

WIPO Patent Drafting Manual



WORLD
INTELLECTUAL
PROPERTY
ORGANIZATION

PREFACE

Four years ago, in response to requests from Member States, the WIPO Secretariat began to examine the practical impact of the lack of patent drafters on the ability of inventors in developing countries to use the IP system, and, thereby, to participate in the economic benefits of intellectual property. Study and analysis confirmed the need for capacity-building in this area; a need recognized by Member States, which were increasingly requesting that the Organization provide capacity-building programs for patent drafting. This “Patent Drafting Manual” was prepared in response to that need. It was developed by experts in the field and tested in training programs prior to publication. It is designed to assist inventors, and those providing services to them, to acquire the technical skills necessary to prepare and file patent applications, including the capacity to draft the all-important claims that determine the scope and coverage of the protection to be granted by the patent.

WIPO would like to express its appreciation to the principal author of this work, Thomas Ewing (USA) for sharing his expertise as a patent attorney and for his tireless efforts in teaching and preparing training materials for the courses based on this Manual. Valuable contributions were also made by Carlos Olarte (Colombia), Kanika Radhakrishnan (India and USA), Markus Engelhard (Germany), Wendy Herby (USA), Professor Karuna Jain (India), Emmanuel Jelsch (Switzerland), Sorin Schneider (Switzerland), Douglas Weinstein (USA), Takashi Fujita (Japan), Karl Rackette (Germany), Samuel Le Cacheux (France), Valérie Gallois (France), Albert Jacobs (USA) as well as various WIPO officials. WIPO is also grateful to the Geneva International Academic Network (GIAN) for its financial support in the development and testing of this publication and associated training materials.

Appreciation is also due to the Member States that provided pilot sites for testing the Manual and associated training materials: Cameroon, Colombia, India, Morocco and Singapore.

It is hoped that this Manual will prove an effective tool for those Member States seeking to strengthen, refine and expand their capacity to assist inventors to protect their intellectual property through carefully crafted patent applications.

TABLE OF CONTENTS

I.	INTELLECTUAL PROPERTY – AN INTRODUCTION	6
II.	PATENTS	11
A.	DETAILED OVERVIEW OF PATENTS	11
1.	What is a Patent?	11
2.	What can be the Subject of a Patent?	13
a.	<i>Mechanical Devices and Articles of Manufacture</i>	15
b.	<i>Processes/Methods</i>	15
c.	<i>Chemical Compositions or Compounds</i>	15
d.	<i>Isolated and Characterized Molecules</i>	15
e.	<i>Genetic Organisms/Gene Sequences</i>	15
f.	<i>Computer Programs</i>	16
g.	<i>Improvements</i>	16
3.	Why are Patents Important?	16
a.	<i>Revenue Source</i>	16
b.	<i>Marketing Benefit</i>	17
c.	<i>Bargaining Chip</i>	17
d.	<i>Industry Control/Influence</i>	17
e.	<i>Defensive Uses</i>	17
B.	LEGAL REQUIREMENTS FOR PATENTABILITY	20
1.	Novelty	20
2.	Utility/Industrial Application	21
3.	Non-Obviousness/Inventive Step	22
C.	PREDICTING PATENTABILITY THROUGH PRIOR ART SEARCHES	25
1.	What is Prior Art?	25
2.	Significance of Prior Art Searches	25
3.	How to Search Prior Art	26
4.	Classification Systems	26
5.	Where to Search	27
III.	PATENT APPLICATION PREPARATION AND FILING	29
A.	PREPARING PATENT APPLICATIONS	29
1.	Obtaining Invention Disclosures from Inventors	31
2.	Identifying Patentable Inventions	32
3.	Understanding the Invention	32
B.	TYPICAL PARTS OF THE PATENT APPLICATIONS	33
1.	Claims	34
2.	Detailed Description or Specification	35
3.	Drawings	38
4.	Background	40
5.	Abstract	41
6.	Summary	42

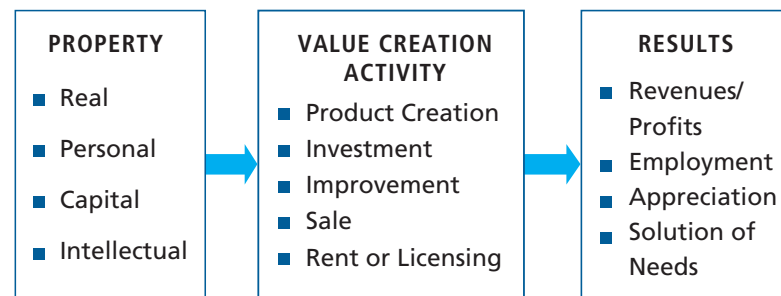
C.	FILING PATENT APPLICATIONS	44
1.	Domestic/Priority Filings	44
2.	Foreign Filings	45
3.	Fee and Cost Considerations in Application Filings	46
4.	Application Filing Requirements in Specific Jurisdictions	48
a.	<i>European Patent Convention Filings</i>	48
b.	<i>US Patent and Trademark Office Filings</i>	49
c.	<i>Patent Cooperation Treaty Filings</i>	50
5.	Comparative Laws and Requirements	55
IV.	PROSECUTING PATENT APPLICATIONS	59
A.	RESPONDING TO OFFICE ACTIONS	61
B.	DRAFTING RESPONSES	61
C.	GETTING CLAIMS ALLOWED	62
D.	OPPOSITION PROCEEDINGS	65
E.	ISSUANCE OF THE PATENT	65
V.	PATENT CLAIM DRAFTING	67
A.	THEORY OF THE PATENT CLAIM	67
B.	PATENT CLAIM FORMAT	68
1.	Parts of a Claim: Preamble, Transitional Phrase and the Body	68
2.	Two-Part Claims or Improvement Claims	72
3.	Means-Plus-Function Claims	73
4.	Claim Punctuation	74
5.	Proper Antecedent Basis	75
6.	Reference Numerals and Bracketed Expressions	75
7.	Claim Phrases	76
8.	Multiple Elements	77
9.	Alternative Elements	77
C.	CLAIM SETS	78
1.	Independent Claims	78
2.	Dependent Claims	79
3.	Multiple Dependent Claims	82
VI.	SPECIFIC TYPES OF CLAIMS	84
A.	APPARATUS OR DEVICE CLAIMS	84
B.	METHOD CLAIMS OR PROCESS CLAIMS	85
C.	PRODUCT-BY-PROCESS CLAIMS	86
D.	RESULT TO BE ACHIEVED AND PARAMETER CLAIMS	86
E.	DESIGN CLAIMS	87
F.	PLANT PATENT CLAIMS	87
G.	COMPOSITION CLAIMS	87
H.	BIOTECHNOLOGY CLAIMS	88

