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Report to Congressional Requesters

June 2003

INTERNATIONAL TRADE

Experts' Advice for Small Businesses Seeking Foreign Patents

GAO-03-910

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Highlights

Highlights of GAO-03-910, a report to the Chairman, Senate Committee on Small Business and Entrepreneurship; the Honorable Christopher S. Bond, U.S. Senate; and the Chairman, House Committee on Small Business

Why GAO Did This Study

Small businesses, which are important to the U.S. economy for their roles in job creation and technological development, must be able to protect and profit from their innovations. One way to protect their innovations on a global basis is to obtain U.S. and foreign patents. These businesses, however, face numerous impediments when trying to patent their goods or processes abroad. These impediments, which GAO identified in a July 2002 report, include high costs, limited resources, and limited knowledge among small businesses about foreign patent laws and systems.

Because of concern that small businesses, particularly high-technology firms, were not obtaining patent protection abroad and thus were losing potential sales in foreign markets, GAO was asked to (1) identify the factors that patent law experts believe small businesses should consider as they decide whether to seek patent protection abroad and provide information on how small businesses viewed these factors and (2) identify the steps that small businesses should take to improve their foreign patent efforts, according to our survey of patent law experts.

www.gao.gov/cgi-bin/getrpt?GAO-03-910.

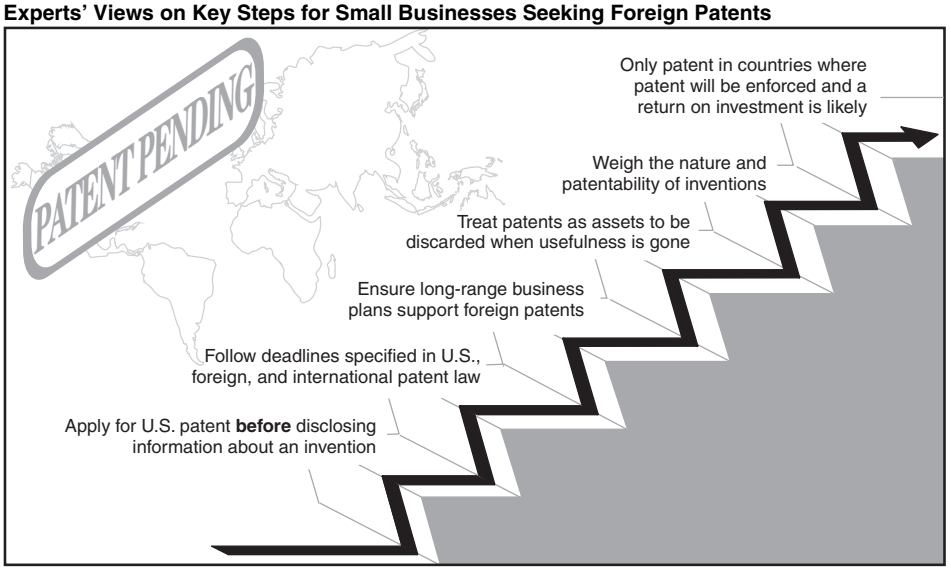
To view the full report, including the scope and methodology, click on the link above. For more information, contact Loren Yager at (202) 512-4347, or YagerL@gao.gov.

What GAO Found

According to the expert panel of patent law attorneys that GAO surveyed, small businesses that are considering whether to seek patent protection abroad should identify and assess the full "cradle-to-grave" costs of acquiring, maintaining, and enforcing foreign patents. Other considerations should include the locations where small businesses intend to sell or manufacture their invention and whether the range of benefits obtained from foreign patents, such as increased sales or higher company value, is sufficient to justify their cost. Furthermore, small businesses should try to understand foreign patent laws and systems and the quality of foreign patent enforcement, the expert panelists said. The small businesses that GAO surveyed agreed that foreign patent costs, benefits, and potential locations were important factors in their decisions to patent abroad. However, some small businesses did not properly evaluate long-term costs and could not determine whether foreign patent benefits outweighed the costs.

The most important step that small businesses could take to improve their foreign patent efforts, according to GAO's survey of patent law experts, is to avoid disclosing information publicly about an invention before filing a U.S. patent application. The United States permits such disclosure, but doing so can invalidate an applicant's right to patent protection abroad. The second most important step is to be aware of filing deadlines, which are specified in foreign laws and international patent treaties. Other important steps included integrating foreign patents into long-range business planning and seeking patents in countries where meaningful protection is available and a return on investment is likely.

Experts' Views on Key Steps for Small Businesses Seeking Foreign Patents



Source: GAO analysis of patent attorney panel questionnaires.

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Abbreviations

EPO	European Patent Office
IP	intellectual property
PCT	Patent Cooperation Treaty
SBA	Small Business Administration
USPTO	U.S. Patent and Trademark Office
WIPO	World Intellectual Property Organization

GAO
Accountability * Integrity * Reliability

United States General Accounting Office
Washington, D.C. 20548

June 26, 2003

The Honorable Olympia Snowe, Chairman
Committee on Small Business
and Entrepreneurship
United States Senate

The Honorable Christopher S. Bond
United States Senate

The Honorable Donald A. Manzullo
Chairman, Committee on Small Business
House of Representatives

Small and start-up businesses[1] are important to the U.S. economy for their roles in job creation and technological development. Small businesses, particularly those in high-technology industries, must be able to protect and profit from the innovations that flow from their research and development expenditures. One way to protect innovations on a global basis is to obtain U.S. and foreign patents. However, in July 2002, we reported that small businesses face numerous impediments when trying to patent their goods or processes abroad. These impediments include high costs, limited resources, and limited knowledge among small businesses about foreign patent laws and systems.[2] We concluded that such impediments affect small businesses more negatively than large businesses and may discourage or prevent small businesses from seeking global protection for their innovations. In that report, we recommended that the federal government (1) assess the advantages and disadvantages to small businesses of making further progress toward patent law harmonization and (2) make information about foreign patent laws, requirements, procedures, and costs available to small businesses.

[1]Under 13 C.F.R. part 121, the Small Business Administration (SBA) established various size standards, based on economic activity or industry, for determining what is a small business for purposes of eligibility for its programs. Based on the SBA standards, we defined a small business for purposes of conducting our work as having 500 or fewer employees.

[2]See U.S. General Accounting Office, *International Trade: Federal Action Needed to Help Small Businesses Address Foreign Patent Challenges*, GAO-02-789 (Washington, D.C.: July 17, 2002).

Because our July 2002 report indicated that small businesses that lack a sufficient understanding of foreign patent laws, processes, and costs may have difficulty making appropriate foreign patent decisions for their companies, you asked us to (1) identify the factors that patent law experts believe small businesses should consider as they decide whether to seek patent protection abroad and provide information on how small businesses viewed these factors and (2) identify the steps that small businesses should take to improve their foreign patent efforts, according to our survey of patent law experts.

The information in this report is based on the results of a Web-based expert panel and a small business survey that we conducted for our July 2002 report. The panel was comprised of 39 U.S. patent attorneys whom we selected based on their experience in obtaining foreign patents for both small and large businesses. We asked these experts to identify factors that are relevant to foreign patent decisions and actions that small businesses can take to improve their foreign patent efforts. We also administered a questionnaire to a random sample of small businesses that had obtained or considered obtaining foreign patents in the last 5 years. The 38 businesses that participated in our survey ranked the importance of various factors to their foreign patent decisions. Much of the information in this report was not included in our July 2002 report. (App. I provides further details about our scope and methodology and the methodology's limitations. App. II lists the members of the expert panel.)

Results in Brief

Small businesses that are considering whether to seek patent protection abroad need to consider a complex array of factors before making this investment, our panel of patent law experts said. For example, these businesses need to identify the full "cradle-to-grave" costs of acquiring, maintaining, and enforcing foreign patents during their average 20-year life span. Without full knowledge of these typically high costs, small businesses risk wasting resources by beginning a patent acquisition process that may be too costly to complete. Further, small businesses need to consider whether the range of benefits that foreign patents may provide to them, such as increasing sales or the company's value, are sufficient to justify their cost. In making this assessment, businesses should consider the nature of their inventions, the locations where they expect to sell or produce them, and the places where their competition is located before choosing the countries in which they will seek patent protection. In addition, small businesses should try to understand how key aspects of foreign and international patent law could affect their decision. For

example, the attractiveness of certain countries would likely diminish if their patent laws and systems do not provide adequate patent protection and meaningful patent enforcement. The small businesses we surveyed said that some of these factors, such as costs and locations, were more important to their foreign patent decisions than other factors. Contrary to the experts' advice, some businesses had not properly evaluated long-term costs and could not determine whether the benefits of holding such patents outweighed the costs.

The experts we surveyed identified and ranked 20 steps that small businesses could take to improve their foreign patent efforts. The most important step they identified is to avoid publicly disclosing information about an invention prior to filing a U.S. patent application. While such disclosure is permitted in the United States, it can invalidate an applicant's right to patent protection in many foreign jurisdictions. The second most important step is to take foreign filing actions in accordance with the deadlines specified in foreign laws and international patent treaties. For example, a company must file a foreign patent application typically within 1 year from the time it filed a corresponding U.S. patent application. Other important steps the experts identified included making foreign patent decisions in accordance with a company's long-term business plan and filing applications only in countries where protection will be meaningful and the patent will produce a return on investment.

Background

A patent is the grant of a property right that a national government or an international intergovernmental authority issues for an invention. Patents cover inventions of new products as well as new processes to make or use new or existing products. While patent rights vary by country, a patent typically gives an inventor the right to exclude others from commercially making, using, offering to sell, or importing the invention in the country that granted the patent during the patent term, usually a 20-year period from the application date. Any violation of that right is considered a patent infringement. Patent owners that wish to address the infringement of, or to "enforce," their patent rights must initiate a legal action in the country or countries where the infringement occurred.

U.S. companies and inventors that seek patent protection in the United States file patent applications with the U.S. Patent and Trademark Office (USPTO). They are typically represented by a patent attorney, who drafts their patent application and responds to USPTO questions about the application. Before granting a patent, USPTO will search for relevant "prior

art" (all patent and nonpatent literature that helps determine whether a new patent will be granted). USPTO will also examine patent applications to, among other things, determine whether the claimed invention is "new and nonobvious." USPTO provides information about the U.S. patent system to independent inventors that are considering whether to obtain a U.S. patent, but it does not provide any information about foreign patent systems.

U.S. companies and inventors that seek foreign patent protection must file applications with foreign patent offices. These applications must conform to the patent laws and requirements in the countries where protection is desired. Foreign patent offices also conduct prior art searches and examine applications in accordance with their own laws. They generally require patent applications to be filed in the host country language or translated into this language at some point after the initial filing. U.S. companies and inventors typically must be represented before the foreign patent office by a foreign patent attorney or agent.

Small Businesses Should Consider a Complex Array of Factors Before Investing in Foreign Patents

Small businesses must weigh a complex array of factors and long-term issues before deciding whether an investment in foreign patents is appropriate for their company, according to the patent attorney experts on our panel. Factors they identified include costs, benefits, location of foreign markets and manufacturing sites, and foreign patent laws and enforcement, among others. Our analysis shows that businesses cannot assess individual factors in isolation but must instead weigh the multiple factors' combined effect on their foreign patent decision. Making the decision more complex, many attorneys said, is the need for small businesses to assess many long-term issues at the time of their decision, such as future outlays they will incur and possible changes in current market or legal conditions over the patent's life span. Many small businesses we surveyed recognized the importance of these factors and incorporated them into their decision-making process. However, some businesses lacked a basic understanding of the foreign patent process and failed to adequately assess long-term issues. (App. III contains more detailed information about the range of factors the experts identified. App. IV provides information on how the small businesses ranked the importance of various factors.)

Small Businesses Should Identify and Assess Long-Term Costs

Most of the experts said that it is important for small business owners to understand the full "cradle-to-grave" costs of holding and enforcing foreign patents and weigh whether such an investment is appropriate for their company. Several of the experts said that small businesses should try to estimate the full costs before making any investment in foreign patents, noting that they have observed that some small businesses make initial investments in foreign patents, perhaps filing multiple applications abroad, only to realize that they cannot afford to continue the process. Small businesses face challenges in learning about foreign patent costs, however. Many types of costs are involved, foreign fees structures change frequently, and small businesses typically have limited resources to devote to staying abreast of these developments, according to several experts. A number of experts suggested that if a small business cannot afford the long-term costs of foreign patents, it should probably look for other ways to protect its innovations or focus solely on the U.S. market.

