities and potential trade barriers created by disparate national patent systems, and reducing private and governmental effort and expense duplication. Under this line of justification, change to implement harmonization is appropriate—even assuming that the patent systems in the United States and elsewhere are internally sound and not in need of reform.

A third line of reasoning evokes national interests in bargaining for favored changes in other countries' patent laws. For example, the United States may believe that the European patent system's lack of a grace period and the Japanese patent system's propensity to delay issue of patents and to give narrow scope to patents harm United States inventors and companies. To induce Japan and Europe to change, the United States would offer to change provisions in its patent system that Japanese and European interests loathe.

We can understand why the three justifications for patent law change are routinely tangled. Harmonization stimulates domestic reform discussion. At the model formulation stage of the international harmonization process, the search for common ground presses a negotiator into introspection about the basis for, and importance of, established practices and standards that may have to be changed. This introspection may lead to the conclusion that a particular practice or standard is not essential or desirable as previously believed, especially when other countries' experiences show the viability of alternatives. However, harmonization can also paralyze domestic reform implementation. If a proposed reform is one favored by other parties to the treaty negotiations, there is an incentive not to make the reform unilaterally but to withhold it as a "bargaining chip." For example, in the United States, there is fairly widespread support for changing the patent term to twenty years from filing and for publishing applications eighteen or twenty-four months after the filing date. These reforms could easily be adopted in the United States without confronting other, more controversial harmonization issues, but they have not been adopted because of their inclusion in the package of changes the United States would

make in exchange for improvements in the Japanese, European and other patent systems.

Untangling the three justifications for patent law reform—domestic reform, international harmonization and national interest bargaining—will more fully illuminate the advantages and disadvantages of the change that harmonization would bring.

A. Domestic Reform: Reducing Cost and Uncertainty

Few fair-minded persons familiar with the workings of the United States patent system would argue that "all is well" and nothing should be changed. Dissatisfaction with at least some features of the system is virtually universal among those who are knowledgeable of its operations and concerned about its efficiency. For example, altering the patent to twenty-years from filing is a long overdue reform that would end incentives to intentionally prolong a patent application's pendency to delay the beginning of the patent term. A filing date-based patent system, together with early publication of applications, would also disarm "submarine patents," i.e., those that hide unseen beneath the PTO "patent pending" ocean and, after an industry sets sail unaware of proprietary rights claims, surface with torpedoes ready to fire. The Bush Administration's Commerce Department Advisory Commission on Patent Law Reform, which concluded that "the current patent system has generally worked well," endorsed the twenty-year term as necessary to avoid "the disruption to commerce that occurs when patent rights, appropriate for granting in an earlier era, are granted at some later date." The United States patent system's biggest scandal is that it permits a patent to issue *decades* after the invention and the filing of the application.[19] During the long pendency period, the inventor's patent attorney can carefully craft broad claims, benefitting from the "hindsight" knowledge of post-filing date commercial developments.

Three words encapsulate the United States patent system's primary shortcomings: *complexity*, *uncertainty*, and *cost*. All legal regimes entail costs and create a degree of uncertainty, but the patent system has become unacceptably inefficient and unpredictable

19. An illustration of the sheer magnitude of pendency delays is illustrated by an April 21, *1993*, court case, in which an applicant unsuccessfully sought broad patent protection for "solid, plastic polypropylene," relying on an application filed on August 3, *1954*! *In re* Ziegler, No. 91-1430, 1993 U.S. App. LEXIS 8604 (Fed. Cir. 1993).

Cases such as *Ziegler* are possible not only because of the provision that measures a patent term from the issue date but also because court decisions give narrower scope to the doctrine of res judicata and the value of finality in patent prosecution than in other legal processes. *See, e.g.*, *In re* Donohue, 766 F.2d 531 (Fed. Cir. 1985); *In re* Hitchings, 342 F.2d 80 (CCPA 1965). *Compare* Beech Aircraft Corp. v. Edo Corp., No. 92-1097, U.S. App. LEXIS 9033 (Fed. Cir. 1993).

in its impact. Answers to the most basic questions about a patent—is it valid? and what does it cover?—are routinely viewed as matters of probabilities.[20] Disputes about patents are often pressed to jury trials with each parties' legal fees climbing above 1 million dollars—even when the patent concerns relatively simple mechanical inventions.[21] Part of the blame for patent litigiousness may be pinned on the highly leveraged effect that particular patent issues, such as willful infringement, inequitable conduct, and lost profits and reasonable royalty determination, can have.[22] But much can also be attributed to rule complexity and vagueness.

