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The Electronic Filing of Applications with the United States Patent & Trademark Office

by
HUNTER L. AUYANG*

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Introduction

The United States Patent and Trademark Office (PTO) has endeavored for many years to establish a "paperless" office. The PTO has engaged in a long and ongoing effort to computerize its operations. Despite the numerous difficulties encountered by the PTO in the past, the PTO is once again taking steps to develop the ability to accept electronically filed trademark and patent applications.

Pursuant to its rule-making powers, in a November 30, 1992 publication in the Federal Register,¹ the PTO notified the business community, the patent and trademark bars, inventors, and other members of the public that it would amend its rules of practice to: (1) allow for electronic filing of patent and trademark applications, and (2) require applications filed in paper form to follow a prescribed order and format. This most recent attempt at introducing electronic filing appears well conceived and may prove ultimately to be successful.

I

Background

All patent and trademark applications are presently submitted in paper form.² The PTO relies heavily on its clerical staff to process over 130,000 patent applications that it receives annually. Approximately 300,000 patent applications are being processed on any given day.³ The PTO is fairly efficient, given the heavy burden of working with such massive volumes of paper. Nevertheless, the process of moving paper applications from building to building and office to office is very labor-intensive, time-consuming, and subject to errors.⁴ The work of the PTO is performed by a staff of about 4,000 examiners and clerks in its patent operations and by a staff of about 350 examiners and clerks in its trademark operations.⁵

The work flow in the PTO revolves generally around three separate types of activities.⁶ Pre-examination processing includes administrative activities that prepare the patent or trademark application before the examiner sees it. Next, examination by a patent or trademark examiner involves communicating with the applicant to amend the application for possible allowance. Finally, if the application is

1. 57 Fed. Reg. 56,537 (1992).

2. Susan Taylor, *The U.S. Patent and Trademark Office: A Case Study in Business Reengineering*, 14 NAT'L PRODUCTIVITY REV. 85 (Dec. 22, 1994).

3. *Id.*

4. *Id.*

5. *Id.*

6. *Id.*

allowed, post-examination activities prepare the application for printing as a U.S. patent or U.S. trademark certificate and for publication in the PTO *Official Gazette*. The PTO anticipates that if applications are filed electronically, it could improve the quality of its services by improving the accuracy of information relied upon during the examination process, limiting the delays caused by mail processing, and eliminating the need for data entry.⁷

The capability to accept electronically filed patent and trademark applications is a prerequisite for reaching the goal of a paperless office. It requires the PTO to undertake the difficult task of reinventing and reengineering its operations to meet this future.⁸ PTO's current effort appears to draw upon valuable lessons learned from its past efforts.

II Automation by the PTO

The scope of the task confronting the PTO was monumental from the beginning. The PTO is one of the largest repositories of technical literature in the world today,⁹ with an archive of about 30 million documents. Some of these documents date back more than 200 years.¹⁰ Among the documents in its patent operations, there are files relating to over five million U.S. patents already issued by the PTO, with about 2,000 new patents being added to the library each week.¹¹ There are documents on the trademark side as well, which are less only by comparison. The PTO realized early on that it faced a growing problem and sought to develop plans to automate its operations.¹²

In the mid-1960s, the PTO developed a plan to install a computerized system capable of electronically preparing patent applications for printing.¹³ The system would also create a database of issued U.S. patents, which would be retrievable for patent searches.¹⁴ A contract was awarded to International Computaprint Corporation (ICC) in

7. 57 Fed. Reg. 56,537.

8. Susan Taylor, *Patent & Trademark Office Sets the Standard for Reengineering Government; Business Process Reengineering*, 26 INDUS. ENG'G, Apr. 1994, at 36.

9. Taylor, *supra* note 2.

10. *Id.*

11. *Id.*

12. *Id.* The seeds were planted for reengineering in the PTO almost ten years ago, when a plan was written for replacing the paper-based patent application process.