Foreign patent fees are numerous, and because comprehensive patent law harmonization is lacking, many fees may be incurred for redundant purposes, according to our patent law experts. Table 1 shows some of the source, nature, and purpose for some costs that are typically incurred. The experts noted that foreign patent office fees often exceed comparable U.S. fees and are sometimes charged for work that USPTO has already done, such as searching for relevant existing patents and other literature.[3] Moreover, although small businesses are allowed to pay reduced USPTO fees compared with their large business counterparts, they receive no similar reductions from most foreign patent offices.[4] Patent applications have to be translated into other languages, and the cost of these translations can be significant.[5] Business also incur both U.S. and foreign patent attorney costs, the latter being necessary because U.S. patent attorneys are typically not allowed to represent clients before foreign

[3]Changes to the USPTO fee structure were proposed in H.R. 1561, "United States Patent and Trademark Fee Modernization Act of 2003," introduced in April 2, 2003. Congress has reviewed, but has not acted on, this proposed legislation.

[4]The Canadian Intellectual Property Office offers reduced fees for small entities.

[5]Translation costs vary according to the length and nature of the patent application but could cost $2,000-$10,000 per translation or more, according to several experts on our panel and our own research. Several experts on our panel said that translation costs are particularly irksome because the quality of an application can diminish in the translation process, and most people who want to read the technical specifications of an invention are likely to read the original version of the application.

patent offices. Finally, because foreign patent applicants can also file their applications through certain regional patent offices that cover multiple countries, such as the European Patent Office,[6] or in accordance with an international patent treaty (the Patent Cooperation Treaty,[7] which enables applicants to file an international patent application and delay certain national patent office charges), additional cost types exist beyond those shown in table 1.

Table 1: Sources, Types, and Purposes of Foreign Patent Costs

Source of cost	Type and purpose
National patent office	*Application or filing fee* - incurred upon filing patent application
	Search fee - incurred to have patent office search for previous or existing patents or other material relevant to the application
	Examination fee - incurred to have patent application examined
	Grant fee - incurred to have patent issued
	Maintenance fee - incurred (usually yearly) to keep patent in force
Private sources	*U.S. patent attorney fees* – incurred to draft patent application, search previous patent literature, and generally represent applicant
	Foreign patent attorney or agent fees – incurred to have approved representation before foreign patent offices
	Translation fees – incurred to translate patent applications in languages accepted by foreign patent offices

Source: GAO analysis based on information provided by expert panelists, national patent office fee schedules, and other private sources.

[6]The 1973 European Patent Convention, which created the European Patent Office, established a single procedure for granting patents in the 27 member countries on the basis of a uniform body of substantive patent law. An application to the European Patent Office is, in effect, a group of national patent applications that are processed together, but become separate patents that are separately maintained and enforced.

[7]The Patent Cooperation Treaty is administered by the World Intellectual Property Organization and is adhered to by 120 countries. It facilitates the simultaneous filing of multiple patent applications in member countries on the basis of a single application. Applicants are able to undergo a single search and examination before deciding whether and in which countries they wish to obtain patents, and can delay filing applications with national patent offices by up to 30 months.

The total cost of obtaining a set of foreign patents to extend a company's U.S. patent protection abroad, and of maintaining those patents over their possible 20-year life span, is quite expensive, according to our expert panelists. Depending on the scope of protection desired, each U.S. patent taken abroad can cost several hundred thousand dollars. (In our July 2002 report,[8] we developed a hypothetical, relatively straightforward patent scenario to estimate the U.S. and foreign patent costs that a small business might incur. The results of this analysis are reproduced in this report in app. V.) The experts advised that small businesses should understand and examine the various methods that exist to file for foreign patents, as well as the cost differences between the various methods. Moreover, they should examine the full life-time costs to hold and enforce their patents, not just the up-front costs to obtain them.

Among the small businesses we surveyed, foreign patent costs were a significant factor in, and often the biggest impediment to, their decisions to patent abroad. The companies collectively identified all cost components, including foreign patent office fees, translation costs, and U.S. and foreign attorney charges, as being particularly expensive. Several of the companies had explored different methods for obtaining foreign patents and many used the Patent Cooperation Treaty. Despite the importance of cost, however, we noted that several of the businesses began the foreign patent process without fully understanding and budgeting for the types and amounts of costs they would incur in the future. For example, one company that was attempting to patent abroad for the first time spent about $80,000 applying for several European patents but said it could not allocate any more funds to the process and might have to abandon its applications. Another business described applying for a Japanese patent without knowing what each step of the process would cost and was surprised each time its patent attorney said additional payments were due. This company ultimately asked its patent attorney to fully disclose all steps and associated costs so that it could better plan for the expenses. Another company said that ignorance about foreign patent costs is prevalent among small businesses.

[8]GAO-02-789.

Small Businesses Should Weigh Potential Benefits and Carefully Select Patent Locations

In addition to cost, the experts said small business should assess the benefits that foreign patents may provide and should review various marketing, manufacturing, and competition issues before selecting the locations where they will seek patent protection. Given the significant expense of foreign patents, the experts said that small businesses should only patent abroad if doing so fits with the company's overall business plan and if the potential benefits will likely outweigh the costs. Small business should also develop long-term plans for how they will maximize the benefit and limit the costs of their global intellectual property portfolio. Unfortunately, in the experts' view, many small businesses do not sufficiently analyze the costs and benefits, do not understand strategies to minimize cost, and may overestimate or underestimate the value of their innovations.

One key to maximizing benefits and minimizing costs is the appropriate selection of foreign patent locations, according to our experts. Many of them recognized that small businesses may lack the resources to patent in as many locations as they desire (this was a predominant view among the small businesses we surveyed). In this situation, the experts advised small businesses to target their patent resources to carefully chosen locations that will provide the most appropriate and useful protection they can afford. Ideally, businesses should seek protection in locations where they expect to sell or manufacture, as well as possibly import, distribute, use, or transport their products or services, according to the experts. Businesses should be mindful of where future markets may develop during the patent term, an assessment that is admittedly difficult to make, several experts said. Competitive concerns, such as where current competitors market or manufacture their products or services, would also be relevant. Other factors, such as the nature of foreign regulatory environments or the extent of nonpatent barriers to market entry, would further influence the choice of foreign patent locations.

Despite this potentially long list of locations to consider, several experts advised that businesses may be able to select a few key countries from among their ideal list and achieve sufficiently effective patent protection for less cost. One expert panelist advised that adopting an overall foreign patent strategy should aid in the selection of locations, noting that possible strategies will fall within a spectrum ranging from competitor-driven to market-driven. According to this expert's advice, "if non-patent barriers to market entry are high and the number of competitors is discrete, this is particularly favorable toward the adoption of a competitor-driven strategy in which patent applications are filed in countries where the home and

manufacturing bases of the competitors are located . . . protection solely in countries of competitors is effectively worldwide patent coverage because manufacturing or sale of all products has been covered. If nonpatent barriers to market entry are low and competitors are liable to spring up anywhere on short notice, this militates toward a market-driven strategy in which patent applications are filed in the most relevant or major markets."[9]

Among the small businesses we surveyed, the most important decision-factor in patenting abroad was the location and size of foreign markets. Some distinct patterns emerged among the businesses regarding location. Pharmaceutical and biotechnology companies, whose products have long development cycles, generally sought to obtain broad global coverage for their products, based on future market expectations. Others, including those in the automotive parts, machine tools and equipment, oil, and environmental cleanup areas, tended to focus on current markets in a few countries were their industries were prevalent or their technology was valued.

While benefits were highly relevant to many small businesses' decisions, assessing them was more difficult. Several businesses said that patents generally offer exclusive rights to market a product or service, thus supporting high prices to recover research and development expenses. However, some businesses that had commercialized products could not identify any measurable benefits that their foreign patents had provided. One business official said he thought his company might have done just as well abroad without holding any foreign patents. Finally, other businesses noted that, due to long commercialization cycles for their products, they were forced to proceed with the foreign patent process and incur the costs without knowing whether their products would succeed and produce any return on investment.

[9]John H. Pilarski, Group Technology Counsel, Illinois Tool Works, Inc., "Practical Considerations on the Formulation of Foreign Patent Strategy," (presented at the 2001 American Intellectual Property Law Association Spring Meeting, May 2001, San Francisco, CA).

Small Businesses Need to Understand Foreign Patent Laws and International Treaties

In addition to commercial concerns, the nature of foreign patent laws and systems is also important in selecting foreign patent locations, many experts said. Because foreign patent laws differ, small businesses should consider targeting their resources toward the countries that offer appropriate patent protection and meaningful enforcement, the experts said. To do so, small businesses need to understand how differences between U.S. and foreign patent laws may affect the kind of patent protection they can obtain abroad. For example, certain types of technology can be patented in the United States, but not elsewhere, and other countries' patent laws may not offer the same breadth of protection that a corresponding U.S. patent affords. In addition, small businesses need to understand how foreign patent systems function to avoid developing unrealistic expectations about the timing, difficulty, or cost of their efforts. In our July 2002 report, the experts identified the lack of sufficient knowledge among small businesses about foreign patent laws and systems as a significant impediment to these businesses' efforts to patent abroad.

The panel of experts identified several key aspects of foreign patent laws and systems and of international patent treaties[10] that small businesses should understand. For example, they specified these four factors:

- **The priority principle** – In the case of competing applications for the same invention, the United States awards the patent to the individual or entity that can demonstrate it was the first to *invent. All* other countries award the patent to the individual or entity that was the first to *file* a patent application.

- **The grace period** – The United States allows patent applicants a 1-year grace period between the first public disclosure of an invention and the patent application date. Many other countries, however, will not grant patents in cases where public disclosure precedes the patent application date. Because of this difference, companies that take advantage of the U.S. grace period may find themselves ineligible to receive foreign patent protection.

[10]Under the 1883 Convention for the Protection of Industrial Property (known as the Paris Convention), 163 countries give limited recognition to each other's patent application filing dates. Under the convention, for 1 year after the date a U.S. patent application is filed, basically the same application may be filed as a foreign counterpart application in any country that is a convention member. Another important international treaty is the Patent Cooperation Treaty, administered by the World Intellectual Property Organization.

- **The availability or nature of patent protection** – Some technologies or processes that can be patented in the United States, such as business methods and certain software processes or biotechnology inventions, cannot be patented elsewhere. In addition, some countries only allow claims (the part of a patent application that defines the invention) that are more narrow or restricted than what the United States typically allows.

- **The strength of enforcement** – Various issues, including the strength of patent enforcement law and the nature of foreign court systems, affect the degree to which a company can enforce a patent abroad. The experts noted that some countries have weak or nonexistent enforcement laws, while others have acceptable laws but slow or ineffective enforcement processes. Further, the remedies available in some countries to address patent infringement, such as injunctions to stop infringement or damages to compensate a company for its losses, differ from what is available in the United States and may not be sufficient to counteract the effects of infringement. Finally, differences in civil litigation, such as whether special courts exist to hear patent infringement cases or the extent of pretrial discovery, may affect the ease or quality of enforcement abroad. Table 2 shows a 2003 assessment by one of our expert panelists of the practical value of patents (determined according to multiple factors including level of patent enforceability and sophistication of court systems) in various countries.

Table 2: Assessment of Patent "Practical Value" in Other Countries

Category of country	Countries	
"A" Countries	Australia	United Kingdom
	Canada	United States
Patents have high practical value	The Netherlands	
"B" Countries	Belgium	Italy (also San Marino)
	Finland	Korea
Patents have medium practical value	France	New Zealand
	Germany	Singapore
	Ireland	Sweden
	Israel	
"C" Countries	Argentina	Norway
	Austria	Pakistan
Patents have low practical value	Brazil[a]	Paraguay
	Chile	Philippines
	China[a]	Poland
	Czech Republic	Portugal
	Denmark	Russia[a]
	Greece	Slovakia
	Hong Kong[a]	South Africa
	Hungary	Spain
	India	Switzerland (also Lichtenstein)
	Japan[a]	Taiwan[a]
	Luxembourg	Thailand
	Malaysia[a] (also Sabah and Sarawak)	Turkey
	Mexico	Ukraine

Source: James A. Forstner, Intellectual Property Consultant, "International Patent Enforcement," (presented at a seminar on European Patent Practice and Procedure 2003, George Mason University Law School, June 2003, Arlington, Virginia).

Notes: According to the source cited, the categories were developed from the perspective of a U.S. company. A number of factors were considered in determining the relative practical value, based on the author's considerable experience in obtaining and enforcing foreign patents, such as the competency of the national patent office, the ability to obtain patent claims of reasonable scope at a reasonable cost in a reasonable time, the enforceability of the patent in a particular country (including the sophistication and independence of the court systems, the ability to obtain injunctions and significant damages, the resolution of court proceedings within a reasonable time, the question of whether the courts are biased against foreign plaintiffs, the competency of the local bar), the deterrence value of patents against potential infringers, the ability to generate significant license royalty income, the level of industrialization in a country, and the consumer population of a country.

