way.[224] In 1996, foreign patent applications were running sixty-one percent higher than in 1995, with the number of applications from United States running ninety-one percent higher.[225] Domestic patent applications have also shown a dramatic increase, rising fifty-nine percent from 1993 to 1994.[226] Overall, foreign applications have gone up from about thirteen percent of total applications filed in the Chinese Patent Office to fifteen percent in 1995.

Besides the Patent Office and the Copyright Office, China also created the United Intellectual Property Protection Center, a "national intellectual property rights watchdog," in September, 1994.[227] The Center's purpose is to monitor the enforcement of intellectual property rights by conducting investigations, gathering evidence, and filing lawsuits on national and regional levels.

Despite all of this, it is unclear whether more independent agencies are needed or if a strong central administrative office would be more effective. For example, China has different agencies on different government levels, which may all have responsibility for enforcing copyrights in a major city. It is not clear who is responsible for conducting infringement investigations: the National Copyright Administration, the United Intellectual Property Protection Center, the Department of Computer Pervasiveness in China's Ministry of Electronics Industry, or a special task force created by the Action Plan.

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[224] P.T. Bangsberg, *Applications from Abroad Rise 25% This Year at Chinese Patent Office*, J. COM., Aug. 25, 1995, at A3.

[225] *Applications for Chinese Patents Increasing*, Xinhua News Agency, Sept. 27, 1996, *available in* WESTLAW, Allnews database, 1996 WL 12532280.

[226] *China--Patent Registration/Protection Emphasized*, Newsbytes News Network, Dec. 11, 1995, *available in* WESTLAW, Allnews database, 1995 WL 13795307.

[227] Simpson, *supra* note 23, at 594.

What happens when they all decide to investigate the same suspected software infringer? Do they have overlapping jurisdiction? Who has the authority to override the others, particularly when procedures for enforcement differ from region to region?

Even if there is a central agency, China as a country is experiencing a rapid decentralization of authority.[228] Many decrees from Beijing are practically ignored if they are not backed up by the similar decrees promulgated in the provinces. This is particularly common in the industrialized provinces of Fujian and Guandong.[229] For example, since 1990, China's central government has announced in newspaper ads that importing and showing illegal laser discs is a crime. In January, 1996, China's ministries of culture and of radio, film and television in Beijing announced that local authorities are empowered to close down illegal laser disc facilities outside of Beijing.[230] Three hundred of five thousand laser disc houses were subsequently closed. Despite all of this, one owner of a infringing laser disc house said, "we have yet to be notified officially that we must shut down."[231]

One fact seems clear: the farther removed an infringer is from China's Patent Office and its National Copyright Administration in Beijing, the less chance that the infringer will be caught.[232]

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[228] Leung, *supra* note 31.

[229] *Id.*

[230] Xie Jinjin, *China: Beijing Will No Longer "Tolerate" Copyright Pirating*, Inter Press Service, Jan. 19, 1996, *available in* WESTLAW, Allnews database, 1996 WL 7881041 [hereinafter Xie].

[231] *Id.*

[232] Thomas T. Moga, *Recent Intellectual Property Developments in Japan, Taiwan, and China*, 70 U. DET. MERCY L. REV. 313, 326 (1993).

Enterprise Patent Specialists Association in China created by Suzhou in 1988.[239]

In July, 1993, a group of Hong Kong professionals joined a Beijing-supported joint venture consulting group called Intellectual Property Protection Services. This group set out to counsel businesses, including such companies as Disney, on how to protect their intellectual property rights in China.[240]

In August, 1995, Shaanxi Province government officials launched a new Intellectual Property Rights Exchange Market, the first of its kind in China. The Exchange Market purchases, sells, and auctions trademarks, patents, and other intellectual property. It also serves as an agent for copyright owners and buyers.[241]

Also on the business side, China now has private law firms and public organizations that specialize in tracking down infringers. For example, the Royal Dutch/Shell Group hired the China United Intellectual Property Protection Center, a law firm/investigation group, to track down a list of suspected counterfeiters.[242] The firm captured on videotape one pirate factory buying used Shell® oil barrels, refilling them with inferior engine oil, and then selling them under Shell's trademark. The firm turned over the videotape to

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[239] *China--Progress in Patent Protection*, Newsbytes News Network, May 5, 1995, *available in* WESTLAW, Allnews database, 1995 WL 2207399.

[240] Simpson, *supra* note 23, at 594.

[241] *Trade Briefs: Intellectual Property Market Opens in China*, J. COM., Aug. 24, 1995, at A5.

[242] Mufson, *supra* note 1.

sponsoring seminars in major Chinese cities like Beijing and Shanghai.[248]

IV. A RESPONSE TO U.S. CRITICS

Despite the Action Plan, some U.S. observers still doubt China's sincerity in enforcing intellectual property rights.[249] They claim that China will continue to ignore pirate operations as long as they provide lucrative kickbacks and jobs for local communities.[250]

U.S. critics need to stop thinking of China as the enemy and to start thinking of it as a business partner. The hostility and blind threats should be replaced with an attitude of cooperation and understanding. The best way to form a productive partnership is to understand the background, capabilities, and limitations of one's partner.

The Action Plan did not yield quick results in large part due to the massive bureaucracy in China. The Action Plan calls for national cooperation from the Patent Office, the National Copyright Administration ("NCA"), the State Administration for Industry and Commerce ("AIC"), and all local authorities,[251] but China still has a long way to go before it develops a uniform national system.

For example, there was a power struggle between Chinese administrative agencies in the negotiations leading up to the 1995 Action Plan. Chen Chong, the Deputy Director of the Department of

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[248] *Id.*

[249] Wineburg, *supra* note 18.

[250] *Id.*

[251] Action Plan, *supra* note 121, at 887.

that pirates are "low-tech parasites"[259] who bring in quick success, but discourage foreign investment. For instance, Japanese companies recently chose other Asian countries to build offshore production operations because they feared China's history of piracy.[260] Thus, piracy is not the proper cornerstone upon which China can build a national economy. Protecting the creative works of authors, inventors, and artists is a solid, long-term investment. Mr. Oman notes that China should use its intellectual property laws to capitalize on its national talent in areas such as Chinese art, literature, sculpture, porcelain, calligraphy, music, and motion pictures.[261]

Overall, it is still unrealistic to expect China to train hundreds of patent examiners, create an efficient national filing system, and educate the public on the evils of infringement overnight.[262] It will take years before the Chinese system resembles anything like the one in the United States. The Chinese Vice Minister of Foreign Trade admitted, "[w]e are fully aware that it is a long and arduous task to protect intellectual property rights."[263]

In response to U.S. criticism, many Chinese officials emphasize that "[w]hat matters most is that China has adopted an honest manner to solve the problem."[264] Chinese officials further argue that

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[259] *Id.*

[260] Brauchli & Lachica, *supra* note 157.

[261] Oman, *supra* note 142.

[262] *China Throws Out U.S. Accusations on Copyright Abuse*, Agence France-Presse, Jan. 30, 1996, *available in* WESTLAW, Allnews database, 1996 WL 3796634 (quoting Hu Zhaoqing, spokesman for the Ministry of External Trade and Cooperation).

[263] Koidin, *supra* note 149, at C2.

[264] *China Throws out U.S. Accusations on Copyright Abuse*, *supra* note 262.

This proposition is further supported by the Lockean property theory: property rights are justified if there is no waste, and there is "enough and as good left" in the common for others.[270] If U.S. companies refuse to let Chinese companies use their intellectual property, for example, to improve U.S. inventions or to create derivative works from U.S. works of authorship, then there will be waste and not "enough and as good left" in the common for others.

U.S. businesses and their legal counsel can successfully enforce intellectual property rights in China under the reciprocity principle by: (1) understanding the impact of Chinese piracy on the international market; (2) establishing a joint venture or grant a license; (3) developing a relationship with officials before entering the market; (4) working with Chinese judges and administrative authorities; (5) educating the public; (6) maintaining an awareness of China's immense bureaucracy; (7) working with other U.S. companies; and (8) planning ahead. As one observer aptly stated, success in China requires "patience, tenacity, and cultural sensitivity."[271]

A. Understand The Impact Of Piracy

First, U.S. businesses need to understand fully what is at stake in China.[272] Chinese patent and copyright pirates are not only supplying counterfeit goods in China, but they are selling thousands, sometimes millions, of their products overseas. U.S. companies are losing their international market share as a result of piracy in China.[273]

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[270] *See* JOHN LOCKE, SECOND TREATISE OF CIVIL GOVERNMENT 28-29 (Lester DeKoster ed. 1978); Joan E. Schaffner, *Patent Preemption UnLocked*, 1995 WISC. L. REV. 1081, 1088.

[271] Interview with Professor Sun, *supra* note 12.

[272] McKeown & Kiang I, *supra* note 63.

[273] McKeown & Kiang II, *supra* note 219, at C42.

shut down.[279] Some pirate operations are also very versatile in being able to relocate to escape detection.[280]

U.S. companies must take the initiative and spend resources now to stop piracy in China before it spreads any further through Asia. Otherwise, U.S. companies will witness an international market saturated with counterfeit goods.[281]

B. Establish Joint Ventures Or Grant Licenses

Second, U.S. companies should take advantage of the Action Plan and form joint ventures to produce their products in China. Instead of complaining to the State Department, U.S. companies should take the initiative to invest in China.[282] Many companies have already done so, including Microsoft, Apple,[283] Novell,[284] Chrysler,

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[279] *U.S. Warns Chinese Once More on Piracy: Theft of Copyrighted Material Brings New Threat of Sanctions*, CHI. TRIB., Feb. 4, 1996, at 9; Mufson, *supra* note 1.

[280] McKeown & Kiang I, *supra* note 63.

[281] *Id.* ("[D]emand for [U.S.] goods will be satisfied through counterfeit rather than legitimate goods, and they will be pre-empted from the market.").

[282] McKeown & Kiang II, *supra* note 219, at C42 ("U.S. companies also need to establish a defensive presence in the Chinese market.").

[283] Andrew Carstens, *The Great WANs of China*, LAN MAG., Aug. 1, 1996 at S35 (noting that Apple licensed Macintosh® operating system to Motorola and through a joint venture with Panda Electronics Group in China).

[284] *Novell and China Software Concludes OEM Cooperative Agreement*, AsiaInfo Daily News Service, June 14, 1996, at 9, *available in* WESTLAW, Allnews database, 1996 WL 10653656.

or licensing agreement because joint ventures are "time-consuming and tedious . . . , often requiring years of negotiation."[291]

U.S. lawyers point out that it may be more profitable to grant a license to a pre-existing Chinese infringer than to investigate and prosecute infringers in court.[292] For instance, Crucible Materials Corporation, a U.S. company, recently spent $1.5 million in litigation costs to prosecute seven Chinese companies for copying their patented products.[293] Over the course of three years, Crucible saw its magnet sales drop from $25 million to about $12 million a year, partially as a result of piracy.[294] Crucible might have prevented some of its losses had it licensed its patents in China.

A licensing strategy takes advantage of the local resources and distribution capabilities that pirate operations have already developed. Licensing can save a U.S. company considerable start-up costs as well. The key, however, is to be flexible in negotiating a license. U.S. intellectual property owners should keep in mind that potential Chinese licensees are not as affluent as businesses in the United States. For example, the number of translated foreign literary works has dropped since 1992, mainly because Chinese publishers cannot afford the licenses.[295] Setting a royalty that is too high is a counter-productive strategy. U.S. copyright owners will not make a profit, the Chinese publishers will publish other works or resort to

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[291] Birden, *supra* note 59, at 413.

[292] McKeown & Kiang I, *supra* note 63.

[293] Gavin, *supra* note 220.

[294] *Id.*

[295] *China--Copyright Violations Drop*, Newsbytes News Network, Dec. 6, 1995, *available in* WESTLAW, Allnews database, 1995 WL 13696792 (citing China's National Copyright Administration report).

State Bureau of Technology Supervision and China's Ministry of Electronics to establish the Chinese-language version of Windows 95 as the standard development software in the country.[300]

Furthermore, a U.S. company should know who the key officials are in a particular province and which officials are the most receptive to enforcing intellectual property rights. This may be more difficult than it seems because China has several levels of government and agencies with overlapping jurisdiction. One should not make the same mistake the U.S. Trade Representatives made when they negotiated with the Copyright Ministry instead of going directly to the Department of Computer Pervasiveness in China's Ministry of Electronics Industry.

D. Work With Judges And Administrative Authorities

Fourth, U.S. companies should work with Chinese judges and administrative authorities.[301] U.S. companies and their attorneys need to inform China's judges about U.S. products and their related intellectual property rights. While China's judges are better educated today than they were in the 1980s,[302] they may be unfamiliar with the technology or the kind of relief U.S. litigants seek. Considering China's historic antipathy toward foreign intervention, it is unwise to say to a Chinese judge, "this is how we do things in the United States, so you must do the same." U.S. litigants should explain what kind of damage award they expect, why such an award is necessary to

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[300] Carstens, *supra* note 283.

[301] McKeown & Kiang I, *supra* note 63.

[302] Interview with Professor Sun, *supra* note 12 (saying Chinese judges today are much better educated than they were before 1982--judges must have a law degree).

changing legal landscape is probably the biggest key to success in China. U.S. practitioners should take advantage of China's new policy regarding the publication of all new legislative and administrative changes.[315] Turn one's back on Shanghai for a month and before one knows it there are two Intermediate People's Courts where there used to be just one. As for the administrative authorities, the government is constantly spawning new entities and reorganizing old ones. Moreover, agencies like China's Patent Office are constantly revising old regulations and passing new ones.

The key is to plan ahead. The Chinese State Administration for Industry and Commerce estimated that about half of the eighty thousand foreign trademarks registered in China have not been used, which implies a "long-term insight of these [foreign] enterprises towards the Chinese market."[316]

VI. CONCLUSION

In the 1990s, China has made strong efforts to enforce its patent, copyright, and trademark laws. After amending its intellectual property laws to conform with international standards, China faces its last obstacle--effective enforcement. Because of the enormous bureaucracy that is inherent in China, it will take time for China to achieve the results that U.S. companies expect. In the meantime, U.S. companies should help facilitate China's enforcement and treat China as a business partner.

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[315] *See* Action Plan, *supra* note 121, at 884; Interview with Professor Sun, *supra* note 12.

[316] *Overseas Trademark Registration Are Increasing in China, Stimulated by the Heated Market Competition and Improved Intellectual Property Rights Protection*, Xinhua English Newswire, Jan. 21, 1996, *available in* WESTLAW, Allnews database, 1996 WL 5569911.

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THE INCREASING WORLDWIDE SIGNIFICANCE OF EUROPEAN PATENT LITIGATION

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contend that such litigation will soon become generally accepted, which would be a significant change in international patent enforcement.

II. FACTORS CAUSING THE DECLINE OF TERRITORIALIZATION

Patent law, and intellectual property law in general, has historically been dominated by the territoriality principle. That principle rigidly restricts the protection derived from exclusive patent rights to only the state which granted those rights.[4] Territoriality has been interpreted not only in a negative sense (i.e., a patentee has no rights outside his territory), but also in a positive sense (i.e., a patentee has full rights within his territory--regardless of what occurred outside the territory).

The territorialization of intellectual property rights was well-suited to a world rigidly divided into national entities, an essential and indispensable element of which was the control over the movement of goods. However, the increase in international trade has led to the decline of territorialization. As discussed below, the legal and political developments that have stimulated the growth of international trade have also severely diminished the territorialization principle as a limit on patent litigation.

A. *Common Markets And Exhaustion*

The rapid expansion of international trade has been augmented by international agreements. The creation of common markets, such as the EU, Mercosur,[5] and NAFTA, has contributed greatly to increasing

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[4] *See* Paris Convention for the Protection of Industrial Property, July 14, 1967, 21 U.S.T. 1629, 828 U.N.T.S. 305, art. 4; BODENHAUSEN, GUIDE TO THE APPLICATION OF THE PARIS CONVENTION FOR THE PROTECTION OF NATIONAL PROPERTY (1968); *see also* DONALD S. CHISUM AND MICHAEL A. JACOBS, UNDERSTANDING INTELLECTUAL PROPERTY LAW § 2E[2][b] (1992).

[5] Argentina-Brazil-Paraguay-Uruguay: Treaty Establishing a Common Market, 30 I.L.M. 1041 (Ascuncion, March 26, 1991) (establishing the Mercado Comun del Sur, or "Mercosur," a common market).

Eventually, the exhaustion principle was codified with respect to both patents and trademarks. The Council Directive of December 21, 1988,[9] and the Council Regulation of December 20, 1993,[10] codify the exhaustion principle for trademarks. Article 81 of the Community Patent Convention[11] provides that a national patent is exhausted upon placement on the market of the product by the owner, or with the owner's consent, in another EU country.[12]

The exhaustion principle has been applied beyond the EU's boundaries.[13] Although EU legislation and cases apply exhaustion to situations in which the product was initially placed on the market in an EU member state (providing that placement exhausts national intellectual property rights),[14] there have been a significant number of

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13, 1994, Athens, Greece, on file with the *AIPLA Quarterly Journal*); VALENTINE KORAH, EEC COMPETITION LAW AND PRACTICE (1990); WILLIAM R. CORNISH, INTELLECTUAL PROPERTY: PATENTS, COPYRIGHT, TRADE MARKS AND ALLIED RIGHTS (1981).

[9] Council Directive 89/104/EEC: First Council Directive of 21 December 1988 to Approximate the laws of Member States Relating to Trade Marks, art. 7, 1989 O.J. (L 40) 1.

[10] Commission Regulation 40/94 on a Community Trade Mark, art. 13, 1994 O.J. (L 11) 1, 6.

[11] Community Patent Convention, art. 81, 1976 O.J. (L 17) 1, 26.

[12] *Id.*

[13] *See* Mario Franzosi, *Grey Market--Parallel Importation as a Trademark Violation or an Act of Unfair Competition*, 21 INT'L REV. INDUS. PROP. & COPYRIGHT L. 194 (1990).

[14] For a survey of the application of exhaustion by the European courts, see Fredich-Karl Beier, *The Doctrine of Exhaustion in EEC Trademark Law--Scope and Limits*, 10 INT'L REV. INDUS. PROP. & COPYRIGHT L. 20 (1979). For an application of the doctrine in the United States, see Champion Spark Plug Co. v. Sanders, 331 U.S. 125, 73 U.S.P.Q. (BNA) 133 (1947); Monte Carlo Shirt Inc. v. Daewoo Int'l Corp., 707 F.2d 1054, 219 U.S.P.Q. (BNA) 594 (9th Cir. 1983). In Italy, the principle of exhaustion was clearly expressed by Italy's highest court in Cass., sez. un., lieur, 4 apr. 1970, Foro It. I, 1, 1175, and by the Turin Court of Appeals, Corte app., 25 feb. 1967,

clearly,[16] the fact that we are beginning to see some decisions taking this approach indicates that exhaustion could be adopted internationally.[17]

B. *International Treaties*

The recent proliferation of intellectual property law harmonization treaties expresses the international need to simplify and promote international commerce, which inevitably leads to the weakening and probable elimination of territorialization. The authors refer not so much to the Patent Cooperation Treaty ("PCT"),[18] which

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[16] *See* CHISUM AND JACOBS, *supra* note 4, § 2E[2][b][ii], at 2-220 (1995). In the United States, a person who purchases a product in another country from a person who owns the patent in both that country and in the United States may import and resell the product in the United States. *See id.* (citing Holiday v. Mattheson, 24 F. 185 (S.D.N.Y. 1885)). Of course, if the patent in the United States is owned by a person other than the owner of the patent in the other country, importation and sale may constitute an infringement. *See id.* (citing Griffin v. Keystone Mushroom Farm, Inc., 453 F. Supp. 1283, 199 U.S.P.Q. (BNA) 428 (E.D. Pa. 1978)).

[17] The principle of worldwide exhaustion seems, on its face, foreseen in the trademark law of many countries, including Germany, Belgium, the Netherlands, Luxembourg, Austria, Denmark, Sweden, and Norway. However, Germany's highest court, the Bundesgerichthof ("BGH"), in a 1995 decision interpreted narrowly German Trademark law as clarified by the exhaustion principle, establishing that the owner of the trademark's exclusive rights do not cease to be effective upon the first sale of a product under the trade mark *irgendwo in der Welt* (meaning somewhere around the world). Levi Strauss & Co. v. Knecht, NJR, 49, 994. The exhaustion of rights doctrine applies only when the product under the trade mark is sold by the owner of the trade mark, or with his consent, in Germany or in any other European Member State. *See* Jesper Rasmussen, *The Principle of Exhaustion of Trade Mark Rights Pursuant to Directive 89/104 (and Regulation 40/94)*, 4 EUR. INTELL. PROP. REV. 134 (1995); *see also* Freidrich-Karl Beier, *Industrial Property and the Free Movement of Goods in the Internal European Market*, 131 INT'L REV. INDUS. PROP. & COPYRIGHT L. 155 (1990); *see also* Nicholas Shea, *Does the First Trade Marks Directive Allow International Exhaustion of Rights?*, 10 EUR. INTELL. PROP. REV. 463 (1995).

[18] Patent Cooperation Treaty, June 19, 1970, 28 U.S.T. 7645, 1160 U.N.T.S. 231.

Convention: a single patent right valid in all Member States.[23] The same phenomenon may be noted in the areas of trademark[24] and design.[25]

C. *Extraterritorial Value Of National Decisions*

A realistic appraisal of the individual, national markets within the common markets shows from where perhaps the strongest attacks on territorialization have come. Specifically, the national markets are absolutely penetrable as a result of the elimination of customs barriers between member states. As a result, a judgment finding infringement of an intellectual property right in a single country within the common market has an effect limited to that same country only in theory. In reality, the exclusion of a product from just one national market may result in the loss of a competitive edge throughout the common market. In particular, because these are highly competitive markets, an undertaking which has been excluded from just one national market may suffer considerable losses, which may be decisive to that undertaking's survival.

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[23] Community Patent Convention, *supra* note 11. This Convention has not entered into force and, in the authors' opinion, will not enter into force. As discussed in the following pages, it seems unnecessary to have a community patent when it is equally possible to coherently manage (by means of worldwide litigation or by exhaustion) a European patent, a national patent, or a family of parallel patents granted in different European countries.

[24] Council Regulation 40/94 of 20 December 1993 on the Community Trademark, 1994 O.J. (L 11) 1.

[25] Proposal for a European Parliament and Council Directive on the legal protection of designs, 1994 O.J. (C 345) 14; Proposal for a European Parliament and Council regulation on Community design, 1994 O.J. (C 29) 20; *see also* Amended proposal for a Directive on the legal protection of designs, C.O.M.(96)66 final--C.O.D. 464 (Feb. 21, 1996); MARIO FRANZOSI, EUROPEAN DESIGN PROTECTION--COMMENTARY ON THE DIRECTIVE AND REGULATION PROPOSALS (1996).

action is commenced in a country that provides greater possibilities for investigation, which allows the parties to obtain more information. The information obtained is then utilized in a second action brought in a country that offers a swifter and cheaper trial, and where it would have been difficult to obtain the information found in the first action. Those countries known as better for gathering information are the United States and Great Britain (known for extensive discovery), France (known for *"seize-description"*),[27] Italy (known for *"descrizione"*),[28] and Belgium. Those countries known for offering a rapid, high-quality trial are Germany and the Netherlands.

GEBRAUCHSMUSTERVERLETZUNGSVERFAHREN IN DER BUNDESREPUBLIK DEUTSCHLAND, GROSSBRITANNIEN, FRANKREICH UND ITALIEN (1989); John R. Thomas, *Litigation Beyond the Technological Frontier: Comparative Approaches to Multinational Patent Enforcement*, 27 LAW & POL'Y INT'L BUS. 277 (1996). For additional information on compound litigation, see Mario Franzosi, European Patent Litigation (1996) (on file with the *AIPLA Quarterly Journal*).

[27] *See* André Bertrand, *Seizure to Acquire Evidence under French Patent Law*, 2 INT'L REV. INDUS. PROP. & COPYRIGHT L. 175 (1995); Bruno Boval, *Bailiffs' Reports, Seizure and Injunctions in Patent Infringement Proceedings in France*, 24 INT'L REV. INDUS. PROP. & COPYRIGHT L. 744 (1993).

[28] For a discussion of preliminary measures in Italian legislation, see Mario Franzosi and Giustino de Sanctis, *Patent Litigation in Italy: A Comment on the Recent Reforms*, PATENT WORLD, June/July 1996, at 36; Mario Franzosi, *Patent Legislation in Italy*, *in* BOOK OF SPEECHES (unpublished manuscript, presented at the Conference on European Patent Litigation, June 15, 1995, on file with the *AIPLA Quarterly Journal*).

A "seize-description" or "descrizione" (description) is an order of the court authorizing the plaintiff--assisted by a bailiff, a court patent expert, and (normally) a photographer--to inspect and describe the alleged infringing products or process. The bailiff will write an accurate description setting out in detail what he has observed during the inspection. This description is an official document and furnishes important evidence as to the defendant's conduct. It is generally possible to obtain the description without notifying the defendant, if there is a risk that the defendant may conceal or remove the infringing articles or means, and without paying a security.

the Dutch procedural law (known as *"kort geding"*),[32] if there is particular urgency[33] and other conditions are met, a judge may issue a precautionary measure (e.g., cease and desist order and penalty for non compliance)[34] having extraterritorial effects[35] a short time after the initial writ of summons.[36]

Court of Appeals, Jan. 16, 1992, 1993 BIE, No. 9, 44, 1992 KG, No. 85, 1992 IER, No. 10, 53; Applied Research Sys. v. Organon, The Hague Court of Appeals, Feb. 3, 1994, 1995 IER 8, 1995 G.R.U.R. Int. 253; Chiron Co. v. Akzo Pharma-Organon Technika-UBI, The Hague District Court, July 22, 1994, 1994 IER, No. 24, 150.