13. H.R. REP. NO. 1307, 96th Cong., 2d Sess., pt. 1, at 36 (1980), *reprinted in* 1980 U.S.C.C.A.N. 6460, 6495.

14. *Id.*

April of 1970 to begin implementing the plan.¹⁵ Under the plan at a later stage the PTO was to assume both the work performed by the contractor and the development of a retrieval system for patent searches, but the PTO was able to do neither.¹⁶ The PTO paid ICC over \$32 million in this unsuccessful attempt to implement the plan.¹⁷ Many millions more were spent by the PTO in its attempt to develop a retrieval system.¹⁸ During this period, the PTO made three separate efforts to develop a working patent database, aborting each attempt. In retrospect, it is likely that the PTO's efforts were premature, given the technology that was available at the time.

In any event, following President Carter's call for a major policy review of industrial innovation to find ways to increase productivity in the United States, the patent laws were amended in 1980.¹⁹ The new laws increased the PTO's funding and allocated money specifically for automation. The laws also created the Court of Appeals for the Federal Circuit.²⁰

The goal was to improve U.S. productivity by creating technologies and industries through innovation.²¹ A reinvigorated patent system was considered a key component in promoting industrial innovation because it would stimulate increased expenditures for basic research and development. In addition, Congress sought to improve the services offered by the PTO and to reduce the backlog of applications that existed at the time.²² Congress enacted H.R. 6933, entitled "To amend the patent and trademark laws," which is the underlying legislation for the PTO's recent automation efforts.²³

The amended patent laws charged the Commissioner for Patents & Trademarks with responsibility for identifying and developing a computerized system for automating the PTO.²⁴ The PTO submitted an ambitious plan to Congress, on December 13, 1982 to automate its entire operations by 1990.²⁵ The plan centered on two basic concepts involving the creation of electronic databases that would: (1) replace all of the PTO's paper patent and trademark files, which lack integrity and could not be cost-effectively maintained; and (2) support

15. *Id.* at 36-37.

16. *Id.* at 37.

17. *Id.*

18. *Id.*

19. *Id.* at 2.

20. *Id.* at 3, 36.

21. *Id.* at 4.

22. *Id.* at 35.

23. *Id.* at 1.

24. *Id.* at 36.

25. 49 Fed. Reg. 24,585 (1984).

searches, examinations, office actions, and other office functions using computer workstations by providing text and digital image retrieval capabilities.

At the time, one of the major problems facing the PTO was the integrity of the search files used by patent examiners and the public.²⁶ Patents were sometimes missing from both the examiner search rooms and the public search rooms. As a result, patents were being issued without the patent examiners having considered all of the relevant prior art in the determination of patentability.²⁷ The PTO specifically sought to eliminate this problem through automation.

In developing an automated system, the PTO also attempted to achieve widespread dissemination of patent information to all segments of the U.S. public by: (1) directly providing electronic database search and retrieval services in the public search facilities located at the PTO and other locations, such as the patent depository libraries or "PDLs"; and (2) indirectly encouraging the private sector to offer commercial patent search and retrieval services.²⁸

The cost for the project was originally estimated at about \$500 million. Planning Research Corporation (PRC) was awarded a \$300 million "cost plus" contract by the PTO to provide the computer software and hardware for an automated patent system (APS).²⁹ PRC was to take the lead, as the general contractor, in the development of APS, with portions of the development being subcontracted to other vendors.

As envisioned, APS was to include: (1) all U.S. patents, patent application files, and related patent data, such as bibliographic, classification, status, and ownership information; (2) a comprehensive collection of foreign patent documents and related patent data, such as bibliographic and classification data, either captured by the PTO or obtained through exchanges with other patent offices, intergovernmental organizations, or other entities; and (3) a collection of selected non-patent technical literature.³⁰ The implementation would require the use of many proprietary components.

To enable APS to store and access information, according to the original conceptual design, APS would operate on a digital private branch exchange, or PBX system, capable of high speed data transfer. To meet the PTO's needs, the system required distributed processing

26. *Id.*

27. *Id.*

28. *Id.*

29. *Id.*

30. *Id.*

capability in which each node in the network would be controlled by an intelligent microprocessor connected by an Ethernet interface. The hardware, then, would operate using a hybrid proprietary version of a UNIX operating system.