Patents in countries that do not appear on this list are considered to have no practical value as of June 2003.

[a]Denotes countries taking significant steps to improve patent value

Among the small businesses we surveyed, the nature of foreign patent enforcement was a more important factor to their patent decisions than the nature of foreign patent laws and systems. Many businesses acknowledged that foreign patent laws and systems were difficult to understand, causing them to rely on their patent attorney to tell them what they need to know.

Several businesses indicated important ways in which they had initially misunderstood foreign patent laws and international patent treaties—such as believing that their U.S. patent provided them global protection.[11] Regarding patent enforcement, many businesses said that they avoid seeking patents in countries with weak patent enforcement, despite the belief in a few instances that those countries held potentially lucrative markets for the companies' products. A few companies' foreign patents had been infringed, leading some to take enforcement actions and others to back out of the market. One company said that, because enforcement proceedings are so prohibitively expensive, it seriously examines enforcement regimes and costs as it makes foreign patent decisions.

Experts Identify Key Steps for Small Businesses to Improve Their Foreign Patent Efforts

Given the challenges that small businesses face in acquiring foreign patents and the limited resources (including time) that some small businesses have, we asked the patent law experts to identify and rank various steps that these businesses could take to improve their foreign patent efforts. In their role as advisors to small businesses, the experts had many years of experience observing the foreign patent behavior of small businesses. Of the 20 items that they ranked, more than 80 percent of the experts identified six steps that they viewed as the most important actions small businesses need to follow. As shown in table 3, these included actions related to the disclosure of an invention, the timing of foreign filing actions, the way the business incorporates intellectual property into its operations and manages it, and the selection of countries in which it seeks protection. (App. VI contains details on all of the steps the experts identified and ranked.)

[11]A U.S. patent does offer some protection for activities outside the United States. For example, it could be used against the manufacturer of a pirated product made outside the United States and sold within the United States, or of a pirated product made in the United States and sold outside of the United States.

Table 3: Patent Law Experts' Views on Most Important Steps That Small Businesses Should Take to Improve Foreign Patent Efforts

Rank	Small business step	Percent of experts rating as most important
1	Avoid divulging information about an invention prior to filing a U.S. application	100%
2	Be familiar with key dates and deadlines that are specified under U.S., foreign, and international laws, and take filing actions accordingly	95
3	Consider the company's long-range business plan	86
4	Manage patent portfolio as an asset, and regularly review foreign portfolio	83
5	Consider the nature and patentabilty of the product	81
6	Only file in countries where protection will be meaningful and patent will produce a return on investment	81

Source: GAO analysis of patent attorney panel questionnaires.

Note: Appendix VI contains complete information on how the experts ranked all steps identified in response to this question.

The experts gave their highest rankings to two steps related to businesses' knowledge of foreign patent laws and international patent treaties, underscoring their view that insufficient knowledge of these issues may cause small businesses to inadvertently impair their ability to protect their inventions abroad. First, the experts were unanimous in stressing the importance of not divulging information about an invention before filing for U.S. patent protection. Several attorneys noted that small businesses sometimes disclose information about their invention to assess its market value or otherwise attract interest in the company or product, only to learn later that they can no longer obtain foreign patent protection in countries that do not offer a grace period between such disclosure and the act of filing a patent application.

Second, the experts also held strong views about the need for small businesses to understand the steps required under international treaties or foreign laws and the associated deadlines and to act accordingly. Applicants or patent holders that fail to observe these requirements risk losing their patent rights, the experts said. For example, an international treaty requires patent applicants to file for foreign patent applications within 1 year of the date of their domestic patent application. Missing this deadline causes businesses to lose the "priority" rights that an international treaty conveys and complicates their efforts to get foreign coverage. In

addition, maintaining patent rights abroad requires that patent holders pay maintenance fees by specified deadlines (these are usually due annually in other countries, whereas U.S. maintenance fees are due only three times over the life of the patent). Finally, some countries require patent applicants to take certain steps that are not required in the United States. For instance, patent applications in the United States are automatically examined, whereas in Japan an applicant must request the examination.

Finally, the panelists suggested that small businesses should thoroughly analyze their long-term business plan and their interest in expanding abroad, as well as the company's commitment to holding and enforcing foreign patents. They recommended that small businesses treat their patents as assets that should be shed as their value decreases. Specifically, businesses should regularly review their foreign patent portfolio to determine whether it makes business sense to maintain each of their patents given the costs involved.

Observations

For a number of small businesses, the decision to expand their businesses by selling abroad is a significant step in the progress of their firm. As part of that decision, many of these firms must consider the methods available to protect their innovations, and one of those methods is by obtaining foreign patents for their products. The processes and costs involved in obtaining and enforcing foreign patents are complex, however, and often not well understood, which can negatively affect foreign patent decisions. For example, the complexity and expense may deter some small businesses from expanding their business abroad altogether. Others begin the foreign patent process with limited or insufficient knowledge and make costly mistakes that they can ill afford. Not surprisingly, we noted that a learning curve exists—some companies that were patenting abroad for the first time lacked full knowledge of the foreign patent process, whereas companies with more foreign patent experience described having learned from previous mistakes that they had made while seeking foreign patents.

We believe the information in this report is potentially helpful to small businesses that are considering foreign patents. Even with complete information about the foreign patent process, the patent decisions are complex due to the need for information such as product-specific projections on potential sales in foreign markets. However, the experiences of other firms and the guidelines from our expert panel should enable small businesses to better understand the importance of key factors and make their decisions about foreign patents more systematically.

As agreed with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after its issue date. At that time, we will send copies of this report to the Ranking Members of the Senate Committee on Small Business and Entrepreneurship and the House Committee on Small Business, and other interested congressional parties; the Administrator of the Small Business Administration; and the Director of the U.S. Patent and Trademark Office. Copies will be made available to other interested parties upon request. In addition, the report will be available at no charge on the GAO Web site at http://www.gao.gov.

If you or your staff have any questions concerning this report, please call me at (202) 512-4347. Key contributors to this report were Shirley Brothwell, Jason Bair, Jeffrey Larson, Rona Mendelsohn, and Elizabeth Sirois.

Loren Yager, Director
International Affairs
and Trade Issues

Objectives, Scope, and Methodology

After we issued a July 2002 report on foreign patent impediments that small businesses face, the Chairman of the Senate Committee on Small Business and Entrepreneurship and the Chairman of the House Committee on Small Business asked us to (1) identify the factors that patent law experts believe small businesses should consider as they decide whether to seek patent protection abroad and provide information on how small businesses viewed these factors and (2) identify the steps that small businesses should take to improve their foreign patent efforts, according to our survey of patent law experts.[1] We collected information on these objectives in two ways. First, we solicited information from a panel of 39 U.S. patent attorneys that we selected because of their expertise in obtaining foreign patents for large and small businesses. Second, we surveyed a sample of 60 small businesses that had obtained or had considered obtaining foreign patent protection and received 38 responses. We formulated the questions in our small business survey based on the information we obtained from the panel of patent law experts.

The Expert Panel

We selected our expert panelists using criteria that included years of experience in obtaining foreign patents and a record of publishing articles in professional journals. Based on these criteria, we invited 39 patent attorneys to be on our expert panel. All accepted. About half of the panelists were in-house counsel for large or small companies, while the other half were outside counsel. The combined expertise of the attorneys on our panel covered a broad spectrum of technologies, including electrical, mechanical, chemical, pharmaceutical, biotechnology, semiconductors and computers, consumer products, medical products, manufacturing, and oil.

We obtained the experts' views through an iterative Web-based panel that consisted of three phases. In the first phase, we asked the patent attorney experts to respond to open-ended questions about broad issues concerning foreign patents and small businesses, including factors that small businesses should consider in deciding whether or not to patent abroad and possible things that small businesses could do better when they decide to patent abroad. We then performed a content analysis that identified major themes within the question posed and grouped the themes into

[1]See U.S. General Accounting Office, *International Trade: Federal Action Needed to Help Small Businesses Address Foreign Patent Challenges*, GAO-02-789 (Washington, D.C.: July 17, 2002).

several categories. To maintain standards of methodological integrity, two coders independently performed the content analysis and then met to reconcile differences. Any issues that the two original coders could not reconcile were referred to other independent coders for a final determination.

In the second phase, we asked the panelists to respond to about 40 close-ended questions that we crafted based on our content analysis. In the third phase, we asked panelists to expand upon their close-ended responses to some questions. All 39 attorneys participated in the first phase, which ran from July 19 to August 28, 2001; 36 attorneys participated in the second phase, which ran from November 5 to 26, 2001; and 32 attorneys participated in the third phase, which ran from January 14 to February 8, 2002.

The Small Business Survey

To answer our two report objectives, we also conducted a survey of small U.S. businesses. Because we wanted to understand how small businesses make decisions about whether or not to obtain foreign patents, we surveyed businesses that had patented inventions in the United States and had also obtained or considered obtaining foreign patents.

As there is no database of U.S. small businesses that have obtained patents overseas, we had to identify these businesses using USPTO data on U.S. patents granted to applicants that had claimed small entity status. To do this, we screened the patent owners to find out if they were (1) small businesses, (2) U.S. companies, and (3) interested in patenting overseas. Given that there were more than 10,000 patents issued to small entities in 1997, the year for which we considered USPTO data, we realized that it would be impractical to conduct a large, generalizable survey. Instead, we decided to conduct a small, randomly selected sample of small businesses that had obtained or considered obtaining overseas patents during the last few years.

We developed the small business survey based on the patent attorneys' responses to the second phase of the patent attorney panel survey. We faxed the survey to 60 businesses in December 2001. In all, 38 of the 60 companies we surveyed responded. We conducted follow-up telephone interviews with 18 of these small businesses to obtain more detailed comments about their answers and to understand more about their foreign patent decisions.

Although we initially randomly selected the sample of small businesses, the number we ultimately consulted was limited because information was not available for a substantial number of our sample. Therefore, the information in this report does not represent the overall set of small businesses that seek foreign patent protection.

In this report, we present (1) the results of the content analysis of the attorneys' open–ended responses about the factors that small businesses should consider, (2) the results of the attorneys' close-ended responses about what steps small businesses should take to improve their foreign patent efforts and, (3) information and illustrative examples from the survey of small businesses.

The information presented in this report is based on expert opinion and secondary sources. We did not independently analyze foreign patent laws to verify the information provided. The information in this report is not intended to represent legal advice.

We did our work from May 2001 to June 2002 in accordance with generally accepted government auditing standards. The information provided during the expert panel was not time-sensitive, but we did update certain information where appropriate. For a fuller description of our methodology, see *International Trade: Federal Action Needed to Help Small Businesses Address Foreign Patent Challenges (*GAO-02-789*)*, appendix I.

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Factors Related to the Decision to Seek Foreign Patents

The patent attorney experts on our panel identified numerous factors that small businesses should consider in deciding whether or not to seek, obtain, and maintain foreign patents. We analyzed their input and developed 13 broad categories that we believe captured the experts' advice. These categories include the location and size of foreign markets; the benefits of foreign patents; the costs of foreign patents; the nature of the technology, invention, or product; the attributes of a patent and its "claims"; the issue of foreign patent infringement and enforcement; the composition of a company's patent portfolio; the location of manufacturing, assembly, and research and development sites; the nature of foreign patent laws and systems; the regulatory environments of other countries; the timing of patent applications and relevant deadlines; the nature of competitive concerns; and the issues of demographics and cultural differences. In our small business survey, we asked respondents to rank the extent to which the categories we developed were important to their foreign patent decisions.

This appendix discusses the various factors that the patent attorney experts identified, organized into the categories and presented in descending order of importance as ranked by the small businesses. Linkages exist among many of the factors and categories, meaning that small businesses that are making foreign patent decisions probably cannot and should not assess the factors in any given category without, at the same time, considering the influence of factors in other categories.

Location and Size of Foreign Markets

The experts said that small businesses should consider obtaining foreign patents in the countries where the current or potential markets for their product or technology are located. Some experts expanded the list of considerations beyond markets, saying businesses should consider holding patents in any country where they plan to import, sell, license, distribute, use, or transport their invention. They stressed that small businesses should conduct market analyses in support of their decision and identified the types of questions that such analyses should address, which included the following:

- How large is a country's population? Countries with large populations may be worthwhile targets for many kinds of products or technologies because of the increased potential for a return on investment.

- Is there a match between a country's consumer base and the item or technology being patented? For example, one expert observed that

seeking patents on marine engines or boats might not make sense in a landlocked country without lakes, regardless of population size, because there would be no real consumer base.