TABLE OF CONTENTS

I.	USE CLAIMS	88
J.	SOFTWARE CLAIMS	89
K.	OMNIBUS CLAIMS	89
VII.	PATENT CLAIM DESIGN	91
A.	PREPARE THE CLAIMS FIRST	91
B.	BROAD AND NARROW CLAIMS	91
C.	CLARITY, CLAIM WORD CHOICE, AND INCONSISTENCIES	94
D.	CLAIM VARIATIONS AND MODIFICATIONS OF THE INVENTION	97
E.	AVOID UNNECESSARY LIMITATIONS	98
F.	NEGATIVE LIMITATIONS AND DISCLAIMERS	99
G.	THE CLAIMS AND COMPETING PRODUCTS	99
H.	THE CLAIMS MUST OVERCOME THE PRIOR ART	99
I.	USE MULTIPLE CLAIM TYPES FOR THE SAME INVENTION	99
J.	MAKE SURE THAT THE SPECIFICATION SUPPORTS THE CLAIMS	100
K.	UNITY OF INVENTION	101
L.	CLAIM POINT OF VIEW	103
M.	NARROWING A PATENT CLAIM DURING PROSECUTION	106
N.	EXCLUSIONS FROM PATENTABILITY	107
O.	THE REQUIREMENT FOR INDUSTRIAL APPLICATION	110
P.	"READING" A PATENT CLAIM ON SOMETHING	112
Q.	CLAIM CONSTRUCTION BY COURTS	113
VIII.	PATENT STRATEGY	115
A.	OFFENSIVE BLOCKING PATENTING TO MOUNT ATTACKS ON COMPETITORS	116
B.	DEFENSIVE PATENTING TO DEFEND ONESELF FROM INFRINGEMENT ACTIONS	117
C.	DESIGN-AROUND TECHNIQUES	118
IX.	ORGANIZING, EDUCATING, AND MOTIVATING THE TECHNICAL TEAM	120
A.	TRAINING MANAGEMENT PERSONNEL AND MARKETING PERSONNEL TO UNDERSTAND THE SIGNIFICANCE OF PATENTS AND PORTFOLIO BUILDING	120
B.	TRAINING SCIENTISTS/TECHNOLOGISTS TO UNDERSTAND WHAT MIGHT BE PATENTABLE, WHO MIGHT BE A CO-INVENTOR AND PREPARING INVENTION DISCLOSURES	122
C.	SETTING UP IN-HOUSE PATENT REVIEW COMMITTEE TO PERIODICALLY REVIEW INVENTION DISCLOSURES AND RECOMMEND WHAT SHOULD BE PATENTED	123
D.	INVENTOR INCENTIVE PROGRAMS TO ENCOURAGE INVENTORS TO INVENT AND REPORT	124
E.	PROFESSIONAL ETHICS	125
APPENDIX A	INSTRUCTIONS FOR SEARCH OF PATENT DATABASES	128
APPENDIX B	SAMPLE INVENTION DISCLOSURE FORM	130
GLOSSARY		133

I. INTELLECTUEL PROPERTY – AN INTRODUCTION

Intellectual Property (IP) is the name given to patents, trademarks, copyrights, industrial designs and other types of intangible property that arise from creations of the mind and in their broadest sense have no physical form.



Like all types of property, IP is owned and can generate income. For this reason IP is considered an asset. It is often the result of investment and should generate a return of one sort or another. IP differs from other types of property because it has no physical form and comes into being because of human intelligence, creativity and imagination.

There are different types of IP each with its own unique laws. IP is sometimes divided into two general categories, "industrial property" and "copyright." Industrial property refers to assets created primarily for the advancement of technology, industry and trade such as patents (inventions), industrial designs, trademarks, service marks, trade secrets and geographic indications of origin.¹ The most common forms of IP are:

Patents: A patent is a legal document granting its holder the exclusive right to control the use of an invention, as set forth in the patent's claims, within a limited area and time by stopping others from, among other things, making, using or selling the invention without authorization. For example, patents could be granted for a battery that efficiently stores solar energy indefinitely and without loss, a vaccine to protect against malaria or a new compound for transforming fish bones into agricultural fertilizer.

Industrial Designs: Industrial design protection allows its owner to control the exploitation of the ornamental shapes associated with products such as the stylish shape of a new sports car, the distinctive plastic casing of a certain type of computer or the shape of a soft drink bottle.

Trademarks: A trademark allows its owner to confirm the origin of his goods to the public. Examples of trademarks include the distinctive names of products such as Nando's® or Coca Cola® or a logo such as the Mercedes Benz® triad symbol.

Service Marks: A service mark is a form of trademark that allows its owner to verify the origin of a service to the public such as "Cheques for Two®."

Copyright: A copyright refers to original expressions and "works of authorship." The person who creates a copyrighted work is called an author. Examples of copyrighted works include: paintings, photography, music, dances, poems, novels etc. In addition, copyright applies to some technical things that have an element of originality such as computer software, technical specifications and related documentation.

1. Article 1(2) of the Paris Convention for the Protection of Industrial Property (Stockholm Act, 1967), reads as follows: "The protection of industrial property has as its object patents, utility models, industrial designs, trademarks, service marks, trade names, indications of source or appellations of origin and the repression of unfair competition."

One difference between copyrights and industrial property is that generally copyrights do not require registration with a government authority as a condition for protection against unauthorized use. Industrial property rights, on the other hand, must be expressly granted by, and registered with, a government authority before they can be recognized and enforced. In theory, anyone can draft a patent or a trademark application but in practice, professionals including lawyers (patent attorneys) and technical professionals called “patent agents” or “patent engineers” write patent applications and file them with government authorities because these applications can be technically and procedurally complex.

This manual deals with patents and how they are applied for and registered. The objective of this manual is to help the reader to develop a general understanding of the skills needed for drafting a patent application, filing it and working with patent authorities to have it issued as a patent. Since national/regional laws and practices may vary significantly, the reader must also review and understand the specific requirements for the jurisdictions of interest to his client. Note that in this manual we will sometimes use the term “patent agent;” this term is not used in the technical sense of a professional who is certified by national authorities to represent inventors in defined circumstances but rather as a generic term to cover anyone who drafts a patent application (including inventors, patent drafters, patent agents and patent attorneys).

MORE PATENT BASICS

Patents may be granted to protect inventions that are new, involve an inventive step and are capable of industrial application.² The patent has to be for an invention that works, or as it is put in some countries, the invention must be capable of being “reduced to practice.” Thus, a clever notion that cannot presently work (e.g. a time machine) cannot be patented. Different countries have different ways of expressing the criteria for patents. For example, patents must generally be technical in nature but not all jurisdictions have the same definitions for what is “technical” and what is not technical.

The term of a patent is generally twenty years from the filing date of the patent application. A patent gives its owner the right to exclude others from making, using, offering for sale or selling the invention or importing the patented invention into the country where the patent has been granted. In other words, a patent provides a property right that allows the owner to say who cannot use the invention protected by the patent. Anyone who is not the patent owner or who is not licensed by the patent owner and who manufactures, uses, imports, offers for sale or sells the patented invention is called an “infringer.” An infringer can be sued in court to force him to stop the infringement and to pay the owner damages.

Patents are “territorial;” they have effect only in countries where they have been applied for and granted. Each country has the sovereign right to grant or refuse to grant patent applications. In a few instances such as the European Patent Office (EPO), groups of nations have agreed by treaty to provide for common examination of patent applications. Some countries have also agreed by treaty to accept patents granted by other nations.³ For example, some former British colonies will accept patents approved by the UK Patent Office and/or the EPO when the UK is a designated country in the EPO application.

Below is a representative patent. This particular patent, EP 1 242 397 B1, was granted by the EPO on September 29, 2005. The patent bears the title “Trans Olefinic Glucokinase Activators.” Although the application was filed with the EPO via the PCT on December 12, 2000, the application claims the priority

2. This definition comes from Article 27.1 of the Trade Related Aspects of Intellectual Property Rights (TRIPS) Agreement. Some countries replace “industrial step” with “non-obvious” and “industrial application” with “useful.” These terms are synonymous but not identical, as will be discussed.

3. Where applicable, the precise procedures vary and the applicant may need to take some procedural steps while the original application is still pending. Consequently, when the patent agent’s client is interested in obtaining patent protection via this route, the patent agent must understand very early in the application process what procedural steps will be required.

filing date under the Paris Convention of US Provisional Application No. 60/170,783, which was filed on December 15, 1999. Thus, the effective date for prior art against this patent is December 15, 1999. The published PCT application, WO2001/044216, included the following abstract for the invention represented by the patent application:

2,3-Di-substituted trans olefinic N-heteroaromatic or urido proprionamides of formula (I) with said substitution at the 2-position being a substituted phenyl group and at the 3-position being a cycloalkyl ring, said proprionamides being glucokinase activators which increase insulin secretion in the treatment of type II diabetes.

The preamble to the main independent claim for the EPO patent reads: "Compound selected from the group consisting of an olefinic amide of the formula..." and then shows a chemical diagram followed by a very detailed description of the novel compound.