All calls for patent law reform should address ways of *simplifying* the patent system, reducing the uncertainty it generates, and lowering its costs. Reform must come through procedural innovation, such as, improved PTO search and examination and nonlitigation dispute resolution. Additionally, the underlying substantive rules must be evaluated with a view to their cost-uncertainty impact. The United States patent system abounds in rules that are highly "fact dependent," that is, their application turns on resolving fact issues, including "who did what when," sometimes what a person "contemplated" or knew on a precise date. Examples are (1) first-to-invent priority,[23] (2) on sale and public use bars,[24] (3) duty

20. *See, e.g.*, Read Corp. v. Portec, Inc., 970 F.2d 816, 828 (Fed. Cir. 1992), *reh'g, en banc, denied*, 1992 U.S. App. LEXIS 23811 (Fed. Cir. 1992) ("determining when a patented device has been 'designed around' enough to avoid infringement is a difficult determination to make. One cannot know for certain that changes are sufficient to avoid infringement until a judge or a jury has made that determination").

21. A good example is *Read*. *Id.* The patent covered a portable loam screening apparatus. The jury found willful infringement and awarded $1,324,782 actual damages. Based on the jury's finding that the infringement was willful, the judge trebled the damages and awarded attorney fees of $1,235,685, a sum that almost equalled the damages, making the total award in excess of $5 million. The appeals court affirmed on liability but overturned the willfulness finding. *Id.*

22. A case example illustrating the "swing" potential of patent litigation is Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics, Inc., 976 F.2d 1559 (Fed. Cir. 1992), *reh'g, en banc, denied*, 1992 U.S. App. LEXIS 24475 (Fed. Cir. 1992) (3M prevailed on the technical liability issues (validity and infringement), but the extent of its victory depended on the fact-rich issues of (1) damages based on retarded price growth (which increased its damage award by $28 million), (2) the infringer's willfulness (which doubled 3M's $53 million base award), and (3) whether it (3M) committed inequitable conduct in procuring its patents (which would have eliminated any recovery even though the patents were otherwise valid and infringed)).

23. *See, e.g.*, Holmwood v. Sugavanam, 948 F.2d 1236, 1239 (Fed. Cir. 1991) (a "rule of reason . . . requires the Patent and Trademark Office to examine, analyze, and evaluate reasonably all pertinent evidence when weighing the credibility of an inventor's story").

24. *See, e.g.*, Biodex Corp. v. Loredan Biomedical, Inc., 946 F.2d 850, 852 (Fed. Cir. 1991), *cert. denied*, 112 S. Ct. 2957 (1992) ("The many factors that enter into the totality of the circumstances underlying the legal conclusion of an on-sale bar involve exploration and resolution of questions of fact.").

of disclosure and inequitable conduct in patent procurement,[25] (4) failure to disclose the best mode,[26] (5) doctrine of equivalents infringement,[27] (6) reasonable royalty measurement,[28] and (7) willful infringement and multiple damage awards.[29] These issues do *not* focus on the technical or scientific questions with which a patent system inherently must deal. They *do* generate uncertainty, breed costly litigation, and allow patent claimants and accused infringers to abuse the system.

The first-to-invent versus first-to-file priority question is an example of a politically sensitive patent reform issue that could benefit from greater focus on the cost-uncertainty impact. The first-to-invent rule, which the United States has used for two centuries, is founded on the notion that it is fairer and more appropriate to award a patent to the first inventor. The patent system's purpose is, after all, to encourage such inventive activity. The rule has a nationalistic as well as ethical underpinning: American companies have a natural advantage because only activities *in the United States* can be relied upon to establish a pre-filing date of invention.[30] First-to-invent defenders contend that the proposed reform, first-to-file priority, favors big companies with patent departments over universities, small companies, and individual inventors; puts

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25. *See, e.g.*, FMC Corp. v. Manitowoc Co., Inc., 835 F.2d 1411, 1415 (Fed. Cir. 1987) ("a balancing of overlapping circumstances is involved in determining, in view of all the circumstances, the presence or absence of inequitable conduct").

26. Wahl Instruments, Inc. v. Acvious, Inc., 950 F.2d 1575, 1579 (Fed. Cir. 1991), *cert. denied*, 490 U.S. 1068 (1989) (noting that: "The words of the statute are not without ambiguity. This case illustrates that the term 'mode' and the phrase 'carrying out the invention' are not definable with precision.").