- Is the consumer base's level of technological development sufficiently advanced to use the item or technology being patented? Small businesses may wish to avoid countries where the consumer base cannot use or manufacture or does not value certain types of technology. (See section on "Nature of the Technology, Invention, or Product" for further discussion of this issue.)

- Are there competing manufacturers already serving this market? (See section on "Location of Manufacturing, Assembly, and Research and Development Sites" for further discussion of this issue.)

- What is the nature of host country regulation over the item or technology being patented? For example, do host governments require regulatory approval for certain items or are they able to impose price controls? (See section on "Regulatory Environments of Other Countries" for further discussion of this issue.)

- What is the tendency for patent piracy and how strongly are patents enforced? (See section on "Foreign Patent Infringement and Enforcement" for further discussion of this topic.)

The experts held varying views about the correct number of markets in which small businesses should seek foreign patents. According to them, some small businesses typically patent in too few foreign locations, while others tend to patent in too many overseas locales. Recognizing the high cost of foreign patents and the need for small businesses to focus their resources, several experts said that small businesses should only patent in the countries where their major markets are located or in a select number of countries that will give effective patent rights within a region. However, some patent attorneys held a different view, saying that small businesses should also consider obtaining patents in countries where markets don't currently exist but might develop in the future. One attorney acknowledged that at the time that foreign patent applications must be filed, it can be difficult to predict the future direction of foreign markets and the likelihood of any significant market developments occurring during the time that a foreign patent is still in force (typically a 20-year period from the time of application). For example, one panelist said that recent revisions in China's patent laws, a country where patent enforcement has generally

been regarded as low, now make China a location where patent protection should be considered for certain inventions.

Foreign Patent Benefits

The experts pointed to a broad range of financial or competitive benefits that foreign patents can provide for small businesses. One expert said that small businesses need to identify which benefits they hope to achieve by obtaining foreign patents in order to better focus their decisions. Potential benefits include protecting the company's technology, increasing the company's value and visibility, making the company more attractive to investors, and rewarding the inventor or raising the inventor's profile. Holding foreign patents can also help small companies secure financing or possibly be acquired by another company. In addition, foreign patents enable businesses to demand higher prices, at home and abroad, for their products or services, expand their market share, and earn revenue from foreign sale or manufacture activities. Similarly, businesses that hold such patents can further earn revenue by licensing to others, the right to sell or manufacture the company's products or services. Several experts also highlighted the possibility of enhancing a company's competitive position through holding foreign patents. Holding patents abroad may help disrupt a competitor's activities, discourage infringement, or provide the company leverage in future negotiations with private sector or government officials in other countries.

Many experts emphasized that small businesses should carefully evaluate potential benefits in order to assess whether these will outweigh the costs of obtaining foreign patents. Several experts expressed their belief that for many small businesses, with their often limited budgets, foreign patent benefits would frequently not exceed costs. In evaluating benefits, one expert said that the amount of money spent to protect intellectual property internationally should be commensurate with the amount of expected international sales. If there are very limited foreign sales, and limited foreign business, there need not be much investment in foreign patents. Another expert argued that unless foreign patents can generate a revenue stream or provide a competitive advantage, their cost is hard to justify. A third expert stated that, if a company's main purpose in seeking foreign patent protection is defensive (that is, to prevent competitors from obtaining corresponding patents that block the company's ability to operate freely), then foreign patents are probably not necessary. If, however, a company intends to license and receive royalties or hopes to prevent competitors from entering the market, then a well-planned foreign patent strategy is essential.

Foreign Patent Costs

The experts discussed foreign patent costs at length and urged small businesses to develop an overall strategy for their foreign patent filing and maintenance activities so that costs can be minimized. Overall foreign patent costs are comprised of a variety of national patent office, international, and private sector fees, which when combined represent a significant expense for large or small businesses. Although understanding these various fees can be challenging, the more informed a small business is about the costs, the better able it is to perform a cost/benefit assessment and to discern whether foreign patents are an appropriate investment. Some experts explained that many foreign patent costs are incurred at the front end of the patent life cycle, during the application process, but that significant costs also continue to be incurred throughout a patent's lifetime. The experts identified ways that small businesses can defer costs by taking advantage of regional or international patent filing options and provided some cost-saving suggestions for small businesses to consider.

Types and Significance of Costs

U.S. companies and inventors that seek to patent abroad incur costs to apply for, obtain, maintain, and enforce their patents. For example, national patent offices typically charge fees when patent applications are filed as well as when they search for prior art (the body of information, including patent and nonpatent literature, that is consulted to determine the patentability of an invention), examine applications, and grant patents. In addition, patent applicants may incur costs to have patent applications translated into other languages. National patent offices also charge fees, called "maintenance fees" or "annuities," to keep a patent active after it has been granted, typically for a period of up to 20 years. Whereas in the United States, most Patent and Trademark Office fees are reduced by half for small entities (defined as a small business, independent inventor, or not-for-profit entity), most foreign patent offices do not offer similar fee reductions. In addition to varying national patent office charges, patent applicants must pay for the services of U.S. and foreign patent attorneys or agents throughout the process, particularly if they take any enforcement action related to their patents.

Acquiring foreign patent protection is expensive, regardless of company size. Companies that patent abroad typically seek patents in several other countries simultaneously and incur the full range of costs in each location. According to the experts, many of these costs are redundant or disproportionate to the benefit they provide—for example, companies may have to pay each patent office to conduct a patent search, even though

much of the literature searched may be the same. Also, companies may have to pay for multiple patent examinations, because each country examines patent applications in accordance with its own laws. Some foreign patent offices charge fees that do not exist in the United States, and some fee amounts are substantially higher than corresponding U.S. Patent and Trademark Office (USPTO) charges. For example, most patent offices levy annual maintenance fees that increase steadily over the 20-year lifespan of a patent, whereas USPTO assesses only three maintenance charges during that time. Finally, several experts said that requirements to translate patent applications into foreign languages result in significant expenses that may have little practical value. One expert cited a study that translations are seldom used and a few experts believed that most parties who are qualified to read and understand the technical descriptions in a patent application are able to do so in English or another prominent language. Another expert noted that a significant benefit of the European Patent Convention is that all paper work can be processed in English (or another recognized language), and translations can be delayed until the very end of the application process.

Given the significant expense, many experts thought it important for small businesses to be well informed about the full cost of foreign patent protection, stating that many small businesses focus on the initial costs but fail to think about long-term costs. Unless small businesses consider the full "cradle-to-grave" costs of foreign patents, then any cost/benefit assessments they perform will be misleading. However, one expert said it is difficult for most U.S. companies to obtain good information about foreign patent costs and may be particularly hard for small businesses. Moreover, foreign patent costs change frequently. Another expert recommended using a software package, known as "Global IP Estimator," that is designed to help businesses perform foreign patent cost calculations.[1] Despite such a tool, however, several experts acknowledged that fully anticipating the true lifetime costs of holding foreign patents is difficult.

Strategies to Reduce Costs

The experts also thought that small businesses should strive to understand and explore the various strategies that exist to reduce foreign patent costs. First, these businesses need to understand the different methods for filing patent applications and determine whether one method is more cost-

[1]Global IP Estimator is available from Global I.P. Net in Kihei, HI.

effective than another. Business can file patent applications directly with each individual patent office in the countries where protection is desired, or they can file patent applications with regional patent offices that cover multiple countries (such as the European Patent Office).[2] Businesses can also file patent applications under an international treaty—the Patent Cooperation Treaty—that covers 120 countries and is designed to help streamline the initial patent search and examination functions and expenses. In the first method, all fees are due directly to the national patent offices, in accordance with their procedures, within 1 year from the time a U.S. patent application was filed. In the latter two methods, additional upfront fees are incurred, but national patent office requirements are streamlined and costs are delayed. The most cost-effective means will vary according to patent strategy, including the number and identity of countries where protection is sought and the nature of the patent application itself. (See app. V for a more in-depth discussion of filing procedures under the Patent Cooperation Treaty.)

In addition to exploring patent filing methods, small businesses can minimize costs in other ways. For example, businesses can try to avoid incurring translation expenses by focusing their efforts toward countries where English applications are accepted (that is, Canada, England, Hong Kong, India). They can limit the inventions they patent or the number of countries in which they seek protection—one expert suggested carefully choosing a few countries in which to spend all available patenting money on getting well-prosecuted, broad patents in those countries rather than getting narrow patents in many countries. This expert also suggested that small businesses concentrate their foreign patent efforts on the key features of a technology that competitors will need in order to be competitive. Finally, many experts advised small businesses to routinely examine the foreign patents they hold to determine whether any are no longer commercially valuable. Such patents could be allowed to expire, potentially saving the business thousands of dollars in annual maintenance fees. Several attorney experts advised that small businesses should evaluate, at every step of the foreign patent process, whether expenditures could be better spent on other things.

[2]The 1973 European Patent Convention, which created the European Patent Office, established a single procedure for granting patents in the 27 member countries on the basis of a uniform body of substantive patent law. An application to the European Patent Office is, in effect, a group of national patent applications that are processed together but become separate patents that are separately maintained and enforced.

Nature of the Technology, Invention, or Product

Several experts said that the nature of a company's technology, invention, or product needs to be assessed when making the foreign patent decision. Businesses should consider the importance of a technology, invention, or product to the company, its competition, or the marketplace, as well as an invention's technical complexity and life span. In many foreign jurisdictions, some types of technology are not considered patentable material, including business method inventions and some types of software or biotechnology (see discussion below in section on "Foreign Patent Laws and Systems"). Furthermore, according to several experts, some technologies, inventions, or products might be better protected as a trade secret than covered by a patent.

If the technology, invention, or product that a company seeks to patent is a core item or is very important to the company's business, this would argue in favor of seeking foreign patents, according to several experts. In addition, if the technology, invention, or product is substantially novel or more advanced than what is available in the marketplace or is particularly relevant to a competitor's business, seeking patents abroad would be warranted. Some experts said it may be desirable to patent inventions that are readily detectable (that is, reverse-engineered based on simple inspection of a product). Similarly, products that can be easily or cheaply brought to market (that is, where barriers to market entry are low) may benefit from a broader patent strategy. Some experts said that companies should also evaluate whether the item they seek to patent is a substantive versus a marginal addition to their own patent portfolio, suggesting that foreign patent costs may be warranted in the former case but not the latter.

The experts identified issues related to the technology, invention, or product that might dissuade companies from filing for foreign patents for certain items or in certain cases. First, several experts advised that patents may not be necessary for inventions for which use or manufacture is not easily detected, and a few well-targeted patents may be sufficient for products that require substantial capital or expertise to produce. Second, experts said that small businesses should be aware that in most foreign locales, the patent application is published at some point after application but prior to granting a patent (typically 18 months after application). This creates a window of opportunity, before the company actually has a patent, for potential infringers to learn about and begin copying the company's item. This may be a greater risk in some countries than others. One panelist suggested that if trade secrets are contained in a patent application, the invention may be of more value when held as a trade secret (and not

disclosed) for a potentially unlimited time period. Third, one expert advised against obtaining foreign patents on technologies, inventions, or products for which there are competing items in the market that already serve the same function.

When weighed against the amount of time required to obtain foreign patents, the life span of a technology, invention, or product may either encourage or discourage companies from seeking such protection. Some items have a valuable life span of only a few years, such as those in the telecommunications and software industries, and will produce licensing revenue only in the early years of a patent. Others, such as those in the pharmaceutical or biotechnology industries, are in development for many years and are monetarily valuable only in the latter years of a patent. The technology, invention, or product's life span needs to be compared with the amount of time required to obtain a foreign patent. On average, U.S. patents are granted about 2 years from the date of application, but patents in Europe are granted about 6 years from the application date; one panelist said obtaining a Japanese patent can take up to 10 years. A product with a shorter life span would be obsolete at the time of patent grant, whereas a longer-lived product would still be valuable. Investing substantial funds in foreign patents is naturally more warranted in the latter case.

Attributes of a Patent and Its "Claims"

Several experts said that small businesses should consider the nature of the patent itself, including its claims (descriptions or definitions of the subject matter that the applicant regards as his or her invention or discovery), as well as its scope and application. Several of the panelists explained that the broader a patent's reach (meaning claims with broad coverage), the more value it will add to the business that holds that patent. This is particularly true if the claims will likely block a competitor's ability to develop a competing product. In contrast, as one panelist said, if claims are narrow and only provide a limited scope of protection, a patent might be less significant, and the need for foreign patent protection would be reduced. Also, the nature of what claims cover is relevant, according to one expert. For example, if claims cover a product that will be marketed to end-users, the patent should be pursued. However, if claims cover a research tool or a key process used to make a final product, it might be better to hold these items as trade secrets than describe them in a patent application.