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 1 242 397 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:
28.09.2005 Bulletin 2005/39

(21) Application number: **00987392.8**

(22) Date of filing: **12.12.2000**

(51) Int Cl.7: **C07D 277/46**, A61K 31/426,
C07D 213/75, C07D 277/56,
C07C 275/50, A61K 31/4402,
A61K 31/44, A61K 31/17,
A61P 3/10

(86) International application number:
PCT/EP2000/012612

(87) International publication number:
WO 2001/044216 (21.06.2001 Gazette 2001/25)

(54) **TRANS OLEFINIC GLUCOKINASE ACTIVATORS**

OLEFINISCHE TRANS-GLUKOKINASE-AKTIVATOREN
ACTIVATEURS TRANSOLEFINIQUES DE GLUCOKINASE

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR**
Designated Extension States:
LT LV RO SI

(30) Priority: **15.12.1999 US 170783 P**

(43) Date of publication of application:
25.09.2002 Bulletin 2002/39

(73) Proprietor: **F. HOFFMANN-LA ROCHE AG
4070 Basel (CH)**

(72) Inventors:
• **CORBETT, Wendy, Lea**
Randolph, NJ 07869-3754 (US)
• **SARABU, Ramakanth**
Towaco, NJ 07082 (US)
• **SIDDURI, Achyutharao**
Livingston, NJ 07039 (US)

(74) Representative: **Witte, Hubert**
Grenzacherstrasse, 124
4070 Basel (CH)

(56) References cited:
WO-A-00/58293

EP 1 242 397 B1

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

KEY WORDS

>> **PATENT** >> **INDUSTRIAL PROPERTY** >> **TRADEMARK** >> **SERVICE MARK** >> **TERM OF PATENT**
>> **INVENTION** >> **ASSET** >> **NOVELTY** >> **UTILITY** >> **REDUCED TO PRACTICE** >> **TERRITORIAL**
>> **INFRINGEMENT**

SELF TEST

1. What is intellectual property?
2. Why is IP an asset?
3. What is the difference between industrial property and copyright?
4. Can a software code be protected by copyright?
5. How long does a patent generally last?
6. A patent has to be new, useful and non-obvious. True or false?
7. A patent gives its owner the right to exclude others from making, using or selling the invention set forth in the patent's claims. True or false?
8. Give an example of each type of IP that you can see in the room where you are now.
9. Once a patent has been issued in one country it is entitled to recognition all over the world. True or false?
10. Patent applications can be written by anyone but it is best if they are drafted by someone who knows how to do it. True or false?

II. PATENTS

A. DETAILED OVERVIEW OF PATENTS

A patent is an award of a limited monopoly from a government for an invention. In the past, governments awarded patents for almost any good or service, whether or not an invention was involved. For example, a king might bestow a patent on salt to a trusted ally. In modern times governments have reduced the scope of patents to protect inventions only. The Republic of Venice created one of the first patent systems of the modern era. The original term for a patent was set at 14 years, twice the length of the average apprenticeship. The term was later extended to 17 years following the grant of the patent. At present most patent terms are set at 20 years from the date of the application's filing.

1. What is a Patent?

A patent generally grants the patent owner the exclusive right to control who makes, uses, sells, offers for sale and/or imports any product or technology protected by the patent's claims. Patent claims are sets of sentences, typically appearing at the end of the patent, that describe the invention being protected. In order to obtain a patent, the patent's claims must typically describe an invention that is new, useful and non-obvious in view of the "prior art." Prior art is a technical term that generally refers to all the public knowledge and inventions that existed before the patent application's filing.

The patent must also satisfy other legal requirements such as certain time limits related to how long the invention was disclosed to the public, if at all, prior to the filing of the patent application. Generally, patents will be denied if the invention has been made public prior to the filing of the application, excluding any grace period that may apply. In some countries such as the United States, there is a one-year grace period during which the application can still be filed; in most other countries a public disclosure of the invention before the application is filed is typically sufficient to cause the patent application to be denied.⁴ In some jurisdictions, patents cannot be obtained for inventions that are contrary to the "*ordre public*" or "immoral." For example, inventions relating to a device for ingesting an illegal narcotic (e.g. an opium pipe) might be unpatentable on moral grounds. However, this restriction can sometimes be more a matter of patent claim format than an absolute prohibition. Not all jurisdictions have the same definitions for morality and some jurisdictions opt not to have their patent laws weigh on morality issues.

A patent application must be filed before publicly disclosing any important research results that may lead to a valuable product or technology. This caution especially applies to research institutions – but the necessity for publishing academic works can easily be accommodated by a publication clearance procedure that reviews journal and conference submissions for patentable novelty.

PROFESSIONAL TIP

Most patents nowadays are produced by "substantive examination systems" in which the patent application is thoroughly reviewed by a government-employed patent examiner. Among other things, the patent examiner will compare the prior art relating to a pending application against the application's claims to determine if the claimed invention provides a legally sufficient advance over the prior art. A few countries still maintain "registration systems" in which an applicant receives a patent once certain formalities have been completed but without the patent application undergoing a substantive examination. In such systems, it is not until the patent is later challenged in court that the issue of whether the patent is invalid because of prior art is studied.

4. Article 11 of the Paris Convention, for example, provides an exception to the typical rule regarding public disclosure. The patent agent must understand the specific procedural and substantive requirements in all jurisdictions of interest to his client.

A patent is said to be valid once it has been granted and has not had a successful challenge against it in a court or before the relevant patent office. A patent is said to be invalid when it is rejected or cancelled because the invention is not new (prior art) or for other reasons. Most of the world's patent systems hold that patents are presumed valid and must be legally proven otherwise. This is especially true in examination systems where an impartial government official has reviewed the patent application and the relevant prior art before granting the patent. The world's patent laws typically recognize patent protection for different types of inventions. Many patent systems essentially aim to provide uniform treatment for all inventions, regardless of the type of invention. When people speak of patents they usually mean "patents of invention" which are sometimes known as "utility patents." These patents protect machines, processes, chemical compositions and the other kinds of inventions that are valuable because of their usefulness. The bulk of this manual relates to patents of invention or utility patents.

Some countries also provide patents or patent-like legal instruments for other types of inventions. For example, in some countries designs may be protected as "design patents" (e.g. the US). In other countries designs are protected under industrial design registration systems (e.g. Belgium). In either case the protection is for a new, original and ornamental design for an article of manufacture, not the functionality.

Where it exists, the term of protection for a design patent may differ from that of a utility patent. In the US the term for a utility patent is 20 years from the earliest US filing date relied upon by the applicant, while the term for a design patent is 14 years from the date of the patent grant. Design patents typically bear similarities both to trademarks and utility patents. For example, a manufacturer produces a coffee pot having a unique shape. The coffee pot itself may or may not offer inventive features that could be the subject of a utility patent application. However, the manufacturer may be interested in protecting the unique shape of his coffee pots. In fact, he may have learned that the public associates the shape of his coffee pots with the company's name. Consequently, the manufacturer would like to be able to prevent other manufacturers from being able to freely copy the unique shapes given to his coffee pots.

A patent applicant may not need to choose between filing a utility patent application and seeking protection for a unique design. The patent applicant may often seek protection for both inventive features and design elements. Assume, for example, that the manufacturer above developed the shape of his coffee pots based on his own research into heat loss. He could then file a utility patent application that protects the invention associated with preventing heat loss in coffee pots while also filing a design patent application on their unique shape.

Some countries offer protection for inventions by means of "utility model registrations" which are also known as "petty patents" or "utility innovations." The requirements for the registration of utility models are typically less stringent than the requirements for obtaining a patent of invention. Conversely, the breadth of protection afforded a utility model is not usually as strong as that provided by a patent of invention.

In practice, protection for utility models is typically sought for innovations of an incremental nature that might not satisfy the criteria for patents of invention, e.g. inability to demonstrate inventive step. The term of protection for utility models is significantly shorter than for patents. Some patent offices do not examine utility model applications substantively prior to registration. Consequently, the precise nature of the right granted will be in question until a dispute arises between the owner and another party. In some countries, utility model protection can only be obtained for certain fields of technology and only for products but not for processes.

Similarly, some countries provide patent protection for plants produced in a specific manner.⁵ For example, in the US, plant patents may be obtained on “any distinct and new variety of plant, including cultivated sports, mutants, hybrids, and newly found seedlings, other than a tuber propagated plant or a plant found in an uncultivated state.” Many countries do not allow the patenting of plants regardless of their means of propagation.