[32] *See* Jan J. Brinkhof, Internationalization of Patent Law, Transborder injunctions and Summary Proceedings in the Netherlands (unpublished manuscript, distributed at International Patent Disputes Conference, May 9 and 19, 1995, Brussels, Belgium, on file with the *AIPLA Quarterly Journal*); *see also* Heleen Bertrams, *The Cross-Border Prohibitory Injunction in Dutch Patent Law*, 26 INT'L REV. INDUS. PROP. & COPYRIGHT L. 618 (19955); R. Ebbink and Nautha Dutilh, Remedies in Dutch Patent Litigation (unpublished manuscript, distributed at IBA 25th Biennial Conference, October 9-14, 1994, Melbourne, Australia, on file with the *AIPLA Quarterly Journal*); Constant Van Nispen, News from the EC-Dutch injunctions and their enforcement in other European Countries (unpublished manuscript, distributed at The 1995 Patent Litigation Conference ("EuroForum"), London, England, February 24, 1995, on file with the *AIPLA Quarterly Journal*).

[33] The urgency requirement is interpreted with some generosity. *See, e.g.*, Chiron Corp. v. Akzo Pharma-Organon Technika-UBI, The Hague District Court, July 22, 1994, 1994 IER, No. 24, 150 ("[T]he patentee who awaits the decision in opposition and then after the rejection of said opposition takes action against infringement with all due haste maintains an urgent interest, regardless of whether it has earlier issued a cease and desist letter or a formal writ of infringement.").

[34] These precautionary measures are issued by the President of The Hague District Court, which is the specialized court that has exclusive jurisdiction in cases involving patent infringement.

[35] *See* Brinkhof, *supra* note 32; Bertrams, *supra* note 32.

[36] The entire proceeding lasts approximately six to ten weeks.

the Netherlands, opinions differ.[39] Nevertheless, Dutch judges do not in general appear concerned when issuing European-wide (or even worldwide) patent infringement injunctions.[40] As discussed below, the rules granting jurisdiction to the Dutch courts are contained in the Brussels Convention,[41] and in the Lugano Convention.[42]

2. The Brussels And Lugano Conventions

An assessment of the Brussels and Lugano Conventions leads to the conclusion that litigating an alleged patent infringement in a European Member State, where the patent was not registered in that state, is permissible in a majority of European states.[43] Further, the

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[39] For an analysis of the reactions of the Dutch legal literature see Bertrams, *supra* note 32. In patent law there are some enthusiastic commentaries. *See, e.g.*, William A. Hoyng, *Vier procesrechtelijke wensen, in* IN HET NU, WAT WORDEN ZAL, SCHOORDIJBUNDEL 111 (1991). But some literature raises questions of a critical nature. *See, e.g.*, Brinkhof, *supra* note 32; Constant Van Nispen, Comment on Decision of the Dordrecht District Court, Dec. 7, 1989, 1990 Informatierecht/AMI 143.

It is the authors' opinion that the *kort geding* may be a violation of article 50.6 of TRIPS, *supra* note 20, if it is not followed in due time by a case on the merits.

[40] *See* Brinkhof, *supra* note 32; *see, e.g.*, Philips v. Hemogram, 24 IER 150 (1994) (Dutch judge granting an injunction, prohibiting the defendants from infringing not only in Europe, but also in Argentina, Brazil, and Australia).

[41] Brussels Convention, *supra* note 2.

[42] Lugano Convention, *supra* note 3.

[43] *See* Peter Schlosser, Alternative Options: Special Rules of Jurisdiction and Mandatory Jurisdiction (unpublished manuscript, distributed at 1995 Pan European Litigation Conference, July 4-5, 1995, Paris, France, on file with the *AIPLA Quarterly Journal*); Dieter Stauder, *Die Anwendung des EWG-Gerichtsstands und Vollstreckungsübereinkommens auf Klagen im gewerblichen Rechtsschutz und Urheberrecht*, G.R.U.R. Int. 465, 477 (1976); HESS, RECHTSFOLGEN VON PATENTVER-LETZUNGEN IM EUROPÄISCHEN PATENTRECHT 30 (1987); Vincenzo Scordamaglia, *Die Gerichtsstandregelung im Gemeinschaftspatentübereinkommen und das Vollstreckungsübereinkommen von Lugano*, G.R.U.R. Int. 779 (1990).

The paragraphs below examine the Conventions' rules making it possible to litigate alleged infringement[45] of patents granted in different countries before a national court of a signatory state.

a. *General rule regarding the domicile of the defendant: article 2*

Article 2 of the Brussels Convention contains the fundamental rule of that Convention: A defendant domiciled[46] in a signatory state must be sued in that state.[47] The policy behind the rule is to make the

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[45] There is a distinction between infringement and validity litigation. Litigation on validity of patents must be brought in the country where the patent is registered. Article 16 of the Brussels Convention provides that for some matters national courts have exclusive jurisdiction, regardless of domicile. Brussels Convention, *supra* note 2, art. 16. The most relevant limitation in the field of Intellectual Property litigation is drafted in article 16.4:

> The following courts have an exclusive jurisdiction, regardless of domicile: . . . in proceedings concerned with the registration or the validity of patents, trade marks, designs or other similar rights required to be deposited or registered, the courts of the Contracting State in which the deposit or registration has been applied for, has taken place or is under the terms of an international convention deemed to have taken place.

Id. art. 16.4. This provision is limited to litigation on the validity of the patent and does not apply to matters related to patent infringement or to patent ownership. *See* Case 288/82, Duijnstee v. Goderbauer, 1983 E.C.R. 3663; Schlosser, *supra* note 43.

[46] To determine where a party is domiciled, articles 52 and 53 of the Convention provide that the Court shall apply the national law of the state where the case is brought. *Id.* arts. 52-53.

[47] Article 2 states:

> Subject to the provisions of this Convention, persons domiciled in a Contracting State shall, whatever their nationality, be sued in the courts of that state.
>
> Persons who are not nationals of the State in which they

domiciled in France.[50] The following table summarizes the contents of article 2 of the Convention:

	PLAINTIFF	DEFENDANT	FORUM	PATENT(S)
(a)	G	F	France	French
(b)	G	F	France	French and German
(c)	G	F	France	German
(d)	G	F	France	U.S. and/or Japanese

b. *Special jurisdiction: article 5.3*

Article 5.3 of the Brussels Convention[51] authorizes a plaintiff to sue a defendant domiciled in a signatory state before the court of the signatory state where the harmful event occurred.[52] This exception to article 2 of the Convention is particularly important in patent in-

[50] It is irrelevant whether the plaintiff owns the corresponding French patent or whether the French patent has been infringed. Jurisdiction does not depend on the subject matter, but on the domicile of the defendant.

[51] Article 5.3 states: "A person domiciled in a Contracting State may, in another Contracting State, be sued: . . . In matter relating to tort, delict or quasi-delict, in the court for the place where the harmful event occurred." Brussels Convention, *supra* note 2, art. 5.3.

[52] Article 5.3 of the Convention refers to the place where the "harmful event occurred." *Id.* Therefore, it could be that article 5.3 applies only if the harmful event occurred in the past. Nevertheless, according to Schlosser, the language of the article seems to confirm that the article also refers to situations in which the harmful event has not yet occurred, since it is only potentially infringing. Schlosser, *supra* note 43, at 12. Therefore, national courts that are able to grant relief against threats of infringement according to national law should also be able to grant such relief under the Convention.

damaging effects.[57] However, in *Kalfelis v. Banque Schröeder, et al.*, the Court of Justice seemed to be less generous.[58]

For example, assume a German plaintiff ("*G*") wants to sue a French defendant ("*F*") in Germany, where the harmful event occurred. Under article 5.3, plaintiff *G* has the following procedural options:

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[57] In patent infringement cases it is possible that the place where damage occurred and the place where the harmful event took place are different. As such, this would seem to provide an additional jurisdictional option. Also, it is probable that the patent owner may have further options. In fact, according to article 5.3 of the Convention, the jurisdiction of the court of a signatory state exists every time an infringing device is sold in that particular state. Brussels Convention, *supra* note 2. Once goods have entered the common market, they are free to circulate within the EU, making it very likely that some of the goods will be sold in signatory states by third parties. In these cases, the authors contend that such sales could be sufficient to establish jurisdiction in the state where they occurred, even though the sales were not made directly by the producer of the infringing device. However, the European Court of Justice held in *Shevill*, [1995] E.C.R. I-415, that in the jurisdiction where the tortious effect originates, it is possible to recover only the damages which correspond to the harm suffered in that state. Accordingly, the patentee should be advised to sue his opponent at the place of the tortious effect only if the damages suffered are limited to that state.

[58] Case 189/87, [1988] E.C.R. 5565 (1987). In *Kalfelis*, the court held that the jurisdictional provision in articles 5 and 6 of the Brussels Convention represents an exception to the general principle of *forum rei* and therefore it must be construed restrictively. *Id.* According to this approach, the judge of the *forum delicti* could issue a decision only with respect to the actions that have taken place within his state territory. *See* Eisvogels, *Bescherming tegan inbreuck op parallele octrooien; Interlas/Lincoln onder de loep*, 1194 BIE No. 17. However, the approach to this problem is not uniform and there are those who argue that an exception must be made for infringements of parallel patents committed by the same defendant in different countries. *See* Stauder, *supra* note 43, at 447. Finally, there are others who argue that a judge empowered on the basis of general or special jurisdiction regulations is certainly empowered to impose a cross-border injunction. *See* Jan Kropholler, *Insert No. 14, in* EUROPÄISCHES ZIVILPROZESSRECHT (1993); J. P. Verheul, Jurisdiction to grant injunctions, *in* Essays on the Law of International Trade (unpublished manuscript, distributed at the Hague-Zagreb Colloquium of 1976, on file with the *AIPLA Quarterly Journal*).

c. *Special jurisdiction: article 5.5*

Article 5.5 of the Brussels Convention[62] authorizes the plaintiff to sue a defendant domiciled in a signatory state before the court of another signatory state when the defendant has a branch, agency, or other establishment in the foreign state and the dispute arises out of the operation of such branch, agency, or other establishment.[63] This mechanism is particularly effective because it permits bringing actions against a parent company for patent infringements nominally committed by the parent's subsidiaries.[64]

Under article 5.5, it is possible to imagine at least two different cases involving parties from different countries. Assume a German plaintiff ("*G*") wants to sue the French subsidiary ("*FS*") and/or an Italian parent ("*IP*") in Germany, where the infringement occurred. The following two options are available to plaintiff *G*:

> (a) sue French subsidiary *FS* and Italian parent *IP* in France for infringing a German patent, even though the infringement was only nominally committed by the subsidiary; or

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[62] Article 5.5 states: "A person domiciled in a Contracting State may, in another Contracting State, be sued: . . . As regards to a dispute arising out of the operations of a branch, agency or other establishment, in the courts for the place in which the branch, agency or other establishment is situated." Brussels Convention, *supra* note 2, at art. 5.5.

[63] For a discussion of the liability of a parent company for the activities nominally carried out by its subsidiary, see Mario Franzosi and Vincenzo Jandoli, *Liability of a Parent Company for Wrongful Acts of its Subsidiaries in Italy*, 6 INT'L CO. & COM. L. REV. 218 (1995), and Mario Franzosi and Michael P. Atzwanger, *Article 5(5) of the Brussels Convention and the Rules on Groups of Companies in Italy: a New Approach?*, 7 INT'L CO. & COM. L. REV. 261 (1996).

[64] Case 218/86, SAR Schotte GmbH c. Parfums Rothschild, 1987 E.C.R. 4905 (interpreting article 5.5 broadly); Case C-439/93, Lloyd's Register v. Bernard, 1995 E.C.R. 531 (confirming that article 5.5 is applicable even when the activity carried on by a branch in the country of establishment is minimal).

made against the defendants are not interrelated.[67] The Court stated that such an interrelationship can only be derived from the allegations of the plaintiff.[68] According to a restrictive interpretation of this rule, a court may decline jurisdiction "if it becomes clear that the person whose residence was taken for founding jurisdiction was included into the proceedings only for this very purpose."[69]

According to article 6.3 of the Brussels Convention,[70] counterclaims may be brought in the court in which the original claim is pending. In addition, the counterclaim must arise from the same contract or facts upon which the original claim is based.

According to article 6 of the Convention, it is possible to imagine at least four different cases involving parties from different countries. For example, assume a German plaintiff ("*G*") wants to sue a French company ("*FC*") and a German company ("*GC*"). Both companies are alleged to have infringed the plaintiff's patent in Germany. The following main options are available to plaintiff *G*:

(a) sue French company *FC* and German company *GC* in Germany for infringing a German patent;

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[67] *Id.*

[68] *Id.*

[69] Schlosser, *supra* note 43, at 16. Similarly, English courts have decided that a threshold requirement must be met: A plaintiff must prove that there exists a serious question to be tried against the proposed co-defendant. *See* Seaconstar Far East, Ltd. v. Bank Markazi Jomhouri Islami Iran, [1994] 1 App. Cas. 438; Abko Music & Records, Inc. v. Music Collection Int'l Ltd., 1995 R.P.C. 657; Unilever PLC v. Chefaro Properties, Ltd., 1994 R.P.C. 567. Further, the defendant cannot be joined merely because he could give useful discovery; there must be some cause of action against him as well. *See* Whaite, *supra* note 30.

[70] Article 6.3 states: "A person domiciled in a Contracting State may also be sued: . . . On a counter-claim arising from the same contract or facts on which the original claim was based, in the court in which the original claim is pending." Brussels Convention, *supra* note 2, art. 6.3.

Article 24 also provides that the provisional measures a signatory state's court may grant are those available under the law of that state.

Article 24 substantially facilitates forum shopping. Under article 24, a plaintiff is theoretically able to file a request for a provisional measure in any of the signatory states and, as a result, choose the state where the procedural law offers better preliminary measures. Nevertheless, it seems extremely unlikely that a court without subject matter jurisdiction would grant preliminary measures. Moreover, it is uncertain whether preliminary measures can be recognized or enforced in another signatory state if those measures are obtained ex parte.[73] However, it appears that the preliminary measures can be recognized if they are obtained ex parte and later confirmed inter partes.[74]

However, a court that has jurisdiction over the matter according to the Convention should be much more willing to consider request for preliminary measures. Apart from the Dutch practice discussed above,[75] courts will probably be very diffident and a little reluctant to grant preliminary measures that would be enforceable in other countries. However, the wording of the Convention is very clear on this matter, and therefore the granting of such measures must eventually become commonplace.

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[73] Article 24 states: "A judgment shall not be recognized: . . . Where it was given in default of appearance, if the defendant was not duly served with the document which instituted the proceedings or with an equivalent document in a sufficient time to enable him to arrange for his defense." Brussels Convention, *supra* note 2, art 24. Therefore, it would seem that a "judgment" as defined in article 25, is not enforceable only when a service that was required by law was wrongfully performed or not performed. *Id.* Nevertheless, the European Court of Justice has ruled that any interim measure will not be recognized or enforced in the Court of another Contracting State if it is obtained ex parte. Case 125/79, Bernard Denilauler v. S.n.c. Couchet Frères, [1980] E.C.R. 1553.

[74] *See Denilaur*, [1980] E.C.R. 1553.

[75] *See supra* section III. B. 1.

22 should not receive a "parochial" interpretation.[78] Instead, they should acquire a European and substantive meaning.[79] In other words, when the plaintiff seeks substantially the same results, the causes of action are identical.

It is not easy to determine the relationship between an action questioning validity and an infringement action based on the same patents. They could probably be considered different but related causes of action.[80]

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[78] *See* Case 29/76, LTU v. Eurocontrol, [1976] E.C.R. 1541.

[79] *Id.*

[80] In Germany, the courts normally preside over patent infringement cases independently, and patent validity is initially decided by the German Federal Patent Court. For an analysis of the German approach, see WILFRIED STOCKMAIR, THE PROTECTION OF TECHNICAL INNOVATIONS AND DESIGNS IN GERMANY (1994), and Matthias Brandi-Dohrn and Peter Chrocziel, *Federal Republic of Germany: Patent Law, in* WORLD INTELLECTUAL PROPERTY GUIDEBOOK § 2-1 (1991).

A contrasting view is presented by the English cases. *See, e.g.*, Amersham v. Corning, 1987 R.P.C. 53. *Amersham* illustrates the unwillingness of English courts to separate infringement cases from validity. The issue presented was whether there should be a stay of English proceedings while validity was determined by the European Patent Office. The English court, refusing a stay, stated:

> [I]t has long been recognized certainly in the patent jurisprudence of this country, that in patent infringement litigation in which the validity of the patent in suit is put in issue, the convenient and, indeed, desirable course and the usual practice, is for both infringement and validity to be tried and decided in the same proceedings, thus ensuring that both infringement and validity fail to be considered and decided upon one and the same construction of the monopoly claims of the patent in suit.

Id. at 58.

In Italy, pure infringement actions and pure nullity actions are rare. Usually when the patentee sues for infringement, the defendant counterclaims for nullity. When the plaintiff sues for nullity, the patentee counterclaims for infringement. Thus, the usual patent litigation in Italy

There are many advantages to filing an action for declaratory judgment against a patent holder who is about to file an infringement action. The most significant advantage is that the party initiating litigation chooses the forum. While a patent holder would bring an infringement action before a court that handles proceedings quickly and effectively, an alleged infringer would seek a declaratory judgment in a country known for very slow proceedings, such as Italy.[83] Italian courts are known to be slow, and further, they rarely grant high damages.[84] As such, Italian courts are very suitable for potential defendants bringing actions for declaratory judgment.[85]

Although one can imagine several scenarios involving parties from differing countries, this article considers only the most evident ones. Assume a German plaintiff ("*G*") that wants to sue a French company ("*FC*") for a declaratory judgment on the non-infringement of certain patents. Plaintiff *G* has several options:

> (a) sue French company *FC* in Italy for a declaratory judgment for non-infringement of an Italian patent (and perhaps for corresponding patents granted in France, Germany, and other countries);
> (b) sue French company *FC* in Italy for a declaratory judgment for non-infringement of a French patent arguing

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according to Article 24 is not an "action" in the meaning of the Brussels and Lugano Conventions. The authors find such reasoning is erroneous: To define an "action" to be "any writ that enables the defendant to arrange for his defense" is improper. *See, e.g.*, Case C-474/93, Hengst Import BV v. Campese, 1995 E.C.R. I-2113, [1996] 1 CEC (CCH) 165 (1995).

[83] In certain cases brought in Italy, it took thirteen years to obtain a first instance decision. *See, e.g.*, Trib. Fermo, 20 May, 1993, G.A.D.I., 1993, 2970, (deciding a case initiated in 1980 and holding that the trademark "*Clark*" for shoes was a violation of "*Clarks*" for shoes).

[84] Cuonzo-Holden, *The Evaluation of Damages in Italian Patent Litigation*, 15 E.I.P.R. 441 (1993); Franzosi and de Sanctis, *supra* note 80.

[85] However, the Italian situation has dramatically changed. Franzosi and de Sanctis, *supra* note 28, at 36.

In practice, substantive patent law in the signatory nations to the European Patent Convention has been harmonized with respect to the most important matters, and if a court does not have an adequate understanding of the applicable foreign substantive law, the court can easily be advised by experts.[87]

Doubts remain as to the possibility of enforcing a judgment in a country which is not a signatory to the Brussels and Lugano Conventions. However, it is clear that judgments are enforceable without difficulties in all signatory countries. Further, even if not directly enforceable in a non-signatory country, a judgment may be enforceable against assets located in signatory countries.[88]

IV. CONCLUSION

The rapid expansion of global trade has been accompanied by a decrease in the legal significance of the territorialization principle to national intellectual property rights. The emergence of common markets and the development of the exhaustion principle has diminished territorialization. International treaties, such as GATT and TRIPS, have likewise reduced territorialization. Finally, the increased penetrability of national markets most strongly shows that the resolution of patent disputes no longer only affects individual nations.

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[87] For example, in Applied Research Sys. v. Organon, The Hague Court of Appeals, Feb. 3, 1994, 1995 IER, No. 8, 1995 G.R.U.R. Int. 253, the court, which was called to decide some issues applying the substantive law of various countries, relied on decisions from other countries and communications from foreign lawyers.

[88] Even though article 26 of the Brussels Convention provides that a judgment will be automatically recognized in the other signatory states, article 31, referring to articles 27 and 28, provides specific cases in which recognition will be rejected. Brussels Convention, *supra* note 2, art. 31. Bertrams, *supra* note 32, at 631, reaches the conclusion that, based on the *forum rei* principles, a Dutch judge is competent to hear a foreign patent infringement case. However, it is not clear whether he may do so on a *forum delicti* basis and in a *kort geding* procedure. *Id.*

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A DIFFERENT NEW MATTER STANDARD FOR BIOTECHNOLOGY PATENT APPLICATIONS ACCOMPANIED BY A DEPOSIT

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[*] © 1997 Heidi L. Kraus. Ms. Kraus is a J.D. degree candidate at The George Washington University Law School, May, 1997.

I. INTRODUCTION

This Article discusses whether a biological deposit can and should overcome a deficiency in the disclosure of a biotechnology patent application due to a material error, so that the error can be corrected without adding new matter.

Errors in the disclosure of patent applications arise regularly. Material errors in the disclosure may render it insufficient to meet the requirements of section 112 of the Patent Act.[1] Thus, claims dependent on the erroneous part of the disclosure would be invalid.[2] There are mechanisms for the correction of errors, but because of the prohibition against adding new matter to the disclosure, only immaterial errors may be corrected.[3] If the correction involves more significant changes, the applicant may have to file a continuation-in-part ("CIP") to correct the specification, thereby losing the filing date of the original application. Where the applicant must rely on the filing date to avoid a bar under section 102(b),[4] to predate related art, or to establish his or her date of invention, it would be helpful for the applicant to be able to correct more significant errors without losing his or her original filing date.

This Article contends that, in certain cases, a biological deposit may render material errors inconsequential because the error would be obvious to one skilled in the art upon examination of the deposit. In addition, a deposit may serve as evidence that although there was a material error in the disclosure, the applicant had possession of the

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[1] 35 U.S.C. § 112 (1994).

[2] *See Ex parte* Maizel, 27 U.S.P.Q.2d (BNA) 1662, 1665 (Bd. Pat. App. & Int. 1992) (affirming the examiner's rejection of claims dependent on an erroneous specification on the basis that "the subject matter now claimed was not described in the specification as filed").

[3] *See* 3 DONALD S. CHISUM, PATENTS § 11.104, at 11-229 (1996).

[4] 35 U.S.C. § 102(b).

II. DISCLOSURE REQUIREMENTS OF SECTION 112, FIRST PARAGRAPH

In exchange for the right to exclude others from making, using, or selling[7] an invention during the patent term, an inventor must disclose certain information. The inventor must support his or her claims by providing information about the invention in the specification.[8] The first paragraph of section 112 defines the information an applicant must disclose to adequately support his or her claims. To comply with section 112, the disclosure must meet three requirements: (1) the description requirement, (2) the enablement requirement, and (3) the best mode requirement.[9]

A. *Written Description*

To meet the description requirement of section 112, first paragraph, the application must describe the invention in such a way that one skilled in the art would know from reading the specification that the inventor had possession of the subject matter claimed as of

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[7] 35 U.S.C.A. § 271 (West Supp. 1996). This is not a complete list of infringing acts under section 271.

[8] *See* CHISUM, *supra* note 3, § 7.01, at 7-3.

[9] 35 U.S.C. § 112. Paragraph one provides in pertinent part that the specification of a patent:

> shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Id.

his patent application."[16] If the answer is positive, the court compares what the inventor knew with what he or she disclosed; the court must determine the objective question of "whether the disclosure is adequate to enable one skilled in the art to practice the best mode."[17]

III. EFFECT AND CORRECTION OF ERRORS IN AN APPLICATION OR PATENT

A. *Practical Effect Of An Error In An Application Or Patent*

How an error in the disclosure will affect the claims depends on whether the error is material and when it is discovered.

1. Materiality Of An Error

Not every error affects the sufficiency of the disclosure. An error will not render the disclosure insufficient if: (i) the error does not affect the ability of the disclosure to describe, enable, or disclose the best mode; or (ii) it affects a part of the specification unnecessary to meet the section 112 requirements.[18]

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[16] Transco Prods. Inc. v. Performance Contracting, Inc., 38 F.3d 551, 558, 32 U.S.P.Q.2d (BNA) 1077, 1084 (Fed. Cir. 1994) (citing Chemcast Corp. v. Arco Indus. Corp., 913 F.2d 923, 16 U.S.P.Q.2d (BNA) 1033 (Fed. Cir. 1990)), *cert. denied*, 115 S. Ct. 1102 (1995).

[17] *Id.*

[18] In *Hormone Research Foundation v. Genentech Inc.*, 708 F. Supp. 1096, 8 U.S.P.Q.2d (BNA) 1377 (N.D. Cal. 1988), *aff'd in part, vacated in part, and remanded*, 904 F.2d 1558, 15 U.S.P.Q.2d (BNA) 1039 (Fed. Cir. 1990) plaintiff's patent disclosed a protein structure with, one less amino acid than the natural protein and three incorrect amino acid residues. *Id.* at 1108, 8 U.S.P.Q.2d (BNA) at 1387. The court held that these errors did not indicate that one skilled in the art would not have been able to determine the true protein sequence without undue experimentation, therefore they did not affect enablement. *Id.*; *see also, Ex parte* D, in which the examiner cited as a reference the Goeddel patent. 27 U.S.P.Q.2d (BNA) at 1068. The applicant argued that the Goeddel patent was not an effective reference as of its filing date because the sequence disclosed in the original Goeddel

of the original date may affect the applicant's ability to meet patentability criteria that depend on the date of invention, such as novelty[25] and nonobviousness.[26] The later the date, the greater the number of references that may anticipate or render the claimed invention obvious. Of course, the inventor can prove that the invention occurred before the filing date, but this may be difficult. Moreover, delaying the date of filing may cause the application to be barred under section 102(b).[27] The later the filing date, the greater the possibility that one of the events listed in section 102(b) may occur and bar patentability of the invention.