Several experts cautioned small businesses to be aware that patent regimes vary from country to country. As a result, not all foreign patents on a single invention will contain claims of the same breadth and value, and the

specific nature of what is protected abroad may vary by country. Some countries do not permit applicants to obtain a meaningful scope of protection for their inventions by granting only very narrow claims. According to one panelist, in such cases, the claims are easily "designed around" by competitors and make patent protection essentially meaningless.

Foreign Patent Infringement and Enforcement

Many experts argued that foreign patents are only valuable to the extent that they can be enforced. Therefore, small business owners should find out how effective patent enforcement is in the target countries and if laws and competent infrastructure exist to deal with infringement. This includes an assessment of the injunction and remedy provisions contained in foreign law, as well as the capabilities of a foreign government and judicial system to enforce overall respect for patent rights, particularly for nonnationals.

Additionally, several experts stressed that small companies should assess their own ability and willingness to enforce patents overseas, because doing so is complicated and expensive. One important aspect of enforcing patents is the ability to detect infringement. However, it can be challenging for small businesses to detect infringement on foreign patents if they do not have operations overseas. Foreign operations, branch offices, or licensees can all provide effective means for detecting infringement.

Several experts noted that variations exist in the degree to which patents are respected and enforced abroad. One expert listed three questions regarding the quality of patent enforcement in another country:

1. Do infringers know that if they infringe a patent they could be forced by a court to stop the infringement and pay damages?

2. Are the courts sophisticated enough in patent matters to reliably enforce patents?

3. Is it possible to obtain an injunction against infringers, and are significant damages available?

Because enforcement is an expensive option to pursue, several experts noted that the outcome needs to be sufficient to make the patent owner whole. One expert explained that litigation costs are generally high in Japan, the United Kingdom, and the United States; but only the latter two countries also award damages that are intended to compensate the

patentee for loss suffered due to infringement, such as lost profits. The extent of damages awarded in other countries, including many European countries, is not sufficient to make the patentee whole and bears little or no relation to the loss incurred. However, another expert countered that the U.K. and U.S. judicial systems are cumbersome and excessively procedural, whereas in the German court system, for example, technically trained judges dispatch cases fairly and promptly. Several experts noted that many countries are beginning to improve their enforcement of patent rights and these developments may make certain countries worth considering, particularly if they present major foreign market potential.

Even if the proper systems are in place, foreign court systems may exhibit overt or covert discrimination against nonnationals. In one instance, an expert explained, a client tried to enforce a patent in India against a local company, but the judge, believing foreign-owned patents to be of limited social value, developed a hearing schedule that was so tedious, the client gave up the case.

Composition of Company's Patent Portfolio

Small businesses should think about the number of foreign patents they already hold in a given country, or abroad in general. Some experts cautioned businesses against having too many foreign patents in their patent portfolio as this may become unmanageable or may not produce a return that is worth the substantial investment made. As several panelists explained, patents can sometimes be outdated if the technology is no longer in use or has become insignificant. Therefore, several experts highlighted the importance of periodically reviewing a company's foreign patent portfolio. If circumstances have changed, appropriate action (for example, termination of an application or abandonment of a patent) might be necessary. Further, one panelist suggested that small businesses should seriously consider the fact that obtaining and maintaining foreign patents will significantly increase the workload of the staff involved in looking after the patent portfolio. For comparison, the panelist noted that many large companies have substantial numbers of staff solely charged with looking after their foreign patent portfolio.

However, according to another expert, some businesses are hoping to become more attractive to larger, international entities by holding as many foreign patents as possible. The strategy is that larger, presumably multinational, entities are more likely to buy out the smaller business if it is holding a large portfolio of foreign patents.

Location of Manufacturing, Assembly, Research, and Development Sites

Many experts on our panel stated that small business owners should consider obtaining patents in any country in which they conduct research and development, or assemble or manufacture all or part of an invention or product. In this same vein, business owners should also consider the location of their competitors' research, assembly, or manufacturing sites. Further, businesses should consider where the main manufacturing centers for similar products or technologies are located and seek protection there to stop unauthorized third parties from manufacturing their invention or product. Patent protection in such locations is important, because manufacturing capabilities already exist and unauthorized production could be quickly and cheaply initiated. At the same time, business owners need to think about whether new manufacturing sites could emerge because the nature of their technology, product, or invention is easily detected, and the cost of setting up a manufacturing process is low. The level of technical competence among a country's population is a relevant factor in making this assessment.

Foreign Patent Laws and Systems

Small business owners need to understand the nature of foreign patent laws and systems as they make their foreign patent decisions. Many differences exist among foreign patent laws, and other countries' laws are different from U.S. patent law. Also, the systems set up throughout the world to process applications and award patents are not the same. Many experts stated that some small businesses are not well informed about these differences and how they can affect a business's ability to obtain foreign patent protection that is comparable to its U.S. patent protection. Because patent law is an area under constant development, one expert said it is important to occasionally review recent procedural, legislative, and judicial developments in foreign countries to ensure that all current relevant factors are known and understood. Moreover, small businesses that understand how foreign patent systems function are less likely to become frustrated by the foreign patent process.

Foreign patent laws can differ from U.S. patent law in many important respects. For example, other countries differ from the United States in how they award patents in the case of competing applications for the same invention. This is referred to as the "priority principle." All countries except the United States award patents to the first inventor to file a patent application, a method called "first-to-file." The United States awards patents to the inventor that can demonstrate it was the first to invent the item in question. These two systems engender very different patent filing

approaches. One encourages rapid use of the patent system, while the other does not.

Another key difference between U.S. and foreign patent regimes further exacerbates the different approaches in the timing of filing patent applications. Small businesses are accustomed to the provisions in U.S. patent law that allow patent applications to be made within 1 year of public disclosure of an invention. But such disclosure may render an applicant ineligible under many foreign patent laws, which require "absolute novelty" as a condition of patent grant—in other words, disclosing an invention publicly before applying for a U.S. patent and securing a "priority date," which is sometimes done to attract interest or financing, can violate the absolute novelty standard applied in other countries. Thus, U.S. patent applicants that are accustomed to the protections in U.S. patent law that enable them to move more slowly in filing patent applications should consider modifying this approach if they desire foreign patent protection.

In addition to these key principles, the types of inventions or technologies that patents can cover differ among countries. For example, business method inventions and certain software processes and biotechnological inventions cannot be patented outside of the United States. Experts also noted that some developing countries have been slow to grant patents for pharmaceutical products, and some countries will not allow patent coverage for methods of medical treatment. One expert said the limits on patent coverage for cutting-edge technology can be particularly problematic for small businesses, which often excel in this area. Foreign patent laws may also differ from U.S. patent law in terms of the degree of protection that issued patents provide (whether measured by the exclusive rights granted to the holder or by the breadth of claims that are allowed); therefore, the nature of protection obtained in each country where patents are held on a single invention may not be identical.

Further, some small businesses may not understand key international treaty provisions that affect the timing of their foreign patent filings. In order to preserve their rights under the Convention for the Protection of Industrial Property (known as the Paris Convention), small businesses must file all foreign applications related to the inventions they seek to patent abroad within 1 year from the date on which their U.S. application was filed. If they do not file within this 1-year period, they lose certain international treaty rights. This may, in turn, affect their ability to obtain foreign patent protection.

Finally, according to one panelist, many countries require compulsory licensing if a patentee does not commercialize the patented product within a certain period of time (frequently 3 years). A small business may be forced to give a license to a competitor to use a technology in which the small business has made a considerable investment but may only be able to demand a "reasonable royalty" under the host country laws. In addition, another expert noted that some developing nations grant patents for much less than the standard 20 years, which can be a major problem with products that may take many years to bring to market.

Regardless of the nature of a host country's patent laws, small businesses should also understand the strength and competency of the national patent office and the degree of difficulty that dealing with a national patent office presents. The strength of the national patent office may be gauged, in part, by the technical expertise of its examiners, the consistency and quality of its patent examinations, and the amount of time it takes to grant a patent. Several experts stated that some foreign patent offices lack sufficient numbers of qualified examiners. In Taiwan, for example, patent law is not always properly applied, because examination of patent applications is contracted out to part-time examiners who are not trained in law, said one expert. Also, major patent offices, such as the European Patent Office and the Japan Patent Office, have tremendous workloads and significant backlogs in processing patent applications (this is also true of USPTO). Several panelists stated that patent pendency times outside of the United States range from 3 to 7 years; the average patent pendency period in Europe is about 6 years. Finally, several experts noted that meeting the formal requirements of multiple patent offices and dealing with their bureaucracies is quite challenging. Some experts expressed the belief that some foreign patent offices practice subtle discrimination against nonnational applicants. For example, one expert said that foreign applicants in Japan are not familiar with the use of particular "code" words and phrases that are used to favor domestic applicants.

Regulatory Environments in Other Countries

Small businesses should also consider the broader regulatory institutions within a country and how government policies could influence their decision to patent in certain countries. One panelist noted that a vast array of products, including pharmaceuticals, agricultural chemicals, and telephonic equipment may not be marketed without government approval. Therefore, the interaction between the regulatory system and patent laws in a country will affect the extent to which patents are commercially meaningful and should be considered when evaluating the prospect of

obtaining foreign patent protection. Several panelists said that policies of protectionism for local industries within a country could also be an important element to consider, because products might face additional barriers to market entry despite having been awarded a patent in that country.

Timing of Patent Applications and Relevant Deadlines

Small businesses need to understand the timing of foreign patent application filing and other deadlines and act in accordance with these deadlines. These include filing foreign patent applications within 1 year of the time a U.S. application was filed in order to protect an applicant's Paris Convention rights and following the time frames and actions established in the Patent Cooperation Treaty (if applicants file under this treaty). It also includes taking actions in accordance with the expectations of national patent offices, such as paying maintenance fees in a timely fashion.

Competitive Concerns

The expert panelists identified a range of competitive concerns that small businesses should evaluate when thinking about foreign patents. In addition to examining the company's own patent portfolio, some experts said businesses should try to assess the composition of any competitor's patent portfolio. One panelist said that a business owner can judge the extent to which he or she should patent overseas based on a competitor's foreign filings, since companies frequently use patents to trade with other companies. Another panelist said that the location of a competitor's patents may reflect its future business plans.

In addition, as mentioned previously, several on our panel agreed that business owners should also consider the location of their competitors' research and development, manufacturing, and assembly sites when deciding on a foreign patent strategy. One panelist suggested it may be worthwhile to patent an invention in countries where companies do not intend to develop or produce their product just to prevent their competitors from doing so. For example, a small chemical company may not have a plastics manufacturing plant in Spain, but if the large company competitor's plastics manufacturing plant is in Spain, the small company should protect its innovation in Spain.

Demographics and Cultural Differences

Small businesses should also consider the population, wealth, size, and other demographic aspects of target countries when deciding whether or not to apply for a foreign patent. For example, countries with large or wealthy populations are worth considering if the potential market size would be larger or sales more lucrative. However, this would only be true if the population was likely to use the product. Likewise, some panelists explained that other demographic elements—such as the level of industrialization, the degree of technological development, and the prevalence of political or economic stability and development—could be useful tools for assessing a country's potential patent value. Finally, social or environmental attitudes may be useful indicators of potential patent value.

Small Business Views on the Relevance of Certain Factors to Their Foreign Patent Decisions

For our July 2002 report, we asked the 38 businesses that responded to our survey to indicate the extent to which their company typically considered certain types of factors when making decisions about foreign patent protection. Businesses were asked to rank 13 types of factors on a scale ranging from "little to none" to "very great." This appendix contains the survey results and shows the percentage of businesses ranking the importance of a given factor at each of the five levels on the scale.

Small Business Foreign Patenting Survey

GAO
Accountability · Integrity · Reliability

II) Factors to Consider in Patenting Abroad - Please check the boxes that apply.

8) Based on your company's overall foreign patenting experiences, to what extent does your company typically consider the following types of factors when making decisions about foreign patent protection?