2. What can be the Subject of a Patent?

The subject matter of a patent refers to what can be patented. In some countries, virtually any invention can be patented. Other countries have somewhat more restrictive definitions of patentable subject matter. In both cases, a wide variety of things can be patented as long as they are new, useful and non-obvious.⁶

Let's look at another issued patent: US Patent No. 6,434,955 issued on August 20, 2002 bearing the title “Electro-Adsorption Chiller: A Miniaturized Cooling Cycle With Applications From Microelectronics To Conventional Air-Conditioning.” The abstract for this patent reads:

A novel modular and miniature chiller is proposed that symbiotically combines absorption and thermoelectric cooling devices. The seemingly low efficiency of each cycle individually is overcome by an amalgamation with the other. This electro-adsorption chiller incorporates solely existing technologies. It can attain large cooling densities at high efficiency, yet is free of moving parts and comprises harmless materials. The governing physical processes are primarily surface rather than bulk effects, or involve electron rather than fluid flow. This insensitivity to scale creates promising applications in areas ranging from cooling personal computers and other micro-electronic appliances, to automotive and room air-conditioning.

While the patent examiner assigned to review this application ultimately found patentability, he nevertheless reviewed nearly 15 pieces of prior art and used two pieces of this prior art in rejecting the claims of the application as originally filed. The issued patent has 19 claims in two sets, with one set of 11 device claims followed by a second set of seven method claims.

5. For example, the “asexually propagated plants” that may be protected in the US are plants reproduced by means other than from seeds, such as by the rooting of cuttings, by layering, budding, grafting and inarching.

6. The TRIPS Agreement in Article 27.1, footnote 5, states that “useful” and “non-obvious” are synonymous terms to “industrial application” and “inventive step.” The terms are not exactly identical, however.



US006434955B1

(12) **United States Patent**
Ng et al.

(10) **Patent No.: US 6,434,955 B1**

(45) **Date of Patent: Aug. 20, 2002**

(54) **ELECTRO-ADSORPTION CHILLER: A MINIATURIZED COOLING CYCLE WITH APPLICATIONS FROM MICROELECTRONICS TO CONVENTIONAL AIR-CONDITIONING**

(75) Inventors: **Kim Choon Ng**, Singapore (SG);
Jeffrey M. Gordon, Sede Boquer (IL);
Hui Tong Chua, Singapore (SG);
Anutosh Chakraborty, Dhaka (BD)

(73) Assignee: **The National University of Singapore**, Singapore (SG)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/922,712**

(22) Filed: **Aug. 7, 2001**

(51) Int. Cl.⁷ **F25B 17/00; F25B 21/02**

(52) U.S. Cl. **62/106; 62/144; 62/480; 62/3.3**

(58) Field of Search **62/101, 106, 109, 62/480, 3.2, 3.3, 141, 142, 144**

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,734,293 A 5/1973 Biskis
 5,046,319 A 9/1991 Jones
 5,157,938 A 10/1992 Bard et al.
 5,463,879 A 11/1995 Jones

FOREIGN PATENT DOCUMENTS

JP A6154593 3/1986
 JP 06154543 A * 6/1994

JP 10202041 A * 8/1998
 JP A2000-39428 2/2000

OTHER PUBLICATIONS

Ramaswamy, et al, IEEE Transactions on Components and Packaging Technologies, pp. 1-7 (Mar. 2000).

Drost, et al, Aiche 1998 Spring National Meeting, New Orleans, 5 pgs. (Mar. 1998).

Uemura, Applications of Thermoelectric Cooling, pp. 622-631 (1998).

Viswanatham et al, Adsorption, vol. 4, pp. 299-311 (1998).

Boelman et al, Ashrae Transactions: Research, vol. 103, Part 1, pp. 139-148 (1997).

Cho et al, Energy, vol. 17, No. 9, pp. 829-839 (1992).

Chua et al, International Journal of Refrigeration, vol. 22, pp. 194-204 (1999).

* cited by examiner

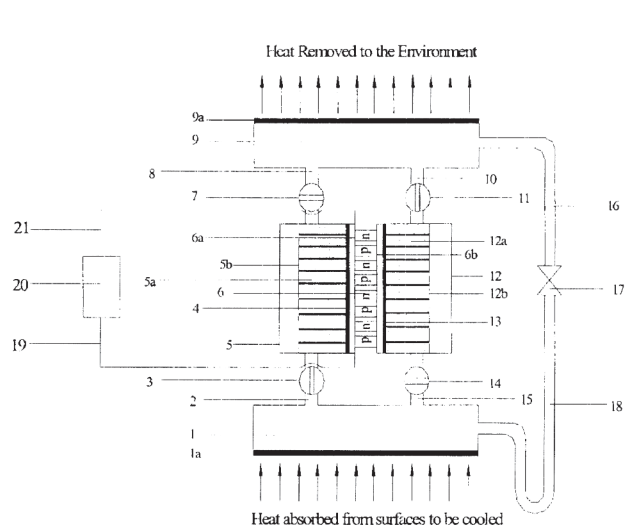
Primary Examiner—Chen-Wen Jiang

(74) *Attorney, Agent, or Firm*—Birch, Stewart, Kolasch & Birch, LLP

(57) **ABSTRACT**

A novel modular and miniature chiller is proposed that symbiotically combines absorption and thermoelectric cooling devices. The seemingly low efficiency of each cycle individually is overcome by an amalgamation with the other. This electro-adsorption chiller incorporates solely existing technologies. It can attain large cooling densities at high efficiency, yet is free of moving parts and comprises harmless materials. The governing physical processes are primarily surface rather than bulk effects, or involve electron rather than fluid flow. This insensitivity to scale creates promising applications in areas ranging from cooling personal computers and other micro-electronic appliances, to automotive and room air-conditioning.

19 Claims, 7 Drawing Sheets



It may be useful to review some categories of subject matter that are commonly patented and so the following discussion addresses various types of patentable subject matter.

a. Mechanical Devices and Articles of Manufacture

Patent laws protect mechanical devices and articles of manufacture. These are the traditional inventions of patent law. Consequently, the publicly-available prior art in these fields goes back about as far as such art could possibly go. For example, a modern patent applicant seeking to protect an invention related to specialized hockey skates should not be surprised to find that an issued patent from the 1860s has been cited by an examiner to show that the modern patent application reads on the prior art. Note that when we say that an application “reads on” prior art, this is a way of saying that there is prior art that is relevant to the claims in the application.

b. Processes/Methods

Patents can cover processes and methods. Many processes and methods are also related to a physical device. A patentee is not limited to seeking protection using just one type of claim. Consequently, a patent application should typically include both apparatus and method claims. So, for example, an inventor can patent his new apparatus for filtering and purifying plant extracts as well as his filtration method.

c. Chemical Compositions or Compounds

Inventors may seek patent protection for chemical compositions such as those arising in the fields of pharmaceuticals, biotechnology, materials science, and petrochemicals. For example, a patent could have been issued long ago on aspirin, a chemical compound that relieves headaches. Patents covering pharmaceuticals, for example, tend to be the most profitable individual patents. Given that the patent application must be filed prior to public disclosure and given that rigorous testing must be conducted for new drugs, it is not uncommon for pharmaceutical companies to file many patent applications on a variety of drugs while they are still in the early testing stages. Consequently, many of these applications are abandoned prior to issuance as patents because the manufacturer subsequently learns that the drug is either not effective or unsafe. Many of the world’s patent laws have prohibitions against patent protection for inventions associated with treatment of the human body. This may require special attention when drafting claims for known pharmaceuticals having new uses as well as for methods of treating various conditions with novel compounds.

d. Isolated and Characterized Molecules

In many countries (e.g. the US and much of Europe) molecules that have been isolated and characterized according to their function and potential utility may be patented.

e. Genetic Organisms/Gene Sequences

Some countries provide patent protection for genetic organisms. Where patentable, such inventions assign a functional purpose to a genetic sequence. On the other hand, a mere nucleic acid sequence without an indication of a function is not a patentable invention. In cases where a sequence or partial sequence of a gene is used to produce a protein or a part of a protein it is necessary to specify which protein or part of a protein is produced and what function this protein or part of a protein performs.