An understanding of the problems the PTO faced in designing and installing APS is instructive. At the highest level, the requirements for APS were difficult to achieve. First, APS had to store very large amounts of patent data, i.e., millions of documents.³¹ Second, the data needed to be retrievable at acceptable transfer speeds to accommodate thousands of users simultaneously.³² Finally, the system needed to store both text and images in a searchable format, because an examiner must review both in determining patentability.³³ The envisioned system presented many technological hurdles that had to be overcome. Today, thirteen years later, the PTO has yet to fully implement the plan for APS.

The patent data on APS is presently stored on a two-component system. The first component of the system contains all U.S. patents scanned to create digital image files with both patent text and drawings. The information is stored as raster data (CIIPT group 4 format) on two different sets of optical disks. One set of disks contains the patents stored as low-resolution images, 150 dpi (dots per inch), and the second set contains the patents stored as high-resolution images, 300 dpi. The optical disks are read by Sony drives controlled by Sun Microsystems workstations. The 150 dpi disks are arranged four (4) disks per drive for rapid access, while the 300 dpi disks are accessed in a jukebox-like manner with 50 disks per drive. The two sets of disks are needed to accommodate the usage requirements of examiners and to provide adequate data transfer speeds. The greater the amounts of data to be transferred, the slower the speed. The "flip" searches performed by examiners use the 150 dpi disks. In addition, because the patents were only scanned in, they cannot be searched, for example, using Boolean logic. Thus, APS needs to have a second component.

The second component of APS is a database containing U.S. patents, text only, issued since 1975. The database sits on an IBM mainframe.³⁴ The search software for the system was developed by Chemical Abstract Service. This database has been available on APS

31. 49 Fed. Reg. 24,585 (1984).

32. *Id.* The goal is to put electronic databases in public search facilities located in the PTO and Patent Deposit Libraries.

33. *See, e.g.*, 52 Fed. Reg. 9526 (1987) (trademark registrations have already been converted to an electronic data base of textual and digital imaging).

34. *See, e.g.*, 54 Fed. Reg. 18,920 (1989) (describing an IBM-based computer system).

since 1987 and is searchable in a manner similar to Lexis and Westlaw databases. This component of APS is accessible from an examiner's PC, while the patents stored on optical disks are not.

In order to access the patent data on the optical disks, the examiner must use Sun Microsystems workstations located in certain areas at the PTO (Cluster Rooms). As the plan was originally conceived, each examiner's office would have a workstation. The workstations were to be configured with dual, high-resolution monitors capable of displaying a page of a patent application in full. Each examiner was to be able to perform all functions from the workstation, including the ability to search according to the current U.S. Patent Classification and International Patent Classification systems and to access selected commercial databases. The PTO anticipated ordering between 1,700 and 3,200 of these workstations. The PTO did not, however, anticipate that the workstations would have special power and cooling requirements that make their installation in each examiner's office prohibitively expensive. The use of Cluster Rooms was a compromise solution.

In addition to the Cluster Rooms established for examiners, several workstations were installed in the public search facilities at the PTO. The public can use APS at no charge simply by taking a training class offered by the PTO. Users of the APS must typically sign up several days in advance. This aspect of the APS program is very successful.

In the mid 1980s, the PTO developed three interrelated systems—Trademark Reporting and Monitoring (TRAM), Trademark Search (T-Search), and Trademark Computer Assisted Retrieval (T-CAR)—for its trademark operations.³⁵ First, TRAM stores and maintains a complete file of trademark applications.³⁶ Second, T-Search maintains a database of basic trademark application and registration information, including text and facsimiles of marks.³⁷ Lastly, T-CAR automates the information pertaining to application serial numbers and registration numbers.³⁸ Trademark examiners have been using T-Search exclusively since January 1988. This system is already outdated and needs to be revamped.

