

© 2000 North Carolina Journal of Law & Technology
Cite as: 1 N.C. J.L. & Tech. 1 (2000)

**THE INTELLECTUAL PROPERTY AND
COMMUNICATIONS OMNIBUS REFORM ACT OF 1999:
an Overview for IP Practitioners**

Julie H. Richardson and Kenneth D. Sibley¹

TABLE OF CONTENTS

Title IV: Inventor Protection

Subtitle G: Patent and Trademark Office

Subtitle A: Inventor Rights

Subtitle B: Patent and Trademark Fee Fairness

Subtitle C: First Inventor Defense Act of 1999

Subtitle D: The Patent Term Guarantee Act of 1999

**Subtitle E: (Pre-Grant) Domestic Publication of Patent
Applications**

Subtitle F: Optional *Inter Partes* Re-Examination

Subtitle H: Miscellaneous Patent Provisions

¹ Julie H. Richardson, Esq., is an associate with, and Kenneth D. Sibley, Esq., is a partner of Myers Bigel Sibley & Sajovec, P.A., a boutique law firm located in Raleigh, NC specializing in intellectual property with a concentration in patent law. Each received a J.D. degree from Duke Law School in 1995 and 1985, respectively. The authors wish to state that this article is for general educational purposes only. It is not intended to give legal advice which must be given in light of all of the facts concerning the particular situation in question. The views and opinions expressed herein represent the current views of the authors only and are not to be attributed to the authors' firm or any clients of the authors' firm.

Title III: Trademark Cyberpiracy Prevention aka “the Anti-Cybersquatting Consumer Protection Act”

Conclusion

On November 29, 1999, what then-Commissioner Dickinson called the “most significant changes” in U.S. Patent law since the 1952 Patent Act were signed into law by President Clinton^{2 3}. This legislation is included in P.L. 106-113, the Intellectual Property and Communications Omnibus Reform Act of 1999 (the Reform Act⁴). Titles III and IV of the Reform Act are of the most concern to IP practitioners and are addressed here^{5 6}. Each of the provisions within these titles has various effective

² See The Intellectual Property And Communications Omnibus Reform Act Of 1999, Pub. L. No. 106-113, 106th Cong., 1st Sess. (1999).

³ Remarks of Q. Todd Dickinson, Remarks At PTO Day, Annual Conference On Patent & Trademark Office, Law And Practice (December 6, 1999) (Transcript available at

<http://www.uspto.gov/web/offices/ac/ahrpa/opa/bulletin/ptoday1299.doc>).

⁴ See S. 1948, 106th Cong., 1st Sess. (1999) P.L. 106-113 includes H.R. 3194, which is known as the “Omnibus Consolidated Appropriations Act,” and also enacts S. 1948 without actually reciting the text of same. S. 1948 covers patent law reform, trademark cyber-squatting, and cable and satellite television broadcasting/programming.

⁵ The text of the new intellectual property laws are posted at the ABA website at <http://www.abanet.org/intelprop/>, by selecting “IPL Legislation” and “106th Congress.”

⁶ Title III is entitled “Trademark Cyberpiracy Prevention” and Title IV is “Inventor Protection (American Inventors Protection Act of 1999).” Title I is titled “Satellite HomeViewer Improvement” and Title II is titled “Rural Local Television Signals.” Title V is titled “Miscellaneous Provisions” (and includes such diverse topics as a commission for online child protection and vessel hull design protection). Title VI is titled “Super Fund Recycling Equity.”

dates (extending from the date of enactment to one year from the date of enactment). The United States Patent and Trademark Office (USPTO) is presently studying implementation rules and guidelines for the new legislation. Therefore, it is expected that a significant number of rule changes will occur in the near future. A short synopsis of the major provisions of the Act (arranged somewhat out of order for readability) is given below.

Title IV: Inventor Protection (American Inventors Protection Act of 1999)⁷

⁷ Title IV is directed to the patent laws and includes Subtitles A-H listed for ease of reference more particularly below.

TITLE IV -- INVENTOR PROTECTION

Sec. 4001. Short title.

Subtitle A -- Inventors' Rights

Sec. 4101. Short title.

Sec. 4102. Integrity in invention promotion services.

Sec. 4103. Effective date.

Subtitle B -- Patent and Trademark Fee Fairness

Sec. 4201. Short title.