The issue of the patentability of genetic materials is under debate and in some countries these materials are not considered patentable subject matter; they decline to grant patent protection to genetic sequences, considering them to be part of nature.

f. Computer Programs

There has been much debate about whether computer programs should be patentable and different countries have different rules on this subject. In some countries a new and useful computer software program is treated as a patentable system, method and/or apparatus for achieving a certain end. A computer program may also be patentable because it implements, through software instructions, a useful function in a new way (e.g. by making the computer program process data more efficiently and faster). This manual will assume that software is patentable but that a pure mathematical algorithm or equation is not patentable.

g. Improvements

Most patents are for inventions that are themselves improvements on prior inventions. An “improvement patent,” however, is a term that refers to a new patent that covers an improved or enhanced effect as compared with the earlier patent. For example, Inventor A holds a patent for an apparatus used to fill medicine bottles. Later, Inventor B receives a patent for a filling apparatus which represents an improvement on Inventor A’s machine. B’s invention may, for example, fill the bottles quicker and with less spillage in a novel way. Even though Inventor B holds a patent on the improved machine he may not be able to practice his patent B without consent from Inventor A since it uses A’s invention. Typically, consent is sought through a licensing negotiation in which both Inventor A and Inventor B recognize the commercial/financial advantages of cooperation – whether they ultimately reach agreement on licensing terms and on which party pays more for the license depends upon their negotiating skills and the unique characteristics of their circumstances.

3. Why are Patents Important?

Patents are significant corporate assets. Intellectual property can be one of the most costly single components for many products. For example, MPEG-2 is a technical standard for video technology in various consumer products. The MPEG-2 licensing fee per DVD player is approximately \$2.50 USD, a fee that the world’s DVD player manufacturers have agreed to pay for their products in order to be compatible with the MPEG-2 standard. In addition, groups of patent holders separately license their patents related to DVD technology. Their fees collectively amount to about \$8.50 USD. Thus, the IP license fees related to DVD players amount to about \$11 USD. Thus, for a DVD player that retails for \$44 USD, about one quarter of its price is related to intellectual property.

Consider also that a company may start with a first-to-market advantage but in a short while competitors will have learned how to make and market the product successfully. At least one competitor will eventually learn how to make the product cheaper than the original manufacturer. Unless the first-to-market company holds significant intellectual property rights (IPRs), it may eventually see its revenue shrink as larger and larger players enter the market. By exploiting its IPRs, the company can completely foreclose the ability of others to manufacture the product, or the company can enjoy licensing revenues that represent a healthy fraction of what its own profits would be for selling the product.

a. Revenue Source

The traditional patent exploitation model is that of a sole inventor who obtains a patent on a key product and then enjoys royalties by licensing the patent to others and/or by using his patent to build an industry around the patent-protected product (e.g. Bell and the telephone). This still occurs, although the sole-inventor blockbuster patent has become somewhat rare. It is now more common for a successful company with the resources to enforce its patent rights against others. While smaller companies can certainly derive significant revenues from licensing their patent rights, many large companies derive enormous revenues from licensing their patent portfolios (e.g. IBM receives nearly \$2B USD/year in licensing revenue).

Generally, an inventor should have realistic (conservative) expectations with respect to income that could be derived from licensing his patent. First, the world has no market in patent rights; some research work has been conducted into establishing a commodities-style market for licensing patent rights but a robust market has yet to appear. Second, many more patents exist nowadays than in the past. Today, a businessperson may be faced with hundreds of related patents and determining for which, if any, he needs a license has become a complicated task. Third, patent litigation throughout the world is expensive and many patentees simply cannot afford to enforce their rights against infringers. The patent agent should be aware that the enforcement and successful exploitation of patents can be difficult at times: this is not an impossible task and depends very much upon the context.

b. Marketing Benefit

Many patent laws have some sort of marking requirement that involves indicating that a given product is protected by patent. For some products, particularly those made of metal, the patent number can be stamped on the product. The purpose of this marking requirement is to provide notice to the public (e.g. the manufacturer's competitors) that the product cannot be freely copied because it is protected by patent. Over time, many companies have found that such marking also serves as an effective marketing tool with the general public. Companies routinely refer to their "patented technology" in press releases and advertising materials. Some companies even provide information about their patent portfolios in their investment materials. Patent law does not encourage patentees to be shy about their patent portfolios and this dovetails nicely with the marketing benefits.

c. Bargaining Chip

Patents have uses beyond just obtaining injunctions against competitors and/or collecting licensing fees. Many companies and research institutions use their patent portfolios as a tool in obtaining a competitive or strategic advantage. For example, a patent owner can use his patents to obtain licenses on a competitor's patents that might be of interest to his company. The patent owner could use the strength of his patent portfolio to convince the competitor that the two companies should cross-license each other's patent portfolios and eliminate the possibility of litigation between them (which could be very much to the detriment of a third competitor who will now not have a license on either company's patent portfolios).

d. Industry Control/Influence

A patent's most direct use is the ability to obtain an injunction against infringement by a competitor who makes, uses, sells, offers to sell or imports a product or service covered by the patent's claims. Under certain circumstances, this "blocking patent" gives its owner control of the industry or product line related to that patent. Of course, the claims of most patents are not so broad as to control the manufacture of all products in any given product category (e.g. a patent covering all computers). In a similar manner, an entire patent portfolio, a collection of patents in the same field, can sometimes be so significant that it influences an entire industry.

The competition laws of some countries may require that the owner of such a blocking patent consent to licensing the patent to others on reasonable terms. In other countries the competition law may only curtail a patent owner's ability to use a patent to control sales of unrelated products. The details of competition and anti-trust law are beyond the scope of this manual.

e. Defensive Uses

The patent agent may hear the term "defensive patenting" with some frequency. This term has three possible meanings. In the first sense, a patent (or patents) is used to "defend" a product, such as a company's

most important product from copying by competitors. In the second sense, patents are used to “defend” the company generally from hostile patent infringement lawsuits from competitors. In the third sense, the phrase describes an inadequate or under-funded patent program. The student should note that there is little about a quality defensive patenting program that renders it less expensive than an aggressive patenting program.

Some companies may hold extremely lucrative patents with no intention of ever licensing or otherwise monetizing them. Such companies will instead use these patents to defend the company’s control over its products by preventing competitors from copying the key competitive features protected by the patents. Selling a product is often, although not always, more lucrative than licensing the intellectual property necessary to manufacture the product. Consequently, many patent owners who also manufacture products use their patents to force competitors either to exit the market or to design around their patents (and hopefully produce an inferior product).

Patents also have some potential application in defending a company itself from patent infringement lawsuits from competitors. In this defensive use, a company hopes that its patents can effectively operate as shields with respect to patent-holding competitors who will refrain from suing the company for infringement out of fear that the company will counter sue them for patent infringement. Patents are “swords” and not “shields” in the sense that a patent does not give its owner the right to manufacture a product protected by the patent. A patent provides a negative right that allows its owner to say who cannot practice the invention protected by the patent. Nevertheless, a patent or group of patents may provide a defensive shield for a patentee against his competitors. Assume that Company A holds 5,000 patents related to products in field X and assume that Company A’s top three competitors each hold 1,500 patents in the same field. The competitors might sue Company A to achieve some business objective, but they would more likely refrain from suing Company A for fear that Company A would counter-sue for patent infringement using its much greater patent portfolio. Whether a given company will benefit from having more patents depends somewhat on the company’s industry segment and its particular technical characteristics and business strategy. A company should not typically obtain patents in the absence of a business purpose for doing so. For a fuller discussion of defensive and offensive patent strategy, see Chapter VIII.

KEY WORDS

>> PRIOR ART >> CLAIMS >> PATENTEE >> CROSS-LICENSE >> "BLOCKING PATENT"
>> REVENUE SOURCE >> PATENTABILITY

SELF TEST

1. What is prior art?
2. At present, what is generally the term or length of a patent in most countries?
3. Patent claims are sets of sentences, typically appearing at the end of the patent, that describe the invention in detail. True or False?
4. What is the difference between "examination systems" and "registration systems" for a patent application?
5. Which type of patent is generally used to protect processes or chemical compositions? a) utility patents, b) design patents or c) plant patents?
6. A patent application may include both apparatus and method (process) claims. True or False?
7. List four reasons why patents are significant.
8. What is a "blocking patent" and why is it important?