27. *See, e.g.*, Laitram Corp. v. Cambridge Wire Cloth Co., 863 F.2d 855, 856 (Fed. Cir. 1988), *cert. denied*, 490 U.S. 1068 (1989) ("This appeal again illustrates one of the many difficult dichotomies that lurk in the lacunae of patent law.").

28. *See, e.g.*, Smithkline Diagnostics, Inc. v. Helena Laboratories Corp., 926 F.2d 1161 (Fed. Cir. 1991) (patentee put forth theory supporting a 48% rate; the infringer put forth a rival theory supporting a 3% rate; court awards 25%). In contrast, copyright infringement remedies do not encompass the free-ranging "reasonable royalty" concept but substitute a statutory damage measure. *See* Chisum & Jacobs, *supra* note 14, at § 4F[5][c], [d].

29. *See, e.g.*, Read Corp. v. Portec, Inc., 970 F.2d 816, 826 (Fed. Cir. 1992), *reh'g, en banc, denied*, 1992 U.S. App. LEXIS 23811 (Fed. Cir. 1992) ("The paramount determination in deciding to grant enhancement and the amount thereof is the egregiousness of the defendant's conduct based on all the facts and circumstances.").

The damage multiplication statute, 35 U.S.C. § 284 (1988), is an example of a patent rule that injects a volatile and frequently contested factual issue, whether the infringer acted "willfully" (rather than, for example, acting reasonably under advice of counsel). The issue could be eliminated; to achieve rough justice, damage awards could be automatically increased by a set percentage, for example, 50%, deterring infringement and assuring the patentee a margin for damage computation error but saving substantial amounts of litigation costs over whether infringement was willful.

30. 35 U.S.C. § 104 (1988). *See, e.g.*, Colbert v. Lofdahl, 21 USPQ2d 1068 (Bd. Pat. App. & Int'f 1991) (discussing circumstances under which a foreign inven-

undue pressure on patent attorneys and agents to provide unreasonably fast service to their clients; and leads to poor quality disclosures in patent applications.[31]

First-to-file proponents cite practical considerations. Proving an invention date in an interference (the procedure the PTO uses to determine priority among competing applications) has proven to be expensive, lengthy, and uncertain. Patent issuance may be delayed, and the industry in question left uncertain as to who owns the technology. Most interferences are won by the senior party, which is the result that would follow automatically and less expensively in a first-to-file system.

One thing is clear: following a first-to-invent priority system, as currently formulated, adds factual issues concerning patentability that increase uncertainty and can often be resolved only by litigation or other dispute resolution procedures. To illustrate, assume a patent issues on June 1, 1993, to inventor Irving, a professor, who assigns his rights to his university (U). The patent's filing date is May 5, 1984. In July 1993, Alpha Company, which is interested in the patented technology and considering whether it must negotiate a license with University U, searches the prior art and finds a publication dated April 1, 1984, authored by Revel, an employee of Beta Company, that describes essentially the same invention as the patent and would invalidate the patent *if* it constitutes prior art. With the United States' first-to-invent priority rule, one cannot say whether the patent is valid without gathering further information and making determinations over which reasonable minds may differ. Whether the Beta employee's publication or work is prior art depends on (1) whether University U can document an invention date before April 1, 1984, which may be difficult if Irving is a typical professor, i.e., does not make or retain records, and (2) whether Alpha can establish that Beta's employee Revel invented the subject

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tor can establish priority by disclosing his or her work to someone in the United States).

For a discussion of the history of geographic distinctions in United States patent law, see Donald S. Chisum, *Foreign Activity: Its Effect on Patentability under United States Law*, 11 INT'L REV. INDUS. PROP. & CR. L. 26 (1980).

31. Even under the current U.S. system, there are pressures to file early. The earlier the filing, the greater the chances of getting broad and effective patent protection. For example, under the statutory bar provisions 35 U.S.C. Section 102(b) (1988), all matter in public use or on sale *in this country* and every publication and patent everywhere more than one year prior to the filing date is prior art—regardless of the applicant's invention date. If filing is delayed, the prior art expands. Also, the senior party has tremendous procedural and proof burden advantages if an interference contest over priority arises. Early filing also assures the applicant of priority in the rest of the world, which uses the first-to-file method.