Sec. 4202. Adjustment of patent fees.

Sec. 4203. Adjustment of trademark fees.

Sec. 4204. Study on alternative fee structures.

Sec. 4205. Patent and Trademark Office Funding.

Sec. 4206. Effective date.

Subtitle C -- First Inventor Defense

Sec. 4301. Short title.
Sec. 4302. Defense to patent infringement based on earlier inventor.
Sec. 4303. Effective date and applicability.

Subtitle D -- Patent Term Guarantee

Sec. 4401. Short title.
Sec. 4402. Patent term guarantee authority.
Sec. 4403. Continued examination of patent applications.
Sec. 4404. Technical clarification.
Sec. 4405. Effective date.

Subtitle E -- Domestic Publication of Patent Applications Published
Abroad

Sec. 4501. Short title.
Sec. 4502. Publication.
Sec. 4503. Time for claiming benefit of earlier filing date.
Sec. 4504. Provisional rights.
Sec. 4505. Prior art effect of published applications.
Sec. 4506. Cost recovery for publication.
Sec. 4507. Conforming amendments.
Sec. 4508. Effective date.

Subtitle F -- Optional Inter Partes Reexamination Procedure

Sec. 4601. Short title.
Sec. 4602. Ex parte reexamination of patents.
Sec. 4603. Definitions.
Sec. 4604. Optional inter partes reexamination procedures.
Sec. 4605. Conforming amendments.
Sec. 4606. Report to Congress.
Sec. 4607. Estoppel effect of reexamination.
Sec. 4608. Effective date.

Subtitle G -- Patent and Trademark Office

Sec. 4701. Short title.

Chapter 1 -- United States Patent and Trademark Office

- Sec. 4711. Establishment of Patent and Trademark Office.
- Sec. 4712. Powers and duties.
- Sec. 4713. Organization and management.
- Sec. 4714. Public advisory committees.
- Sec. 4715. Conforming amendments.
- Sec. 4716. Trademark Trial and Appeal Board.
- Sec. 4717. Board of Patent Appeals and Interferences.
- Sec. 4718. Annual report of Director.
- Sec. 4719. Suspension or exclusion from practice.
- Sec. 4720. Pay of Director and Deputy Director.

Chapter 2 -- Effective Date; Technical Amendments

- Sec. 4731. Effective date.
- Sec. 4732. Technical and conforming amendments.

Chapter 3 -- Miscellaneous Provisions

- Sec. 4741. References.
- Sec. 4742. Exercise of authorities.
- Sec. 4743. Savings provisions.
- Sec. 4744. Transfer of assets.
- Sec. 4745. Delegation and assignment.
- Sec. 4746. Authority of Director of the Office of Management and Budget with respect to functions transferred.
- Sec. 4747. Certain vesting of functions considered transfers.
- Sec. 4748. Availability of existing funds.
- Sec. 4749. Definitions.

Subtitle H -- Miscellaneous Patent Provisions

Subtitle G: Patent and Trademark Office⁸

This provision of the Reform Act, known as the Patent and Trademark Office Efficiency Act (PTOEA), establishes the USPTO as an agency of the United States, within the Department of Commerce⁹. As such, the Commissioner is now the Under Secretary of Commerce for Intellectual Property and Director of The USPTO (Director)¹⁰. The Office is now a performance-based organization and is structured to retain *independent* control of its revenues, budget allocations, and expenditures¹¹. PTOEA requires that the patent offices and the trademark offices be established as separate operating units within the Office. PTOEA also allows the USPTO to establish satellite offices throughout the United States as necessary and appropriate to conduct business and authorizes the entering into and performance of contracts (authorizing the

Sec. 4801. Provisional applications.

Sec. 4802. International applications.

Sec. 4803. Certain limitations on damages for patent infringement not applicable.

Sec. 4804. Electronic filing and publications.

Sec. 4805. Study and report on biological deposits in support of biotechnology patents.

Sec. 4806. Prior invention.

Sec. 4807. Prior art exclusion for certain commonly assigned patents.

Sec. 4808. Exchange of copies of patents with foreign countries.

⁸ See S. 1948, Title IV, Subtitle G - Patent and Trademark Office, Ch. 1, 2 & 3, §§4701-4749. The short title for this subtitle is the "Patent and Trademark Office Efficiency Act."