In the midst of the technical hurdles that the PTO faced in getting APS "up and running," the PTO had the choice of either scrapping the plans for APS and starting over, or trying to integrate new tech-

35. 49 Fed. Reg. 31,460 (1984).

36. *Id.*

37. *Id.*

38. *Id.*

nologies as they became available. The PTO chose the latter course. The integration proved to be very difficult because of the proprietary software developed by PRC.

The PTO did not manage the APS development properly; oversight mechanisms were lacking. The software developed by PRC was, and still is, infested with bugs. The standards used in development were too loose and the check-offs were done summarily. The government procurement process, due to the time needed to obtain approvals for upgrades, also contributed to the development problems of APS.

Moreover, because PRC was not working under a fixed-cost contract, there was no incentive for cost control. To date, the development of APS has taken thirteen years and cost nearly \$1 billion for the hardware and software. Much of the hardware for APS is now obsolete. As an example, the system was originally installed using copper cables, which carry far less information than the fiber optic cables now available. These copper cables will need to be replaced. Fortunately, the PTO's latest development effort appears to be better managed.

III "Trilateral" Cooperation

The PTO was not alone in recognizing that, in today's information technology age, it had to keep pace by automating its operations. Patent offices around the world have also reached the same conclusion, and some have embarked on similar automation drives. The European Patent Office (EPO), Japanese Patent Office (JPO), and World Intellectual Property Organization (WIPO) have, or are considering, programs to encourage or compel the electronic filing of applications.³⁹ One of the major factors motivating these organizations to institute electronic filing is the savings that will be immediately realized in the cost of typesetting. For example, the PTO's typesetting budget alone was over \$60 million for 1994.⁴⁰ The entry of the application data by the PTO is a duplication of effort since the application is normally prepared on a computer by a patent attorney or agent.

A cooperative, trilateral effort is currently underway to develop software that will handle electronically filed applications. The PTO, EPO, and WIPO are jointly funding the Electronic Applications SYS-

39. Charles L. Dennis II, *Patent Office Electronic Filing Plans Should Affect Your Computer Planning Now*, 12 IPL NEWSLETTER, Spring 1994, at 3.

40. *Id.*

tem (EASY) project.⁴¹ The PTO is managing the project, with the costs borne jointly by the participating offices. The project's milestones and development plans are also largely being determined in cooperation with EPO and WIPO. It is expected that the JPO will join in this development effort in the near future.⁴²

In considering the possible models for an electronic filing system, the PTO, EPO, and WIPO agreed to reject the current system used by the JPO as a model. The filing of patent applications in electronic format was made mandatory by JPO in 1989.⁴³ The JPO system requires the use of expensive custom terminals, and most Japanese patent firms have purchased these custom terminals.⁴⁴ For most foreign applicants, the change was probably transparent since Japanese law firms are typically engaged to prepare translations of, and file, patent applications with the JPO. While there may be advantages to controlling the transmission of application information through the use of special terminals, the pace of both hardware and software development renders custom terminals obsolete, as the Japanese now realize.⁴⁵

In the development of EASY, the PTO strategically sought the advice of the practitioners who will ultimately be required to use the software to file applications electronically. For instance, when the PTO began its development activities, it asked the American Intellectual Property Law Association's Information Retrieval Committee to establish a subcommittee to provide guidance in the software design process.⁴⁶ The American Bar Association followed in establishing a similar committee to assist the PTO.⁴⁷ The EPO has similarly established a committee of European practitioners to help guide the system's development.⁴⁸

The consensus developed among the various groups was that, for an electronic filing system to be accepted, it must: (1) be easy to use, (2) not employ to any great extent specialized computer hardware, (3) accept most commonly used word processing software, and (4) be flexible enough to operate on various types of commonly used com-

41. See PATENT & TRADEMARK OFFICE, U.S. DEPARTMENT OF COMMERCE, INTRODUCTION TO EASY (ELECTRONIC APPLICATION SYSTEM) PATENT OR TRADEMARK APPLICATION 3 (1994).