B. LEGAL REQUIREMENTS FOR PATENTABILITY

Chapter I provides some basic facts about patents. This section will expand upon that introduction by providing a more detailed understanding of patent laws and requirements. In order to be patentable an invention must fulfill several requirements. These requirements may be broadly classified as novelty, utility (industrial application) and non-obviousness (inventive step). Furthermore, an invention may be patented only if it fits into one of the statutory classes of subject matter protected by the national law. Other legal requirements also exist, such as the necessity for providing an enabling disclosure.

1. Novelty

Novelty is one of the most important patentability requirements. It lies at the heart of the patent system. An invention must be new. In other words, the invention must not be in public use or known by others. In most countries the invention must be new at the time of the patent application's filing, while in some other countries such as the US, the invention must be new at the time of its creation. A prior patent or publication of the same invention will defeat novelty (prevent a patent from being issued or invalidate it later). Basically, if an invention is not new, it is not patentable. While novelty is a fundamental requirement for patentability, the standards of novelty vary from country to country. Keep in mind that novelty does not mean revolutionary; even little things can be new and useful.

Many countries have an "absolute novelty" requirement. The absolute novelty requirement can also be interpreted as a "world novelty" requirement in the sense that a disclosure anywhere in the world represents valid prior art against a patent application. Additionally, the inventor's own actions may constitute prior art. Thus, an applicant must file his patent application before making any public disclosure of the invention. For example, publication of the inventor's own research results before the filing of a patent application can destroy novelty. In most countries disclosing a new and useful research result (where this includes disclosing an invention) can eliminate the possibility of obtaining a patent on the invention in a subsequently-filed application. In other countries such as the US, an applicant may satisfy the novelty requirement by filing a patent application within a one-year grace period after disclosing the invention to the public or first offering it for sale. The grace period prevents the inventor's own disclosure about his invention from becoming prior art against his patent application for a limited time period (one year from disclosure in the case of the US). Of course, just because an inventor could publicly disclose his invention and later file a valid patent application in a country that maintains a grace period does not mean that a corresponding application could be validly filed in a country that did not have a grace period. Since the activities that constitute public disclosure and prior art vary from country to country, the patent agent must review and understand the applicable laws.

EXAMPLE

Inventor A who is based in the US presents a paper in Country X on April 30, 2004. He then returns to the US and becomes preoccupied with other work. In November 2004 he remembers that he needs to file a patent application on the invention. He rushes to his patent agent for advice.

Is it too late for him to seek patent protection? Not in the US because the US allows a grace period of one year. In this case it has been less than a year since the initial disclosure and therefore the novelty requirement is satisfied. However, in most other countries with an absolute novelty requirement (no grace period) or a grace period of less than six months, Inventor A's own public disclosure renders his invention unpatentable in countries with the absolute novelty requirement.

In patent prosecution the lack of novelty is also known as "anticipation." If a single anticipating reference such as an article in a technical journal or an earlier patent contains all the limitations or features of a claimed invention, the invention as claimed is said to have been anticipated by the reference. This concept is further explained in the example below. A prior

art reference discloses a chair with a seat and four legs which may be made of wood or metal. Assume that Inventor A invents a rocking chair with a seat and four legs made of wood, and assume further that the inventor's pending claims only refer to a seat and four legs and do not mention the rocker attachments for the chair.

Does the prior art reference anticipate this invention? Yes, because all the limitations of the claimed invention are to be found in the prior art reference. The reference anticipates the claimed invention. This does not mean that the claims cannot be amended to recite an invention that avoids the prior art, such as by adding the rocker attachments to the claims, it just means that the patent agent needs to amend the claims as presently worded.

Also note that in order for a single reference to anticipate an invention, all of the limitations must be present in the single reference. A patent examiner may not combine multiple references to argue that the combination anticipates the invention. However, as will be discussed later in the section on non-obviousness and inventive step, several references may be combined to show that an invention is obvious and thus not patentable.

2. Utility/Industrial Application

In order to be patentable an invention must be useful. In patent language this is called "utility" in some jurisdictions or "industrial application" in other jurisdictions.⁷ These terms are synonymous but not identical. A patent will not be granted if the invention cannot perform its designated function. The historical justification of the utility requirement is to ensure that society receives a positive benefit before granting an exclusive right to an applicant or inventor. Some countries' patent laws also judge moral aspects such as denying patent protection to inventions that involve harmful functions.

To comply with a utility requirement an invention does not need to demonstrate superiority to existing products or processes. Typically, utility only requires that an invention performs the functions specified and achieves some minimally-beneficial result. In some jurisdictions the patent applicant may have to show that his invention satisfies a requirement for industrial application, a concept analogous to utility, as noted above. Some jurisdictions are more narrowly focused than others in terms of where an invention can be applied, e.g. by commercial actors as opposed to end-user consumers.

In some cases the industrial application requirement may be satisfied by making the claims conform to a specific format. For example, assume a patent examiner finds that a device for dispensing fashion advice lacks industrial application according to the laws of his country. In such a situation the patent agent may find that industrial application can be found by recasting the claims in another light, such as a device for maintaining inventory levels in a clothing warehouse. Additional specifics of industrial application will be discussed later in Chapter VII, Section O.

An invention does not typically need to demonstrate commercial viability in order to satisfy the utility or industrial applicability requirement. For example, assume an inventor has discovered that the metal platinum has a unique property by which it prevents water from freezing into ice. The inventor then realizes that this property could be applied to the plumbing industry by an inventive process that lines water-pipes with platinum metal to prevent them from bursting in freezing weather. Even though the invention may be too expensive to implement practically, this use of platinum in water-pipes would nevertheless satisfy the utility requirement.

In some countries the invention must also not be illegal, immoral or contrary to public policy. The requirement is usually easily met for mechanical devices and processes but can sometimes be a problem for chemical compounds and processes. In the life sciences domain, for example, an inventor might discover a new compound or new process to make a compound without discovering a specific practical purpose to which it can be

7. Article 27.1 of the TRIPS Agreement treats these terms as being synonymous. However, they are not exact synonyms.

“Usefulness” is an important question for a patent agent to ask about a potentially-patentable invention. When looking at research results and reflecting on whether they are patentable, ask the inventor: “Are the results useful?” If they are useful for solving a practical problem, even if it is small, steps should be taken to determine whether it could meet the other requirements of patentability.

applied. The courts of some countries have found sufficient utility if a chemical compound produces effects in laboratory animals, such as reducing a tumor in laboratory mice or as an intermediate to produce other compounds of known utility. Similar to chemical compounds and processes, the utility requirement is sometimes hard to meet for inventions in the field of biotechnology. For example, an

inventor might have isolated DNA fragments but without demonstrating a suitable use for such fragments he will not be able to satisfy the utility requirement.

3. Non-Obviousness/Inventive Step

The third requirement for patentability is non-obviousness. In some countries this requirement is referred to as an “inventive step.” Non-obviousness requires that an invention must not have been obvious to one of ordinary skill “in the art” (the scientific/technical field of the invention). Basically, obviousness means that something cannot be patentable when any person of average skill in the relevant scientific/technical field could put together different pieces of known information and from them arrive at the same result. The time period for non-obvious and inventive step varies across jurisdictions but is typically either at the time of the application’s filing or at the time of its invention.

Non-obviousness differs from novelty in the sense that an invention may be obvious even though it is not precisely disclosed in prior art. Put another way, a patent examiner may find an invention to be obvious by combining several publications that each disclose a piece of the overall inventive picture even though the invention is novel (e.g. not anticipated by any single one of the references). The purpose behind the non-obviousness requirement is the same as that behind the novelty requirement; namely, a patent should only be granted if an invention represents a significant improvement over the prior art.