⁹ See S. 1948, §4711. The agency establishment provision is codified at 35 U.S.C. §1 (2000).

¹⁰ See S. 1948, §4713 codified at 35 U.S.C. §3(a). The Act also establishes both a Commissioner of Patents and a Commissioner of Trademarks.

¹¹ See S. 1948, codified at 35 U.S.C. §§1-2 (2000).

planned move from Crystal City, Virginia to Arlington, Virginia).¹²

Subtitle A: Inventor Rights (Inventors' Rights Act of 1999)

Introducing federal legislation that parallels state legislation in North Carolina (and elsewhere), the Inventor's Rights Act is an attempt to protect inventors from deceptive practices associated with inventor marketing companies. As defined under the Act, "invention promoters" do not include government agencies, qualified nonprofit, charitable, scientific or educational organizations, or persons or entities involved in evaluating the commercial potential of, or offering to license or sell, a utility patent or a previously filed nonprovisional utility patent application. The Act further defines the term "invention promoters" to exclude any party participating in a transaction involving the sale of stock or assets of a business as well as any party who directly engages in the business of retail sales of products or the distribution of products.¹³

The provisions of this Act are currently in force (effective sixty days from the date of enactment). It requires invention promoters to disclose information in writing to a customer prior to entering into a contract for invention promotion services. The information includes:

- the total number of inventions evaluated by the promoter for commercial potential in the past five years (with a

¹² See *id.*

¹³ See Subtitle A, codified at Chapter 29, 35 U.S.C. §297 (2000), identified at the beginning of Ch. 29 as §297. "Improper and deceptive invention promotion."

breakout of the number which received positive evaluations and the number which received negative evaluations),

- the total number of customers who have contracted with the promoter within the past five years
- the total number of customers known to have received a net financial profit as a direct result of the promoter's services
- and the names and addresses of all previous invention promotion companies with which the promoter or its officers have been affiliated in the previous ten years.

Any customer injured by material false or fraudulent statements or representations or omissions of material fact can recover from the promoter reasonable costs, attorneys fees, actual damages, and statutory damages of not more than \$5000 (which can be trebled where the customer proves that the promoter intentionally acted to deceive).¹⁴

Subtitle B: Patent and Trademark Fee Fairness

This Act reduces the original patent filing fee, the reissue-filing fee, and the national filing fee for certain international filings from \$760 to \$690. The first patent maintenance fee has also been reduced from \$940 to \$830.¹⁵ The Act authorizes the Director to adjust trademark fees in the year 2000.¹⁶ As such, trademark fees are likely to rise to make the Trademark Office self-supporting. The new fees are in force (effective thirty days after the date of enactment of the Act).¹⁷

¹⁴ *See id.*

¹⁵ *See* 35 U.S.C. §41 (2000).

¹⁶ *See id.*

¹⁷ *See* 35 U.S.C. §41,42(c) (2000).

Subtitle C: First Inventor Defense Act of 1999

This Act provides a new defense to patent infringement based on earlier invention (reduced to practice one year before and initiated prior commercial use before effective filing date of asserted patent). The new defense is effective starting with the date of enactment (but cannot be asserted in pending actions or adjudicated actions including those with consent judgments).¹⁸

The defense is personal and cannot be assigned except as a transfer of the line of business to which the defense relates, and even then, is only assertable for sites using the method before the later of the date of assignment or the effective filing date of the patent. The defense can only be asserted *as a defense against infringement of a commercially used method*.¹⁹ The term method is defined as “a method of doing or conducting business.”²⁰ The Act further notes that the defense is not considered a general license.²¹

That is, the Act states that it shall be a defense to an action for infringement with respect to any subject matter that would otherwise infringe one or more claims *for a method* ... “if such person had, acting in good faith, actually reduced the subject matter to practice at least one year before the effective filing date of such patent, and commercially used the subject matter before the effective filing date of such patent.”²² However, the Act also states that the sale or other disposition of a useful end product

¹⁸ See S. 1948, Subtitle C codified at 35 U.S.C. §273 (2000).

¹⁹ See S. 1948, Subtitle C codified at 35 U.S.C. §273 (2000).

²⁰ S. 1948, Subtitle C codified at 35 U.S.C. §273(a)(3) (2000).

²¹ See S. 1948, Subtitle C codified at 35 U.S.C. §273(b)(3)(C) (2000).