Most proposals for adoption of a first-to-file system include provisions, such as an internal priority document system, for easing the expense of early filing and assuring that patents contain full disclosures of the invention.

matter of the publication in the United States before Irving's invention date.[32] It is even possible that the University U's patent will yet become involved in an interference. Revel and Beta may have an application still pending in the PTO (a contingency that cannot be resolved without Beta's cooperation because the PTO holds pending applications in confidence) and can "provoke" an interference with the University U's patent by adopting comparable claims before one year after the University's patent issued.[33]

Under the harmonization model, Irving's and Revel's invention dates become irrelevant. Because Revel's publication predates Irving's filing, only one factual issue concerning the patentability of Irving's invention remains: Did Revel derive her information from Irving? If so, the grace period would exclude Revel's publication from the prior art.

A first-to-invent advocate might respond that this simplification and cost-reduction prejudices Irving and his assignee, University U, who are deprived of the procedural opportunity to show that Irving was in fact the first and true inventor and should not lose his patent rights solely because he was slow to file an application. But the public policy question that must be resolved is whether our society can afford to provide such an opportunity if that opportunity is one of a set of provisions that causes unacceptably high cost and uncertainty. In many ways, the debate should parallel the debate over health care reform. Ideally, all persons should have access to the entire range of available medical procedures and medications, but the cumulative cost impact of providing such access may be too high.

B. Harmonization: The Advantages and Disadvantages

Harmonization of the currently disparate patent laws of the major patent-granting countries offers advantages and disadvantages. Advantages include:

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32. It is widely realized that an inventor, as patent claimant, may rely on his or her actual invention date, not solely the application filing date. 35 U.S.C. § 102(a), (e), (g) (1988). Not so widely realized is that inventions by others can constitute patent-defeating prior art. *See, e.g.*, New Idea Farm Equip. Corp. v. Sperry Corp., 916 F.2d 1561 (Fed. Cir. 1990) (defendant found not liable for patent infringement).

Back-dating to an invention date from a filing or public disclosure date is a two-way street: in most cases, it leads to the same result as reliance on the public dates—but at a cost of considerably greater uncertainty and proof expense.

33. *See* 35 U.S.C. § 135 (1988). *See also* Parks v. Fine, 773 F.2d 1577 (Fed. Cir. 1985), *modified*, 783 F.2d 1036 (Fed. Cir. 1986) (interference provoked by adding claims to patent application which copied claims in another patent).

1. Reducing Uneven Patenting

Harmonization could reduce, though never eliminate, international suspicion, and possible trade barriers and market distortions that uneven patenting may cause. For example, assume that inventor Able invents a new material that dramatically reduces electric power utilization costs. Because Able gave a public speech describing her invention a week before filing a patent application, she cannot obtain a patent in Japan, Europe and other countries. Companies operating in those areas may use Able's technology without paying license fees to her. Able may feel unjustly treated by "unfair foreign patent systems." The patent status difference may create a marginal economic incentive to locate plants requiring high electrical power usage outside the United States. It also may diminish the value of Able's United States patent because United States companies may cite international competitive conditions to resist paying high royalty fees to Able.

In other circumstances, an invention may be patentable in Japan and Europe but not in the United States. For example, if Able made a confidential offer to sell a system embodying her invention to a United States customer more than one year before filing an application, Able cannot obtain a United States patent.[34] Such a nonpublic disclosure would probably not bar a patent in Japan or Europe.

2. Enhancing the Patent System's Balanced Incentive, Disclosure, and Dissemination Functions

The patent system creates incentives for technology creation and disclosure by offering exclusive property rights that are limited in time and scope. It is often asserted that the patent system's incentive functions are "balanced" or restricted by "other" societal interests (that is, interests external to the patent system's policy framework), especially the interest in free competition,[35] but the patent system's own internal standards and policies also encompass limitations and a balancing of interests, including competition.[36] A "strong" and effective patent system must deny protection for "inventions" that are obvious applications of existing technology;[37]

34. *See, e.g.*, Buildex Inc. v. Kason Indust., Inc., 849 F.2d 1461, (Fed. Cir. 1988).

35. *See, e.g.*, Axis S.P.A. v. Micafil, Inc., 870 F.2d 1105, 1111, (6th Cir. 1989), *cert. denied*, 493 U.S. 823 (1989) (noting that "[o]ur patent and antitrust laws seek to further different and opposing policies").