EXAMPLE

A court invalidated a patent for the blockbuster osteoporosis drug Fosamax (in once-weekly form) made by Merck because of prior art that rendered the claimed invention obvious. About a year before Merck filed its patent application, two articles were published in a pharmaceutical journal about osteoporosis. These articles suggested the use of a weekly dose of bisphosphonate to treat osteoporosis instead of a daily dose. The weekly dose alleviated some of the gastro-intestinal (GI) complications caused by taking the pills daily. Merck attempted to patent this once-a-week dosage of the medicine that was seven times the daily dosage. Since the articles previously disclosed the concept of the weekly dosage, the patent was found to be invalid because it was “obvious” in light of prior art.

While making a determination regarding non-obviousness there are three things that a patent examiner will likely consider:

- i. the scope and content of the prior art references;
- ii. the differences between the prior art and claimed invention; and
- iii. the level of skill of someone of ordinary skill in the art.

When examining the scope and content of prior art references a patent examiner will primarily search for prior art in the same field as the invention. This means that the examiner will usually not search in fields of art that are unrelated to the subject matter of the invention.

Identifying the differences between the prior art and the claimed invention requires carefully comparing the prior art and the claimed invention to detect the precise similarities and differences between the two. For instance, if both the claimed invention and the prior art references disclose a method or process for doing something, the patent examiner will compare the steps in the methods to determine if they are distinct. Likewise, if an invention is a chemical compound with a specific structure, the examiner will compare the chemical structure to other compounds in the prior art to determine how the individual components in the structure are different. If the patent examiner finds that a prior art reference completely discloses the applicant's invention (as claimed), the patent examiner will find that the patent application's novelty has been destroyed. If the patent examiner finds that this prior art reference discloses most of the applicant's invention (as claimed), the patent examiner may find that the patent application's claims are "obvious" over the prior art reference, especially if the patent examiner finds other prior art references that in combination with the first reference disclose the entirety of the claimed invention. "Obviousness" is also known as "lack of inventive step" in some jurisdictions. (See Chapter IV "Prosecuting Patent Applications" for a more detailed discussion on the mechanics of claim rejection during patent prosecution.)

In determining non-obviousness the patent examiner will compare the claimed invention with all its characteristics to the prior art references. However, if a prior art reference explicitly excludes an element of the invention, this reference may not be used to show obviousness. This is called "teaching away."

For example, assume that prior art reference X discloses a copper electroplating solution comprising of 1) an alkaline solution of copper sulfate, 2) any concentrated acid from 30-50 grams per liter (*excluding sulfuric acid*) and 3) an aqueous solution of a pH-modifying substrate in an amount sufficient to adjust the pH to a value of from 3.5-5.0.

Inventor A has come up with a similar invention of a copper electroplating solution comprising of 1) an alkaline solution of copper sulfate, 2) *sulfuric acid* from 10-20 grams per liter and 3) an aqueous solution of a pH-modifying substrate in an amount sufficient to adjust the pH to a value of from 3.5-5.0.

Here, the invention would satisfy the non-obviousness requirement because the prior art explicitly "teaches away" or excludes sulfuric acid from the claimed invention. The prior art reference explicitly states that sulfuric acid will not work while the claimed invention states sulfuric acid may be used.

The third factor considered when determining non-obviousness is the level of skill of someone of ordinary skill in the relevant art. This is not the skill level of the inventor but rather a hypothetical person who is presumed to be aware of all of the pertinent art. The patent agent should note that an inventor is often a person of "extraordinary" skill in the relevant field and if non-obviousness were judged from this higher level of skill, it would probably be more difficult to demonstrate patentability.

In addition to the above-mentioned factors, patent examiners as well as the courts will sometimes consider secondary factors when deciding the issue of non-obviousness. These secondary factors include whether the invention solves a long-standing problem, overcomes the failure of others or is a commercial success. The existence of any of these factors may be demonstrative of the lack of obviousness of the claimed invention. Put another way, these secondary factors help demonstrate that even though the invention seems obvious, it is, in fact, not obvious because other people failed in their attempts to solve the long standing problem. Also, evidence that an invention is a commercial success tends to show that the invention was not obvious.

KEY WORDS

>> NOVELTY >> NON-OBVIOUSNESS >> UTILITY >> ABSOLUTE NOVELTY >> ANTICIPATION
>> PUBLIC POLICY >> "TEACHING AWAY"

SELF TEST

1. What is novelty?
2. The publication of a new technology or research result can destroy novelty. True or False?
3. In a country with an "absolute novelty" requirement, an applicant must file his patent application after making a public disclosure of the invention. True or False?
4. Give an example of an anticipatory reference.
5. What is utility? Why is it required for patentability?
6. To comply with the utility requirement, an invention must be superior to existing products or processes. True or False?
7. Why is meeting the utility requirement sometimes a problem for chemical compounds and processes?
8. What is non-obviousness?
9. What is the difference between non-obviousness and novelty?
10. In contrast to anticipation, prior art references may be combined to defeat patentability by showing that the claims of a pending application are obvious in view of the prior art. True or False?

C. PREDICTING PATENTABILITY THROUGH PRIOR ART SEARCHES

1. What is Prior Art?

Prior art refers to scientific and technical information that exists before the effective date of a given patent application. Prior art may be found in any public documents such as patents, technical publications, conference papers, marketing brochures, products, devices, equipment, processes and materials. The “effective date” of a patent application is typically the date of the earliest filed patent application that the pending application can claim. For example, if the present application is a division of a parent application filed on May 6, 1996, the effective date of the present application is May 6, 1996 even though the present application itself was filed much later.

A prior art search refers to an organized review of prior art contained in public documents. Prior art searches can be of various kinds: patentability searches conducted by an inventor before filing a patent application; invalidity searches in litigation conducted by the accused infringer; patent examination searches conducted by a government examiner in order to determine whether to grant or reject a patent application and state-of-the-art searches for information in a technical field. In all cases, searches are conducted using different kinds of databases, from public databases of issued patents on the Internet to exhaustive databases including technical literature. Searches can be done by legal professionals, by scientists or by researchers. Sometimes, defendants in patent litigation even offer bounties for invalidating prior art.

2. Significance of Prior Art Searches

A patent agent or inventor is not required to search for prior art. However, there may be advantages to performing a search in some cases. A prior art patentability search may be conducted before the filing of a patent application to gauge the prospects of obtaining broad claim coverage. The purpose of conducting such a search is to find references related to the claimed invention in order to make an assessment of its patentability. There are varying opinions on how extensive this search should be. Many patent agents and patent lawyers only do a brief search to identify the readily-available prior art. These searches are typically fast and inexpensive since the patent agent's clients often do not want to pay for an expensive, thorough search. Also, it is often presumed that the inventor himself will have a good sense of novelty based on his reading of the literature in his field and by communication with his peers. In some cases a more rigorous search may be justified before investing in an expensive foreign patent application. In this connection filing a patent application under the WIPO Patent Cooperation Treaty (PCT) provides the opportunity to receive an international search report prepared by a professional examiner. In many cases the PCT search report will represent the first official action by any patent office including that which received the priority application. Thus, the PCT search report can provide the patent agent with valuable early insight. (See, Chapter 3 for further explanation of the PCT.)

Prior art searches are a good way to get information on developments in the field of invention. Prior art searches may sometimes reveal what competitors consider worth protecting. Search results may be a critical factor in deciding whether to file a patent application. If a prior art search reveals references that anticipate the claimed invention, the inventor and the patent agent should consider how they can “avoid the prior art” by drafting the claims to overcome it. If this is not possible, they may wish to consider whether filing the patent application is still appropriate. In some cases, a prior art search may reveal patent references that are problematic. Just because you see a reference that seems similar to the invention does not mean the proposed application should be abandoned. The prior art may instead warrant a “design around” effort to see how the claims of the new application can be changed to avoid the prior art. (See Chapter VIII on Patent Strategy.)

EXAMPLE

Inventor A has come up with an invention for a pencil with a light attached. Further, assume that while doing a patentability search a patent agent discovers an unexpired patent in the country where A plans to make, use or sell the pencil. The patent also covers a pencil with a light attached. In such a case the prior art search can alert Inventor A (and his company) of the existence of the patent and he can either design around the patent or decide not to enter the pen-with-light market.