²² S. 1948, Subtitle C codified at 35 U.S.C. §273(b)(1) (2000).

produced by a patented method “shall exhaust the patent owner’s rights under the patent to the extent such rights would have been exhausted had such sale or other disposition been made by the patent owner.”²³ This exhaustion of rights provision appears to give broader relief than the basis upon which the defense may be asserted (a “commercial business method” limitation).

The method limitation for which the defense may be asserted along with the “exhaustion of rights” and “no general license” provisions appear somewhat contradictory and further study of this Act will be needed to align the “no general license provision”, the “commercial business method” limitation, and the “exhaustion of rights” provision. One reading may be that for a single patent having both product and method claims, all commercial products produced by a method meeting the requirements of this defense -- even when covered by product claims -- are not subject to damages. However, in the case where there are products which infringe product claims (and meet the other requirements of the new defense) but where there is no method claimed in the asserted patent, the new defense cannot be asserted and the products are therefore subject to infringement damages.²⁴

In summary, key language used in this subtitle is “commercial” use (which includes non-profit use with some limitations) of a “method.” As the term “method” is defined in the Act as a method of doing or conducting business, one interesting issue will be to watch for cases which will set the interpretation of this provision.²⁵ That is, will the protectable type of methods be

²³ S. 1948, Subtitle C codified at 35 U.S.C. §273(b)(2) (2000).

²⁴ See S. 1948, Subtitle C codified at 35 U.S.C. §273 (2000).

²⁵ See *id.*

limited to only the so-called State Street type patents (*i.e.*, “business method” patents) or will it be extended to encompass a broad variety of methods, *i.e.*, any method used in a business whether used to conduct its business or do business when method claims appear in an asserted patent (no matter how conventional those method claims may be).^{26 27}

Note that, in light of this new defense, as transfers and sales of businesses proceed, it may be important to structure the transaction to fit within the new defense and to include a statement in the assignment itself that the assignee has the right to assert the new defense.

Subtitle D: The Patent Term Guarantee Act of 1999

This provision allows for patent term adjustment if the prosecution or issue of an original patent is delayed due to the failure of the USPTO to take specified actions within an allotted time (*i.e.*, “the 14-4-4-4 provision”). It also provides a three year

²⁶ See *State Street Bank and Trust Co. v. Signature Financial Group*, 149 F. 3d 1368, 41 USPQ2d 1597 (Fed. Cir. 1998) (the patent at issue claims a financial-based business method). It should also be noted that the “method of doing or conducting business” limitation in this provision was a last minute change from the more general terminology of “processes.”

²⁷ An interesting sidenote is that “business” method patents include e-commerce-based business methods (art class 705) which are presently under intense scrutiny and disfavor from some in the public sector. The PTO is instituting a “second layer” of review for all patent applications in this class. See *59 Patent, Trademark & Copyright J.* No. 1468, p. 710 (March 31, 2000). This scrutiny is responsive to harsh criticism regarding Amazon.com’s “single-click” patent (US Patent No. 5,960,411) which was used to block a competitor from using the claimed system during the lucrative 1999 Christmas buying season.

maximum pendency due to USPTO actions with a *pro rata* extension for each day beyond three years until the patent is issued (not including time consumed by interferences, secrecy orders, and appellate review by the Board of Patent Appeals and Interferences or by a Federal Court, and applicant processing delays and the like). Similarly, for applications subject to interferences, secrecy orders, and appeals, the term shall be extended one day for each day of the pendency of the proceeding, order, or review.²⁸

For the “14-4-4” prosecution timelines:

- The USPTO must provide at least one of the notifications under section 132 or a notice of allowance not later than *fourteen* months after regular filing, or the date an international application fulfills the requirements of section 371.
- The USPTO must respond to a reply or appeal within *four* months after the reply was filed or the appeal taken.
- The USPTO must act on an application within *four* months after the date of decision by the Board of Patent Appeals and Interferences or Federal Court action under sections 141, 145 and 146.
- The USPTO must issue a patent within *four* months after the issue fee is paid and the issue requirements are satisfied.²⁹

The term of the patent shall be extended one day for each day beyond that allowed as noted above. The adjusted patent term may be reduced to account for applicant’s delays (generally

²⁸ See Subtitle D of S. 1948 codified primarily at 35 U.S.C. §154(b)(1)(A) (2000).