Factor	Extent scale					
	Little to none (%)	Some (%)	Moderate (%)	Great (%)	Very great (%)	N
8.1) Costs associated with foreign patenting	5%	3%	27%	32%	32%	37
8.2) Benefits associated with foreign patenting	0	8	19	44	28	36
8.3) Location and size of possible foreign markets	0	3	11	41	46	37
8.4) Location of your company's or your competitors' possible manufacturing/assembly/R&D sites	16	16	16	22	30	37
8.5) Foreign legal systems and regulatory environments	8	24	29	26	13	38
8.6) Foreign patent systems and patent laws	8	24	22	27	19	37
8.7) Foreign patent enforcement/infringement	3	19	19	38	22	37
8.8) The nature of the technology/invention/product	5	5	27	27	35	37
8.9) The attributes and scope of the patent and the claims	8	11	22	32	27	37
8.10) The composition of your company's patent portfolio and any related business strategies	16	5	24	35	19	37
8.11) The composition of your competition's patent portfolio and any related business strategies	35	19	19	11	16	37
8.12) Patent timing and deadlines	27	16	24	22	11	37
8.13) Cultural and demographic factors in other countries	34	29	11	20	6	35
8.14) Other:	0	0	0	0	0	0
8.15) Other:	0	0	0	0	0	0

Legend
N = Number of responses

Note: Percents were calculated by removing any "Don't Know/Not Applicable" responses from the total number of responses ("N"). Percents in this appendix may not correspond to those listed in the body of the report due to rounding.

2

Processes and Costs Involved in Obtaining Foreign Patent Protection: A Hypothetical Scenario for 2002

Note: The material in this appendix appeared originally in our report titled *International Trade: Federal Action Needed to Help Small Businesses Address Foreign Patent Challenges*, GAO-02-789, June 2002. The fees disclosed in the appendix are based on information that was available as of June 2002 and have not been updated.

Companies may obtain foreign patent protection in several ways. The costs associated with obtaining such protection vary depending on the process followed, the nature of the patent sought, and the extent of global patent coverage desired. This appendix presents a hypothetical scenario that we developed for a small business seeking to patent a single invention abroad. Our goal was to illustrate a common foreign patent process and to estimate the costs that a small U.S. business[1] might incur when filing for, obtaining, and maintaining foreign patent protection in the United States and nine other countries. We based this hypothetical scenario, in part, on what several patent attorneys advised us could be considered a "typical" small business patent application and process.

Our scenario depicts a small company filing for foreign patent protection for one of its products in six European countries (France, Germany, Italy, Ireland, Sweden, and the United Kingdom), Canada, Japan, and South Korea. Patent laws in each of the nine countries cover the technology for this product, which can be protected with a single patent. The hypothetical company has already filed its U.S. application for this product. The U.S. patent application on which the company will base its foreign applications was relatively short and straightforward, consisting of 25 pages, 5 drawings, and 15 claims (claims define the invention and are what make the patent legally enforceable). Patents will ultimately be issued in each country where the company is pursuing protection. In order to keep its patents in force, the company must pay recurring fees (referred to as "maintenance fees") to each national patent office. In our scenario, the company opts to keep each patent in force for its full term, which is 20 years from the date of patent application filing. (Additional information about our scenario and methodology can be found at the end of this appendix.)

[1]Under 13 C.F.R. part 121, the Small Business Administration (SBA) has established various size standards, based on economic activity or industry, for determining what a small businesses is for purposes of eligibility for SBA programs. Based on SBA standards, we defined a small business for purposes of conducting our work as having 500 or fewer employees.

Given this scenario, the estimated cost of the U.S. patent, maintained for a period of 20 years, is about $10,000 (in 2002 current year dollars).[2] The estimated cost of the foreign patents, maintained for a similar length of time, would range from about $160,000 to about $330,000 (in 2002 current year dollars). These are minimum estimates that include patent application filing and issuance fees, translation fees for applicable foreign patent offices, maintenance fees, and estimates of attorney and foreign patent agent fees associated with work related to the filing and paying of these fees. Actual patent costs for a patent filing strategy similar to our scenario could be far higher because we assumed that the patent application would not face a difficult examination process in any of the countries. Thus, our scenario eliminated many patent office and legal costs that companies incur in trying to obtain a patent. Actual patent costs would also vary if certain key assumptions were modified. For example, filing applications in more than nine countries would increase the cost of obtaining foreign protection. Also, if a patent application was longer or more complex than the one in our scenario, the cost to obtain patent protection abroad would rise because translation expenses and some foreign patent office charges would be higher. Conversely, if patent protection was not maintained for the full 20-year term in each of the countries, official fees and attorney fees to maintain the patent would decrease.[3] The latter condition would reduce the overall cost of foreign patent protection relative to the U.S. cost. Finally, these estimates do not include costs that could be incurred from legal fees payable for litigation associated with possible infringement and defense of a patent.

Estimated Cost of U.S. Patent

The scenario assumes that the small business has already filed its U.S. patent. As shown in table 4, the minimum cost to obtain that patent would be about $6,412. This includes U.S. Patent and Trademark Office (USPTO) small entity filing and issuance fees, as well as attorney charges to prepare

[2]These estimates are expressed in 2002 current year dollars because of a lack of information about the timing and amount of future expenditures for patent maintenance and attorney fees. Additional information on our scope and methodology in developing these estimates can be found at the end of this appendix.

[3]U.S. patent maintenance costs are fully paid by the end of the twelfth year from the date the application was filed, whereas foreign patent maintenance costs continue to be incurred through the twentieth year from the date of application. Thus, holding foreign patents for shorter periods of time reduces the cost of foreign patent protection relative to the cost of U.S. protection.

and file the patent application and obtain the issued patent. The minimum cost to maintain the patent for a 20-year term would be about $3,528. This includes USPTO maintenance fees that are charged 3 times during the 20-year term after the patent is granted, as well as attorney charges to pay those fees. In this scenario, 65 percent of the costs are incurred to obtain the patent and 35 percent to maintain it.

Table 4: Estimated Costs to Obtain and Maintain U.S. Patent for 20 Years

Type and stage of fee	Cost in U.S. dollars
Application	
USPTO basic filing fee	$370
Attorney charges to prepare and file patent application	5,002
Issuance	
USPTO issue fee	$640
Attorney charges	400
Total application and issuance costs	**$6,412**
Maintenance	
USPTO fee at year 3.5	$440
USPTO fee at year 7.5	1,010
USPTO fee at year 11.5	1,550
Attorney charges to pay 3 maintenance fees	528
Total maintenance costs	**$3,528**
Total cost to obtain and maintain the patent	**$9,940**

Source: GAO analysis of USPTO fees and American Intellectual Property Law Association data.

Notes: All USPTO fees are small entity fees effective October 1, 2001.

Attorney charges are based on the American Intellectual Property Law Association's *Report of Economic Survey 2001* and reflect the median charges for the subject item.

Filing for a Foreign Patent

A company can acquire foreign patent protection in two ways: (1) by filing separately in each country or region where protection is desired or (2) by filing for patent protection in 120 countries at the same time through an international application established by the 1970 Patent Cooperation Treaty (PCT), as amended.[4]

[4]Much of the technical information presented in this appendix is drawn from Stephen Elias, ed., *Patent, Copyright, & Trademark: A Desk Reference to Intellectual Property Law* (Berkeley: Nolo Press, 1996).

Companies may file separately in each country where protection is desired under the rules established by the 1883 Paris Convention, as amended. Also known as the Convention for the Protection of Industrial Property, this treaty is adhered to by 163 countries and gives limited recognition to one another's country patent application filing dates. Applicants choosing this route must file foreign patent applications within 1 year of the date on which they filed their domestic patent application (known as the "priority date"). Applicants will face the requirements and costs that each country imposes upon filing their patent applications. As a result, filing separately may be cost-effective for those interested in holding patents in only a few countries.

The second process for foreign filing is through an international patent application under the Patent Cooperation Treaty (PCT), which the World Intellectual Property Organization (WIPO) in Geneva, Switzerland, administers. This treaty is adhered to by 120 countries and facilitates the international filing of patent applications by centralizing filing procedures and standardizing the application format. The PCT enables applicants to obtain an international search report or "prior art search"[5] and preliminary examination.[6] This is commonly called the "international stage" of a PCT application.[7] Following this stage, PCT applicants then decide in which countries they want to hold patents and enter processes in these countries to obtain such patents. This is commonly called the "national stage" of a PCT application. Applicants incur PCT fees during the international stage and national patent office fees during the national stage.[8] However, by filing through the PCT, applicants can delay paying the national stage fees for up to 30 months from their patent priority date.[9] This delay allows applicants

[5]Prior art is the body of information, including patent and nonpatent literature, that patent offices consult to determine the patentability of an invention.

[6]An examination is a process in which a patent examiner will correspond with applicants and decide whether inventions deserve patents based on claims.

[7]The expression "international phase" or "stage" is not officially used in the PCT, but according to WIPO, it has become customary and is used in its Patent Cooperation Treaty guide (http://www.wipo.int/pct/guide/en/).

[8]The expression "national phase" or "stage" is not officially used in the PCT, but according to WIPO, it has become customary and is used in WIPO's PCT guide (http://www.wipo.int/pct/guide/en).

[9]Most patent offices, including those in our scenario, provide for a delay of 30 months. However, some will allow a 31-month delay from the priority date.

more time to assess the value of their invention and the likelihood of obtaining a patent in a particular country before incurring the costs associated with obtaining patent protection in that country.

If an applicant desires patent protection in a region such as Europe, Eurasia, or Africa, the applicant may file with a regional patent office or, if filing through the PCT, designate a regional office. The European Patent Convention and the Eurasian Patent Convention are examples of regional patent treaties that allow applicants to file one single application for the contracting states within those regions. For instance, the European Patent Convention and its associated office, the European Patent Office, consist of 27 member states.[10]

Obtaining a Foreign Patent Using PCT

In our scenario, the company uses the Patent Cooperation Treaty process for filing its foreign patents. We chose to illustrate the PCT process because it is a widely used and "typical" method for obtaining foreign patent protection, according to patent attorneys we interviewed. The PCT process consists of two main phases, the international stage and the national stage.

International Stage: PCT Processes and Costs

The international stage of the PCT process is comprised of several steps, as shown in figure 1. First, applicants file a PCT application and pay associated filing fees to a PCT receiving office, as shown in box 1 of figure 1. The receiving office, which is a contracting state, is the authority to which nationals or residents of that state submit their international applications.[11] Second, applicants select an International Searching Authority[12] to prepare an international search report that will provide

[10]The European Patent Convention member states include Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Hungary, Germany, Greece, Ireland, Italy, Liechtenstein, Luxembourg, Monaco, the Netherlands, Portugal, Romania, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, and the United Kingdom.

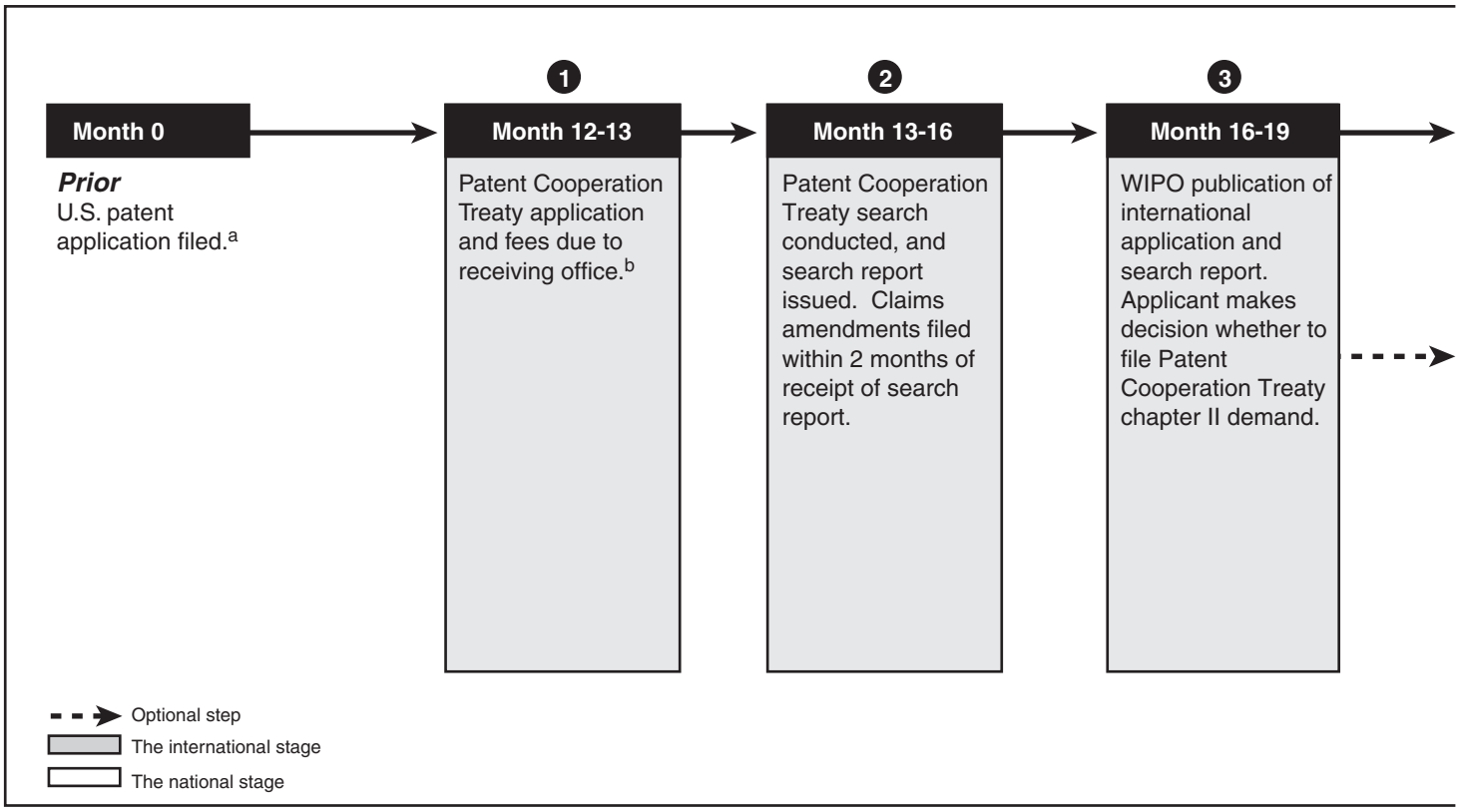
[11]Applicants may also file with the International Bureau of WIPO regardless of the state of which the applicant is a resident or national. Residents or nationals who are party to regional patent conventions may file international applications with the regional offices that the conventions established.