Finally, an error discovered after issuance may affect the validity of the patent. After issuance, a defendant in an infringement action can challenge the validity of claims on the grounds that there is a material error that makes the disclosure insufficient under section 112.[28]

B. *Correction Of Errors In The Specification*

For an issued patent, errors in the specification that are the fault of the applicant may be corrected by reissuance of the patent,[29]

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[25] 35 U.S.C. § 102(a).

[26] 35 U.S.C.A. § 103 (West Supp. 1996).

[27] 35 U.S.C. § 102(b).

[28] *See* Procter & Gamble Co. v. Kimberly-Clark Corp., 740 F. Supp. 1177, 1179 n.1, 12 U.S.P.Q.2d (BNA) 1577, 1578 n.1 (D.S.C. 1989); *see also* Vernay Lab., Inc. v. Industrial Elec. Rubber Co., 234 F. Supp. 161, 163, 142 U.S.P.Q. (BNA) 494, 496 (N.D. Ohio 1964).

[29] If an error does not affect the sufficiency of the disclosure but nonetheless renders the patent inoperative, the inventor can seek reissue under 35 U.S.C. § 251. However, "[w]here a patent is fatally defective, e.g., invalid for inadequate disclosure, such a defect cannot be cured by reissue seeking to put into the specification something required to be there when the patent application was originally filed." *In re* Hay, 534 F.2d 917, 920, 189 U.S.P.Q. (BNA) 790, 792 (C.C.P.A. 1976).

descriptive matter subsequent to an applicant's filing date in order to complete its disclosure so as to conform the specification's description of the invention to the statutory standard."[34]

"'New matter is that which is not found in the specification, drawings, or model, as first filed, *and* [is that] *which involves a departure from the original invention.*'"[35] If a defect would be obvious to one skilled in the art, correction of the defect does not add new matter to the disclosure.[36] Moreover, addition of matter that only clarifies or completes the prior disclosure is not prohibited under the new matter rule.[37] Moreover, an amendment will not add new matter if it is merely a statement of an inherent property of the previously disclosed invention.[38] Finally, under this inherency exception, "newly discovered properties of [a] compound not disclosed in the original

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[34] *Ex parte* Maizel, 27 U.S.P.Q.2d (BNA) 1662, 1670 (B.P.A.I. 1992).

[35] *In re* Oda, 443 F.2d 1200, 1203-04, 170 U.S.P.Q. (BNA) 268, 271 (C.C.P.A. 1971) (quoting ROBINSON ON PATENTS § 561 (1890)).

[36] *Id.* at 1204, 170 U.S.P.Q. (BNA) at 271. In *Oda*, due to a mistake in translation, the specification incorrectly disclosed a compound as nitric rather than nitrous acid. *Id.*, 170 U.S.P.Q. (BNA) at 271-72. The court held that the defect was obvious because the specific gravity given in reference to the "nitric" acid matched that for "nitrous" acid, and because it made sense to use "nitrous" rather than "nitric" acid in the way described. *Id.* at 1205, 170 U.S.P.Q. (BNA) at 272.

[37] Eli Lilly & Co. v. Premo Pharm. Lab., Inc., 630 F.2d. 120, 133, 207 U.S.P.Q. (BNA) 719, 732 (3d Cir. 1980); *see also* Jessel v. Newland, 195 U.S.P.Q. (BNA) 678, 685-86, *vacated in part*, 196 U.S.P.Q. (BNA) 504 (Comm'r Pat. 1977) (holding that an amendment which substituted a different color picture and different reference to a color dictionary was not new matter where it only "attempted to disclose with greater specificity and accuracy the color characteristics of the claimed plant").

[38] Kennecott Corp. v. Kyocera Int'l, Inc., 835 F.2d 1419, 1422-23, 5 U.S.P.Q.2d (BNA) 1194, 1197-98 (Fed. Cir. 1987); *Ex parte* Marsili, 214 U.S.P.Q. (BNA) 904, 906 (Bd. Pat. App. 1979); *see also In re* Magerlein, 346 F.2d 609, 612, 145 U.S.P.Q. (BNA) 683, 685 (C.C.P.A. 1965) (holding that the correct orientation of a hydroxy group on the steroid claimed was an inherent property of the compound because all of the compounds produced by the process described would have the same orientation).

112.[44] Adequate disclosure requires that biological material on which an invention depends be deposited if it is not readily available to the public or cannot be found or made without undue experimentation.[45] Thus, a deposit ensures that the materials necessary for one skilled in the art to practice an invention are available to the public upon issuance of the patent.[46] Although a deposit is often used to meet the enablement requirement, it may also be used to meet the best mode or description requirements, and to satisfy the section 114 requirement that the PTO be guaranteed access to the invention during pendency of the application.[47]

V. THE WAYS IN WHICH NEW MATTER AND DISCLOSURE REQUIREMENTS FURTHER THE GOALS OF THE PATENT SYSTEM

The disclosure requirements and the prohibition against new matter work together to promote certain aims of the patent system. Any exception to these requirements should further, or at least not interfere with, the policies underlying them. Therefore, before proposing a different standard, this section discusses the way in which the new matter rule and the disclosure requirements work together to further the goals of the patent system.

A. *Effect Of An Error In The Disclosure On These Policies*

Allowing errors in the disclosure of an application, or freely allowing their correction would work against the goals of the patent system for several reasons.

The U.S. system aims to reward the first to invent rather than

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[44] 37 C.F.R. § 1.802.

[45] *Id.*

[46] *Wands*, 858 F.2d at 735, 8 U.S.P.Q.2d (BNA) at 1403.

[47] *Id.* at 735-36, 8 U.S.P.Q.2d (BNA) at 1403.

Finally, it is not beneficial to the public to allow an inventor to change the disclosure, while keeping the original filing date. In effect, this would allow the inventor to take something out of the public domain before he or she is capable of disclosing how the invention works (before he or she gives the quid for the quo).[52] Although we do allow applicants to add new claims that are supported by the original specification without filing a CIP (thereby keeping the original filing date for new claims), the fact that the disclosure adequately supports the new claim indicates that the inventor already had possession of the invention.

B. *Role Of The Disclosure And New Matter Rules In Furthering The Goals Of The Patent System*

The prohibition against new matter acts in concert with the requirement that the disclosure of a patent application be sufficient as of the filing date to further the goals of the patent system.

1. The New Matter Rule

One aim of the prohibition against new matter is to prevent an applicant or patentee from "enlarg[ing] the scope of an application once filed, or of a patent once granted, the effect of which would be to enable the patentee to appropriate other inventions made prior to such alteration, or to appropriate that which has, in the meantime gone into public use."[53] In other words, with no rule against new matter, an applicant could file, then add claims or enlarge the disclosure later, but refer back to the original filing date, thereby predating related art that may have since developed, and other inventors who may have since invented. Thus, the new matter rule

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[52] *See* Vernay Lab., Inc. v. Industrial Elec. Rubber Co., 234 F. Supp. 161, 163, 142 U.S.P.Q. (BNA) 494, 496 (N.D. Ohio 1964) ("[One] object of the patent statutes [is] to inform the public of the limits of the patent monopoly asserted so as to enable to public to know what elements of the manufactured item may be duplicated without a license.").

[53] Railway Co. v. Sayles, 68 U.S. (7 Otto) 554, 563 (1878).

requirement ensures that the applicant *has* possession of the invention.[58] Requiring that the applicant has possession at the date of filing furthers the goals of the patent system by rewarding the correct person at the point when he or she deserves a patent.

The aim of the second aspect of the section 112 disclosure requirement is to ensure that the invention is comprehensible to those skilled in the art as soon as the patent issues.[59] This furthers the patent system's incentive to provide information to the public about the invention.

3. New Matter Prohibition And Disclosure Requirements As A Counterweight To The Incentive To File Early

Both the rule against new matter and the disclosure requirements act as counterweights to the incentive to file prematurely that is created by the priority rules. An applicant may establish the date of invention by constructive reduction to practice,[60] actual reduction to practice,[61] or conception plus due diligence. The first to conceive the subject matter in question is the first inventor, provided he or she exercises reasonable diligence in reducing it to practice from a time prior to when the first person to reduce it to

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[58] *Id.*

[59] *Glass*, 492 F.2d at 1232, 181 U.S.P.Q. (BNA) at 34.

[60] The date of constructive reduction to practice is the filing date of the application. Rule 657(a) allows an applicant to rely on the filing date of the claim to establish the date of invention for that claim. 37 C.F.R. § 1.657(a) (1995); *see also Glass*, 492 F.2d at 1232, 181 U.S.P.Q. (BNA) at 35.

[61] The actual date of reduction to practice is the date "no technological problems, the resolution of which would require more than ordinary skill and reasonable time remain in order to obtain an operative, useful embodiment." *In re* Hawkins, 486 F.2d 569, 574-75, 179 U.S.P.Q. (BNA) 157, 161 (C.C.P.A. 1973) (citing *In re* Argoudelis, 434 F.2d 1390, 1395, 168 U.S.P.Q. (BNA) 99, 104 (C.C.P.A. 1970) (concurring opinion)).

the rule requiring sufficiency of disclosure as of filing to further some of the goals of the patent system: to reward the correct person, to encourage public disclosure of information, and to prevent an applicant from removing information already in the public domain.

VI. DEPOSITS MAY COMPENSATE FOR INSUFFICIENCIES IN THE DISCLOSURE CAUSED BY ERRORS

The policies of rewarding the first to invent, and requiring complete disclosure at the time of filing, would seem to mandate so strongly against allowing an applicant to correct material errors in the specification, that the fact that the applicant made a deposit of the invention could not overcome these policies. However, there are arguments for making an exception.

A. *Applicants Required To Make A Biological Deposit Bear A Larger Burden Than Do Other Applicants*

Patent applicants who deposit biological material have a greater burden than other patent applicants. Depositing applicants must pay a relatively large sum to make and maintain the deposit;[65] the fee is not associated with any other type of subject matter.[66] In addition to the monetary cost, the applicant may be concerned about risking exposure of secret information by placing a valuable sample of the invention or its components in the hands of a third party--i.e., the depository-- before its subject matter is protected by a patent. This is a risk not taken by other applicants.

Additionally, one may argue that an applicant who deposits the entire biological invention may actually disclose more than necessary because, after issuance, the public has access to the entire

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[65] John Edward Schneider, Note, *Microorganisms and the Patent Office: to Deposit or Not to Deposit, That is the Question*, 52 FORDHAM L. REV. 592, 602-03 (1984).

[66] *Id.* at 602.

reference may be amended to add the material originally incorporated by reference without violating the rule against new matter.[70]

The rule allowing incorporation by reference[71] makes sense, as it comports with both the public disclosure aspect and the reduction to practice aspect of the disclosure requirement. When an applicant includes information by reference at the time of filing, albeit incorrectly, the applicant demonstrates that he or she has enabled reduction of the invention to practice as of the filing date and has merely failed to follow the formalities of disclosure. By incorporating the referenced material, then, the applicant merely supplements the disclosure with a longhand version of the material that is already present though only in shorthand. Thus, amending a specification to include material previously incorporated only by reference compromises neither the public disclosure (i.e., enablement) requirement, nor the requirement that the applicant demonstrate possession of the invention as of the filing date.

By analogizing a deposit to a reference to a publication, an applicant could argue that he or she should be allowed to incorporate a deposit into a disclosure by reference.[72] If the deposit is considered

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[70] MPEP, *supra* note 67, § 608.01(p)(B)(1); *see also Hawkins*, 486 F.2d at 574, 179 U.S.P.Q. (BNA) at 161. In *Hawkins*, the original application referred to the British application for information needed to complete the disclosure. Although reference to a foreign application is an incorrect incorporation by reference, the court held that the applicant could amend the application to add information from the references without the amendment qualifying as new matter. *Id.*

[71] MPEP, *supra* note 67, § 608.01(p)(B)(1).

[72] In *Ex parte* Schmidt-Kastner, 153 U.S.P.Q. (BNA) 473 (Bd. Pat. App. 1963), the Board of Patent Appeals found that a deposit made prior to filing is analogous to a cross-reference to an earlier application for starting material, and thus could render an otherwise inadequate disclosure sufficient. *Id.* at 474 ("[T]he deposit of an organism in a recognized repository prior to the filing of a patent application . . . is analogous to a cross-reference to an earlier filed patent application for a description of the preparation of a starting material."); *see also Ex Parte* Maizel, 27 U.S.P.Q.2d (BNA) 1662, 1669 (B.P.A.I. 1992) (holding that "a patent applicant's deposit

Another criticism is that allowing the applicant to amend the disclosure based on the analogy to incorporation by reference could enable applicants to bypass the rule requiring that the specification be complete when filed, because under the current rules, a deposit, referred to in a specification as filed, need not be made at the time of filing. This would encourage premature filings. The standard suggested below requires that an application meet certain criteria in order to avoid these problems.

C. *Proposed Standard*

If the applicant can show that all of the following criteria are met, the applicant may correct a minor error relating to a deposit without violating the prohibition against new matter:

(1) The reference to the deposit must be made in the original, as-filed, application (the one that the applicant wishes to correct).[74]

(2) The deposit must be made as of the filing date.[75]

(3) The deposit must include the entire component that is affected by the error.[76]

(4) One skilled in the art must be able to recognize the error and determine the correct parameter

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[74] Otherwise, the disclosure will not be considered to contain an adequate written description of the invention as of the filing date.

[75] Otherwise, it cannot serve as evidence that the applicant had possession of the invention as of that date.

[76] Otherwise, it cannot serve as evidence that the applicant had possession of the correct version of the invention. *See Ex parte* Maizel, 27 U.S.P.Q.2d 1662 (Bd. Pat. App. &. Int. 1992) in which the Board rejected the argument that a deposit could make up for lack of enablement because, inter alia, the deposit only contained a fragment of the cDNA sequence claimed. *Id.* at 1668-69.

(7) There must be a sufficiently correct description of the invention to demonstrate that the applicant had reduced the invention to practice. That is, most of the parameters used to describe the invention must be correct.

(8) Past amendments correcting material errors should be considered and should weigh heavily against the allowance of additional amendments correcting material errors.[81]

9) Finally, this standard should apply only to pending applications.[82]

Applicants who meet the criteria of the proposed standard should be able to amend the disclosure of their application to correct errors. The criteria ensure that the standard complies with the aims and policies of the patent rules discussed above. Under this standard, the deposit is evidence that the applicant reduced the invention to practice as of the deposit date, and disclosed it in the application through the reference to the deposit. As a result, it is not new matter. This standard does not consider applicants who wish to rely on other evidence to establish the date of their invention for two reasons. First, applicants who can prove an invention date prior to their filing date

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[81] Applicants should not be able to use this standard to correct a largely erroneous disclosure in small steps, thus circumventing criterion seven.

[82] There are several reasons to limit use of the standard to pending applications. First, allowing correction of material errors in issued patents might encourage the patent owner to stay silent about errors until discovered by others, in an attempt to receive both a patent right and a trade secret. Second, this criteria would give applicants an incentive to correct material errors as early as possible. Lastly, a material error in an application that is corrected before issuance is less harmful to the public than an error in an issued patent. An error in an application (that is corrected) will only be present at the time when the application was secret, whereas, a patent that issues with a material error could mislead the public.

(2) Errors involving the characterization of a microorganism or virus where there is sufficient written description to make clear to which microorganism or virus the claims refer, and where the correct parameters can be found from experimentation with the deposited material.

2. Application To Cases

There is no published decision to date that resolves the issue of whether a deposit may render a material error in the specification inconsequential to the disclosure requirement of section 112. This issue was broached, but not decided, in *Ex parte* Maizel.[83]

In *Maizel*, the inventor claimed, among other things, a recombinant vector containing the DNA sequence encoding the protein B cell growth factor (BCGF) and recombinant cells that produce BCGF.[84] The DNA and protein sequences disclosed were incorrect.[85] The Board found the error to be material.[86] Appellants argued that because the specification was enabling for the recombinant vector (DNA sequence) that was deposited, the specification inherently enabled the sequence contained on the plasmid and, therefore, satisfied the description requirement for this sequence.[87] The Board rejected this argument because: (1) description and enablement are two distinct requirements of section 112; and (2) the claims to the DNA sequence and protein were much broader than

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[83] 27 U.S.P.Q.2d (BNA) 1662 (B.P.A.I. 1992).

[84] *Id.* at 1664.

[85] *Id.* at 1665-66.

[86] *Id.* at 1667.

[87] *Id.* at 1668.

insertion of new matter and thus rendered the Goeddel patent ineffective as a reference.[95]

The Board of Patent Appeals acknowledged that there were some differences between the sequence disclosed in the original application and the sequence disclosed in the issued patent, but nonetheless refused to find Goeddel ineffective because the applicant did not show that the original Goeddel specification failed to enable the claims to the recombinant DNA sequence.[96] The Board based its decision in part on the fact that the errors in the DNA sequence originally disclosed did not affect the amino acid sequence for the protein encoded.[97] Although the Goeddel patent involved a change in the disclosed DNA sequence similar to that in *Maizel*, the Board came to the opposite conclusion about the adequacy of the disclosure. One major difference between the two cases is that in *Ex parte* D, the error did not affect the sequence of the protein product encoded by the DNA sequence; whereas in *Maizel*, the error greatly affected the protein product.[98]

Although these errors in sequence could occur the same way and are similar in their degree, the results under the present new matter standard can differ significantly merely because of the placement of the erroneous nucleotides in the long string of

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[95] *Id.* at 1068.

[96] *Id.* at 1068.

[97] *Id.*

[98] Another difference between the two cases is the burden of proof, and who holds it. The Goeddel reference was an issued patent, which is presumed to be valid, *id.* at 1069, whereas in *Maizel* the error was in an application. *See* 27 U.S.P.Q.2d at 1663. In *Ex parte D*, the Board of Patent Appeals might have come to the opposite conclusion about the effectiveness of the Goeddel reference had it not issued as a patent yet, and an interference might have ensued. However, it remains that the Board relied on the examiner's statement that the change in the DNA sequence had no effect on the amino acid sequence encoded. 27 U.S.P.Q.2d at 1068.

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FROM VIDEO GAMES TO ARTIFICIAL INTELLIGENCE: ASSIGNING COPYRIGHT OWNERSHIP TO WORKS GENERATED BY INCREASINGLY SOPHISTICATED COMPUTER PROGRAMS

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I. INTRODUCTION

Imagine a computer program that generates kaleidoscope images based on a handful of user inputs. Maybe the user scans in a company logo, or a self-portrait; maybe the user just types in "sailboat" or "pyramid." The program then generates a kaleidoscope image incorporating the user's input. Can the user sell the kaleidoscope images without the consent of the programmer? Who owns the copyrights to the kaleidoscope images? Some possibilities are: the programmer, the user, both the programmer and the user, the computer itself, both the computer and the programmer, both the computer and the user, or nobody.

In accordance with the primary objective of copyright law, "[t]o promote the Progress of Science and useful Arts,"[1] the courts must determine copyright ownership in such a way that the future development of useful arts is encouraged. In this example, the programmer has envisioned the kaleidoscopic images and written a program to produce them, whereas the user may have entered into the computer a single word, "sailboat." If the programmer supplies the lion's share of the creativity and effort in producing the copyrightable kaleidoscopic images, granting the copyright to the programmer might create the most incentive for the future production of such images.

Nevertheless, most views that have been expressed publicly favor awarding the rights to the user.[2] These views have evolved

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[1] U.S. CONST. art. I, § 8, cl. 8.

[2] NATIONAL COMMISSION ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS, FINAL REPORT 45 (1979) [hereinafter CONTU] ("[T]he author is the one who employs the computer."); Arthur R. Miller, *Copyright Protection for Computer Programs, Databases, and Computer-Generated Works: Is Anything New Since CONTU?*, 106 HARV. L. REV. 977, 1071 (1993) (arguing that the authorship of a computer generated work is attributable to some human, perhaps the person who merely activates or employs the computer, even if the machine is responsible for most or all of the effort in creating the work); Pamela Samuelson, *Allocating Ownership Rights in*

fingertips.[5] If the user of such a program, without any background in music, uses a program to compose the musical score for a symphony, can the writer of the MIDI program claim an interest in the copyright to the musical score or a recording of the performance of that score?

Virtual reality programs allow the user to interact with the program to create any number of copyrightable[6] works. For example, in one program, the user controls a wand, and as the user waves the wand around, the user sees a trail of bubbles accompanied by musical tones; thus, allowing the user to compose music as well as "musical sculpture."[7] Could the user of such a program sell the music and sculpture created with the program? Could the programmer sell the music and sculpture created by someone else? Interactive games are a more common example of virtual reality programs generating copyrightable output. For example, Virgin Interactive's *Daedalus Encounter* allows the player to interact with actual footage of movie stars Tia Carrere and Christian Bocher.[8] Could a player save the output of the game and sell it as a movie starring Tia Carrere?

A large variety of "expert systems" programs generate copyrightable output ranging from architectural drawings to medical advice to legal research. Could the user of one of these programs use the output to publish a book on the subject?

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[5] Marcus O'Leary & Alison Harrington, *Focus: Intellectual Property*, 8 THE LAWYER No. 45, Nov. 22, 1994, at 18.

[6] Here, the term "copyrightable" refers to works that are fixed in a tangible medium of expression and otherwise protectable by copyright law. 17 U.S.C. § 102(b) (1994).

[7] Greg S. Weber, *The New Medium of Expression: Introducing Virtual Reality and Anticipating Copyright Issues*, 12 COMPUTER/L.J. 175, 190 (1993).

[8] *Watch a Star Crash into a Sun: Tia Carrere Stars in the Latest "Interactive Movie,"* COMPUTER GAME REV., May 1995, at 56.

derivative of some work other than the computer program, such as images supplied by the user, and the copyright to the output will be tied to the copyright of the underlying work.

Section III analyzes copyright ownership of works that are generated by computer programs, but that are not derivative of any other works. Where a computer program generates original art, music, or literature, copyright protection may be granted to the programmer, the user, the computer, or some combination (joint authorship). The analysis will begin with the claims of the programmer and the user. The major obstacle facing the programmer is that the programmer does not cause the output to be fixed in a tangible medium because of the user's intervention, or the randomness built into the program. The major obstacle facing the user is that the user may fail to meet minimal requirements of originality.

Further, Section III analyzes situations where the computer program itself may appear to be the author of its output, illustrated with actual examples of works composed by computers. Although at least two of these works have been granted copyrights by the Copyright Office, the author concludes that the purpose of copyright law, to stimulate creativity among authors, precludes present day artificial intelligence programs from receiving copyright protection. The conflict that arises from this conclusion is that while policy does not justify awarding copyright protection to the computer, the computer may nevertheless be the only entity who meets the Supreme Court's definition of "author." The problem is similar to the problem of works made for hire, where copyright is awarded to the person who makes the creative decision to generate the work (the employer), even though that person is not the person who actually fixes the work in a tangible medium of expression (the employee). The Fictional Human Author Theory[10] is a solution to this problem for artificial intelligences that requires the courts to bend the language of the

[10] *See infra* Section III.B.3.

Softkey claims the right to restrict the use of documents generated by the Softkey program.[13]

1. Derivative Works Defined

On first impression, the Softkey provision seems only fair because Softkey has created the images, digitalized them, and inserted them into a user-friendly database. The user of the program basically points to an image on the computer screen, and the program pastes the image into the user's document. In this type of situation, the computer generated work contains images which are not only produced by the program, but which are verbatim copies of images contained in the program.

The generated work is a derivative work based on the program if the generated work contains large blocks of expression that clearly copy the expression contained in the program.[14] The Copyright Act defines a "derivative work" as "a work based on one or more pre-existing works . . . in which a work may be recast, transformed, or adapted . . . which, as a whole, represent an original work of authorship."[15] Despite the broad wording of this definition, the legislative history accompanying passage of the 1976 Copyright Act clearly indicates that a second work is a derivative work only if it incorporates protected elements of expression from an underlying

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[13] In the winter of 1994, my informal survey of clip-art programs revealed no clip-art programs providing any provisions regarding copyright to the programs' images. In January, 1995, Softkey was the only software manufacturer whose license restricted the use of its program's output. By May, 1995, Adobe Printshop had added a similar provision to their software license. This trend is likely to continue and spread to other types of computer programs.

[14] 17 U.S.C. § 101 (1994).

[15] *Id.*

If the user of the program uses the program's images to generate a new document, then the new document will be subject to the rules regarding derivative works just as if the program were a book of images.[18] Under those rules, the copyright owner has the exclusive right to prepare derivative works based on the copyrighted work, and any derivative works created without the consent of the copyright owner infringe the copyright.[19]

2. The Video Game Cases

Although there appears to be no case law directly addressing copyright protection for documents generated by clip-art programs, the reasoning is similar to that used in protecting the audiovisual displays of video games. In *Stern Electronics, Inc. v. Kaufman*[20] and *Williams Electronics, Inc. v. Arctic International, Inc.*,[21] the plaintiffs were manufacturers of video games who sued others for manufacturing video games that created audiovisual displays similar to those generated by the plaintiffs' computer programs. The plaintiffs held copyrights on both the computer programs and the audiovisual displays generated by the programs.[22] In holding that the plaintiffs'

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[18] *See* Mirage Editions, Inc. v. Albuquerque A.R.T. Co., 856 F.2d 1341, 1343, 8 U.S.P.Q.2d (BNA) 1171, 1172 (9th Cir. 1988) (mounting art work taken from a published commemorative book onto ceramic tiles for resale created a derivative work and thus infringed the book's copyright).