²⁹ See *id.*

described as any extensions of time or response periods greater than three months from a mailing date). It is notable that although an extension of term may be made where the application is appealed, no such relief is extended for applicants electing to file continuation applications. For each of the term extension provisions under this Act, the Director will calculate the extension. The Applicant receives one reply and then has a 180-day time limit to appeal the Director's term adjustment to the District Court of the District of Columbia. The term extension cannot be appealed by a third party prior to grant.³⁰

Subtitle E: (Pre-Grant) Domestic Publication of Patent Applications

New to U.S. patent practice, each application for a patent shall be published promptly after eighteen months from the earliest filing date for which a benefit is sought.^{31 32} Upon request, an application may be published earlier than the end of the eighteen-month period. In the past, in the United States, all patent applications were held in secrecy by the USPTO until they issued.³³

³⁰ See 35 U.S.C. §154 (2000).

³¹ The publication procedures of Subtitle E of S. 1948 are primarily codified at 35 U.S.C. §122. These changes are effective one year from the date of enactment and apply to applications filed after November 29, 2000. However, it should be noted that the provisional royalty rights under Subtitle E may be available to applications pending on November 29, 2000 which are "voluntarily" published by the applicant.

³² The publication changes do not apply to provisional applications or design patent applications.

³³ See 35 U.S.C. §122(a) (2000), now amended, to incorporate the publication provisions in Subtitle E of S. 1948.

However, the application shall not be published if the application is no longer pending; is subject to a secrecy order; is a provisional application; or is an application for design. The applicant can also request upon filing with certification that the invention disclosed in the application will not and has not been filed in another country or under a multilateral agreement that requires eighteen-month publication (a European Patent Connection filing, a Patent Cooperation Treaty filing, etc.).³⁴

If the applicant then does pursue foreign or under multilateral agreement filings later, he or she must notify the Director within forty-five days of that later filing date or the U.S. application is regarded as abandoned.³⁵

In addition, if a subset of the U.S. case is to be foreign filed, a revised/redacted version can be presented to the USPTO to publish the redacted version. No protest or pre-issuance opposition may be initiated after publication without the express written consent of the applicant. However, a third party may seemingly “back-door” this provision by writing to the applicant disclosing known prior art. This disclosure to the applicant, may, in turn, force the applicant to then submit the information to the USPTO during the pendency of the application (potentially along with the characterization of that art by the third party), under the duty of disclosure.^{36 37}

In a sharp departure from previous U.S. law, this Act now provides that a patent shall include the right to obtain a reasonable royalty from any person who, during the period beginning on the publication date until the issue date makes, uses, offers for sale or

³⁴ See 35 U.S.C. §122(b)(2)(A) (2000).

³⁵ See 35 U.S.C. §122(b)(2)(B)(iii) (2000).

³⁶ See Subtitle E of S. 1948, *supra*.

³⁷ See 37 C.F.R. §1.56 (2000) (referring to the duty of disclosure).

sells, in the U.S., the invention as claimed in the published application (if the invention claimed in the patent is substantially identical to the published claimed invention). There is a six-year statute of limitations on the “provisional” right to collect the reasonable royalty (six years from date of issue). Correspondingly, section 102(e) is now amended to include applications by another published under section 122(b) filed in the U.S. before the invention thereof.³⁸

Subtitle F: Optional *Inter Partes* Re-Examination

This provision is aimed at providing a third party with an administrative alternative to more costly court-based patent litigation. As such, it provides the third party with an optional *inter partes* re-examination procedure. This provision will apply to patents that issue from an original patent application *filed after the date of enactment*. Therefore, as a practical matter, this procedure will not be available for several years. During the *inter partes* re-examination proceeding, the third-party requestor is granted one opportunity to file written comments addressing issues raised in an Office Action or the patentee’s response thereto. The third-party requestor can appeal a final decision favorable to the patentee or be a party to an appeal undertaken by the patentee.³⁹

Significantly, the provision requires the identification of the real party in interest and includes estoppel provisions so that the third-party requestor cannot subsequently challenge in court the

³⁸ See 35 USC §102(e), 122(b) (2000).