42. Dennis, *supra* note 39, at 4.

43. *Id.* at 3.

44. *Id.* at 4.

45. *Id.*

46. *Id.*

47. *Id.*

48. *Id.*

puters.⁴⁹ From this consensus, the PTO established its development criteria. The development contract was awarded to Compass Services, Inc., a company located in Rockville, Maryland.⁵⁰

IV The EASY Pilot Program

In November 1993, the PTO released its first version of the EASY software for testing as part of a pilot program.⁵¹ A second version of the EASY software was released in July 1994.⁵² The PTO has a small staff of four persons overseeing the pilot program and evaluating the EASY software's ability to prepare documents for use in filing patent and trademark applications electronically.⁵³ The PTO will provide copies of EASY to interested parties upon written request.⁵⁴

The participants in the EASY pilot program receive: (1) a Patent Module; (2) a Trademark Module; (3) an Assignment Module; (4) the latest version of the EASY User Manual Documentation, including the Document Input Guide (DIG) for document preparation; (5) EASY Macros to assist in following DIG; and (6) an evaluation form.⁵⁵ Participants are requested to send the mock applications prepared using EASY to the PTO and report software errors encountered during the preparation.⁵⁶

The EASY software is designed for filing U.S. patent and trademark applications and can be used for filing EPO and PCT applications as well.⁵⁷ This multi-purpose use will aid practitioners by reducing the time needed to understand how to use the EASY software. The goals of the EASY program, as stated by the PTO, are as follows:

49. *Id.*

50. Interview with Lisa Lidums, EASY Project Leader, U.S. Patent & Trademark Office, at U.S. Patent & Trademark Office.

51. PATENT & TRADEMARK OFFICE, *supra* note 41, at 12.

52. *Id.*

53. Interview with Lisa Lidums, *supra* note 50.

54. Interview with Gregory R. Gabel, Pilot Test Coordinator, U.S. Patent & Trademark Office, at U.S. Patent & Trademark Office (Jan. 4, 1995). Requests should be sent to:

U.S. Patent & Trademark Office
Administrative Management Systems Division
Crystal Park, Suite 1001B, Room 1085
Washington, D.C. 20231
Attention: Greg Gabel

55. *Id.*

56. *Id.* at 2.

57. Interview with Lisa Lidums, *supra* note 50.

1. Provide electronic filing forms and a method to attach important electronic source documents;
2. Run on easily accessible computer equipment;
3. Help the applicant improve the speed and accuracy of filings; and
4. Help the PTO reduce the cost of processing and printing an application.⁵⁸

There are currently about 155 companies and law firms testing the EASY software and the response from the majority of users has apparently been very enthusiastic.⁵⁹

EASY is an application program developed to operate on a Microsoft Windows platform. Therefore, the software can run on any computer that can support Windows 3.1, *i.e.*, a computer with a 386SX or higher microprocessor.⁶⁰ The PTO, unfortunately, has no current plans to make EASY run on Macintosh hardware, despite the urgings of several bar committees.⁶¹ EASY is not presently a network program, but is network compatible in that it allows the database of bibliographic information to be centrally located so that network users can access the information.⁶²

The EASY software is menu-driven and presents the user with screens that are very similar to those found on most Windows applications. The version of the software presently available for testing is not fully functional, with some functions being purposefully disabled. The EASY software provides templates that allow a user to fill in the required information. The opening menu asks the user whether the application is to be prepared for submission to either the PTO, EPO, or WIPO. The screen formats for the information to be inputted are similar for the PTO, EPO, and WIPO applications, pursuant to an agreement reached by the three patent offices.

After choosing the office to which the application is to be directed, the software asks for information that identifies the application; for example, bibliographic data regarding the inventor(s). The software will store the bibliographic information so that it need not be re-entered for filing multiple applications. Documents accompanying the application, such as the assignment and power of attorney, can also be attached.