[19] 17 U.S.C. § 106(2) (1994); *see also Mirage*, 856 F.2d at 1343, 8 U.S.P.Q.2d (BNA) at 1172 ("By borrowing and mounting the pre-existing, copyrighted individual art images without the consent of the copyright proprietors . . . [including the book publisher,] . . . appellant has prepared a derivative work and infringed the subject copyrights."). Professor Samuelson also noted that computer-generated output could be a derivative work if it met these requirements, but she concluded, in 1986, that most computer output would not be derivative. Samuelson, *supra* note 2, at 1215.

[20] 669 F.2d 852, 213 U.S.P.Q. (BNA) 443 (2d Cir. 1981).

[21] 685 F.2d 870, 215 U.S.P.Q. (BNA) 405 (3d Cir. 1982).

[22] *Williams Elecs.*, 685 F.2d at 872, 215 U.S.P.Q. (BNA) at 407; *Stern Elecs.*, 669 F.2d at 854, 213 U.S.P.Q. (BNA) at 444.

expression in a tangible medium.[26] The clip-art is protected, and works based on the clip-art are derivative works--no matter how they are generated.

B. *Object-Oriented Programming Resembles Clip-Art*

Perhaps the most significant example of computer-generated works is the widespread use of OOP methods. According to this method, programmers create software subroutines, or "objects," which other programmers use as building blocks to create more complicated programs.[27] For example, Apple's "Hypercard" system allows the Hypercard user (the second programmer) to create programs by simply connecting object icons in the user interface of the Hypercard program.[28] Other OOP products, such as Rational Software's ROSE software development environment, allow users to generate a flow chart or other graphical design models of their objective.[29] The ROSE program then generates a source code based on the design model.

Computer programs generated by OOP are derivative of the OOP programs just as the output generated by clip-art programs is derivative of the clip-art program. For example, output of the clip-art programs contain verbatim copies of images contained in the code of the clip-art program; output of the Apple Hypercard or ROSE program contains verbatim copies of computer source code that is

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[26] *Id.*

[27] David M. Barkan, *Software Litigation in the Year 2000: The Effect of Object-Oriented Design Methodologies on Traditional Software Jurisprudence*, 7 HIGH TECH. L.J. 315, 320-21 (1992).

[28] Jon S. Wilkins, *Note: Protecting Computer Programs as Compilations Under* Computer Associates v. Altai, 104 YALE L.J. 435, 453 (1994) (citing Apple Computer's "Hypercard" as a rudimentary example of this method).

[29] Rational Software's "ROSE" (Rational Object-Oriented Software Environment) is a graphical OOP software development environment. More than than 10,000 copies of the program have been distributed.

works are clearly derivative works.[33] Software companies and their attorneys should avoid any misunderstandings by clearly stating in the license for the clip-art program or for the OOP system that the licensee may claim copyright protection for works generated by the program.[34]

In addition, the user may have certain rights to the extent that the user is adding creativity to the images supplied by the programmer.[35] While the programmer has the right to control distribution of any unauthorized derivative work, the user would have rights to any original expression contributed by the user.[36] Although these rights would not be "ownership" rights that would allow the user to distribute the work, these rights would allow the user to preclude the programmer from distributing the derivative work.[37] For instance, if a screenwriter made an unauthorized screenplay derived from a copyrighted novel, the novelist could claim infringement based on the screenwriter's use of the novel's expression, but the screenwriter could preclude the novelist from distributing the

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[33] 17 U.S.C. § 101 (1994) (defining "derivative work").

[34] *See supra* notes 12-13 and accompanying text.

[35] Stewart v. Abend, 495 U.S. 207, 223, 14 U.S.P.Q.2d (BNA) 1614, 1622 (1990) ("The aspects of a derivative work added by the author are that author's property, but the element drawn from the pre-existing work remains on grant from the owner of the pre-existing work."); Harper & Row Publishers, Inc. v. Nation Enter., 471 U.S. 539, 547, 225 U.S.P.Q. (BNA) 1073, 1075 (1985) ("The copyright is limited to those aspects of the work--termed 'expression'--that display the stamp of the author's originality.").

[36] Samuelson, *supra* note 2, at 1210 n.103; *see also* Russell v. Price, 612 F.2d 1123, 1128, 205 U.S.P.Q. (BNA) 206, 211-12 (9th Cir. 1979) (holding that copyright owner of a play could prevent exhibition of a film derived from the play).

[37] Samuelson, *supra* note 2, at 1210-11 (*citing* 1 MELVILLE B. NIMMER, NIMMER ON COPYRIGHT § 3.04, at 3-19 (1991)).

user makes a derivative work by modifying expressions supplied by the programmer, whereas in the translation or image processing programs, the programmer--through the program and possibly in collaboration with the user--makes a derivative work by modifying documents or images supplied by the user.

For works where the program is modifying a user-supplied image, the issues generally are not whether the programmer or the user should receive copyright protection for the derivative work, but rather if the modified work is a derivative work at all. The general trend seems to be that derivative works based on expressions supplied by the user are copyrightable, but the copyright does not go to the computer programmer.[42] Instead, copyright ownership is awarded to either the user of the program, as in the colorization example, or the author of the original work (who is neither the programmer nor the user), as in the translation case, or both, as in the case of digitally processed images. Even if the programmer were to try to claim authorship to the computer generated works, it seems unlikely that the programmer would get any more than the rights to preclude the user from distributing the derivative work; the programmer would not have ownership rights that would allow the programmer to distribute the derivative work.

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[42] Gastineau, *supra* note 40, at 109 (arguing that a photograph which has been digitally altered with the aid of a computer program may be a joint work with the original photographer and the computer user as co-authors). The Copyright Office of the Library of Congress decided that colorized versions of black and white motion pictures, which were produced with the aid of computers, are eligible for copyright as derivative works if they contain "a certain minimum amount of individual creative human authorship." 52 Fed. Reg. 23,443 (1987). *But see* Armento v. City of Asheville, Civ. No. 1:94CV58, 1996 U.S. Dist. LEXIS 5268, at *3-4 (W.D.N.C. March 26, 1996) (dealing with computer-generated map); Signo Trading Int'l, Ltd. v. Gordon, 535 F. Supp. 362, 364, 214 U.S.P.Q. (BNA) 793, 795 (N.D. Cal. 1981) (holding that electronic translations of a group of words and phrases lacked sufficient originality to receive copyright protection because the translation was a "mechanical process" which failed to capture the "nuances and subtleties of the work").

following: (1) factors supporting the programmer and factors supporting the user as the author of computer-generated works; (2) under what circumstances the computer itself should be considered the author of the work; (3) under what circumstances some combination of the user, programmer, and computer should be considered joint authors of a computer-generated output; (4) enforceability problems; and (5) recommended applications to some actual and hypothetical situations.

A. *Section 102 Of The Copyright Act*

If a human had composed *The Policeman's Beard is Half Constructed*,[48] the work would certainly have been eligible for copyright protection. Why should the result be different if the programmer composes the poetry through the use of a computer program?

1. CONTU's Analysis

Before the days of sophisticated computer programs, an artist using a machine or tool to create an original work could claim copyright protection for the work even if the machine played an integral part in composing the work, because machines were regarded as inert tools.[49] For example, a photograph is authored by the photographer, not the camera or the maker of the camera; a sound

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brief or general and the role of the computer in the design or arrangement process becomes [increasingly] greater, the authorship of the user becomes increasingly difficult to defend.").

[48] RACTER, *supra* note 9.

[49] Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53, 60 (1883) (awarding the photographer a copyright in photographs because the photograph reflected the photographer's "disposition, arrangement, or representation"); *see* Time Inc. v. Bernard Geis Assoc., 293 F. Supp. 130, 143-44, 159 U.S.P.Q. (BNA) 663, 673 (S.D.N.Y. 1968) (holding that copyright of the Zapruder film, showing the Kennedy assassination, was valid).

human creativity, then the creativity being applied may be the programmer's creativity at least as much as the user's creativity.

2. Fixation

The major obstacle for the programmer's claim to copyright ownership is the programmer's failure to fix the computer-generated work in a tangible medium of expression. Nonetheless, under certain factual situations, the programmer may cause fixation of the output through the computer program. An argument that has been suggested favoring awarding rights to the user is that the user, rather than the programmer, is the instrument of "fixation" of the work, because the user is the person who immediately causes the work to be created.[54] However, this argument was rejected in the *Stern Electronics* and *Williams Electronics* video game cases.[55] In *Williams Electronics*, the defendant (the infringer) contended that the programmer did not fix the audiovisual displays because the player's performance determined in part what display appeared on the screen. The Second Circuit rejected the argument because "many aspects of the display remain constant . . . regardless of how the player operates the controls" and this "repetitive sequence of a substantial portion of the sights and sounds of the game" qualifies for copyright protection.[56]

This reasoning applies to any composition program whose output is fairly repeatable. For instance, if the program composes the same poem every time the user types in "tree" as a subject, then it is primarily the programmer, not the user, who is the instrument of fixation. Although it is true that the output would not have been

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[54] Samuelson, *supra* note 2, at 1202.

[55] *See supra* Section II.A.2. and text accompanying notes 23-24.

[56] Williams Elecs., Inc. v. Arctic Int'l, Inc., 685 F.2d 870, 874, 215 U.S.P.Q. (BNA) 405, 408 (2d Cir. 1982); Stern Elecs., Inc. v. Kaufman, 669 F.2d 852, 856, 213 U.S.P.Q. (BNA) 443, 446 (2d Cir. 1981). The court in *Williams Electronics* also noted that there was no player participation involved in some parts of the displays. 685 F.2d at 874, 215 U.S.P.Q. (BNA) at 408.

sufficiently distinguishable variations."[62] Under this standard, the user need not contribute much creativity in order to have created an original work.[63]

However, while the standard is low, the standard is not non-existent. In *Feist*, Justice O'Connor, writing for a unanimous Court, held that a telephone directory failed to meet the originality requirement because it was a mere reproduction of information provided by subscribers.[64] Copyright protection has also been refused to advertising slogans that do not "by [themselves] have some value as a composition."[65] Therefore, a user will not satisfy the originality requirement by typing in "compose" or "tree."

B. *Artificial Intelligence And The Objective Of Copyright Law*

In addition to the requirements of section 102 of the Copyright Act, any solution to the problem of copyright for computer-generated works must conform to the objectives of the Copyright Clause.[66] This discussion begins by examining the question of whether the program itself should receive copyright protection for the works it generates. This illustrates the basic problem presented by intelligent computers; awarding copyright to the one who is the author--in the sense of being the originator or intellectual inventor of a work--does not further the objective of stimulating future creativity.

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[62] Alfred Bell & Co. v. Catalda Fine Arts, Inc., 191 F.2d 99, 105, 90 U.S.P.Q. (BNA) 153, 158 (2d Cir. 1951).

[63] *See* Samuelson, *supra* note 2, at 1202-03.

[64] *Feist*, 499 U.S. at 362, 18 U.S.P.Q.2d (BNA) at 1284.

[65] Higgins v. Keuffel, 140 U.S. 428, 431 (1891); *see also* Alberto-Culver Co. v. Andrea Dumon, Inc., 466 F.2d 705, 711, 175 U.S.P.Q. (BNA) 194, 198 (7th Cir. 1972) (following propositions stated in *Higgins*).

[66] U.S. CONST. art. I, § 8, cl. 8.

the scrutiny that patent applications receive, the registration of *Just This Once* was significant enough that Ralph Oman, the Register of Copyrights, noted the book's registration in his annual speech on the state of the Copyright Office.[71]

While AIs at present cannot be considered authors for copyright purposes, this conclusion may change if (or when) AIs develop to the point that they possess the decision-making capability to decide whether and how to create copyrightable works. The Fictional Human Author Theory is a possible solution to the basic problem presented by AI: what should the law do if awarding the copyright to the "originator" of the of a work will not stimulate future creativity? This Article will examine how a similar dilemma exists between the programmer and user in the case of composition programs.

1. The Purpose Of Copyright Law Precludes Computers From Being Authors . . . For Now

The express purpose of copyright law is to "promote the Progress of Science and useful Arts."[72] Copyright monopolies are not granted to reward authors for their labors, but rather to encourage

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since *The Policeman's Beard is Half-Constructed*:

> Silent vibrations of power emanated from the four men who occupied the plush velvet chairs surrounding the antique cherry wood table supposed to have once been owned by Napoleon.
>
> Actually, the chances were good this meeting was more than the result of an idle rumor. Nick Salerio was a man with a flair for class.

FRENCH, *supra* note 9, at 1.

[71] Remarks by Ralph Oman, Register of Copyrights, 46 Pat., Trademark & Copyright J. (BNA) 395 (Aug. 9, 1993).

[72] U.S. CONST. art. I, § 8, cl. 8.

within the constitutionally-mandated purpose of copyright to grant copyright protection to AIs.[74]

2. The Conflict Between Authorship And Incentive For Creativity

The foregoing analysis illustrates a basic problem presented by AI: the rule of awarding copyright protection to the "originator" of a work conflicts with the objective of awarding copyright protection to promote future creativity. The Supreme Court has repeatedly defined "author" to include a requirement of originality. In the *Trade-Mark Cases*,[75] the Court stated: "The writings which are to be protected are the fruits of intellectual labor . . . founded in the creative powers of the mind."[76] In *Burrow-Giles Lithographic Co. v. Sarony* the Court defined an "author" as "he to whom anything owes its origin; originator; maker; one who completes a work of science or literature."[77] The Court then defined a "writing" as "literary productions of those authors . . . by which the ideas in the mind of the author are given visible expression."[78] The Court described copyright as being limited to "original intellectual conceptions of the author," and emphasized

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[74] *See* Miller, *supra* note 2, at 1066 (awarding copyrights to AIs does not serve the objective of the Copyright Clause because "a computer . . . needs no incentive to produce its output"); Samuelson, *supra* note 2, at 1199 ("[I]t simply does not make any sense to allocate intellectual property rights to machines because they do not need to be given incentives to generate output. . . . Only those stuck in the doctrinal mud could even think that computers could be 'authors.'").

[75] The Trade-Mark Cases, 100 U.S. 82 (1879).

[76] *Id.* at 94.

[77] Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53, 58 (1883); *see also* Feist Publications Inc. v. Rural Tel. Serv. Co., 499 U.S. 340, 345, 18 U.S.P.Q.2d (BNA) 1275, 1278 (1991) ("The originality articulated in *The Trade-Mark Cases* and *Burrow-Giles* remains the touchstone of copyright protection today. . . . It is the very 'premise of copyright law.'" (citations omitted)).

[78] *Burrow-Giles*, 111 U.S. at 58.

to whom the work "owes its origin" would benefit the public by stimulating creativity. The Supreme Court expressed this belief when it stated "encouragement of individual effort by personal gain is the best way to advance public welfare through the talents of authors and inventors."[83] Congress acknowledged this principle by stating in the Copyright Act that ownership of a copyright initially rests in the author or authors of the work.[84] Unfortunately, the principle will have to be re-evaluated in the case of AIs which are capable of authorship, but are not capable of personal gain.

3. The Fictional Human Author Theory

The discussion above established that a sophisticated AI might generate output that is the "intellectual production" of the AI and not attributable either to the user or the programmer. However, the policies of copyright law suggest that the AI should not be awarded copyright protection. Moreover, the AI lacks the discretion to decide whether or not to create future artistic works, the owner of the AI (i.e., whoever owned the rights to operate the AI) typically would have that discretion. One way to provide an incentive for the AI owner to create works is the Fictional Human Author Theory. Under this theory, when a court finds that a given output of AI is "authored" by the AI rather than a person, the court should presume the existence of a fictional human author and assign the copyright to the owner of the AI.[85] Under this theory, the court (or the Copyright Office) finding that *The Policeman's Beard is Half Constructed* is the result of Racter's intellectual effort, would assign the copyright to Chamberlain, who is presumably Racter's owner.[86] If Chamberlain licensed Racter to a computer user, Chamberlain would retain rights to Racter's output

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[83] Mazer v. Stein, 347 U.S. 201, 219, 100 U.S.P.Q. (BNA) 325, 333 (1954).

[84] 17 U.S.C. § 201 (1994).

[85] Butler, *supra* note 67, at 744-45.

[86] A search of Westlaw's database of Copyright Registrations did not reveal any registered copyright for Racter itself.

that the user has certain rights to works generated by the program.[98] The Softkey ClipArt license, discussed above, is an excellent example; the programmer grants to the user the rights to works generated by the program's images, as long as the images are not used to create a product for sale. This arrangement allows users to create documents for personal use, which encourages users to purchase the software, and allows the programmer exclusive rights to sell products based on the clip-art images, e.g., greeting cards. If the programmer wanted to make the program more marketable to users, the programmer could easily do so by granting copyright ownership over output to the user in the software license. This option is the key difference between the user-programmer dispute and the AI problem; there is no licensing option that will give an AI program like Racter the sophistication to decide whether or not to generate future works. Therefore, there is no mechanism to stimulate new creativity by awarding copyright ownership to an AI. Nevertheless, the objection raised here is a strong argument in favor of awarding copyright protection to the user even if the user is not the "originator" of the work.

5. Works For Hire

It has been established that even if the programmer can meet the requirements of section 102, awarding copyright protection to the user may make more sense from a policy standpoint. The user makes the decision whether or not to create the output, and therefore the user should be given incentive for creativity. Although the general rule is that copyright rests in the one who causes the work to be fixed in a tangible medium of expression, Congress and the courts have already established one exception where the work is the intellectual conception of someone other than the person who meets the section 102 requirements. This exception is the work for hire doctrine. Under this doctrine, the author of a "work made for hire" is "the employer or

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[98] *See supra* notes 12-13 and accompanying text; ProCD, Inc. v. Zeidenberg, 86 F.3d 1447, 1455, 39 U.S.P.Q.2d (BNA) 1161, 1167 (7th Cir. 1996) (upholding the enforceability of software shrinkwrap licenses).

and risk of a publisher or producer."[104] Clearly, the concept that the employer should be deemed the owner of the copyright where the owner was the "motivating factor" in the creation of the work was unchanged by the 1976 Copyright Act.

The policy behind the works for hire doctrine is analogous to the problem of computer-generated works. In works for hire, the employee actually fixes the work in a tangible medium of expression. However, the employer is considered the author of the work, because the employer is the "motivating factor in producing the work." For computer-generated works, the program or the programmer (through the program) may actually fix the work and be the "originator" of the work, but the user may have made the decision of whether or not to produce the work. The user, thus, appears to be the "motivating factor in producing the work." Nevertheless, the Court's reasoning in *CCNV v. Reid* suggests that this policy alone cannot override the clear statutory language of section 102 without, at least, a clear statement of intent by Congress to create an exception to section 102. In *CCNV v. Reid*, Justice Marshall showed an unmistakable willingness to leave the policymaking to Congress. The circuit courts had split regarding which test should be applied to determine whether the "author of an original work" was an employee or an independent contractor according to section 101. One interpretation was that the employer owns the copyright of a work for hire whenever the employer retains the right to control, direct, or supervise the product.[105] The Second, Fourth, and Seventh Circuits held that the work was for hire when the employer had actually wielded control with respect to the creation of

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[104] *CCNV v. Reid*, 490 U.S. at 746, 10 U.S.P.Q.2d (BNA) at 1993; *see also* HOUSE COMM. ON THE JUDICIARY, 89TH CONG., SUPPLEMENTAL REPORT OF THE REGISTER OF COPYRIGHTS ON THE GENERAL PROVISION OF THE U.S. COPYRIGHT LAW: 1965 REVISION BILL, COPYRIGHT LAW REVISION PT. 6, at 66-67 (Comm. Print 1965).

[105] *CCNV v. Reid*, 490 U.S. at 738, 10 U.S.P.Q.2d (BNA) at 1989 (citing Peregrine v. Lauren Corp., 601 F. Supp. 828, 225 U.S.P.Q. (BNA) 681 (D. Colo. 1985)).

C. *Joint Authorship*

1. Definition Of Joint Authorship

The Copyright Act defines a "joint work" as "a work prepared by two or more authors with the intentions that their contributions be merged into inseparable or interdependent parts of a unitary whole."[110] Parts of a unitary whole are "inseparable" when they have little or no independent meaning standing alone.[111] On the contrary, parts of a unitary whole are "interdependent" when they have some meaning standing alone but achieve their primary significance because of their combined effect.[112]

Authorities are split regarding whether the contribution of each joint author must be copyrightable or whether the individual contributions do not need to be copyrightable, so long as the combined result of their efforts is copyrightable. Professor Nimmer states that each author's contribution need not be copyrightable.[113] However, the majority of courts support Professor Goldstein's view that each contribution must rise to the level of copyrightable subject matter.[114] The primary reasons that the Nimmer formulation has not been adopted by the courts are: (1) it would restrict the free exchange of ideas by limiting an author's use of existing ideas in a work; and (2) the Goldstein model strikes a more appropriate balance between

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[110] 17 U.S.C. § 101 (1994) (defining "joint work").

[111] Childress v. Taylor, 945 F.2d 500, 505, 20 U.S.P.Q.2d (BNA) 1191, 1194 (2d Cir. 1991).

[112] *Id.*

[113] 1 MELVILLE B. NIMMER, NIMMER ON COPYRIGHT § 6.07, at 6-23 (1996).

[114] 1 PAUL GOLDSTEIN, COPYRIGHT: PRINCIPLES, LAW, AND PRACTICE § 4.2, at 1.2 (1989); Erickson v. Trinity Theatre, Inc., 13 F.3d 1061, 1071, 29 U.S.P.Q.2d (BNA) 1347, 1354 (7th Cir. 1994); *Childress*, 945 F.2d at 507, 20 U.S.P.Q.2d (BNA) at 1196; Ashton-Tate Corp. v. Ross, 916 F.2d 516, 521 (9th Cir. 1990).

such as an interactive version of Scott French's "Hal," might create joint works if it were advertised to allow the user to co-author custom-made romance novels, or if it allowed the user to contribute significant elements of expression in the program output--e.g., details of the characters' appearances or idiosyncratic mannerisms or mottos.

The authors of a joint work are co-owners of the copyrighted work.[120] Each joint owner has an independent right to use or license the use of a copyright, subject to a duty to account to other joint owners for any profits the owner earns from licensing or using the copyright.[121] Therefore, a work that is jointly authored by the programmer and user can be exploited by either the programmer or user, subject only to a duty to account.

2. AIs As Joint Authors

Because a joint author must intend to contribute to a unitary whole, an AI may only be a joint author if the AI has intentionality, the ability to "intend." Current wisdom is that AIs do not possess such intentionality, nor will they until they approach the sophistication of *Star Trek's* "Data."[122] Tal Vigderson suggests that Scott French's Hal computer lacked intentionality to commit copyright infringement, because the value judgments underlying *Just This Once* (such as themes regarding homosexuality) reflect the programmer's values.[123] The computer does not supply the values, because the

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[120] 17 U.S.C. § 201(a) (1994).

[121] Oddo v. Ries, 743 F.2d 630, 633, 222 U.S.P.Q. (BNA) 799, 800-901 (9th Cir. 1984).

[122] "It has been estimated that it would take roughly ten trillion calculations per second to equal the speed of the human brain. It is believed that computers will not reach this speed, economically, [until 2023 A.D.]". Vigderson, *supra* note 67, at 420-21 (citing HANS MORAVEC, MIND CHILDREN: THE FUTURE OF ROBOT AND HUMAN INTELLIGENCE 59-68 (1988)).

[123] *Id.* at 422.

credited with the same intent, and the owner of the copyright to the AI program could be considered a joint author. On the other hand, such a theoretical construction of the FHA would not allow the court to divine intent on the basis of circumstantial evidence, such as whether the contributors billed themselves as co-authors. To evaluate this kind of evidence, the court would have to look at whether the owner of the AI copyright showed the intent that the AI would be a joint author. For instance, the owner of the kaleidoscope program could be considered to have intended to be an FHA joint author if he advertised "kaleidoscope images co-authored by my amazing computer." The court should probably look at both types of evidence, since they are probative as to the underlying issues; whether the copyright protection is being granted to those whom the work "owes its origin," and whether granting the copyright will create incentives for future creativity.

D. *Enforceability*

1. Calling All Copyright Police . . .

A major practical problem with awarding copyright ownership to the programmer is enforceability. Is the user expected to notify the programmer and voluntarily pay royalties every time the user uses the program to generate another work? More likely, the user will have an incentive to conceal the output, and the programmer will have a choice of licensing the software into a shroud of distrust and suspicion or avoid licensing the software altogether.[127] However, this problem is not so different from the problem of enforcing any software license. Once the software is in the user's hands, the programmer must rely on the user's good faith, and whatever policing efforts the programmer can afford to ensure that the user respects the copyright. The programmer already must make sure that the user does not produce unauthorized copies of the software, decompile the software, or make derivative works based on the software. Further,

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[127] Samuelson, *supra* note 2, at 1208.