[12]An International Searching Authority is a national office or intergovernmental organization that is highly experienced in examining patent applications and is specified by the receiving office. The International Searching Authority establishes documentary search reports on prior art with respect to inventions that are the subject of applications.

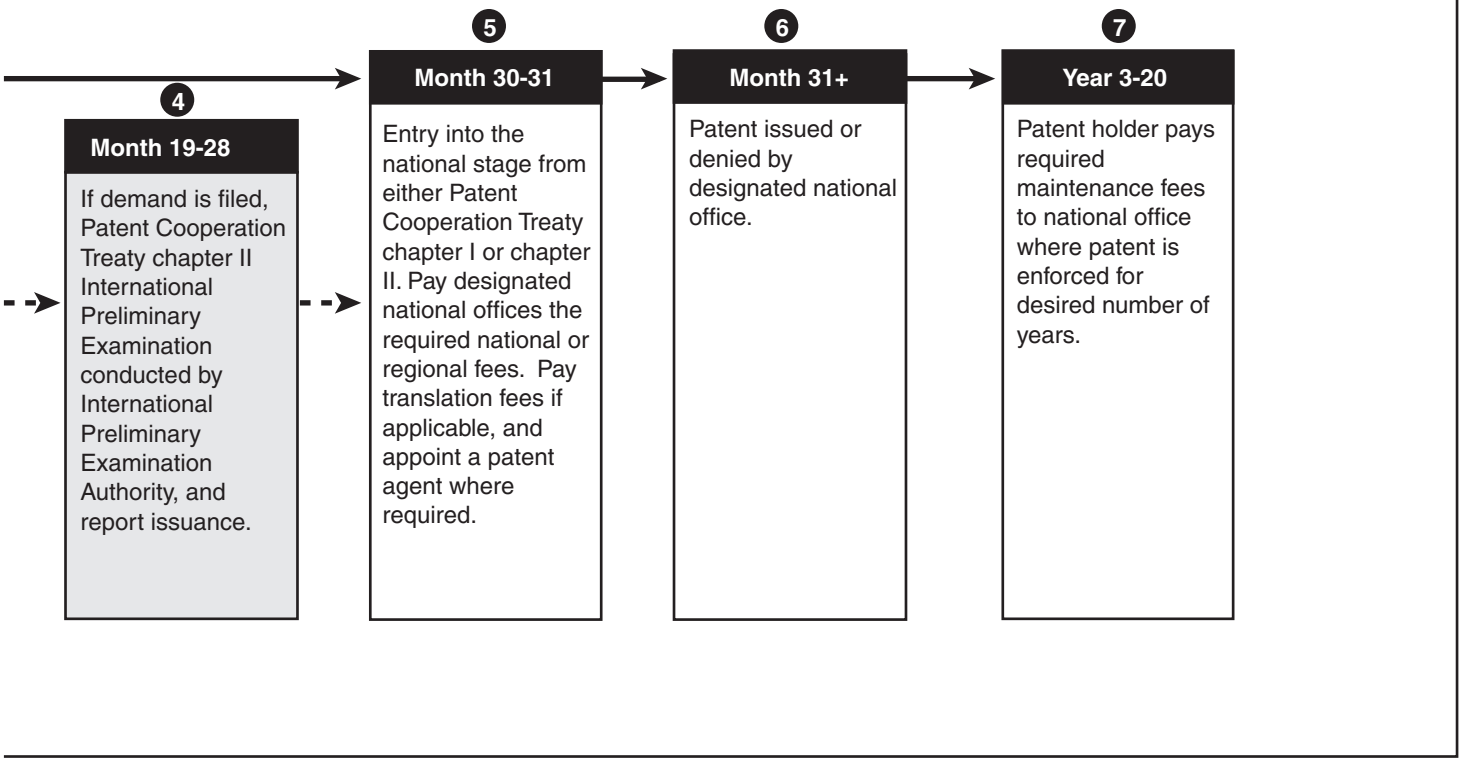
information on relevant prior art based on the claims of the application.[13] The International Searching Authority conducts a prior art search and issues a search report for the applicant's review, as shown in box 2 of figure 1. Based on the results of the report, the applicant may decide to continue or discontinue the patent process in certain countries. Discontinuing the patent process because of an unfavorable search report allows the applicant to save on the costs of processing the application in various countries. However, the applicant may amend the claims of his or her application and maintain only those that are favorable and likely to result in the grant of a patent.

[13]See The World Intellectual Property Organization, Patent Cooperation Treaty: chapter 2, article 33, (Geneva: WIPO, http://www.wipo.int/pct/en/index.html, downloaded in May, 2002).

Figure 1: The International and National Stages of the PCT Process



Source: GAO analysis of the Patent Cooperation Treaty and national patent office fee schedules.



[a]This figure illustrates the process and timetable in cases where an applicant has first filed a U.S. patent application. However, applicants may file their initial application under the PCT. In these cases, the steps would be the same, but the timetable would differ.

[b]The PCT application is due at month 12, and the fees are due at month 13.

Once WIPO publishes the international application, as shown in box 3 of figure 1, the applicant has the option of obtaining an international preliminary examination report.[14] The preliminary report provides an initial

[14]The international preliminary examination report is produced by an International Preliminary Examination Authority, which is appointed in the same fashion as the International Searching Authority.

and nonbinding opinion about whether the claimed invention appears to be novel, nonobvious, and industrially applicable.[15] If the applicant decides not to obtain this preliminary report, the applicant will enter the national stage of the patent process. If the applicant decides to obtain an international preliminary examination report, he or she must file a "PCT chapter II demand." The issuance of the international preliminary examination report, as shown in box 4 of figure 1, allows the applicant to assess the chances of obtaining a patent in a particular country before incurring the costs associated with pursuing patent protection in that country.

The costs associated with the international stage include fees payable to the receiving office for work related to filing the international application, obtaining the international search report, and designating the national patent offices where applicants may decide to file during the national stage. Applicants will also incur U.S. patent attorney fees for filing and any applicable work corresponding to the PCT process. We will address these costs in the final section of this appendix. The receiving office sets the transmittal fee. This fee is payable for the tasks associated with the receipt and checking of the international application. The fee also covers the transmittal of application copies to WIPO and the International Searching Authority. The International Searching Authority sets and receives the search fees for establishing the international search report. The international fee accrues to WIPO and is the sum of the basic fee and the designation fees. The basic fee is for tasks that include the publication of the international application and the communication of notifications to the applicant, the receiving office, the International Searching Authority, the International Preliminary Examination Authority, and national and/or regional offices. The designation fee is payable for the first five national or regional offices designated in the application. There is no charge for designations beyond five.

Our scenario assumes that the United States operates as the receiving office, as well as the International Searching Authority and the International Preliminary Examination Authority, for the hypothetical company's patent application. Table 5 shows the fees associated with the international stage of the foreign filing process through the PCT. The

[15]See The World Intellectual Property Organization, Patent Cooperation Treaty: chapter 1, article 15, (Geneva: WIPO, http://www.wipo.int/pct/en/index.html, downloaded in May, 2002).

company would pay four designation fees: one each for Canada, Japan, South Korea, and the European Patent Office. In our scenario, the company chooses to pursue national stage entry after chapter II processing. This means that the business will incur the additional costs of having preliminary examination conducted by an International Preliminary Examination Authority to further assess the chances of obtaining a patent for its invention in the desired countries or regions. The additional costs include two fees payable to the International Preliminary Examination Authority. The first of these is a preliminary examination fee that accrues to the International Preliminary Examination Authority for carrying out and establishing the international preliminary examination report. The second is a handling fee that accrues to WIPO for carrying out various tasks related to the international preliminary examination report. The estimated total cost of the international stage, given this scenario, is $2,100.

Table 5: Estimated International Stage Patent Costs

Type of fee	Cost in U.S. dollars
PCT chapter I fees	
Transmittal fee[a]	$240
Search fee[b]	450
International fees (basic fee and designation fees)	
Basic fee	407
Designation fee ($88x4)	352
Certified copy fee	15
Total PCT chapter I fees	**$1,464**
PCT chapter II fees	
Preliminary examination fee[c]	$490
Handling fee	146
Total PCT chapter II fees	**$636**
Total international stage fees (PCT chapter I and chapter II fees)	**$2,100**

Source: USPTO fee schedule.

Notes: U.S. and foreign patent attorney fees not included.

[a]USPTO is the receiving office.

[b]USPTO is the International Searching Authority.

[c]USPTO is the International Preliminary Examination Authority.

National Stage: National Patent Office Processes and Costs

The national stage is the second of the two main phases of the PCT patent procedure. For official entry into the national stage, the applicant will be responsible for paying the required fees to each national or regional patent office elected,[16] along with the fees associated with furnishing a translation of the international application where applicable, as shown in box 5 of figure 1. The applicant may also be required to appoint a patent attorney or agent in each of the designated offices. (A patent agent is a nonattorney with technical training who is legally permitted to draft, file, and prosecute patent applications on behalf of inventors.) Such appointment may be required if the applicant is a nonresident of the designated office's respective country. The deadlines for these requirements are generally by month 30 after the priority date, but some PCT contracting states may extend this deadline to month 31. Once these steps are completed, the company will officially enter the national stage via chapter I or chapter II.[17] Next, the designated offices will carry out an examination of the application and either issue or deny the national or regional patent based on their respective national laws, as shown in box 6 of figure 1.

The costs associated with the national stage include official fees payable to each designated office for filing the patent application, examining the application, and granting the patent. The applicant may also incur fees for the translation of the patent application. In addition, the applicant will incur costs for any work involving a U.S. patent attorney or a foreign patent attorney or agent (hereafter referred to as "foreign representatives"). We will address these costs in the final section of this appendix.

Our scenario assumes that the company will be pursuing patents through three national offices—Canada, Japan, and South Korea. The company is also pursuing patents in six European Patent Office member states—France, Germany, Ireland, Italy, Sweden, and the United Kingdom. Table 6 shows the fees associated with the national stage of the foreign filing process through PCT. Official fees include the filing fee, state designation fees in the case of the European Patent Office, examination fees, and

[16]The PCT defines a national or regional office as "designated" in chapter I and "elected" in chapter II.

[17]Effective April 1, 2002, the entry date for chapter I was changed from 20 months to 30 months from the priority date pursuant to PCT Article 22. Officials from USPTO noted that many contracting countries of PCT have indicated that the change is incompatible with their current national laws. Therefore, they will not recognize the change until their respective national laws have been changed.

patent granting fees. The company will incur translation fees for Japan, South Korea, and the non-English speaking countries designated in the European Patent Office; namely, France, Germany, Italy, and Sweden. The total estimated cost of the fees associated with the national stage, given our scenario, is $13,417. This does not include costs associated with either U.S. attorney or foreign representative work.

Table 6: Estimated National Stage Patent Costs

National or regional patent office	Official fees	Translation fees[a]	Total (cost in U.S. dollars)
Canada	$314	$0	**$314**
European Patent Office	3,237	1,739	**4,976**
Japan	1,699	2,999	**4,698**
South Korea	1,229	2,200	**3,429**
Total	**$6,479**	**$6,938**	**$13,417**

Source: Global IP Estimator (software package that provides cost estimates of international patent applications). (Kihei, HI:Global I.P. Net, 2002).