36. *E.g.*, Graham v. John Deere Co., 383 U.S. 1 (1966) (holding patents invalid for failing to meet the "nonobvious" test); Morton Salt Co. v. G.S. Suppiger Co., 314 U.S. 488 (1942) (holding that using patent monopoly to restrain competition was against public policy), *reh'g denied*, 315 U.S. 826 (1942).

37. 35 U.S.C. § 103 (1988).

otherwise, it would remove knowledge from the public domain and reward low-risk rather than encourage high-risk research and development.[38] Equally, it must deny protection for unsupported general speculation;[39] otherwise, it would reward "paper" innovators' "attempt to preempt the future before it has arrived" at the expense of those who subsequently specifically demonstrate a new technology's viability.[40] Finally, it must limit the *scope* of patents;[41] otherwise, it would dampen incentives to create further technology.[42]

Harmonization can enable the international patent system to better realize a *balanced* incentive system. If the countries with the major markets for the commercial exploitation of inventions all offer patent protection on uniform terms, no country will take a "free ride" on the investment in research and development that other countries' patent systems induce.

3. *Facilitating Coordination of National Patent-Granting Activities*

Peterson and Crystal maintain that uniform substantive patentability standards would enable patent offices to coordinate their activities in searching and examining patent applications.[43] Prior art searches and examination results become more transferable when the substantive standards under which they are conducted are the same. The result could be lower costs and higher quality service by these offices in searching and examining patent applications.

4. *Lowering User Costs*

Peterson and Crystal also maintain that owners of technology will incur lower patent procurement expenses per invention because they need not plan for and respond to national patent sys-

38. *See* ROBERT P. MERGES, PATENT LAW AND POLICY 411 (1992) (viewing the nonobviousness standard of patentability "as an instrument for encouraging researchers to pursue projects whose success appears highly uncertain at the outset"); Robert P. Merges, *Uncertainty and the Standard of Patentability*, 7 HIGH TECH. L.J. 1 (1992).

39. 35 U.S.C. § 112 (1988).

40. Fiers v. Revel, 984 F.2d 1164 (1993). *Cf. In re* Ziegler, No. 91-1430, 1993 U.S. App. LEXIS 8604 (Fed. Cir. 1993).

41. *See, e.g., In re* Vaeck, 947 F.2d 488 (Fed. Cir. 1991) (noting that "there must be sufficient disclosure, either through illustrative examples of terminology, to teach those of ordinary skill how to make and how to use the invention as broadly as it is claimed").

42. *See* Robert P.Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839 (1990) (discussing the importance of limiting the scope of patents).

43. Peterson & Crystal, *supra* note 2.

tems' idiosyncracies.[44] This will not necessarily lead to less total investment in patenting but will make owners more able to afford to pursue patent rights on more potentially patentable inventions. It will almost certainly mean that small companies and individual inventors will be more able to afford to obtain and license patent rights outside their home countries.

5. Enforcement

Proponents argue that harmonization would increase the effectiveness of protection for patentable inventions even in situations where the inventor is primarily interested in a single or limited number of national markets, such as the United States. With increasing international trade, potential competitors in a domestic market are likely to be based in another country. A United States patent is theoretically effective to protect the United States market through a combination of infringement suits against users and sellers and exclusionary actions in the United States International Trade Commission,[45] but, if an inventor can obtain patents in every country under essentially the same conditions, she can take action against infringing manufacturers at the source.

Westergard presents a contrary point of view, arguing that the WIPO draft treaty contains "far too little . . . for effective international enforcement of patents."[46] The model lacks "evidentiary, procedural and jurisdictional provisions." Thus, in Westergard's view, the advantages of harmonization in improving the international patent system will not offset the disadvantages unless harmonization includes not only substantive rule harmonization, but also at least minimum enforcement standards that assure that a patent right in each country has a comparable practical impact.

Disadvantages of harmonization include:

1. Surrendering Flexibility and Ability to Change

Harmonization could lead to *rigor mortis*. Achieving agreement on even the most basic elements of patent law will require considerable effort and much compromise. If and when a model is adopted and implemented, it will be difficult to change. If the model entails country A changing its law on points 1, 2, and 3, country B changing its law on points 4, 5, and 6, and country C changing its law on points 7, 8, and 9, all doing so reluctantly and only in the interest of overall harmonization on points 1 through 9, then, as a

44. *Id.*

45. *See* CHISUM, *supra* note 13, § 16.05[3].