E. *Recommendation And Application*

Although it would be difficult to formulate a bright-line formula to determine who should own the copyright to every type of computer-generated work, the discussion above illuminates some guidelines that a court could use when faced with a dispute over the copyright ownership of a computer-generated work. The first step of any analysis is whether the computer-generated work is a derivative work based on the program. In other words, does the computer-generated work contain recognizable elements of expression embodied in the computer program (as in the case of clip-art programs and the products of object-oriented programming)[130] or some other work (as in the case of translation programs or colorization programs).[131] If the work is a derivative work, then the owner of the copyright for the underlying work (e.g., the programmer for OOP) has the exclusive right to generate derivative works based on the underlying work.[132]

For computer-generated works that are not derivative works, such as poetry written by computer programs or art work drawn by computer programs, a court must follow a multi-step analysis. First, the court must determine whether the output of the program is repetitive and predictable. If the program generates the same output regardless of the user's input, then the programmer has some claim to have fixed the work in a tangible medium of expression in the computer program.[133] Second, the court must consider whether the user's input meet the test in *Feist* for minimum standards of creativity. The user should not receive a copyright where the user's input is a

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[130] *See supra* Sections II.A., B.

[131] *See supra* Section II.D.

[132] *See supra* Section II.C.

[133] *See supra* Section III.A.2.

Steps (3)-(5) of the test are not applicable, because the computer-generated work is attributable to the programmer.

2. The User As Sole Author

The user might be the sole owner of the copyright to the output of a drafting program, or a word processing program, or any program where the program simply provides tools for the user to manipulate in expressing the user's creativity. Following the proposed analysis: (1) The programmer fails the section 102 fixation requirement, because the output is not repeatable or predictable; (2) the user's input satisfies both the fixation requirement and the *Feist* minimal creativity requirement; (3) joint authorship is not possible because the programmer fails to meet section 102 fixation; and (4) the user, not the computer program itself, is the "originator" of the output. For example, the copyright to this article belongs to the author even though this article is the output of a word processing program, because the article contains the author's fixed expression and not the programmer's or the computer's mind. On the other hand, Racter is the originator of *The Policeman's Beard is Half Constructed*, because Racter's poems do not reflect the user's views on souls, mechanics, or stewardesses.[138]

3. The Programmer And User As Joint Authors

The programmer and the user might be joint authors of the output of a program such as the virtual reality program described in the introduction, where the user's manipulation of a wand created a "musical sculpture."[139] Following the rule: (1) Many features of the output are predictable and repeatable, such as the particular music tones and the appearance of the trail of bubbles in the visual display; (2) the user's choice of individual notes/bubbles made with the wand

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[138] *See supra* text accompanying notes 75-82.

[139] *See* Weber, *supra* note 7, at 175.

5. Fictional Human Author As Sole Author

The owner of the AI will own the copyright to the work on assignment from a FHA for works such as Racter's *The Policeman's Beard is Half-Constructed*. Following the rule: (1) The program output is not repetitive or predictable, so that the programmer does not meet the fixation requirement; (2) no user contribution satisfies *Feist*, because there appears to be no significant user input in the poems and stories in *The Policeman's Beard is Half Constructed*; (3) joint authorship between the programmer and user is not applicable; (4) the program output clearly "owes its origin" to the program itself (in Racter's case, the output of the program is generated at random by Racter, so that the output "owes its origin" to Racter); and (5) awarding copyright protection to the FHA will encourage the FHA to create future works, because awarding the copyrights to the AI (Racter) would not cause Racter to pursue future works. As noted above, the Copyright Office appeared to follow the Fictional Human Author Theory in the registration of *The Policeman's Beard is Half Constructed* by listing Racter as the author of the computer prose and poetry but listing Racter's programmer as the owner of the copyright.[143]

IV. CONCLUSION

It would be convenient to have a bright-line rule that gave consistent and predictable answers, but it may be necessary to settle for a case by case approach that examines specific facts and various contributions to the work's creation.[144]

While the discussion above illustrates guidelines, there can be no bright-line rule. As Professor Miller recognizes in the above-quoted passage, the term "computer-generated works" encompasses too many different types of works with too many different ways to divide the authorship to expect to develop a simple bright-line rule

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[143] *See supra* text accompanying notes 90-93.

[144] Miller, *supra* note 2, at 1059.

within the present system of copyright. This is not to say that the issues cannot be settled. The examples given above show how a handful of principles can lead to at least five different results, all fairly consistent in principle. These problems are not going to go away; they will only get more complex in the future. As more and more software companies address the rights to products generated by their programs as Softkey does in its ClipArt program, it will be interesting to see how courts resolve this issue.

meet the requirements of minimal creativity;[140] and (3) the programmer and user intend their contributions to be parts of a unitary whole; hence, they intend to be joint authors.[141] Both the programmer and the user realize that the other has some stake in the output of the program. It is a common collaboration; one provides the details of sound and appearance, while the other provides the melody and visual pattern. Because the expression is traceable to the user and the programmer, the artificial intelligence provisions of the rule do not apply.

4. The AI As Sole Author

The AI will be the sole owner in situations such as the episodes of *Star Trek: The Next Generation* where the AI character "Data" creates music, art, or other copyrightable work. Again following the rule: (1) The programmer of the AI (whoever designed Data) fails the fixation requirement because Data's art work is not repeatable or predictable; (2) there is no "user" of Data (in other words, Data produces art work on his own); (3) joint ownership is not applicable because there is no user; (4) the works generated by Data meet the section 102 requirements (sculpture or painting would meet fixation and originality for Data as easily as they would for a human); and (5) the AI possesses the discretion over whether to produce future works, and therefore, the Copyright Office or courts should award copyright protection to the AI, which would encourage the AI to create future creative works.[142]

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[140] "A copyist's bad eyesight or defective musculature, or a shock caused by a clap of thunder, may yield [copyrightable work]." Alfred-Bell v. Catalda, 191 F.2d 99, 105, 90 U.S.P.Q. (BNA) 153, 158 (2d Cir. 1951).

[141] *See supra* Section III.C.1.

[142] *See supra* Section III.B.1.

simple command, such as "run" or "compose."[134] Third, if both the programmer and the user meet the requirements of fixation and originality (i.e., if the first two inquiries are both "yes"), then the court must examine whether the programmer and user intended to be joint authors. If they did so intend, then they are joint authors.[135] Fourth, a court must determine whether the computer-generated work contains blocks of expression attributable neither to the programmer nor the user. For instance, if the computer program generates a poem that is not repetitive or predictable, and the user's contribution is minimal, then the author of the poem may be the computer program (the AI) itself. Finally, if the court finds that the AI itself authored a work, then it must examine whether the AI has the sophistication to decide whether it will generate future works.[136] If awarding the copyright to the AI will stimulate the AI to create future works, then the AI should receive copyright protection; if not, then the court should assign the copyright to the owner of the computer program under the Fictional Human Author Theory.[137] The remainder of this section will apply these rules to some of the examples of computer-generated works described in the introduction.

1. The Programmer As Sole Author

The programmer might be the sole copyright owner of output to the kaleidoscope program that was given as an example at the outset of this article, if the output is repeatable and the user input is limited. Following the multi-step analysis: (1) A substantial portion of the program output is repeatable and predictable, because the program will generate the same kaleidoscope images every time the user inputs the word "tree;" (2) the user's input of a single word "tree" fails to meet the minimum standards of creativity according to *Feist*.

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[134] *See supra* Section III.A.3.

[135] *See supra* Section III.C.1.

[136] *See supra* Sections III.B.1., 2.

[137] *See supra* Section III.B.3.

if the programmer had rights to the output, then the programmer would also have to ensure that the user is not selling products generated by the software.

2. Which Program Generated This Output?

Another enforceability problem is identifying infringers. It is extremely difficult to determine whether a particular work was generated by the program in general, and even harder to idenitify whether a work was generated by a particular user's copy of a particular program, since a number of users will likely have identical software.[128] One possible solution for the programmer is that sometimes details of the computer output will indicate if it was generated by a particular program. In the *Williams Electronics* video game case, the audiovisual display generated by the infringer's program was shown to have been produced by a copy of the copyright holder's program. This showing was made in-part because the infringer's audiovisual display wrongly computed the score of the game, following an error in the copyrighted program itself, and in-part because the high scores of the infringer's audiovisual display contained the initials of the employees of the copyright holding company, including its president.[129]

Another solution is that the circumstances might indicate if the program user is violating the license. If a greeting card producer owns a Softkey ClipArt license, for example, and starts selling a line of greeting cards incorporating the ClipArt images, it will be pretty clear that the card maker's copy of the program is the copy of the program which was used to generate the copyright-infringing cards.

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[128] *Id.*

[129] Williams Elecs., Inc. v. Artic Int'l, Inc., 685 F.2d 870, 876 n.6, 215 U.S.P.Q. (BNA) 405, 411 n.6 (3d Cir. 1982).

computer has nothing to say about sexuality. Lawrence B. Solum suggests that even if computers learn to simulate intentionality, they will never truly have intentionality because they have no grasp of "meaning" to do things and because they could always be reprogrammed.[124] Perhaps Vigderson and Solum would change their minds if AIs approached the sophistication of "Data."[125] If or when this comes to pass, the issues surrounding AIs will extend beyond copyright, because AIs that possess intentionality are also likely to possess free will, and a larger issue will arise over whether AIs should be given constitutional rights such as freedom from slavery or freedom of speech. Until that time, however, it seems fair to say that Chamberlain's Racter and Scott French's Hal lack intentionality.

A more pressing question is whether FHAs may be joint authors. As noted above, the FHA is human, so the FHA does not suffer from an AI's inborn lack of intentionality. However, in determining whether an FHA intended to be a joint author, whose intent should be considered? Following the concept of the FHA, the court might try to reconstruct a human who made the same contribution as the AI. The court could then determine whether the contribution was significant enough to typically make the contributor a co-author.

For instance, if an artist agreed to draw a kaleidoscope image of a pattern that the user supplied, the artist would probably undertake the drawing with the intention of being at least a joint author.[126] Therefore, an AI with the same contribution could be

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[124] Solum, *supra* note 67, at 1267.

[125] For anyone who thinks "Data" is an unrealistic possibility, compare how far AIs have progressed in the nine years between *The Policeman's Beard is Half Constructed* and *Just This Once*. *Compare supra* note 43 *with supra* note 70.

[126] Assuming, of course, that this would not be a "work for hire." *See* 17 U.S.C. §§ 101, 201(b) (1994) (stating that the author of a work prepared by an employee in the scope of employment is the employer unless expressly agreed otherwise). *See also supra* Section III.A.5.

copyright law and contract law by allowing any person to endow another with authorship status by contract and by not allowing parties to use contract law to convert uncopyrightable matter into copyrightable matter.[115] This rule suggests that to be considered joint authors both the programmer and the user must meet the requirements of section 102.

Another key aspect of joint authorship is the nature of the intent that each joint author must entertain at the time of each joint author's creation. Although the statute simply states that each must intend that their contributions be merged into a unitary whole, the courts have interpreted this to mean that they must intend to be joint authors; i.e., they must intend for each contributor to have an interest in the copyright.[116] The reasoning for this interpretation is that persons such as editors, peer reviewers, and research assistants intend their contributions to be merged into the unitary whole, but they do not expect to be accorded the status of joint authorship. To accord them a half-interest in the copyrighted work would result in few authors seeking peer review, which is an unpalatable result.[117] In the case of authorship of traditional literary or dramatic works, the intention of the parties is divined from factual circumstances such as whether both contributors are billed as co-authors in publicity materials,[118] and whether the contributions of one party typically result in co-authorship.[119] Under this rule, any composition program,

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[115] *Erickson*, 13 F.3d at 1071, 29 U.S.P.Q.2d (BNA) at 1354; *Childress*, 945 F.2d at 507, 20 U.S.P.Q.2d (BNA) at 1196.

[116] *Erickson*, 13 F.2d at 1069, 29 U.S.P.Q.2d (BNA) at 1352-53; *Childress*, 945 F.2d at 507-508, 20 U.S.P.Q.2d (BNA) at 1196-97.

[117] *Childress*, 945 F.2d at 507, 20 U.S.P.Q.2d (BNA) at 1196.

[118] *Erickson*, 13 F.3d at 1072, 29 U.S.P.Q.2d (BNA) at 1355-56.

[119] *Childress*, 945 F.2d at 509, 20 U.S.P.Q.2d (BNA) at 1198 (contributing ideas about a play's presentation and minor details of expression did not make an actor a co-author); *Ashton-Tate*, 916 F.2d at 520 (finding that contribution of ideas and guidance of a user interface did not make contributor a joint author).

the work.[106] The Fifth Circuit held that the work was for hire if the author is an "employee" as defined by general agency at common law.[107]

By focusing on the actual control wielded by the employer, the Second Circuit's interpretation would have given copyright protection to the employer whenever the employer had actually been, through the employer's control over the work's development, the "motivating factor" in causing the work to be created. Nevertheless, because the text of the statute did not support the actual control test and Congress' use of the term "scope of employment" in section 101(1) suggested an intent to incorporate a widely used term of art in agency law,[108] the Court adopted the Fifth Circuit's test, stating: "Sound though other distinctions might be as a matter of copyright policy, there is no statutory support for an additional dichotomy between commissioned works that are actually controlled and supervised by the hiring party and those that are not."[109] Clearly, Justice Marshall recognized the appeal of the actual control test, but felt constrained by the clear meaning of the statutory text and a clear statement of Congressional intent. Unless Congress affirmatively acts to make exceptions to computer-generated works or works generated by AIs, it is unlikely that the Court will create any exception to section 102(a) on the basis of policy alone.

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[106] *Id.* at 739, 10 U.S.P.Q.2d (BNA) at 1989 (citing Brunswick Beacon, Inc. v. Schock-Hopchas Pub. Co., 810 F.2d 410, 1 U.S.P.Q.2d (BNA) 1701 (4th Cir. 1987); Evans Newton Inc. v. Chicago Sys. Software, 793 F.2d 889, 230 U.S.P.Q. (BNA) 166 (7th Cir. 1986); Aldon Accessories Ltd. v. Spiegel, Inc., 738 F.2d 548, 222 U.S.P.Q. (BNA) 951 (2d Cir. 1984)).

[107] *CCNV v. Reid*, 490 U.S. at 739, 10 U.S.P.Q.2d (BNA) at 1989 (citing Easter Seal Soc'y for Crippled Children & Adults, Inc. v. Playboy Enters., 815 F.2d 323, 2 U.S.P.Q.2d (BNA) 1585 (5th Cir. 1987)).

[108] *Id.* at 740, 10 U.S.P.Q.2d (BNA) at 1990.

[109] *Id.* at 742, 10 U.S.P.Q.2d (BNA) at 1991; *see also Easter Seal Soc'y*, 815 F.2d at 334, 2 U.S.P.Q.2d (BNA) at 1594 ("[T]here is simply no way to milk the 'actual control' test of *Aldon Accessories* from the language of the

other person for whom the work was prepared" unless there is a written agreement to the contrary.[99]

The concept behind the work for hire doctrine is that the employer receives the copyright because even though technically the employee meets the requirements of section 102, the employer is really the driving force behind the creation of the work. Prior to the 1976 Copyright Act, courts granted a copyright to the employer where the employee's work was created at the "instance and expense of the employer, or in other words, when the 'motivating factor in producing the work was the employer who induced the creation.'"[100] Although codification by the 1976 Copyright Act produced a dispute over how much control the employer could exercise over the creative process,[101] the basic concept remained unchanged.[102] In *CCNV v. Reid*,[103] Justice Marshall noted that Congress had expanded the works for hire doctrine to include certain types of independent contractors, but that Congress chose to include these categories specifically; these types of works were ordinarily prepared "at the instance, direction,

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[99] 17 U.S.C. § 201(b) (1994); Community for Creative Non-Violence v. Reid, 490 U.S. 730, 737, 10 U.S.P.Q.2d (BNA) 1985, 1989 (1989) [hereinafter *CCNV v. Reid*].

[100] Murray v. Gelderman, 566 F.2d 1307, 1311, 197 U.S.P.Q. (BNA) 142, 145 (5th Cir. 1978) ("[T]he fact that appellant authored the book in the technical sense is immaterial under the works for hire doctrine."); Siegel v. National Periodical Publications, 508 F.2d 909, 914, 184 U.S.P.Q. (BNA) 257, 260 (2d Cir. 1974) (quoting Picture Music, Inc., v. Bourne, Inc., 457 F.2d 1213, 1216, 173 U.S.P.Q. (BNA) 449, 450-51 (2d Cir. 1972)).

[101] *CCNV v. Reid*, 490 U.S. at 739-751, 10 U.S.P.Q.2d (BNA) at 1989-95 (discussing and resolving the circuit split in favor of a rule that the term "employee" in the statute is to be construed in light of the general common law of agency).

[102] H.R. Rep. No. 94-1476, at 62 (1976), *reprinted in* 1976 U.S.C.C.A.N. 5659, 5736 ("There is no need for a specific statutory provision concerning the rights and duties of coowners [sic] of a work; court-made law on this point is left undisturbed.").

[103] 490 U.S. 730, 10 U.S.P.Q. 2d (BNA) 1985 (1989).

copyrights may be transferred by any means of conveyance, and that the new owner is entitled to all the protection and remedies accorded to the original owner.[97]

4. The Parallel Between The AI Problem And The Dispute Between Programmers And Users

In the AI setting, a computer may be the source of a work's creativity, but awarding the copyright to the computer fails to achieve the objective of copyright law: computers will not be stimulated to generate future works. Now apply this reasoning to a dispute between a programmer and user. Maybe the programmer supplied the creativity, and the user only typed in the word "compose." The resulting composition "owes its origin" to the programmer, but the user has made the decision whether or not to create the output. The programmer in this case made the decision whether or not to create the program, and for that decision the programmer was awarded the copyright for the program itself. Assigning the rights to the user will give the user more incentive to operate the program and generate new works. It will also encourage the user to purchase or license the program from the programmer. Here, by giving the user more incentive to license or purchase programs, the programmer is likewise encouraged to create more programs. In this sense, the same reasoning that suggests that AIs should not be awarded copyright ownership also suggests that users should be awarded copyrights to computer-generated works even if they are not the "originators" of the work.

However, it seems illogical to say that programmers will have more incentive to develop creative programs if they have fewer rights regarding those programs. A programmer could always make the program more attractive to users by specifying in the software license

[97] 17 U.S.C. § 201(d) (1994).

that an author must be able to prove "the existence of those facts of originality, of intellectual production, of thought, and of conception."[79]

In applying these definitions to *The Policeman's Beard is Half Constructed*, who is the "originator" of the work? Consider an excerpt:

> Awareness is like consciousness. Soul is like Spirit. But soft is not like hard and weak is not like strong. A mechanic can be both soft and hard, a stewardess can be both weak and strong. This is called philosophy or a world view.[80]

Is this an expression of Bill Chamberlain's ideas regarding souls, mechanics, and stewardesses, or is Racter the "originator" of the poem? In his introduction to *The Policeman's Beard is Half Constructed*, Chamberlain states that "the programmer is removed to a very great extent from the specific form of the system's output. This output is no longer of a preprogrammed form. Rather, the computer forms output on its own."[81] Clearly, Racter is the "originator" of the poem. The Copyright Office may have acknowledged this fact when they registered Racter as the author of *The Policeman's Beard is Half Constructed*.[82]

The other prong of the dilemma has already been established: awarding a copyright to Racter does not further the objective of the Copyright Clause, because it will not stimulate future creativity. Before AI, the law assumed that awarding the copyright to the person

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[79] *Id.* at 58-60; *see also Feist*, 499 U.S. at 346-347, 18 U.S.P.Q.2d (BNA) at 1278.

[80] RACTER, *supra* note 9.

[81] *Id.*

[82] The Copyright Office registered *The Policeman's Beard is Half Constructed* listing Racter as the author, Joan Hall as illustrator, and William Chamberlain as author of the introduction. RACTER, *supra* note 9.

authors to generate works of authorship for society's benefit.[73] When considering whether to give a copyright to an AI, the Copyright Office and the courts must consider whether such a copyright will encourage the AI or other authors to generate future works for society's benefit. In other words, will Racter generate more works as a result of receiving copyright protection for *The Policeman's Beard is Half Constructed*? Certainly not, because Racter does not make the decision whether or not to generate output. William Chamberlain, Racter's programmer, owner, and user, makes that decision. While Chamberlain might use Racter more in the future if Racter's works are protected from infringement, this is only true if Chamberlain can profit by publishing Racter's output. Such profits would be curtailed if Chamberlain is powerless to sue others for infringing *The Policeman's Beard is Half Constructed* or Racter's other works. Therefore, Chamberlain should be encouraged to generate future works, not Racter.

This conclusion will continue to hold until AIs develop the sophistication such that the AIs have discretion over whether they will generate artistic works. For example, the fictional character "Data" on the television series *Star Trek: The Next Generation* is an AI and a violinist, sculptor, and painter in his free time. Awarding copyright protection to Data might encourage Data or other AIs to spend more time creating artistic works, so it might make sense to award Data copyright protection for its creations. However, until technology bridges the gap from Racter to Data, it will not make sense

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[73] Sony Corp. of Am. v. Universal City Studios, 464 U.S. 417, 429, 220 U.S.P.Q. (BNA) 665, 674 (1984) ("The sole interest of the United States and the primary object in conferring monopoly lie in the general benefits derived by the public from the labors of authors." (citations omitted)); Mazer v. Stein, 347 U.S. 201, 219, 100 U.S.P.Q. (BNA) 325, 333 (1954) ("The economic philosophy behind the clause empowering Congress to grant patents and copyrights is the conviction that encouragement of individual effort by personal gain is the best way to advance public welfare . . . .").

Whether an Artificial Intelligence ("AI") should be recognized as the author of a copyrightable work is one of the most puzzling problems in copyright law. A full discussion of the philosophical, moral, constitutional, and practical issues regarding what sorts of legal rights a computer program itself can or should have is beyond the scope of this paper.[67] While there are many differing viewpoints regarding whether AIs should be considered authors, clearly the problem is no longer purely speculative. CONTU stated that "the development of this capacity for 'artificial intelligence' has not yet come to pass, and indeed, it has been suggested to this Commission that such a development is too speculative to consider at this time."[68] However, in 1985 the Copyright Office granted copyright registration for *The Policeman's Beard is Half Constructed*, listing the programmer and illustrator as copyright owners, but listing the computer program "Racter" as the author.[69] In 1993, the Copyright Office registered *Just This Once*, a novel written by an AI program named "Hal" that was programmed to mimic the works of late romance author Jacqueline Susann.[70] While it is true that copyright registrations do not receive

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[67] Many attempts have been made to solve this problem and its corollaries. *See generally* Karl F. Milde, Jr., *Can a Computer be an "Author" or an "Inventor?,"* 51 J. PAT. OFF. SOC'Y 378 (1969); Miller, *supra* note 2, at 1066 (concluding that AIs should not be authors because computers need no incentive to produce their output); Dan Rosen, *A Common Law for the Ages of Intellectual Property*, 38 U. MIAMI L. REV. 769 (1984); Samuelson, *supra* note 2, at 1185; Lawrence B. Solum, *Legal Personhood for Artificial Intelligences*, 70 N.C. L. REV. 1231 (1992); Timothy L. Butler, Note, *Can a Computer be an Author? Copyright Aspects of Artificial Intelligence*, 4 COMM./ENT. L.J. 707 (1982); Tal Vigderson, Comment, *Hamlet II: The Sequel? The Rights of Authors vs. Computer-Generated "Read-Alike" Works*, 28 LOY. L.A. L. REV. 401 (1994) (discussing whether a romance novel written by an AI that was programmed to mimic author Jacqueline Susann might inappropriately copy Susann's style).

[68] CONTU, *supra* note 2, at 44.

[69] RACTER, *supra* note 9.

[70] Scott French, Hal's programmer, is listed as the author, and the registration lists the work as "an original and computer aided text." The [illegible] of *Just This Once* illustrate how far AI has progressed

created "but for" the user's act of typing, the limited nature of the user's role in fixation can be seen by the repeatability of the output. After all, it would be strange to ascribe authorship to the user where the same output would have been generated no matter which human author caused the output to be generated.[57] However, this argument is weaker in cases where there are, say, fifty poems that might be generated in response to a user inputting "tree," and the argument fails in cases where the program output is different each time the program is run.[58] Therefore, the programmer can generally only satisfy the fixation requirement where the output is repetitive or predictable.[59]

3. Originality

The requirement of originality is the major obstacle to the user's claim to copyright protection, even though the standard of originality is low. To be copyrightable, a work need only be original to the author and possess some minimal degree of creativity.[60] "To be sure, the requisite level of creativity is extremely low, even a slight amount will suffice."[61] In fact, "a copyist's bad eyesight, or defective musculature, or a shock caused by a clap of thunder, may yield

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[57] Samuelson, *supra* note 2, at 1206-07.

[58] According to the developers, Racter never repeats itself because it contains no stock responses and has its own "eccentric personality." *Have a Talk With Your Computer*, BYTE, April 1985, at 445.

[59] A disturbing aspect of this conclusion is that those programs whose output is least repeatable may require the most creativity from the programmer, i.e., the hardest program to create is the program that thinks for itself. However, when programs can truly be said to think for themselves, the copyrights may go to the programs themselves and not the programmers. *See infra* Sections III.B., C.

[60] Feist Publications Inc. v. Rural Tel. Serv. Co., 499 U.S. 340, 345, 18 U.S.P.Q.2d (BNA) 1275, 1278 (1991) (citation omitted).

[61] *Id.*

recording of birds in a forest is authored by the person placing the recorder, not the recorder itself or the maker of the recorder.