Selected information is input as required, since not all the fields will be applicable. The software asks for information to meet the specific requirements of the office to which the application is to be sub-

58. PATENT & TRADEMARK OFFICE, *supra* note 41, at 2.

59. Interview with Lisa Lidums, *supra* note 50.

60. PATENT & TRADEMARK OFFICE, *supra* note 41, at 7.

61. Dennis, *supra* note 39, at 21.

62. Interview with Lisa Lidums, *supra* note 50.

mitted. For example, U.S. patent law requires that an applicant disclose and submit all prior art that the applicant is aware of as an Information Disclosure Statement (IDS). For this reason, the EASY software has a screen that is designed specifically for preparing the IDS, so that information can be input directly.

The specification and claims of a patent application are attached as a separately prepared WordPerfect or Microsoft Word file. EASY supports these two word processing programs, since the majority of U.S. and European law firms now use WordPerfect and most of the remainder use Word. The PTO will attempt to support other word processing programs as well.⁶³

The EASY software has a validation feature that checks the application for format errors before the application is submitted to the PTO. The software checks the fields for mandatory information and notifies the user if errors are found. Once the validation is complete, the application can be printed and downloaded onto a floppy disk. EASY will then print a listing of the inputted information and a signature page.

The PTO is planning to conduct four (4) pilot programs, as follows:

- Pilot 1 will provide forms for the entry of bibliographic data, fee and attaching word processing and graphics files;
- Pilot 2 will develop software to "tag" a word processing file when it is received by the PTO;
- Pilot 3 will shift the tagging software to applicant's PC; and
- Pilot 4 will test the on-line filing of applications prepared using the EASY software.⁶⁴

The EASY software will ultimately be the intake component in an end-to-end system for electronic processing and publication of patent and trademark information.⁶⁵ EASY will be integrated with the PTO's Patent Application Management system to fully automate the tracking and processing of patent applications.

V

The Future

Within the next two years, the PTO plans to begin accepting patent and trademark applications in electronic, computer-readable format along with paper copies.⁶⁶ The submission of applications on floppy disks will initially be voluntary. Practitioners will need to de-

63. Interview with Lisa Lidums, *supra* note 50.

64. PATENT & TRADEMARK OFFICE, *supra* note 41, at 11.

65. Interview with Lisa Lidums, *supra* note 50.

66. PATENT & TRADEMARK OFFICE, *supra* note 41, at 15.

cide whether or not they should invest the time and effort necessary to learn how to use the EASY software. Large corporations and law firms that submit numerous applications are likely to allocate the resources and staff to use the EASY software. Many smaller companies and law firms may choose not to expend such resources, because of the lack of incentive to do so.

Certain incentives could be offered, such as a dual fee structure with lower fees for the submission of only computer-readable applications. To obtain full compliance by practitioners, however, it is likely that the filing of applications on disks would have to be made mandatory. This would require amending the laws and rules that govern the filing of patent and trademark applications, which should be possible.

There is now an additional reason for the PTO to require that the filing of patent applications be on floppy disks with the anticipated passage of Senate Bill 1854, the "Patent Term and Publication Reform Act."⁶⁷ This law will require the PTO to open to the public and/or publish patent applications after 18 months of their filing date or foreign priority date, whichever is earlier.⁶⁸ The PTO's work will be made easier if applications are already on floppy disks.

Finally, in the "first-to-file" world that the United States will undoubtedly soon join, applicants will be motivated to file their applications as quickly as possible. The ability to file electronically will mean that an application will arrive at the PTO nearly instantaneously at the push of a button. The resulting scenario is that, once the PTO makes on-line electronic filing available, everyone will acquire the ability to file electronically to avoid the potential consequences of losing a race to the PTO. The PTO needs to proceed with its development of on-line application filing capabilities, because if the PTO builds the system, the public will use it.

67. *Patent Office Oversight: Hearings Before Subcomm. on Patents, Copyrights, and Trademarks of the Senate Judiciary Comm.*, 103d Cong., 2d Sess. (1994) (statement of Gary L. Griswold, Vice-President, Intellectual Property Owners).

68. *Id.*