46. W. David Westergard, *Harmonization Enforcement: The Reality Behind the Panacea*, 26 J. MARSHALL L. REV. 593, 594 (1993).

political matter, it will be difficult later to change a point that later becomes undesirable or obsolete. Any participant may view a change as a reneging on the basic compromise.

National autonomy lends itself to innovation and change. Country A may change its law on point 3. If the experience with the change is shown to be beneficial and workable, countries B, C, etc. may adopt or improve upon the change.

2. Unacceptable Compromises

Attitudes toward intellectual property rights in inventions and the means for perfecting such rights are intertwined with cultural values and national policies that differ from country to country. To compromise these values or policies may simply be an unacceptable cost to a particular country—even though harmonization is otherwise perceived as beneficial.

3. Transition Costs

Adoption of a harmonization model would require every country to make significant changes, but the United States would be called upon to make the most substantial ones. Indeed, if only the five provisions discussed above were implemented, the change would be the most significant change in United States patent law since the Patent Act of 1836.

The change would necessitate two forms of transition costs. First, inventors and practitioners must be educated and trained in the new system. Second, for a lengthy period of time, practitioners, the PTO, and the courts would deal with two patent systems. Given the fundamental nature of the changes, it is almost inevitable that a new United States patent law conforming to the harmonization model would be made effective only for patent applications filed after a specified date subsequent to the law's enactment. Pending applications and issued patents would continue to be governed by existing law. Dealing with one system of patent law as complex as that in the United States is bad enough; dealing with two would compound the pain.[47]

Patent reform transition costs are higher than with changes in other legal regimes, including the other intellectual property sys-

47. The confusion and expense of maintaining two legal structures is not an insurmountable obstacle to patent law harmonization. Other countries, such as Great Britain, have made it through such a transition period. Canada is currently in transition from a first-to-invent system to a first-to-file-with-grace-period system that closely resembles what the United States would likely go through. *See* Blake R. Wiggs, *Canada's First-to-File Experience—Should the U.S. Make the Move?*, 73 J. PAT. & TRADEMARK OFF. SOC'Y 493 (1991) (discussing the advantages and disadvantages of the first-to-file and first-to-invent systems).

tems, copyright law and trademark law. Patent procurement contains many more substantive and formal requirements and more complex administrative procedures than is the case with copyrights or trademarks, and questions concerning compliance with the requirements may be raised any time during a patent's effective term.[48]

C. Bargaining Justifications

Harmonization proponents cite a bargaining justification for United States participation. By agreeing to change provisions in its own law that other countries view as disadvantageous to their nationals, such as the first-to-invent priority rule, the United States will receive in exchange changes in other countries' laws that harm United States inventors and companies, such as the absence of a grace period in Europe and the administrative delays and weak, narrow patent enforcement in Japan.

The bargaining justification for patent harmonization must be critically evaluated. If the changes patent harmonization would require do approximate the changes the United States' national interest would lead to as a matter of domestic policy, and if the advantages of having a harmonized (i.e., homogenized) international patent system *per se* do not outweigh its disadvantages, it is doubtful whether specific changes in other countries' patent systems can alone justify the changes.

On what basis can we calculate the net gain or loss to United States interests? Consider the grace period issue. Some United States inventors lose valuable rights abroad because of Europe's failure to allow a grace period, but those who are better advised file applications before any public disclosure, knowing that the United States grace period is not recognized abroad. Some United States inventors win interference contests with non-United States inventors that they would lose under a first-to-file priority system, but many do not, primarily because of strict invention date proof requirements.[49]

Consider perceived problems with the Japanese patent system. They arise not from specific legal provisions that are amenable to change by treaty, such as the United States first-to-invent priority provision and the European no-grace period absolute novelty provi-

48. *See, e.g.*, Lemelson v. TRW, Inc., 760 F.2d 1254 (Fed. Cir. 1985) (patent's validity depends upon whether the inventor complied with Patent Office rules that were in effect in 1961 but were later changed).

49. *See, e.g.*, Griffith v. Kanamaru, 816 F.2d 624 (Fed. Cir. 1987) (university's lack of diligence in reducing to practice a professor's conception of the invention caused it to lose priority to a Japanese company that promptly filed applications claiming the invention in Japan and the United States).

sion, but from the cumulative impact of actions by patent applicants, examiners, and courts, as well as from government funding decisions. Even assuming that a treaty can significantly affect these practices, the question of how to estimate the gains and loses remains.

Harmonization must stand primarily on its merits, not on its potential for resolving cross-national patent system grievances, which can better be carried out by other means.