CONTU concluded that users of computers should similarly be awarded the copyrights to the program output, because:

> the computer, like the camera or typewriter, is an inert instrument, capable of functioning only when activated directly or indirectly by a human . . . . [the computer] affects the copyright status of a resultant work no more than the employment of a still or motion picture camera, a tape recorder, or typewriter.[50]

Although the CONTU report was issued in 1978, in 1993 Professor Miller quoted a leading scholar on artificial intelligence as saying that artificial intelligence was still striving to emulate the intelligence of a cockroach.[51]

However, given the examples provided above describing computer-composed poetry, music, and art,[52] it seems inaccurate to say that a computer program that composes music or writes poetry contributes no more creativity than a camera. Nearly a decade after the CONTU report, the Office of Technology Assessment issued a report questioning CONTU's conclusion, stating: "[I]t is misleading . . . to think of programs as inert tools of creation. . . . Moreover, CONTU's comparison of a computer to other instruments of creation begs the question of whether interactive computing employs the computer as co-creator, rather than as an instrument of creation."[53] It might be said that even if the computer is a mere tool for applying

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[50] CONTU, *supra* note 2, at 45-46.

[51] Miller, *supra* note 2, at 1037.

[52] *See supra* text accompanying notes 43-45.

[53] U.S. CONGRESS, OFFICE OF TECHNOLOGY ASSESSMENT, INTELLECTUAL PROPERTY RIGHTS IN AN AGE OF ELECTRONICS AND INFORMATION 72 (1986)

III. OWNERSHIP OF NON-DERIVATIVE WORKS

A different question is presented where the computer program is the primary source of creativity for the computer-generated work, but the computer-generated work does not contain copies of any expressions contained in the program. Programs that write poetry,[43] compose music,[44] or create art ("composition programs"), [45]may generate copyrightable works but may require limited user input, for example, typing in the word "compose." In these cases where the computer-generated work clearly contains the original work fixed in a tangible medium of expression that should qualify it for copyright protection, but the user has not contributed the minimum originality that would give the user a copyright,[46] it seems fair to award the copyright to the programmer.[47] This section will explore the

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[43] RACTER, *supra* note 9 (containing computer generated short story attempt at a Shakespearean scene, limericks, dialogues, and conversations in which Racter puts questions to the programmer and then spins freely from the responses to users' questions with random yet coherent sentences.). For example:

> A hot and torrid bloom
> Which fans wise flames and begs to be
> Redeemed by forces black and strong
> Will now oppose my naked will
> And force me into regions of despair.

Id.

[44] Rory O'Connor, *PC as Ersatz Composer Creates a Controversy*, SAN DIEGO UNION-TRIB., June 6, 1995, at 3.

[45] Don O'Briant, *The Latest in Music, Videos, and Books*, ATLANTA J. & CONST., July 18, 1996, at 9E.

[46] *See, e.g.*, Feist Publications Inc. v. Rural Tel. Serv. Co., 499 U.S. 340, 18 U.S.P.Q.2d (BNA) 1275 (1991); *see infra* Section III.A.3.

[47] RAYMOND T. NIMMER, THE LAW OF COMPUTER TECHNOLOGY ¶ 1.14, at 1-88 (1989) ("[W]here the computer generates detailed graphics with minimal input from the user, the creative input comes from the author of the program, and the program author owns the copyright."); Samuelson, *supra* note 2, at 1201 ("[W]hen the user's instructions become increasingly

screenplay based on the screenwriter's original expression in the screenplay.[38]

D. *Programs Such As Translation Programs Create Derivative Works Based On The User's Input*

Another distinction that must be made is between a derivative work based on the program, and a derivative work based on the user's input. A program such as Softkey's ClipArt would produce a derivative work based on the expressions contained in the program. In contrast, a program that translates a user's document from one language to another,[39] a program that allows the user to manipulate a digitally processed image,[40] or a program that allows the user to colorize a motion picture provided by the user,[41] would all create works that, if derivative, would be based on the user's input and not the program.

The ClipArt program is somewhat the converse of a translation or a digital image processing program. In the ClipArt program, the

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[38] *Id.; see also* G. Ricordi & Co. v. Paramount Pictures, Inc., 189 F.2d 469, 471, 89 U.S.P.Q. (BNA) 289, 290 (2d Cir. 1951) (discussing relationship between a motion picture, opera, and play that were all based on a novel).

[39] For example, MicroTrac Software's *Spanish Assistant for Windows* is able to translate Spanish or English documents.

[40] *See generally*, Pamela L. Kunath, *Lights, Camera, Animate! The Right of Publicity's Effect on Computer-Animated Celebrities*, 29 LOY. L.A. L. REV. 863 (1996) (analyzing the right of publicity for celebrities whose images have been digitally manipulated as in the movie *Forest Gump*); John Gastineau, *Bent Fish: Issues of Ownership and Infringement in Digitally Processed Images*, 67 IND. L.J. 95 (1991); *see also* Folio Impressions, Inc. v. Byer Cal., 752 F. Supp. 583, 589, 18 U.S.P.Q.2d (BNA) 1137, 1141-42 (S.D.N.Y. 1990) (holding that computer clip-art manipulation of floral fabric patterns involved merely trivial originality), *aff'd*, 937 F.2d 759, 19 U.S.P.Q.2d (BNA) 1418 (2d Cir. 1991).

[41] The Copyright Office provided notice that "claims to copyright in certain computer-colorized versions of black and white motion pictures may be registered." 52 Fed. Reg. 23,443 (1987).

contained in the code of the Hypercard or ROSE program.[30] The primary difference between clip-art and OOP is that the user of an OOP may exert more creativity in selecting and arranging the objects from the original program into the output. The user of an OOP is not merely cutting-and-pasting images from the user interface onto the output document as the clip-art user might be doing. The OOP user must supply the functional design or flowchart for the output program, and that is often the most difficult stage of the programming process.

C. *The Programmer And User May Share The Bundle Of Rights To Works Generated By OOP Or Clip-Art Programs*

So far we have seen that for programs such as clip-art and OOP, the programmer owns a copyright to expressions that are contained in the program. Works that are generated by the program, which recognizably incorporate these expressions, are derivative works based on the computer program.[31] Consequently, the user should not receive copyright protection for works generated by clip-art or OOP, because the programmer has the exclusive right to generate derivative works based on the programmer's copyrighted material.[32] Clearly, this result runs contrary to the expectations of both the programmer and the user. Why purchase an OOP system if you cannot use it to generate your own code? Nevertheless, the result is required, because works containing verbatim copies of copyrighted

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[30] *See supra* text accompanying notes 13, 16.

[31] *See supra* Section II.A.1.

[32] 17 U.S.C. §§ 103(a), 106(2) (1994) (stating that the author of a derivative work does not receive protection for any part of the work in which the subject material was contained unlawfully); *see also* CONTU, *supra* note 2, at 45-46 ("[I]t is, of course, incumbent on the creator of the final work to obtain appropriate permission from any other person who is the proprietor of a program or database used in the creation of the ultimate work.").

audiovisual displays were copyrightable, the Second Circuit described how the creative process involved in programming the computer to generate an audiovisual image gave the programmer a copyright in the audiovisual work generated:

> Someone first conceived what the audiovisual work would look and sound like. Originality occurred at that point. Then the program was written. Finally, the program was imprinted into the memory devices so that, in operation with the components of the game, the sights and sounds could be seen and heard. The resulting display satisfies the requirement of an original work.[23]

The audiovisual display is protected, not as an element of the computer program copyright, but as a separate original work, because it is conceived and fixed in a tangible medium by the programmer.[24] The computer program functions only as the medium in which the expression is fixed.[25]

This process of creation and fixation is readily analogous to the clip-art program. In both cases the programmer conceives of a copyrightable expression and imprints the expression into the program so that it is available to the user. At that point, the programmer has a copyright in the expression, having fixed the

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[23] *Stern Elecs.*, 669 F.2d at 856-857, 213 U.S.P.Q. (BNA) at 446. The two basic elements for an expression to be protected by copyright are: (1) the subject of copyright must be an original work of authorship; and (2) the work must be fixed in a tangible medium of expression. 17 U.S.C. § 102 (1994).

[24] The *Stern Elecs.* analysis assumes that every combination of sights and sounds was anticipated and programmed by the programmer. 669 F.2d at 855-57, 213 U.S.P.Q. (BNA) at 446. An audiovisual display that was randomly generated or otherwise not anticipated by the programmer would not be fixed in a tangible medium under the test formulated here.

[25] *Id.*

work.[16] To state this in practical terms, the secondary work is derivative of the primary work if there is a "substantial similarity" between the two works, such that "an average lay observer would recognize the alleged copy as having been appropriated."[17] Therefore, the computer generated work is not a derivative of the program unless the generated work bears a recognizable resemblance to expressions contained in the computer program. In a case such as the Softkey ClipArt program, a computer-generated document might contain, for instance, an image of a sunflower that was pasted into the document from the clip-art library. The document would be a derivative work based on the clip-art program if the document's sunflower bore a recognizable resemblance to the sunflower contained in the clip-art program.

Creating works using a clip-art program is analogous to creating works using a book of images: the images can be cut or copied by the user and pasted into the user's document, but the programmer and book author are the original authors of the images.

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[16] H.R. REP. NO. 94-1476, at 62 (1976), *reprinted in* 1976 U.S.C.C.A.N. 5659, 5675 ("[T]o constitute a violation of section 106(2), the infringing work must incorporate a portion of the copyrighted work in some form."). Professor Samuelson also believes that the requirement is supported by the text of section 101, because the examples provided by the section 101 definition of derivative work all involve blocks of expression taken from an original work, i.e., translation, musical arrangement, dramatization, fictionalization, motion picture version, sound recording, art reproduction, abridgement, and condensation. Samuelson, *supra* note 2, at 1215 (discussing 17 U.S.C. § 101). For example, an unauthorized screenplay is only a derivative work of a novel if the screenplay incorporates expression from the novel. *Id.* at 1211 n.103.

[17] Steinberg v. Columbia Pictures Indus., 663 F. Supp. 706, 711, 3 U.S.P.Q.2d (BNA) 1593, 1596 (S.D.N.Y. 1987) (citation omitted); Berkic v. Crichton, 761 F.2d 1289, 1291 n.1, 226 U.S.P.Q. (BNA) 787, 788 n.1 (9th Cir. 1985); Litchfield v. Spielberg, 736 F.2d 1352, 1357, 222 U.S.P.Q. (BNA) 965, 968 (9th Cir. 1984). Although the "average layperson" test is no longer used to compare computer source code, Computer Assoc. Int'l. v. Altai, Inc., 982 F.2d 693, 713 (2d Cir. 1992); Whelan Assoc., Inc. v. Jaslow Dental Lab., Inc., 797 F.2d 1222, 1232-33, 230 U.S.P.Q. (BNA) 481, 487-88 (3d Cir. 1986), in this case, the derivative work would have only copied the clip-art images, not the source code, from the computer program.

Copyright Act,[11] but which is faithful to the purpose of copyright law. Under this theory, where neither the programmer nor the user meet the requirements of authorship to a copyrightable work, the court should assign the copyright to whoever owns the copyright to the computer program. This article will then examine the issues of joint authorship and problems of enforceability.

Finally, this Article will summarize a set of guidelines, including a five step rule for non-derivative computer-generated works and give several examples of how the rule would be applied in varying factual situations.

II. OWNERSHIP OF COMPUTER-GENERATED DERIVATIVE WORKS

A. *Programs Such As Clip-Art Libraries Generate Derivative Works Based On The Program*

The easy case for the programmer is where the program simply allows the user to "cut-and-paste" images contained in the program into the user's computer-generated document. For example, Softkey's *PC Paintbrush ClipArt Library* is a computer program that allows the user to paste images from the program into the user's document. The box cover states that "Images are royalty free if documents are not for resale" and the *End User License Agreement* states: "You may . . . [m]ake copies of the digitalized images contained on the Product for use in advertisements, public or private presentations, business communications, multi-media presentations, and other uses as long as the images are not used to create a product for sale."[12] Clearly,

[11] 17 U.S.C. §§ 101-201 (1994).

[12] Softkey, End User License Agreement (Jan. 1995) (on file with the *AIPLA Quarterly Journal*).

At least two books written by computer programs have been awarded copyrights by the Copyright Office.[9] If the programmer of one of these programs sold the program to someone else, and the buyer used the program to generate a new book, who would be the author of the new book?

Perhaps most significant is that an enormous amount of computer software produced today is written via Object-Oriented Programming ("OOP"), whereby a software development system allows the user of the system to write new programs simply by arranging subroutines contained in the development system in much the same way as new houses are built from prefabricated components. Can the user claim to be the author of the works generated by the OOP system if the user has not written a single line of code? Can the programmer restrict the user from using the OOP system to compete with the programmer?

Clearly, works generated by computer programs come in all shapes and sizes. This article will illustrate the differences among certain computer-generated works and suggest guidelines for a coherent system of assigning copyright that is reasonably faithful to the existing copyright statute and its policies, and is comprehensive enough to deal with the wide variety of computer-generated works.

Section II deals with copyright ownership of computer-generated derivative works. For programs such as clip-art programs where the program's output are copies of images or expressions contained in the program itself, the programmer should own the copyright to the output. For other programs such as translation programs or image processing programs, the output may be

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[9] *See* SCOTT FRENCH, JUST THIS ONCE (1993) (Copyright Registration No. TX-3-633-395, romance novel written primarily by a computer program named Hal that was programmed to mimic the style of author Jacqueline Susann); RACTER, THE POLICEMAN'S BEARD IS HALF CONSTRUCTED (1984) (Copyright Registration No. TX-1-454-063, computer generated prose and poetry).

from principles that were established in the 1800s in connection with technology that was clearly no more than a tool of the user, such as a camera or typewriter.[3] However, as computer programs become more and more sophisticated--so that more and more of the creativity in a program's output derives from the computer program rather than the user--it becomes clear that a more sophisticated test is required to serve the interests of justice and the goals of the copyright laws.

A few real world examples demonstrate the wide variety of disputes that might result from a failure to formulate clear rules on copyright authorship of computer-generated works and address the issue in software licensing. In computerized clip-art programs, a program supplies images that the user can cut-and-paste into the user's own documents.[4] Can the user of one of these programs use the images to produce a line of greeting cards for worldwide sale? In digital image processing programs, the user supplies images, and the program modifies the images at the user's direction. Do the rights to the modified images belong to the copyright owner of the original image, or the programmer of the image-processing program, or the user of the image-processing program?

Musical Digital Interface ("MIDI") technology allows any user to generate music as if the user has an entire orchestra at his

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Computer-Generated Works, 47 U. PITT. L. REV. 1185, 1192 (1986) ("[T]he user of a computer generator program should be considered the author of a computer-generated work, and should be free to exploit this product commercially.").

[3] Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53, 60 (1883) (copyright to photographs awarded to photographer); *see also* CONTU, *supra* note 2, at 45-46 ("[T]he computer affects the copyright status of a resultant work no more than the employment of a still or motion-picture camera, a tape recorder, or a typewriter.").

[4] Among the licenses from about a dozen commercial clip-art libraries, two licenses stated that the user of the software was not permitted under the license to republish the clip-art images. *See infra* text accompanying notes 12-13.

nucleotides. It does not seem fair or logical that nearly the same error could have such disparate results. The proposed standard will prevent this type of situation from arising.

VII. CONCLUSION

Errors in patent applications may result in the loss of the original filing date, which in turn could cost the applicant a patent. Applicants who have gone to the extra expense of depositing part or all of their invention should be able to rely on the deposit to supplement their disclosure. With the proposed standard, they could correct material errors if they comply with the criteria. This standard is narrowly tailored to allow correction of material errors in only those cases in which the applicant can prove that the application demonstrates that he or she had reduced the invention to practice as of the date of filing. Moreover, by avoiding discrepancies like the one between *Maizel* and *Ex parte* D, the standard suggested in this article follows the aims and policies of the disclosure requirements and new matter rule more closely than does the present new matter standard.

the plasmid that was deposited.[88] The applicants did not show that the plasmid deposited contained the full DNA sequence claimed.[89]

Maizel is an example of where, under the suggested standard, if the deposited vector had contained the entire DNA sequence claimed--including the section that was erroneously described--the applicant could have amended the disclosure to correct the DNA sequence without adding new matter.

The error in *Maizel* is similar to one in a patent discussed in *Ex parte* D.[90] In *Maizel,* the DNA sequence disclosed in the specification and drawings incorrectly added two nucleotides causing a frame shift that changed all of the amino acid residues within a certain area of the protein product.[91] The Board found that this change was material, and as a result, the description was inadequate.[92]

The error in the Goeddel patent, referred to in *Ex parte* D,[93] was found not to affect the sufficiency of the disclosure--in part because the protein sequence was not affected. In *Ex parte* D, the examiner cited as a reference against the applicant the Goeddel patent in which the DNA sequence disclosed in the issued patent differed by either one or three bases from the sequence disclosed in the original application.[94] The applicant argued that this difference was the

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[88] *Id.* at 1668-69.

[89] *Id.* at 1667.

[90] 27 U.S.P.Q.2d (BNA) 1067 (B.P.A.I. 1993).

[91] *Maizel,* 27 U.S.P.Q.2d at 1667.

[92] *Id.*

[93] 27 U.S.P.Q.2d (BNA) 1067.

[94] *Id.* at 1068-69.

do not need to rely on the filing date for purposes of proving date of invention. Second, the standard relates to the rule against new matter, which does not apply until the filing date, as an application cannot be amended until after it has been filed.

The proposed standard ensures that both aims of the disclosure requirement, as well as the policy underlying the prohibition against new matter, are met. By allowing correction of errors prior to issuance, the proposed standard meets the public disclosure requirement because the issued patent must contain the correct version of the disclosure. Thus, the public receives the benefit of the complete correct disclosure.

By limiting the degree and type of error that may be corrected, and by requiring that other sufficient disclosure was provided in the original disclosure, criteria four through eight ensure that the applicant reduced the invention to practice as of the filing date and that the applicant is not attempting to enlarge the scope of the application through the amendment. This avoids the situation where the wrong person is rewarded with a patent. These criteria also discourage premature filing and ensure that the applicant does not take something from the public domain before he or she can support it. Additionally, the first three criteria provide that the patent application in question is suitable for implementation of this test. If the deposit cannot meet these criteria, the deposit cannot be evidence of events occurring as of the filing date.

D. *Application Of The Proposed Standard*

1. Hypothetical Examples

Examples of errors in applications that would be subject to the proposed standard, if it were implemented, include:

(1) DNA sequence errors that involve relatively few base pairs but may result in a frame shift, thus affecting the amino acid sequence; or

from experiments using the deposit.[77] The experimentation required to discover the error and to correct the parameter must not be undue.[78]

(5) The amendment must change a parameter that is already described in the application. It may not be used to fill in necessary information.[79]

(6) The error should not be something that would have likely occurred had the applicant done adequate experimentation to determine the parameter disclosed.[80]

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[77] This criterion parallels the rule that correction of errors that would be obvious to one skilled in the art do not add new matter. *In re* Oda, 443 F.2d 1200, 1204, 170 U.S.P.Q. (BNA) 268, 271 (C.C.P.A. 1971).

[78] The Federal Circuit has stated that:

> Factors to be considered in determining whether a disclosure would require undue experimentation [are]. . . (1) the quantity of experimentation necessary, (2) the amount of direction of guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.

In re Wands, 858 F.2d 732, 737, 8 U.S.P.Q.2d (BNA) 1400, 1404 (Fed. Cir. 1988) (citing *Ex parte* Forman, 230 U.S.P.Q. (BNA) 546, 547 (B.P.A.I. 1986)).

[79] Otherwise, applicants would be encouraged to file prematurely, define the invention vaguely, and then use this standard to include the necessary information later.

[80] The applicant must be able to point to a reason for the error, such as incorrect reading of results or mistaken procedure. Otherwise, this standard might encourage applicants to randomly choose parameters defining the invention and then correct them later.

part of the disclosure, it appears that there is no need to use words at all to describe, enable, or give the best mode of that part of the invention that is deposited. A reference to the deposit made in the application as of the filing date should be enough to adequately disclose the part of the invention deposited. Indeed, the deposit requirement stems from a recognition that words or diagrams alone are sometimes insufficient to adequately describe novel microorganisms.

However, a deposit is merely intended to be a safeguard, and is not required where an invention may be adequately disclosed by words alone.[73] Thus, to interpret the rules as allowing a deposit to totally substitute for a written disclosure would circumvent the purpose of allowing a deposit.

The analogy is weak for another reason. A deposit of biological material is different from a reference to a publication in two ways. First, in the absence of any accompanying written disclosure, a person obtaining the deposit would have to do expensive and time consuming experiments to learn about the material deposited, whereas to understand material incorporated by reference, one only has to read the reference. Second, although publicly available upon issuance of the patent, the deposit is not as easy to obtain as a publication because a deposit is only available at perhaps one or very few depositories, whereas most publications are usually available at or through almost any large library.

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of a biological material in a public depository effectively incorporates the deposited material, by reference, into the patent application"). *But see In re* Interference A v. B v. C, 159 U.S.P.Q. (BNA) 538, 540 (Comm'r Pat. 1967) (commenting that deposits "are not and cannot be accepted as part of the application disclosure as section 112 does not authorize a physical object outside the written description as part of the disclosure"). However, *In re* Interference A v. B v. C, was decided before the deposit rules were promulgated. *Id.*

[73] Deposit of Biological Materials for Patent Purposes, 54 Fed. Reg. 34,864, 34,864 (1989).

invention or part of it from the depository; whereas with entirely written disclosures, the public must recreate the invention from scratch. Because of the larger burden and greater disclosure borne by applicants required to make biological deposits, it seems fair to allow these applicants to rely on their deposits to support deficiencies in their disclosures wherever consistent with the goals and policies of the patent system.

B. *Incorporation By Reference*

One rationale for allowing a deposit of a biological entity to supplement the disclosure in order to meet section 112 requirements is that our system allows incorporation of material into a specification by reference, and a deposit is like a reference. An applicant may incorporate essential material[67] into an application by referring to patents or other publications.[68] A deposit is like a reference because, like a reference, a deposit is to a physical part of the patent application. However, by referring to either a deposit or a reference, the information contained in either the deposit or reference is made part of the application and supports the disclosure.

However, not all types of references may be used. For example, an application may not incorporate essential material by referring to a foreign patent.[69] Nevertheless, a disclosure that is insufficient because it incorrectly incorporates essential material by

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[67] Essential material is that material needed to meet the disclosure requirements of the first paragraph of section 112. MANUAL OF PATENT EXAMINING PROCEDURE § 608.01(p)(B)(1) (5th Ed. 1983) (rev. 15, Aug. 1993) [hereinafter MPEP].

[68] *Id.; see also In re* Hawkins, 486 F.2d 569, 574, 179 U.S.P.Q. (BNA) 157, 161 (C.C.P.A. 1973).

[69] MPEP, *supra* note 67, § 608.01(p)(B)(1); *see also Hawkins*, 486 F.2d at 574, 179 U.S.P.Q. (BNA) at 161.

practice enters the field.[62] An applicant may need to establish the actual date of reduction to practice or the date of conception to predate other inventors or related art. If not, the applicant can rely on his or her constructive reduction to practice, i.e., the filing date.

Constructive reduction to practice requires the least amount of evidence for proof of the date of invention because the applicant need only point to the filing date. Therefore, applicants have an incentive to file as early as possible. This incentive could result in applicants filing before an invention is complete and then filling in the necessary information later. It would not be fair to allow an inventor to rely on his or her filing date to establish the date of invention if he or she had not actually invented it by that date.[63]

However, the disclosure requirement, in combination with the new matter rule, discourages premature filing. Under the section 112 requirement an applicant may not rely on the filing date "unless at that time, without waiting for subsequent disclosures, any person skilled in the art could practice the invention from the disclosure of the invention. . . . If [an applicant] cannot supply enabling information, he is not yet in a position to file."[64] The new matter prohibition furthers this rule by preventing an applicant from adding the necessary information after filing. If an applicant needs to change the application materially, he or she must file a CIP and lose the original filing date for claims dependent on this information. Thus, there is no benefit to be gained from filing prematurely.

In summary, the rule against new matter acts in concert with

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[62] 35 U.S.C. § 102(g) (1994). "Under our patent system, he who first arrives at a complete conception of the inventive thought is entitled to recognition and reward, unless and until the interest of the public is compromised by his lack of diligence in demonstrating that his invention is capable of useful operation." Laas v. Scott, 161 F. Supp. 122, 126 (E.D. Wis. 1908).

[63] *See Glass*, 492 F.2d at 1232, 181 U.S.P.Q. (BNA) at 34.

[64] *Id.*

helps to ensure that an applicant deserves a patent award, and does not remove inventions from the public domain that he or she has no right to claim.

2. The Disclosure Requirement

The disclosure must be complete; that is, it must meet the conditions of section 112 paragraph one as of the filing date.[54] This condition is based both on the prohibition against adding new matter after filing, and on the priority rules under which the filing date becomes the date of constructive reduction to practice in determining priority of invention.[55]

The condition that the disclosure must be complete as of the filing date may be qualified. The term "sufficiency of disclosure" has been interpreted to include two separate requirements that must meet different deadlines: (1) "the reduction to practice requirement, which must be satisfied as of the filing date of the application;" and (2) "the public disclosure requirement (so that those skilled in the art can practice the invention), which need not be satisfied prior to issue date."[56] These different deadlines reflect the different purposes of the disclosure requirement.

The aim of the "reduction to practice" aspect of section 112's disclosure requirement is to make it clear from the application, as filed, that the invention claimed and described in the specification "[is] fully capable of being reduced to practice."[57] In other words, this

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[54] 35 U.S.C. § 112 (1994); *In re* Glass, 492 F.2d 1228, 1232, 181 U.S.P.Q. (BNA) 31, 34 (C.C.P.A. 1974).

[55] *Glass*, 492 F.2d at 1232, 181 U.S.P.Q. (BNA) at 34; *In re* Hawkins, 486 F.2d 569, 574, 179 U.S.P.Q. (BNA) 157, 161 (C.C.P.A. 1973).