³⁹ See Subtitle F of S. 1948, codified by adding new Chapter 31 to Part 3 of Title 35 of the United States Code. A party may now pursue re-examination under 35 U.S.C. §311 (*inter partes* re-examination) rather than under 35 U.S.C. §302 (*ex parte* re-examination).

validity of the patent based on any ground the third-party requestor raised or could have raised during the USPTO *inter partes* proceedings. This estoppel provision does not prevent the assertion of invalidity based on newly discovered art unavailable at the time of the re-examination proceedings (and may also preclude the challenge of any fact determined during the process unless proved to be erroneous based on information unavailable at the time of the *inter partes* re-examination decision). In addition, once an order for *inter partes* re-examination has been issued, neither the patent owner nor the third-party requestor (or privies of either) may file a subsequent *inter partes* re-examination of the patent until an *inter partes* re-examination certificate is issued and published, unless authorized by the Director.⁴⁰

Subtitle H: Miscellaneous Patent Provisions

A provisional application (even one without claims) can be treated as an application (converted to a regular utility application) upon timely request. If no such request is made the provisional application is regarded as abandoned twelve months after the filing date of the application and shall not be subject to revival. This section became effective on the date of enactment.⁴¹

A study and report on biological deposits in support of biotechnology patents are required within six months of the date of enactment of the Act. Section 102(g) is amended to add section 102(g)(1) regarding interference and the proof of prior invention.

⁴⁰ See also Robert T. Pous and Charles L. Gholz, *Will Inter Partes Re-examination be Embraced by Third Parties as an Alternative to Litigation?*, *Intell. Prop. Today*, pp. 37-40 (March 2000).

⁴¹ See Subtitle H of S. 1948 (includes a variety of subjects under multiple sections 4801-4808).

Section 103(c) is also amended to change the prior art exclusion for certain commonly assigned patents from sections 102(f) and 102(g) to one or more of sections 102 (e), (f), and (g), bringing in the “secret” prior art of sections 102(e). The section 103(c) amendment applies to applications filed on or after November 29, 1999.⁴²

Title III: Trademark Cyberpiracy Prevention (The Anti-Cybersquatting Consumer Protection Act)

This Act creates a new civil cause of action under section 43(d) of the Lanham Act, which applies to all registered domain names.⁴³ This Act provides that a person shall be liable to the owner of a mark, including a personal name which is protected as a mark, if that person, *inter alia*, has a bad faith intent to profit from that mark. There is a limitation on damages applicable to registration, trafficking, or use of a domain name that occurred before the date of enactment. In addition to potential monetary awards for attorneys fees, the Act allows the plaintiff to elect actual damages or statutory damages of between \$1,000-\$100,000 per domain name “as the court considers just.”⁴⁴

The Act also includes a new civil liability provision for persons registering a domain name of another living person, or a name substantially and confusingly similar to the person. This new protection is entitled “Cyberpiracy Protections for Individuals.”⁴⁵

⁴² *See id.*

⁴³ *See* Section 3002(a) of S. 1948.

⁴⁴ 35 U.S.C.S. § 297 (b)(1)(B) (2000).

⁴⁵ Section 3002(b) of S. 1948.

Conclusion

Director Dickinson's bold statement on the significance of the Reform Act is appropriate.⁴⁶ Further, the clarification of important provisions of the act will likely take the better part of the next decade to fully develop.⁴⁷ For example, the scope of the first inventor defense for business methods will require significant clarification. The availability of reasonable royalty damages prior to issuance, after publication, will likely influence all of prosecution, litigation, and licensing practice. In addition, the Reform Act increases the authority and role of the USPTO. The *inter partes* re-examination procedure is just one example of the expanding role of the USPTO. Coupled with the Office's increasing independence and the importance of strong intellectual property protection to a favorable U.S. balance of trade, these changes will warrant careful monitoring to insure that the office is adequately supported in meeting its new responsibilities.⁴⁸

⁴⁶ See also Hayden Gregory, Washington Legislative Report, *Patent Reform, Trademark Cyberpiracy, and Satellite Television Measures Enacted*, 18 IPL Newsletter No. 2, pp. 41-45 (winter 2000) (discussing new legislation).

⁴⁷ The USPTO is presently updating rules and regulations. Refer to the www.uspto.gov website for future updates to relevant laws, rules and procedures.

⁴⁸ See Bernard Wysocki, Jr., *The Outlook: In U.S. Trade Arsenal Brains Outgun Brawn*, *The Wall St. J.*, Mon. April 10, 2000, p. 1, col. 5.