Notes: Exchange rates used by Global IP Estimator software: British pounds = 0.6876 to the U.S. $; Euro = 1.1193 to the U.S. $; German marks = 2.1893 to the U.S. $; Japanese yen = 131.71 to the U.S. $; Canadian dollar = 1.5913 to the U.S. $; Korean won = 1,317.8 to the U.S. $.

[a]Translation fees vary according to the length of the application. Our estimate assumes 25 pages of translation.

Maintaining a Foreign Patent

Maintenance fees, also referred to as "annuities" or "renewal fees," are paid to each patent office where a patent has been obtained. Maintenance fees would be applicable if the business decided to keep a patent granted to it in force, regardless of how the company filed. Maintenance fees keep the patent in effect and must be paid on a recurring basis, usually annually for up to 20 years after the priority date, as shown in box 7 of figure 1. Patent holders can expect an annual increase in fees charged by each national patent office for maintaining the patent. If a business decides not to maintain any of its patents and therefore not enforce them for a full term, the maintenance fees for each patent would cease from the last year during which the patent was kept in force.

Our scenario assumes that the company seeks to keep the patent it obtained through the PCT process in force in each of the nine countries for

a term of 20 years from the priority date.[18] Table 7 provides the total maintenance fees over 20 years that would be payable to the patent offices in our scenario, not including attorney fees. The fees would be payable to Japan, Canada, South Korea, and each country that the company designated through the European Patent Office. The total estimated cost to the business for full-term foreign maintenance is $83,543. This does not include costs associated with either U.S. attorney or foreign representative work.

Table 7: Estimated Costs Involved in Maintaining a Foreign Patent in Nine Countries for 20 Years

Country	Cost in U.S. dollars
Canada	$1,510
France	5,001
Germany	13,520
Ireland	4,637
Italy	6,002
Japan	22,783
South Korea	18,910
Sweden	5,552
United Kingdom	4,903
European Patent Office renewal fees	725
Total	**$83,543**

Sources: Canadian Intellectual Property Office, European Patent Office, German Patent and Trademark Office, Irish Patents Office, Italian Patent and Trademark Office, Japanese Patent Office, Korean Intellectual Property Office, United Kingdom Patent Office, and WIPO.

Notes: Exchange rates are based on data from DRI-WEFA, *World Outlook Comparison Tables, Forecast Data, 2001,* fourth quarter, and DRI-WEFA, *Monthly World Outlook* (Philadelphia:DRI-WEFA, Feb. 15, 2002). Exchange rates are based on an average exchange rate forecast for years 2001-2005 and years 2006-2020.

Maintenance fees are expressed in current year dollars because of a lack of information about the timing and amount of future expenditures for patent maintenance.

Renewal fees are payable to the European Patent Office for the years before the European Patent Office grants the patent. In our scenario, we assume the European Patent Office grants the patent in year 5. As a result, the company must pay a renewal fee of $351 in year 3 and $374 in year 4 to the European Patent Office. The figure for European Patent Office renewal fees in the table reflects fees for years 3 and 4 and the maintenance fees for designated member states for years 5-20.

[18]We assumed that the patents would be held for the full 20-year term in each country to show what the maximum maintenance costs might be. However, most patents are not held for the full term.

U.S. Attorney and Foreign Representative Fees

Throughout the foreign patent process, the company will incur fees for U.S. attorneys and foreign patent representatives. Unlike national patent office fees, which governments typically publish in fee schedules, U.S. attorney and foreign representative costs may vary widely, depending on a number of factors. Therefore, they are difficult to estimate reliably. For example, items such as the nature of the patent sought, the extent of global patent coverage desired, the foreign patent process followed, and the amount of time patent attorneys spend modifying patent applications to meet the expectations of individual patent offices will affect the cost of U.S. patent attorney and foreign representative services. U.S. patent attorney fees will also vary throughout the United States. For these reasons, our estimates of U.S. patent attorney and foreign representative costs are, at best, approximate.

We presented our foreign patent scenario to, and obtained cost estimates from, four of the patent attorneys on our panel.[19] We asked them to estimate the U.S. attorney and foreign representative fees that the hypothetical company might incur at the international and national stages and throughout the maintenance phase. Their estimates for the U.S. attorney and foreign representative charges during the international and national stages were similar, but their estimates of these costs during the maintenance phase covered a broader range. As shown in table 8, the total cost of U.S. attorney and foreign representative fees for the company could range from under $60,000 to $230,000.

[19]These attorneys were based in San Jose, Calif.; Washington, D.C.; Minneapolis, Minn.; and New York City.

Table 8: Estimated U.S. Attorney and Foreign Representative Fees

	International stage	National stage	Maintenance phase	Total (cost in U.S. dollars)
U.S. attorney fees	<$10,000-$20,000	<$10,000-$30,000	<$10,000-$60,000	**$<30,000-$110,000**
Foreign representative fees	0	$20,000-$50,000	$10,000-$70,000	**$30,000-$120,000**
Total fees	**<$10,000-$20,000**	**<$30,000-$80,000**	**<$20,000-$130,000**	**<$60,000-$230,000**

Source: GAO analysis of patent attorney cost estimates.

Total Scenario Costs

The total estimated foreign patent costs to the company in our scenario ranged from about $160,000 to about $330,000, as shown in table 9. In this scenario, the company would incur about 35 percent of the lifetime costs to file and obtain the foreign patents and about 65 percent of the costs to maintain the foreign patents for their full 20-year term.

Table 9: Estimated Total Foreign Patent Costs

Stage	Costs in U.S. dollars
International stage costs	$2,100
U.S. attorney and foreign representative fees at the international stage	<10,000-20,000
National stage costs	13,417
U.S. attorney and foreign representative fees at the national stage	<30,000-80,000
Maintenance fees	83,543
U.S. attorney and foreign representative fees during the maintenance stage	<20,000-130,000
Total	**$<159,060-$329,060**

Source: GAO analysis of sources cited in table 4-8.

Scope and Methodology

To estimate the U.S. patent costs that a small business might incur, we obtained relevant fees from the USPTO schedule of patent fees, effective October 1, 2001. We used the small entity fees because the company in our

scenario would be eligible to pay these lower fees. We obtained estimates for attorney costs from the American Intellectual Property Law Association's *Report of Economic Survey 2001*. This survey is done every 2 years and, among other things, provides statistics on billing rates and typical charge for representative intellectual property services. The data in the 2001 report is based on 1,829 responses. We used the median costs contained in the survey for actions that corresponded to our scenario.

To estimate the foreign patent costs that a small business might incur, we developed our hypothetical foreign patent scenario based on information that we obtained from our small business survey and patent attorney panel, as well as on input from several patent attorneys. We took this route because few of the studies that we analyzed about foreign patent costs were tailored to small businesses. Moreover, because many caveats exist in the foreign patent process, a scenario enabled us to better estimate costs. Based on this information and input, we developed what the patent attorneys advised was a reasonably typical foreign patent scenario for a small business. This scenario included filing a patent application of average length and complexity in a limited number of important countries, reflecting the choices that small businesses have to make because of cost considerations. We also chose to illustrate the PCT process because it is a commonly used process that small businesses might follow.

The scenario included a range of assumptions to help narrow the scope of cost estimates as much as possible, particularly for the patent attorneys who estimated U.S. and foreign patent attorney charges. These hypothetical foreign patent scenario assumptions are as follows:

1. The U.S. application consists of 25 pages, 5 drawings, and 15 claims, including 2 independent claims.

2. Prior art is relevant to the first independent claim and its dependent claims, but not the other independent claim.

3. The first independent claim and its dependent claims are ultimately allowed after amendment.

4. One office action occurs.

5. No appeals, opposition, invalidation, scope trials, or the like occur.

6. The issued patent contains 15 claims.

7. The company keeps each of its patents in force for 20 years.

8. The PCT application is filed in the United States. USPTO acts as the receiving agent and conducts the search and examination.

We included the nine countries in our scenario for various reasons. We selected Japan because it is an important market, and because we wanted to illustrate the higher costs that companies face when they seek patent protection in Japan. We selected Canada because U.S. small businesses are eligible for lower fees there and can file their applications in English, thereby avoiding translation charges. We selected South Korea to represent developing markets where companies may wish to obtain patent protection. We opted to include six European countries to represent reasonable but still limited protection in this major foreign market.

We obtained information about the cost of filing a PCT application in the United States from the USPTO schedule of PCT fees. We used the Global IP Estimator software published by Global I.P. Net to obtain information on patent fees in each country included in our scenario. This software provides estimates of national patent office fees for countries throughout the world, including translation costs where applicable. We obtained information about these fees and costs from Global IP Estimator in January 2002. We validated the information in the Global IP Estimator by examining the WIPO's PCT applicant guides and published fees and the various national patent office Web sites. We obtained information about maintenance fees from WIPO, the European Patent Office, and the national patent office Web sites. Since many of these sources presented the fees in the national currency of the respective patent office, we used average exchange rates for years 2001-2005, and 2006-2020, provided by DRI-WEFA, an economic consulting firm.

To obtain information about the cost of U.S. and foreign patent attorney services throughout the process, we surveyed four patent attorneys who were members of our patent attorney panel. The attorneys estimated, within ranges of $10,000, the U.S. patent attorney and foreign representative costs for the international and national stages and the maintenance phase of our scenario. Although the American Intellectual Property Law Association's *Report of Economic Survey 2001* contained data on U.S. patent attorney charges for these services, we did not use this data because it did not include foreign representative costs.

We have expressed all costs in 2002 current dollars due to a lack of information about the timing and amount of future expenditures for patent maintenance and attorney fees. We collected information on the patent maintenance fees for the United States and foreign countries for the patent scenario described in this appendix. However, we do not have a breakdown of the costs on an annual basis, which would enable us to convert this stream of payments into present value terms. Since a larger share of foreign patent costs in this scenario accrue in the later years as compared to the U.S. costs, a present value calculation will result in a greater percentage reduction in foreign costs than in U.S. costs. Nevertheless, foreign patent costs still remain substantially higher than U.S. costs.

We also shared our analysis with USPTO officials, who provided assistance and technical comments.

Patent Law Experts' Views on Steps That Small Businesses Should Take to Improve Foreign Patent Efforts

We asked the patent law experts: "What could small businesses do better as they consider whether or not to seek, obtain, and maintain foreign patent protection?" We analyzed their responses and developed a list of 20 steps. We then asked the experts: "How important are each of the following suggestions for small businesses to consider?" Response options ranged from "least important" to "most important." The steps are presented in rank order in table 1 based on the combined percent of experts rating a step as "important" or "most important."

Table 10: Patent Law Experts' Views on Small Business Steps to Improve Foreign Patent Efforts

Small business step	Percent of patent law experts rating step as important or most important
1. Avoid divulging information about the invention prior to filing a U.S. application.	100
2. Be familiar with key dates and deadlines that are specified under U.S., foreign, and international law, and take foreign filing actions accordingly.	95
3. Consider the company's long-range business plan.	86
4. Manage patent portfolio as an asset and regularly review foreign portfolio.	83
5. Consider the nature and patentabilty of the product.	81
6. Only file in countries where protection will be meaningful and patent will produce a return on investment.	81
7. Begin to consider foreign patent options early, such as in the research and development phase, and seek legal advice at that time.	75
8. Obtain experienced U.S. patent counsel that is familiar with obtaining foreign patents.	74
9. Consider filing under international and regional treaties (Patent Cooperation Treaty, European Patent Office, etc.).	73
10. Do a thorough market analysis (i.e., company's interest in overseas markets, current and potential size of foreign markets, nature of competition, etc.).	72
11. Become more knowledgeable about the total cost of seeking, obtaining, maintaining, and enforcing foreign patents.	71
12. Obtain experienced foreign patent representation (attorney or agent).	70

(Continued From Previous Page)

Small business step	Percent of patent law experts rating step as important or most important
13. Realistically consider company's willingness and ability to enforce patents abroad.	70
14. Involve top company officials in foreign patent decisions.	66
15. Consider alternative ways of commercializing foreign patent (i.e., licensing, joint ventures, partner with other U.S. or foreign firms, etc.).	64
16. Consider strategic options in the development of foreign patent applications (i.e., file shorter applications, design applications to meet foreign requirements, modify claims, consider utility patents where available, etc.).	61
17. Become more knowledgeable about foreign patent laws and practices and how they differ from U.S. patent laws and practices.	61
18. Estimate cradle-to-grave foreign patent costs and do a thorough cost/benefit analysis.	59
19. Seek training opportunities on foreign patent protection for any in-house counsel and other staff.	47
20. Seek advice and partner with other businesses.	35

Source: GAO analysis of patent attorney panel questionnaires.

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