[56] *Glass*, 492 F.2d at 1234, 181 U.S.P.Q. (BNA) at 36 (Miller, J., concurring).

[57] Feldman v. Anstrup, 517 F.2d 1351, 1355, 186 U.S.P.Q. (BNA) 108, 113 (C.C.P.A. 1975).

the first to file.[48] Therefore, for applicants relying on their filing date as the date of invention, it should be clear from the disclosure that the applicant can reduce the invention to practice on the date he or she claims as the filing date.[49] This may be unclear where large errors render the specification inadequate to support the invention. It would be unfair to other inventors in the field to let an applicant claim more than he or she supports in his or her disclosure because this would prevent others who actually first conceive of the invention and use due diligence in reducing it to practice from claiming it. The system would not reward the correct person, thus diluting the incentive to develop and disclose new inventions.

In addition, full disclosure of the invention is part of the quid pro quo for the exclusive rights our system grants to the inventor during the patent term.[50] In exchange for these rights, our system requires complete and correct disclosure.[51] To maximize the efficiency of our system and obtain complete and correct disclosure, the rules should not encourage inventors to file prematurely. Allowing applicants to freely correct material errors after filing, without loss of the filing date, would encourage people to claim things that they could not support as of the filing date (premature filing). An erroneous or incomplete disclosure of the invention is not beneficial to the public.

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[48] 35 U.S.C. § 102 (1994).

[49] Feldman v. Anstrup, 517 F.2d 1351, 1355, 186 U.S.P.Q. (BNA) 108, 113 (C.C.P.A. 1975).

[50] *In re* Lorenz, 305 F.2d 875, 878, 134 U.S.P.Q. (BNA) 312, 314 (C.C.P.A. 1962); *see also* Eli Lilly & Co. v. Premo Pharm. Lab., Inc., 630 F.2d 120, 137, 207 U.S.P.Q. (BNA) 719, 735 (3d Cir. 1980)("In enacting the patent laws, Congress recognized that it is necessary to grant temporary monopolies on inventions in order to induce those skilled in the 'useful arts' to expend the time and money necessary to research and develop new products and to induce them 'to bring forth new knowledge.'").

[51] Carter-Wallace, Inc. v. Otte, 474 F.2d 529, 548, 176 U.S.P.Q. (BNA) 2, 11 (2d Cir. 1972).

specification or abstract may be added by amendment without being treated as 'new matter' under [section] 132."[39]

IV. THE DEPOSIT REQUIREMENT

A deposit is a sample of biological material,[40] needed to practice an invention, that is given to a recognized depository so that after the patent issues anyone who wishes to practice the invention will have access to the material.[41] The deposit provides a means for complying with section 112 disclosure requirements when the invention depends on biological material that is extremely difficult for the public to find or make[42], or where the invention cannot be adequately described by words.[43]

An applicant need not deposit biological material unless the material is necessary to satisfy the disclosure requirements of section

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[39] *Eli Lilly*, 630 F.2d at 134, 207 U.S.P.Q. (BNA) at 732.

[40] "[T]he term biological material shall include material that is capable of self-replication either directly or indirectly. Representative examples include bacteria, fungi including yeast, algae, protozoa, eukaryotic cells, cell lines, hybridomas, plasmids, viruses, plant tissue cells, lichens and seeds." 37 C.F.R. § 1.801 (1995).

[41] *In re* Wands, 858 F.2d 731, 735, 8 U.S.P.Q.2d (BNA) 1400, 1403 (Fed. Cir. 1988).

[42] *Id; see also* Deposit of Biological Materials for Patent Purposes, 54 Fed. Reg. 34,864, 34,868 (1989) (to be codified at 37 C.F.R. § 1.802(b)). "[B]iological material need not be deposited unless necessary for the satisfaction of the statutory requirements of 35 U.S.C. § 112. Thus, the rule would state that the ultimate reason for a requirement for a deposit would be to satisfy 35 U.S.C. § 112." *Id.*

[43] "Where the invention involves a biological material and words alone cannot sufficiently describe how to make and use the invention in a reproducible or repeatable manner, access to the biological material is necessary for the satisfaction of the statutory requirements for patentability under 35 U.S.C. § 112." Deposit of Biological Materials for Patent Purposes, 54 Fed. Reg. 34,864, 34,864 (1989).

or by a certificate of correction.[30] Correction of errors in an application may be done by amendment.[31]

Both correction of an issued patent and amendment of the application are limited by the rule against new matter. An applicant or patentee may not add new matter to the disclosure of an invention;[32] therefore, amendments containing new matter will be rejected.[33] "The patent laws do not permit insertion of additional

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[30] Clerical or typographical errors which are not the fault of the Patent Office may be corrected if the correction does not involve a change that would add new matter to the patent. 35 U.S.C. § 255 (1994). Section 255 "permits a minor error, when made in good faith, to be corrected." Brandt, Inc. v. Crane, 558 F. Supp. 1339, 1341 (N.D. Ill. 1983).

[31] 37 C.F.R. § 1.117 (1995). Correction of errors may be made by amendment "'for the purpose of curing defects, obvious to one skilled in the art.'" *In re* Oda, 443 F.2d 1200, 1204, 170 U.S.P.Q. (BNA) 268, 271 (C.C.P.A. 1971) (quoting Quigley v. Zimmerman, 73 F.2d 499, 503, 23 U.S.P.Q. (BNA) 310, 314 (C.C.P.A. 1934)).

[32] Section 132, which applies to rejection of patent applications, provides in pertinent part: "No amendment shall introduce new matter into the disclosure of the invention." 35 U.S.C. § 132. In addition, Rule 118(a) of the Rules of Practice in Patent Cases, provides in pertinent part:

> No amendment shall introduce new matter into the disclosure of an application after the filing date of the application. . . . All amendments to the specification, including the claims and the drawings filed after the filing date of the application must conform to at least one of them as it was at the time of filing of the application.

37 C.F.R. § 1.118(a).

Section 251, which applies to reissuance of patents, provides in pertinent part: "No new matter shall be introduced into the application for reissue." 35 U.S.C. § 251.

[33] Rule 118(b) provides in pertinent part: "claims containing new matter will be rejected and deletion of the new matter in the specification and drawings will be required even if the amendment is accompanied by an oath or declaration in accordance with § 1.63 or § 1.67." 37 C.F.R. §

2. When Discovered

If a material error is discovered prior to issuance of the patent, and rectification of the error involves the addition of new matter, the applicant will have to file a CIP to correct the specification.[19] The claims dependent on the new information in the CIP will have the filing date of the CIP rather than that of the original application.[20]

The loss of the original filing date could affect the patentability of these claims in various ways. The U.S. system rewards the first to invent.[21] If the applicant is relying on the filing date to establish the date of invention,[22] loss of the original filing date may result in either (i) a rejection of the application on the grounds that another invented first[23] or (ii) the loss of seniority in an interference.[24] Additionally, loss

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application differed in three bases from the sequence disclosed in the issued patent. *Id.* The board held that Goeddel was effective because the applicant had not shown that Goeddel's original specification failed to enable the claims. *Id.* at 1069.

[19] *See* Technicon Instruments Corp. v. Alpkem Corp., 664 F. Supp. 1558, 1574, 2 U.S.P.Q.2d (BNA) 1729, 1738 (D. Or. 1986).

[20] 37 C.F.R. § 1.131 (1995).

[21] 35 U.S.C. § 102(g) (1994).

[22] Amgen, Inc. v. Chugai Pharm. Co. Ltd., 13 U.S.P.Q.2d (BNA) 1737, 1762 (D. Mass. 1989), *aff'd in part, rev'd in part, and vacated in part*, 927 F.2d 1200, 18 U.S.P.Q.2d (BNA) 1016 (Fed. Cir. 1991)("As a general rule, the date an application adequately disclosing the invention is filed is presumed to be the date of invention.") (1994).

[23] 35 U.S.C. § 102(g) (1994).

[24] In an interference, establishing the earliest filing date is significant because "a rebuttable presumption exists that, as to each count, the inventors made their invention in the chronological order of their effective filing dates. The burden of proof shall be upon a party who contends otherwise." 37 C.F.R. § 1.657 (a) (1995). Thus, the junior party (second to file) must prove that he or she invented the subject matter in the disputed claims before the senior party's (first to file) filing date. If both parties rely

the date of filing.[10] "Such possession is effective if one of ordinary skill in the art could have combined the publication's description of the invention with his or her own knowledge to make the claimed invention."[11] The applicant does not have to describe the invention exactly, but it must be clear to one of ordinary skill in the art that the applicant "invented what is claimed."[12]

B. Enablement

In addition to describing the invention, section 112 requires that the application explain how to make and use the invention.[13] "[E]nablement requires that the specification teach those in the art to make and use the invention without 'undue experimentation.'"[14] The fact that a disclosure requires some experimentation to comply with section 112 is not fatal, as long as the experimentation is routine.[15]

C. Best Mode

The third disclosure criteria is the best mode requirement. To meet the best mode requirement, the applicant must satisfy a two-prong test. First, the court asks the subjective question of whether "the inventor knew of a mode of practicing the claimed invention that he considered to be better than any other at the time the inventor filed

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[10] Waldemar Link, GmbH & Co. v. Osteonics Corp., 32 F.3d 556, 559, 31 U.S.P.Q.2d (BNA) 1855, 1857 (Fed. Cir. 1994); Vas-Cath Inc. v. Mahurkar, 935 F.2d 1555, 1563, 19 U.S.P.Q.2d (BNA) 1111, 1116 (Fed. Cir. 1991).

[11] Flehmig v. Giesa, 13 U.S.P.Q.2d (BNA) 1052, 1055 (B.P.A.I. 1989).

[12] *Vas-Cath*, 935 F.2d at 1563, 19 U.S.P.Q.2d (BNA) at 1116.

[13] *See* CHISUM, *supra* note 3, § 7.03, at 7-10.

[14] *In re* Vaeck, 947 F.2d 488, 495, 20 U.S.P.Q.2d (BNA) 1438, 1444 (Fed. Cir. 1991).

[15] *Ex parte* D, 27 U.S.P.Q.2d (BNA) 1067, 1069 (B.P.A.I. 1993); *In re* Wands, 858 F.2d 731, 736-37, 8 U.S.P.Q.2d (BNA) 1400, 1404 (Fed. Cir. 1988).

invention and was capable of enabling it at the time the application was filed. Therefore, the applicant would not violate the policy behind the new matter rule by amending the disclosure.

These issues have not been directly addressed by the courts. However, in *Ex parte* Maizel,[5] the Board of Patent Appeals and Interferences considered this argument and did not discount it as invalid, but decided the case on different grounds. Moreover, the Board remarked that it would be desirable to have a mechanism in the Patent and Trademark Office ("PTO") for the correction of errors in DNA sequences.

This Article proposes a different new matter standard for biotechnology applications that are accompanied by a deposit. The test has several criteria that must be met and that ensure compliance with the policies behind both the disclosure requirements and the new matter rule.

Section II of this Article summarizes the disclosure requirements of the first paragraph of section 112.[6] Section III discusses the effect of an error on the disclosure, the correction of errors, and the prohibition against new matter. Section IV discusses deposits. Section V presents the policies underlying the disclosure requirements and the new matter rules. Finally, section VI discusses arguments and theories for a different standard for applications with a deposit and proposes a new standard.

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[5] 27 U.S.P.Q.2d (BNA) 1662 (B.P.A.I. 1992).

[6] 35 U.S.C. § 112.

Two litigation techniques have emerged as viable means of avoiding the remaining limitations of territorialization: compound litigation, and more recently, worldwide litigation. The judicial development of worldwide litigation is still experimental, and case law is not yet well-developed. It may be necessary to wait a year or two (or more) before a clear trend emerges in the courts with respect to these developments. However, the rules of the Brussels and Lugano Conventions leave no room for interpretations other than those discussed above.

Even if legally feasible, the practical challenges of international patent disputes will remain. Specifically, the management of cases involving patents granted in various countries, which requires the application of various substantive laws, may be challenging for the national courts. For example, consider the case of an infringement action in Germany concerning a U.S. patent. To what extent should the U.S. discovery rules apply? What about the U.S. statute of limitations, which in the United States is procedural law, but in other countries is substantive law? These examples display the confusion surrounding worldwide patent litigation. To resolve these dilemmas, European judges called upon to resolve matters involving substantive foreign patent law will be forced to request the advice and assistance of experts. However, in conclusion, these difficulties are far outweighed by the increased judicial efficiency that would result from regular, effective compound and worldwide litigation.

that the damages he would suffer if the patent holder tried to enforce his French patent in France would provoke consequential damages in Italy;
(c) sue Italian subsidiary ("*IS*") and French parent ("*FP*") in Italy for a declaratory judgment of non-infringement of a French patent; or
(d) sue French company *FC* and Spanish company ("*SC*") in Italy for a declaratory judgment of non-infringement of an Italian patent (and perhaps of corresponding patents granted in France, Germany, and other countries).[86]

The following table summarizes the contents of these examples:

	PLAINTIFF	DEFENDANT(S)	FORUM	PATENT(S)
(a)	G	FC	Italy	Italian and others
(b)	G	FC	Italy	French (event in Italy)
(c)	G	IS and FP	Italy	French
(d)	G	FC and SC	Italy	Italian and others

The Convention appears to state that a court in a signatory state, having jurisdiction under the Convention, is obliged to apply the procedural law of the court and the substantive laws of the countries that granted the patents at issue. The problem of diversity among substantive laws is not as problematic as one might imagine.

[86] However, not all of these cases are possible under the various European procedural rules. For example, following the main exception described above, an action for declaration of non-infringement is not possible in England. In addition, jurisdiction in cases (b) or (d) may be difficult to establish in some countries.

Regardless, the rule of article 21 of the Convention is significant when a plaintiff brings a declaratory judgment action for non-infringement in an effort to prevent a patent holder from bringing an opposing infringement action. For example, if a manufacturer fears that a patent holder might commence one or more patent infringement lawsuits in a different European Member State, the producer may prevent such lawsuits by seeking a non-infringement declaratory judgment against the patent holder in any Member State. Under article 21, such an action will prevent the patent holder from beginning an infringement action in any other European Member States.[81] Article 21 is extremely clear in this area.[82]

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involves both infringement and nullity. *See* MARIO FRANZOSI AND GIUSTINO DE SANCTIS, INTERNATIONAL PATENT LITIGATION: A COUNTRY BY COUNTRY ANALYSIS (1997).

[81] In proceedings concerning the registration or validity of patents, article 16.4 of the Brussels Convention grants exclusive jurisdiction to the Courts of the contracting state where the deposit or registration has been applied for or has taken place. Brussels Convention, *supra* note 2, art. 16.4. The only way to avoid conflict with article 16.4 is to request declaratory judgment only as to the basis of the absence of infringement, without attacking the validity of the patent. In fact, in such a case, the defendant patent holder cannot use article 16.4 of the Convention to support the theory that the national court does not have jurisdiction.

[82] It should be mentioned, however, that a court of a European Member State ("Court B") that acknowledges that there is a *lis pendens* before a court of another Member State ("Court A"), is not prevented from taking the case and issuing provisional measures. In other words, article 21 does not apply to cases that fall under article 24. *See supra* section III. B. 2. e.

This is probably excessive. To prevent Court B from ruling when a case is pending in another European Member State, a series of balancing actions have been studied, such as an action in another state to enjoin the patent holder from applying for provisional measures in Court B (i.e., an anti-injunction action). However, in the authors' opinion it should be possible for the patent holder to sue and enjoin the prospective infringer from seeking an order prohibiting the patentee from applying for provisional measures (i.e., an anti-anti-injunction action). The complications which may arise and the advantages for the attorneys involved are incommensurable in these situations.

The rationale for this exception (i.e., that an application according to Article 24 is admissible in Court B even though an action regarding the merit is already pending in Court A), should be that an application

A number of possible applications of article 24 can be imagined. For example, assume a German plaintiff ("G") files a request for a preliminary injunction before an Italian Court against an Italian company ("IC"), a German company ("GC"), and other companies from various countries. The German plaintiff G may sue alleging the infringement of corresponding patents in all of those countries. The following table summarizes the above example:

	PLAINTIFF	DEFENDANT(S)	FORUM	PATENT(S)
(a)	G	IC, GC and others	Italy	Italian, German and others

f. *Lis pendens: article 21*

Article 21 of the Brussels Convention[76] provides that when the same case is brought before the courts of different states, any court subsequently seised shall decline jurisdiction in favor of the first court seised on its own motion. Article 22 provides that, where actions are not the same, but are related, a subsequent court has the option of deciding whether or not to stay its proceedings.[77] A certain number of decisions of the European Court of Justice have held that articles 21 and

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[76] Article 21 states:

> Where proceedings involving the same cause of action and between the same parties are brought in the courts of different Contracting States, any court other than the court first seised shall of its own motion stay its proceedings until such time as the jurisdiction of the court first seised is established.
>
> Where the jurisdiction of the court first seised is established, any court other than the court first seised shall decline jurisdiction in favor of that court.

Brussels Convention, *supra* note 2, art. 21.

[77] *Id.*

(b) sue French company *FC* and German company *GC* in Germany for infringing German and French patents;
(c) sue French company *FC* and German company *GC* in Germany for infringing a German, U.S., and/or Japanese patent; or
(d) sue French company *FC* and German company *GC* in Germany for infringing a U.S. patent.[71]

The following table summarizes article 6:

	PLAINTIFF	DEFENDANT(S)	FORUM	PATENT(S)
(a)	G	FC and GC	Germany	German
(b)	G	FC and GC	Germany	German and French
(c)	G	FC and GC	Germany	German, U.S. and/or Japanese
(d)	G	FC and GC	Germany	U.S.

e. *Provisional measures: article 24*

Article 24 of the Brussels Convention[72] authorizes any court of a signatory state to grant a provisional order (including a protective order) or preliminary measure that has an effect in any or all of the signatory states. Such authority is granted even though such a court does not have subject matter jurisdiction under the Convention.

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[71] *See supra* note 48 (regarding patents granted in non-European Member States).

[72] Article 24 states: "Application may be made to the courts of a Contracting State for the provisional, including protective, measures as may be available under the law of that State, even if, under this Convention, the courts of another Contracting State have jurisdiction as the substance of the matter." Brussels Convention, *supra* note 2, art. 24.

(b) sue only Italian parent *IP* in France for infringing a German patent, even though nominally the infringement was done by the French subsidiary, *FS*.

In both cases, jurisdiction over the Italian parent *IP* derives from the application of article 5.5. In case (a), jurisdiction over the French subsidiary follows the application of the general rule regarding the defendant's domicile, found in article 2 of the Convention. The following table summarizes the contents of article 5.5 of the Convention:

	PLAINTIFF	DEFENDANT(S)	FORUM	PATENT
(a)	G	IP and FS	France	German
(b)	G	IP	France	German

d. *Co-defendants and counterclaims: article 6*

Article 6.1 of the Brussels Convention[65] provides that when there are two or more co-defendants, the plaintiff may bring the action in a court where either of the co-defendants is domiciled. However, a connection between the various claims made against multiple defendants is required. In the authors' opinion, the wording of Article 6.1 necessitates that the European Court of Justice construe such a connection fairly liberally. However, in *Kalfelis v. Banque Schröeder*,[66] the Court held that article 6.1 does not apply if the claims

[65] Article 6.1 states: "A person domiciled in a Contracting State may also be sued: . . . Where is one of a number of defendants, in the courts for the place where any one of them is domiciled." Brussels Convention, *supra* note 2, art. 6.1.

[66] Case 189/87, [1988] E.C.R. 5565 (1987).

(a) sue defendant *F* in Germany for infringing a German patent;[59]
(b) sue defendant *F* in Germany for infringing a German and a corresponding French patent;
(c) sue defendant *F* in Germany for infringing a French patent; or
(d) sue defendant *F* in Germany for infringing a U.S. and/or Japanese patents.[60]

In each of these cases, the German courts would have jurisdiction under article 5.3 because the harmful event took place in Germany.[61] The following table summarizes the contents of article 5.3 of the Convention:

	PLAINTIFF	DEFENDANT	FORUM	PATENT(S)
(a)	G	F	Germany	German
(b)	G	F	Germany	German and French
(c)	G	F	Germany	French
(d)	G	F	Germany	U.S. and/or Japanese

[59] For case (a) under article 2 of the Convention, jurisdiction is not only guaranteed by the Convention, it is also provided by the laws of the singular states.

[60] *See supra* note 48 (regarding patents granted in non-European Member States).

[61] *See, e.g.*, Case C-68/93, Shevill v. Presse Alliance, S.A., [1995] E.C.R. I-415 (holding that the plaintiff suffered harm in every state in which the magazine at issue had been sold).

fringement cases[53] because it gives jurisdiction to the courts of every country where an alleged infringement took place.[54]

Since the European Court of Justice ("Court of Justice") has interpreted the rule with some openness, the possibilities of forum shopping are great.[55] In *Handelskwekerij G.J. Bier B.V. v. Mines de Potasse d'Alsace S.A.*,[56] the Court of Justice held that article 5.3 provides the plaintiff with the right to commence proceedings in the country where the tortious act was committed or in the jurisdiction where the act produced

[53] Article 5.3 applies to patent infringement cases. *See* Molnlycke v. Procter & Gamble, English Court of Appeal (1991); Case 189/87; Kalfelis v. Banque Schröeder, et al. [1988] E.C.R. 5565 (1987).

[54] According to the ruling of the European Court of Justice, a plaintiff in a defamation suit may sue for all damages within the jurisdiction of the location of the tortious conduct (i.e., the place of publication). Case C-68/93, Shevill v. Presse Alliance, S.A., [1995] E.C.R. I-415. The *Shevill* holding, according to Schlosser, *supra* note 43, at 22, implies that "in the case of a bundle of patents issued by the Munich Patent Office the plaintiff (who sues in one single court) must not specify which harm he has suffered by the infringement of which national patent." *Id.*

[55] The legal literature on the issue presents different opinions. For a discussion favoring a restrictive interpretation, see HESS, *supra* note 43, at 32, and Scordamaglia, supra note 43, at 779. For a discussion on the Netherlands' broader interpretation, see Stauder, *supra* note 43, at 477; J. P. Verheul, *Rechtamacht in het Netherlands Internationaal Privaatrecht*, *in* HET EEG-BEVOEGDHEIDS-EN EXECUTIEVERDRAG 50 (1986).

[56] Case 21/76, [1976] E.C.R. 1735.

defendant's defense easier. The rule applies unless displaced by one of the special rules regarding jurisdiction, which are examined in the following paragraphs.

According to article 2, there are at least four different situations that could arise involving parties from different countries. The following example displays those situations. Assume that a German plaintiff ("*G*") wants to sue a French defendant ("*F*") in France. Plaintiff *G* could sue under on of the following options:

> (a) sue defendant *F* in France for infringing a French patent;[48]
> (b) sue defendant *F* in France for infringing French and German patents;
> (c) sue defendant *F* in France for infringing a German patent; or
> (d) sue defendant *F* in France for infringing a U.S. and/or Japanese patent(s).[49]

In all four cases, article 2 of the Convention applies. Options (c) and (d) are particularly interesting because the defendant in those situations is sued before a court in France solely because he or she is

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> are domiciled shall be governed by the rules of jurisdiction applicable to nationals of that State.

Brussels Convention, *supra* note 2.

[48] Actually, although the Convention contains this possibility, the Convention only allows a foreign plaintiff to sue a national defendant for the infringement of a national patent.

[49] A European defendant may be sued in the European Member State of his or her domicile for the infringement of a patent granted in another European Member State. *See* cases (b) and (c). It is also possible to sue said defendant for the infringement of a patent granted in a non-Member State (e.g., Japan or the United States) provided the defendant (or co-defendant, *see infra* section III. B. 2. d.) is domiciled in a European Member State. *See* case (d). In fact, the Conventions do not put limits on the localization of the claim.

Conventions appear to allow a national judge to rule on the infringement of patents of other countries to an extent greater than already practiced by Dutch judges (who have only issued extraterritorial decisions in urgent proceedings).[44] Specifically, pursuant to the Conventions, it appears that national judges may hear infringement proceedings regarding a national patent, corresponding patents granted in other states which are members of the Convention, and even corresponding patents in non-signatory countries.

[44] In fact, in the Netherlands it is generally assumed that the *kort geding* proceeding falls within article 24 of the Brussels Convention, *supra* note 2, which provides a court of a signatory country the jurisdiction to grant interlocutory or safeguarding measures provided by the legislation of that country, even though the court of a different country is competent for the principle action. *Id.* *See* Jan J. Brinkhof, *Das einstweilige Verfügungsverfahren und andere vorläufige Massnahmen im Zusammenhang mit Patentverletzungen*, G.R.U.R. Int. 392 (1993). It is extremely rare that a *kort geding* is continued in principle proceedings, because several disputes are settled before continuing in principle proceedings and, moreover, because there is no obligation to commence principle proceedings within a certain time in Dutch *kort geding* proceedings. *See* Brinkhof, *supra* note 32, at 384; Bertrams, *supra* note 32.

Although a trademark infringement case, *Interlas v. Lincoln*,[37] is the Dutch case that initiated this trend. In *Interlas*, the Hoge Raad (the Netherlands' highest court) granted an injunction with effects in Belgium, the Netherlands, and Luxembourg. The *Interlas* Court held that there were no legal restrictions precluding such an order, and the court emphasized such an order's practical advantages. *Interlas* was followed by a number of cases involving trademark and patent infringements in which Dutch judges granted injunctions outside Dutch borders.[38]

One wonders whether Dutch judges have jurisdiction to examine a foreign patent infringement and then grant an extraterritorial injunction, and whether a Dutch judge is competent to do so. Even in

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[37] HR 24 November 1989, 1992 NJ 404, 1597 with comments, Verkade, 1991 BIE, No. 23, 86.

[38] *See, e.g.*, Philips v. Hemogram, The Hague District Court, Dec. 30, 1991, 1992 BIE, No. 80, 323, 1992 IER, No. 17, 76; Vredo v. Samson, The Hague Court of Appeals, June 4, 1992; Pipe Liners v. Wavin, the Hague District Court, Dec. 28, 1990, 1991 KG, No. 80, 1991 IER, No. 6, 19, *aff'd*, The Hague Court of Appeals, Jan. 16, 1992, 1993 BIE, No. 9, 44, 1992 KG, No. 85, 1992 IER, No. 10, 53; Applied Research Sys. v. Organon, The Hague Court of Appeals, Feb. 3, 1994, 1995 IER, No. 8, 1995 G.R.U.R. Int. 253; Chiron Co. v. Akzo Pharma-Organon Technika-UBI, The Hague District Court, July 22, 1994, 1994 IER, No. 24, 150. In Cordis v. Schneider AG et al., unreported interlocutory judgment of the President of the District Court of The Hague, Dec. 22, 1994, the Dutch judge refused the requested cross-border injunction because Cordis, the plaintiff, brought actions against the respective foreign European defendants in the courts in their own jurisdiction before bringing the preliminary relief action in The Netherlands. The court held that the patentee was not reluctant to initiate proceedings on the merits in all the designated contracting states. The patentee must be deemed to have known in making his decision what the possibilities and impossibilities were in the different jurisdiction for which he opted. "It seems to be in conflict with the reasonable conduct of a case that a patentee should have control of combining the advantages of conducting proceedings on the merits in certain jurisdictions, with the advantages that [the present preliminary relief] proceedings in the Netherlands can have." *Id.*

The problem of compound litigation is complying with the formalities for admission of proof acquired in a foreign court. Specifically, the Hague Convention of March 1, 1954,[29] creates limitations that increase the complication, length, and cost of an action where foreign evidence is introduced. Sometimes there is a tendency to avoid the complexity of evidence admission by adducing pieces of evidence gained in other countries without respecting the formalities of the Hague Convention. For example, such avoidance may occur when the evidence in question is simple documentary proof. However, other countries may consider such practices infringing of procedural, and even criminal law. Therefore, such practices should only be used with caution. Normally, however, the country in which the evidence gathered abroad is to be used admits such evidence without raising difficulties.

B. *Worldwide Litigation*

A recent trend, one that has not yet been fully explored, is to commence an action in a single country where the action's subject matter of the infringement is a family of patents granted by various countries.[30]

1. Dutch Pan-European Injunction

The Netherlands is the first jurisdiction to have addressed an entire family of patents. In several patent infringement cases, the Dutch courts have granted relief with effects beyond Dutch borders.[31] Under

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[29] Hague Convention on Civil Procedure, Mar. 1, 1954, 286 U.N.T.S. 265.

[30] *See* Robin Whaite, Forum Shopping in European Patent Disputes (unpublished manuscript, distributed at the IBC Brussels Conference, May 9-10, 1995, on file with the *AIPLA Quarterly Journal*); *see also* Thomas, *supra* note 26.

[31] *See, e.g.*, Philips v. Hemogram, The Hague District Court, Dec. 30, 1991, 1992 BIE, No. 80, 323, 1992 IER, No. 17, 76; Vredo v. Samson, The Hague Court of Appeals, June 4, 1992; Pipe Liners v. Wavin, The Hague District Court, Dec. 28, 1990, 1991 KG, No. 80, 1991 IER, No. 6, 19, *aff'd*, The Hague

Moreover, a judgment declaring the marketing of the product in a single member state unlawful may cause, in practical terms, the undertaking to withdraw that product from the entire common market. Specifically, if a product is declared infringing in a member state of a customs union, and if an undertaking wishes to keep the product out of a particular country, there is no other practical method to do so than to cease marketing the product in the entire common market. As a result of the absolute abolition of all customs barriers between countries of a customs union, there seems to be no other legal means of preventing such products from reaching a member state where they would infringe an intellectual property right. This means that, although legally limited to the territory of a single member state, a court's decision has practical effects for the entire customs union.

III. LITIGATION OF INTERNATIONAL PATENT DISPUTES

Practitioners may avoid territorialization of intellectual property rights by implementing either of two litigation strategies. The first and better-known approach is compound litigation, where various segments of proceedings in different countries are joined. The second and more recent strategy, worldwide litigation, consists of bringing an action in one country with the goal of obtaining a judgment applicable in other counties. The following paragraphs discuss and provide examples of both approaches.

A. *Compound Litigation*

Compound litigation, consisting of fragments of procedures commenced in several countries, results from the desire to utilize the different litigation and investigation tools available under the substantive and procedural laws of various countries.[26] Ideally, an

[26] Variation of litigation methods among countries affects the position of patent holders and their competitors. *See* BASTIAN ET AL., DER MARKENVERLETZUNGSPROZESS IN AUSGEWÄHLTEN LÄNDERN DER EUROPÄISCHEN WIRTSCHAFTSGEMEINSCHAFT (1993); STAUDER, PATENT UND

simplified the procedure for obtaining a patent, but to GATT,[19] and in particular TRIPS,[20] both of which aim to harmonize substantive intellectual property law.

The need for harmonization is especially easy to identify in the common markets already in existence. For example, the European Patent Convention ("EPC") was recently enacted in the EU.[21] The EPC establishes uniform criteria for obtaining patents for inventions in all EU states and creates a single procedure for obtaining a patent, with prior examination, that is valid for all designated EU member states (creating a patent having the same effects as a national patent in each state).[22] Further, there is the concept articulated in the Community Patent

[19] General Agreement on Tariffs and Trade, *opened for signature* Oct. 30, 1947, 61 Stat. A3, 55 U.N.T.S. 187 [hereinafter GATT].

[20] Agreement on Trade-Related Aspects Of Intellectual Property Rights Including Trade In Counterfeit Goods, *opened for signature* Apr. 15, 1994, 33 I.L.M. 81 [hereinafter TRIPS].

[21] Convention on the Grant of European Patents, Oct. 5, 1973, 1160 U.N.T.S. 231.

[22] *Id.*; *see* Friedrich-Karl Beier, *Das europäische Patentsystem, in Europäische Patentsystem, in* Europäisches Patentübereinkommentar, 1 LIEFERUNG 53-54 (1984)

decisions expressing a worldwide exhaustion principle.[15] In conclusion, although the principle of worldwide exhaustion has not been defined

Foro Padano 1967, I, 468. *But see* Monza Trib., 27 nov. 1992, Giur Compl. 1996, 145. *See also* G. Tesauro, *La jurisprudence de la cour de justice sur le droit de la "proprietè intellectuelle,"* in BOOK OF SPEECHES OF THE INTERNATIONAL CONFERENCE ON INTELLECTUAL & INDUSTRIAL PROPERTY 11-13 (1994); Vito Mangini, *Competition and Monopoly in Trademark Law: An EEC Perspective*, 11 INT'L REV. INDUS. PROP. & COPYRIGHT L. 591 (1980).

[15] For the United States, see Weil Ceramics & Glass, Inc. v. Dash, 878 F.2d 659, 11 U.S.P.Q.2d (BNA) 1001 (3d Cir. 1989); K Mart Corp. v. Cartier Inc., 486 U.S. 281, 6 U.S.P.Q.2d (BNA) 1897 (1988). For Italy, see Pret. Prato, sept. 28, 1985, Giur. Dir. Ind., II, 768. One of the most recent, and in some respects one of the most interesting, decisions in this context (because it breaks with a tradition which was considered insurmountable) is that of the High Court of Tokyo of March 23, 1995, in Jap Auto Products Kabushiki Kaisha and Another v. BBS Kraftfahrzeug Technik AG, 1995 Tokyo High Court, no. 3272. *See* Shusaku Yamamoto, *A Reversal of Fortune for Patentee and Parallel Importers in Japan*, 7 EUR. INTELL. PROP. REV. 341 (1995) (discussing *Jap Auto*). Prior to *Jap Auto*, the tendency of the Japanese courts regarding parallel imports had not moved beyond the traditional theory bound to the territoriality of intellectual property rights. This allowed the holder of a Japanese patent to summon before the court for infringement all persons having imported, without prior authorization, products lawfully purchased abroad protected by corresponding foreign patents. *See, e.g.*, Brunswick Corporation v. Orion Kogyo Kabushiki Kaiksha, 1 Mutaishu 160 (1969); Yamamoto *supra*, at 341. *Jap Auto* completely turned this tendency on its head. The High Court of Tokyo held that the effects of Japanese patent law on the product sold in Germany and from there imported into Japan had been extinguished at the moment the patent owner marketed the products abroad using a corresponding patent right. This is the exhaustion principle on a worldwide level.

that trade. In the EU, for example, all customs barriers and bureaucratic hindrances that prevented and controlled the circulation of goods within Europe have been eliminated.

Within the international legal structures of these common markets, the territorialization principle has been limited. In the EU, the first common market strictly structured by law, the European Court of Justice dealt a strong blow to the territorialization principle when it introduced the "exhaustion of rights" principle.[6]

According to the exhaustion principle, the owner of a national intellectual property right may not assert that right in order to block the importation of products using the same or a parallel right where such products have already been placed on the market in another EU country by the owner himself, or with the owner's consent.[7] Although the exhaustion principle was initially introduced in the field of trademark law, it was soon applied to patents.[8]

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[6] *See* Case 192/73, Van Zuylen v. Hag, 1974 E.C.R. 731, 2 C.M.L.R. 127 (1974) (stating that the owner of a trademark in one EU nation cannot oppose the importation of a product legally produced in another Member State under an identical trademark having the same origin, even where there is no actual legal or economic connection between the two owners of the right). This principle is now accepted if there remains an economic connection between the two owners. *See* Case 15/74, Centrafarm v. Sterling Drug, 1974 E.C.R. 1147, 1162, 2 C.M.L.R. 480 (1974); Case 16/74, Centrafarm v. Winthrop, 1974 E.C.R. 1183, 1194, 2 C.M.L.R. 480 (1974). The exhaustion principle is generally considered sound. *See* Kaoru Takamatsu, *Parallel Importation of Trademarked Goods: A Comparative Analysis*, 57 WASH. L. REV. 409, 444 (1982); Leigh Hancher, *The European Pharmaceutical Market: Problems of Partial Harmonization*, 15 EUR. L. REV. 9, 24-25 (1991).

[7] *See generally* AMIRAN BENYAMMINI, PATENT INFRINGEMENT IN THE EUROPEAN COMMUNITY 287 (1993) (a lengthier explanation of the exhaustion principle).

[8] Case 15/74, Centrafarm, 1974 E.C.R. 1147, is the first case where the exhaustion principle was applied to patents. *See also* G. Tesauro, *La Jurisprudence de la Cour de Justice sur le Droit de la Propriéte Intellectuelle*, in BOOK OF SPEECHES, 76 (unpublished manuscript distributed at the International Conference on Intellectual and Industrial Property, April 11-

I. INTRODUCTION

This Article explores the possibility of litigating in a single European country the infringement of patents granted in other European and non-European countries.[1] Such litigation is possible on the basis of the Brussels Convention of September 27, 1968[2] and the Lugano Convention of September 16, 1988[3] ("the Conventions").

One can litigate a patent infringement action in a European country that is a signatory of the Conventions (a "European Member State") provided the alleged infringement is of a patent granted in another European Member State. In the authors' opinion, it is also possible to litigate in a European Member State the infringement of a patent granted in a non-Member State, provided that the defendant or co-defendant is domiciled in a Member State. For example, the authors contend that it is possible to sue in a European Member State for the alleged infringement of a U.S. or Japanese patent. The authors

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[1] In urgent matters, the Dutch courts have already followed this approach. Specifically, they have issued orders enjoining the infringement of non-Dutch patents. *See, e.g.*, Interlas v. Lincoln, HR 24 November 1989, BIE 1991, at 86.

[2] European Communities Convention on Jurisdiction and the Enforcement of Judgments in Civil and Commercial Matters, 1968 O.J. (L 304) 163 [hereinafter Brussels Convention]. *See* DASHWOOD ET AL., A GUIDE TO THE CIVIL JURISDICTION AND JUDGMENTS CONVENTION (1987). The Brussels Convention was signed by the members of the European Economic Community (EEC) (the predecessor of the European Union (EU)).

[3] European Communities Convention on Jurisdiction and the Enforcement of Judgments in Civil and Commercial Matters, 1988 O.J. (L 319) 9 [hereinafter Lugano Convention]. The Lugano Convention was signed by the members of the EEC and of the European Free Trade Area (EFTA).

There are some differences between the Brussels and the Lugano Conventions, but these differences concern only secondary aspects of the Conventions. For a complete analysis of such differences, see Stefania Bariatti, *L'entrata in Vigore della Convenzione di Donostia San Sebastiano sulla Giurisdizione e sull'Esecuzione delle Sentenze, in* RIVISTA DI DIRITTO INTERNAZIONALE PRIVATO E PROCESSUALE 471 (1992).

above, sometimes it takes months for local infringers to be notified of new laws and regulations, such as the ban on illegal laser discs.[312]

U.S. businesses need to be patient and expect modest results. Local officials still have a strong economic incentive to look the other way when it comes to shutting down factories in their provinces. It is unlikely that Chinese infringers will shut down their highly profitable operations, destroy their own equipment, lay off all their employees, and turn over their counterfeit goods to the government simply because the U.S. companies demand it. Hu Zhaoqing, the spokesman for the Ministry of External Trade and Cooperation, recently said, "[i]t is unrealistic to request China to eradicate piracy immediately."[313] U.S. companies should plan to invest money now on enforcement measures in order to make a profit in the future.

G. Work With Other U.S. Companies

Seventh, U.S. companies should cooperate with other U.S. firms in China, whether their businesses are related or not.[314] Companies should share strategic insights on how to prosecute infringers, which officials to trust, and which agencies are the most active in enforcing the laws.

H. Stay Informed And Plan Ahead

Finally, the most important suggestion is to stay informed of changes in China's laws and plan ahead. This may be common sense, but keeping track of recent developments with China's rapidly-

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[312] Xie, *supra* note 230 (quoting one owner of an infringing laser disc house as saying, "we have yet to be notified officially that we must shut down").

[313] *China Throws out U.S. Accusations on Copyright Abuse*, *supra* note 262.

[314] McKeown & Kiang I, *supra* note 63.

piracy, and China's government will end up paying the costs to enforce foreign copyrights that do not benefit Chinese citizens.

There are several benefits to licensing. As mentioned above, once the U.S. firm has a local interest, Chinese courts are more likely to grant increased damages and injunctions. As long as there is a licensed Chinese manufacturer, shutting down pirate factories is no longer a total loss to the community. Professor Frankie Fook-Lun Leung, a former attorney in Hong Kong who is now a professor of Chinese law, stated that "tangible changes [in enforcement] will come about only if China's widespread piracy harms the country's own economy."[296] Professor Leung cites Taiwan as an example, where local businesses eventually put pressure on the government in the 1980s to prosecute infringers.[297]

C. Develop Relationships

Third, U.S. businesses should develop a relationship with the Chinese officials *before* they form a joint venture or a subsidiary in China.[298] Unify Corporation has set a good example in this area. The U.S.-based software company worked with China's various administrative agencies and implemented a software registration program in which users can register their previously unlicensed software.[299] Another example is Microsoft's agreement with China's

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[296] Leung, *supra* note 31.

[297] *Id.*

[298] *See* McKeown & Kiang I, *supra* note 63.

[299] *UNIFY: Unify, In Cooperation With People's Republic of China, Announces Software Licensing & Registration Program*, M2 Presswire, Aug. 27, 1996, *available in* WESTLAW, Allnews database, 1996 WL 11272065 (quoting U.S. Dept. of Commerce spokesman in Beijing as saying, "Unify's licensing program is an excellent model for software companies doing business in China").

Procter & Gamble, McDonald's,[285] Borland International, Digital Equipment, and Software Systems Associates.[286] One U.S. expert notes that, while the risk is high, the potential for substantial profits is also high.[287] If U.S. companies do not form joint ventures, they risk losing their patents, copyrights, and trademarks to China's public domain.

Furthermore, forming a joint venture in China is a quick means to establish goodwill with Chinese authorities. A joint venture overcomes many of the local enforcement problems in China that "simply cannot be dealt with at a distance."[288] Chinese authorities are much more likely to prosecute pirates if Chinese jobs and factories that form part of a joint venture are at stake.

If forming a joint venture or subsidiary is too costly, another possibility is to license or assign the intellectual property right. For example, Disney licensed a Hong Kong-based company to merchandise its products in China and has been earning over one hundred million dollars a year.[289] Microsoft licensed the China Great Wall Computer Group and other Chinese software groups in an attempt to challenge counterfeit MS-DOS products with legally protected versions.[290] Many foreign companies prefer an outright sale

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[285] Interview with Mr. Chen, *supra* note 16.

[286] Simpson, *supra* note 23, at 610.

[287] Interview with Professor Sun, *supra* note 12.

[288] Moga, *supra* note 232.

[289] Simpson, *supra* note 23, at 604.

[290] *Id.* at 610.

For instance, some Chinese pirates are selling CD-ROMs that have sixty to seventy business software programs and a retail value of up to twenty thousand dollars for six to ten dollars in Europe and South America.[274] "[I]gnoring the piracy problem will not make it go away."[275]

U.S. companies should also keep in mind that Chinese pirates are ruthless and ingenious. Unlike U.S. CD manufacturers, pirate factories do not throw away a mold after a certain number of CDs are produced.[276] They use the same mold until it is no longer usable, regardless of quality. They might sell the first one hundred CDs for ten dollars a piece, the next one hundred for nine dollars a piece, and so on until the last ten are sold at one dollar a piece. The nine-dollar CDs often find themselves in department stores, while the one-dollar CDs are sold by street vendors.[277] Another example of the resourcefulness of these pirates involves Disney's The Lion King® movie. Chinese street vendors were selling pirated copies of The Lion King® months before it was released on video in the United States.[278]

In response to U.S. pressure, pirate manufacturers induce local officials, judges, and sheriffs to help them avoid investigation. One successful practice is to form a partnership with military personnel because pirate factories on military bases are almost impossible to

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[274] Sarah Jackson-Han, *U.S. May Threaten China with Copyright Sanctions*, Agence France-Presse, Jan. 23, 1996, *available in* WESTLAW, Allnews database, 1996 WL 3793256; Mufson, *supra* note 1.

[275] McKeown & Kiang II, *supra* note 219, at C42.

[276] Leung, *supra* note 31.

[277] *Id.*

[278] Simpson, *supra* note 23, at 607.

intellectual property enforcement in the United States is not perfect.[265] Accordingly, these same officials ask why the United States should hold China to such high standards. Besides enforcement, there are still unresolved issues in the patent, copyright, and trademark laws within in the United States. For instance, the issue of how to protect features of software remains largely unresolved.[266] Even with its superior technology, more experienced judges, patent examiners, and a uniform federal system, the United States is still developing and refining its laws. It is unfair to hold China to a higher standard. Finally, in all fairness, the United States itself has failed to fulfill all of its obligations under the Action Plan.[267]

V. HOW U.S. PRACTITIONERS CAN IMPROVE ENFORCEMENT

International law is based upon the "reciprocity principle."[268] It is unrealistic for U.S. companies to demand patent, copyright, and trademark protection in China for the sole purpose of excluding the Chinese people from using them.[269] There must be some form of quid pro quo, such as licensing a copyright in China, so as to allow both countries to profit.

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[265] *Id.* ("Even in western countries, infringements have not been eradicated.").

[266] *See Lotus Development Corp. v. Borland Int'l, Inc.*, 49 F.3d 807, 34 U.S.P.Q.2d (BNA) 1014 (1st Cir. 1995), *aff'd by an equally divided court*, 116 S. Ct. 804 (1996).

[267] Interview with Professor Sun, *supra* note 12 (asserting that the PTO and other U.S. agencies have not fulfilled all of their obligations under the Action Plan).

[268] PARRY AND GRANT ENCYCLOPAEDIC DICTIONARY OF INTERNATIONAL LAW 323 (Clive Parry et al. eds., 1986).

[269] Harrington, *supra* note 25, at 369.

Computer Pervasiveness in China's Ministry of Electronics Industry ("Department of Computer Pervasiveness"), claimed that the U.S. Trade Representatives should have negotiated with his agency, instead of the NCA.[252] Mr. Chong said his agency has the official responsibility for developing a national software market and a domestic production industry. He further claimed that the negotiations took an extra six months because the NCA "really didn't understand the issues."[253] Mr. Chong added that, after the agreement, the NCA was not enforcing software registration requirements.[254]

This power struggle indicated a deeper problem--an inconsistency in China's laws. China's Copyright Law authorized the NCA to administer China's copyrights, including computer software.[255] The Regulations on Computer Software Protection, however, implied that the Department of Computer Pervasiveness has the responsibility to control software copyright registration.[256] This conflict came to an end in late 1995, when China gave the NCA exclusive control of software copyrights.[257]

Some U.S. observers, including Ralph Oman, the former U.S. Register of Copyrights, believe that China firmly understands the value of enforcing intellectual property rights.[258] Mr. Oman asserts

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[252] *Wrong Red Tape (China-US Intellectual Property Negotiations Stall)*, PC WEEK, July 17, 1995, at A5.

[253] *Id.*

[254] *Id.*

[255] Copyright Law, *supra* note 40, ch. I, art. 8, at 14,563.

[256] Software Protection Regulations, *supra* note 101, ch. I, art. 8, at 14,683.

[257] Interview with Professor Sun, *supra* note 12.

[258] *See* Oman, *supra* note 142.

Chinese prosecutors, who closed down the factory and fined the pirate company more than $100,000.[243]

Aside from these developments in the business community, China is also facing societal pressure to seize and destroy counterfeit goods. Parents are alarmed by the accessibility of pirated video cassettes being shown at illegal "laser disc houses."[244] These violent and pornographic laser discs are drawing droves of Chinese adolescents, and parents believe that such screenings are the cause of recent "lawless behavior of Chinese youth."[245] Letters from concerned parents are pouring into government offices.[246] Increased community pressure will likely be placed on local authorities to shut down these illicit operations.

In addition to efforts by China and the United States, in May, 1995, Japan's Prime Minister offered to help China improve its intellectual property system.[247] Like the United States, Japan is also deeply concerned over the flood of imitation Japanese consumer electronics and video games in China. Japan's offer was a turnaround from its previous policy of hurling demands and threats at Beijing to stamp out infringement. Japanese officials now say that they will send their Patent Agency experts to China to train Chinese agents by

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[243] *Id.*

[244] Xie, *supra* note 230.

[245] *Id.* (also quoting Wang Wengyuan, Deputy Director of the Cultural Market Administration, as saying "[illegal laser disc houses] are pernicious to our younger generations").

[246] *Id.*

[247] *Japan to Help China Improve Intellectual Property System*, ASIAN ECON. NEWS, May 8, 1995, *available in* WESTLAW, Allnews database, 1995 WL 2298725.

D. *Practitioner And Grass Roots Changes*

The Chinese Ministry of Justice has encouraged more citizens to enter the legal profession, especially in specialized areas like intellectual property law.[233] The Ministry is trying to transform all state-run law firms into private, independent firms to conform with a market economy.[234] The Chinese State Council has granted more responsibility to the All-China Lawyer's Association (China's version of the American Bar Association) to set standards for Chinese law firms.[235]

On the academic side, at least forty-eight universities have instituted intellectual property courses.[236] The People's University, The Huazhong Science and Technology University, and The Zhejiang University now offer second bachelor degrees in intellectual property law.[237] The Beijing University has opened a new School of Intellectual Property.[238]

In addition to attorney associations and universities, there has been increased support from China's business community for stronger enforcement of intellectual property laws. For instance, in Suzhou, a model city cited for strong patent protection, ninety-five percent of the 213 medium and large-sized business enterprises have full or part-time patent specialists. This progress was a result of the first

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[233] Yu, *supra* note 67, at 150.

[234] *Id.*

[235] *Id.*

[236] *Id.* at 149.

[237] *Id.*

[238] *Id.*

Other administrative agencies also possess the power to impose fines and grant injunctions.[219] For instance, an administrative judge of China's International Trade Commission recently held seven Chinese companies liable for stealing patented technology on making magnets from a U.S. company.[220] The judge recommended to the full Commission that the infringing Chinese magnets be blocked from entering the United States. It was the first such ruling by the Commission after the Action Plan was signed.[221]

Among China's most recent efforts to boost foreign patent, copyright, and trademark applications were high-profile visits to the United States by the Chinese Patent Office Director General,[222] the Chief of the Bureau of Economic Regulations (State Economic and Trade Commission), and the Deputy Chief of the Bureau of Legal Affairs (State Council of the People's Republic of China).[223]

As an apparent response to these efforts, foreign patent applications in China have increased by twenty-five percent in 1995, with those from Japan, the United States, and Germany leading the

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[219] M. Margaret McKeown and Heng-Pin Kiang, *China Begins Revolution in Intellectual Property; Partnering with a suspected counterfeiter could be a way to navigate through an alien system*, NAT'L L.J., Oct. 31, 1994, at C41-C42 [hereinafter McKeown & Kiang II].

[220] Robert Gavin, *Ruling for Crucible Repels Chinese Magnets; Crucible, Taking a "Junkyard Dog" Attitude, Wins a Round in a Trade Fight to Fend off Chinese Patent Pirates*, POST-STANDARD SYRACUSE, Dec. 13, 1994, at D8.

[221] *Id.*

[222] Slind-Flor, *supra* note 148, at B1.

[223] Conference of U.S.-China Trade Secrets Law, The George Washington University Law School, Sept. 6, 1995.