3. How to Search Prior Art

The prior art searcher can simply go to the library and conduct research just as he would research any other topic. He can also review existing patents either on-line (via the public databases published on the Internet) or in a public patent library.

An on-line prior art search can be done as either a keyword search or a field search.

- 1) **Keyword Search:** Before beginning a search based on keywords start by listing those you would use to describe the invention. Think of all possible aspects of the invention and choose keywords that describe each such aspect. The quality of a keyword search will largely depend on the appropriateness of keywords selected.
- 2) **Field Search:** A field search might be used to refine the results of the keyword search. Once the keyword search has been conducted, use the field search to narrow the results down to the field in which the invention at hand operates.

4. Classification Systems

As one can imagine the world's patent offices receive thousands of patent applications that must somehow be sorted and assigned to an appropriate group of patent examiners. Patent examiners are typically organized in a tiered structure based on the kinds of technology in the patent applications that they review. For example, one division might examine electrical patent applications with sections in the group respectively reviewing: a) power systems, b) micro-electronics and c) specialized circuitry. This organization only solves part of the problem; individual patent applications must still be routed to the proper section for examination.

The world's patent offices typically solve this problem by using classification systems. When a new patent application is received it is quickly reviewed and sorted according to its technology type and then routed to the proper examining group. One can imagine a patent application being sorted in much the same way the post office sorts a letter. This sorting process is aided by a classification system.

Similarly, when a patent examiner goes to examine a patent application he needs to classify it and then conduct a prior art search in the fields where he has classified it. There is an international patent classification system and some countries such as the US have their own classification systems. In accordance with international standards the international patent classification for a given patent or published patent application will appear with code "(51)" on the cover and the local classification, if any, will appear with code "(52)."⁸

WIPO maintains the International Patent Classification (IPC) and a related treaty⁹ that pertains to classifying the technical content of patent documents. Classifications change from time to time and the classification located on a patent document is typically the IPC classification valid at the time of the application's publica-

8. For the full list of codes, see WIPO Standard ST.9 (Recommendation Concerning Bibliographic Data on and relation to Patents and SPCs) at <http://www.wipo.int/scit/en/standards/pdf/03-09-01.pdf>

9. The Strasbourg Agreement.

tion. The complete, current (eighth edition) IPC can be found on the WIPO website at <http://www.wipo.int/classifications/ipc/ipc8/?lang=en>.

An IPC classification is made up of a letter denoting the IPC section, the highest level of abstraction (such as “B” for the “performing operations, transporting” section). The section is followed by a class number which provides greater specificity (such as class “60” for “vehicles in general”). In some cases the section and class numbers may be followed with a subclass number for even further specificity (such as “R” for “Vehicles, Vehicle Fittings, Or Vehicle Parts, Not Otherwise Provided For”). This number is followed by an “IPC main group number” (such as “1” for “Optical Viewing Arrangements”). Finally, a forward slash is followed by a number representing an IPC subgroup (such, as “10” for “Front-view mirror arrangements; Periscope arrangements”). Thus, the complete IPC symbol in this example is B60R1/10. Because inventions can be difficult to capture with a single IPC symbol, patent examiners will often provide additional or secondary IPC classifications for a patent application.

The USPTO also maintains a manual on patent classification and provides an on-line database to aid in determining the classification for a given invention. This database can be accessed at: <http://www.uspto.gov/web/patents/classification>.

By searching the various databases provided one can determine that a mouse trap would be located in Class 43, subclass 58 and depending upon the further characteristics of the trap, possibly other sub-classes as well. For example, a simple mousetrap with a door that closed when the mouse picked up the cheese would be Class 43, subclass 62, or “Fishing, Trapping, and Vermin Destroying” (Class 43) and “Trap: Falling Encaging Member” (subclass 62). Applying this class and subclass information to the USPTO patent database discussed below and using the search parameter “ccl/43/62” reveals 16 patents including US Patent 4,638,590 titled “Humane Animal Trap” whose drawings show a very simple mechanism for penning a small animal.

In conducting a prior art search the searcher can include as a search term a code from a classification system. Thus, instead of just searching on the word “traps,” which might appear in thousands of patent applications not related at all to animal traps, the searcher may include in the search the word “traps” and the classification “43/62” discussed above. In some instances, the number of patents assigned to a specific class is so small that the searcher can simply review all the patents in the class. The patent agent should be aware that sometimes slightly similar applications can be assigned slightly different classifications.

5. Where to Search

There are several good databases where one can search and expect to obtain comprehensive prior art search results. The databases include national and international databases. The patent searcher does not necessarily have to pay to use these databases as most are free and public and many can be accessed on the Internet. For specific instructions on where to find the databases and how to search, see Appendix A to this Manual.

KEY WORDS**>> PRIOR ART >> PATENTABILITY SEARCH >> DESIGN AROUND****SELF TEST**

1. What is a prior art patentability search?
2. List three different entities/persons who generally conduct prior art patentability searches.
3. You must conduct a prior art patentability search before filing an application. True or False?
4. Give three examples of where one might conduct a prior art patentability search.
5. The EPO database contains patents from all over the world. True or False?
6. You must conduct the same kind of search before filing a patent application as an examiner conducts in the process of search and examination of a patent application. True or False?
7. What do you do if you find prior art that seems related to the invention for which you are planning to file a patent application?

III. PATENT APPLICATION PREPARATION AND FILING

A patent application memorializes the agreement between the inventor and the government office that results in the issuance of a patent. Accordingly, a patent application is in many ways like a contract. Writing a high-quality patent application is important because it sets out in a clear fashion the terms by which the patent owner and others will be bound. In this sense, drafting a patent application is different from writing a scientific paper. As the patent document contains technical subject matter it will also bear some similarities to a scientific or technical paper, although it does not usually need to rise to the level of a blueprint for making the invention protected by the patent. The issued patent will be reviewed over the years by public officials such as patent examiners and judges and business partners. Thus, the patent application should be drafted with these important audiences in mind.

The parts of the patent application typically include the Background, Summary, Detailed Description and Drawings, Claims, and Abstract. The patent agent is unlikely to draft the patent application in this order and should ordinarily draft the claims first. This is because the claims are the heart of a patent. In reading a patent application:

- the Background section sets the stage for what is to come;
- the Summary section mirrors the claims;
- the Detailed Description and Drawings enable the claims by providing a sufficient technical disclosure of the invention;
- the Claims define the scope of exclusive protection, and
- the Abstract is primarily an aid for patent searchers and normally receives very little substantive review.

All these sections will be explained in more detail below.

A. PREPARING PATENT APPLICATIONS

The first question a patent agent needs to have answered upon receiving a request to prepare a patent application is: how soon does this application need to be filed?

The world's patent laws all have strict requirements regarding when an application must be filed with respect to various events. These events can range anywhere from the first date of attempted commercial exploitation, the first date of export, the first date of public disclosure. The patent agent needs to know:

- (1) Where does my client want to protect his invention?
- (2) Has something already happened that would impair the client's ability to protect the invention in the desired countries?
- (3) How soon does the client intend to do something that would jeopardize his ability to protect the invention in the desired countries?

Even if the patent agent has no time obstacles in his way he should endeavor to complete the patent application as quickly as possible, as would be expected of any professional. A third party might file an application on the client's invention at any time, thus leaving the patent agent as the primary reason for his client not receiving a patent. Also, prior art might become available (e.g. an article might be published) that couldn't have been used against the client's application if the application had been filed earlier. However, the patent agent should know that his workload is typically driven by dates that are largely out of his control and he will frequently have to re-arrange his work schedule to accommodate unexpected time bar discoveries.

Always ask the client and the inventor when the patent application needs to be filed. Don't rely on the client's or the inventor's interpretation of the law: check the facts yourself.

PROFESSIONAL TIP

EXAMPLE

Engineer X calls to ask you about obtaining a patent on his invention in the US. You ask him some preliminary questions but he does not have time to speak in detail so you agree to meet in two days. At the meeting he hands you a large document describing his invention in great detail. You attempt to gather information about possible obstacles to patenting, so you ask him the following:

- (1) Has this invention been shown to anyone without a non-disclosure agreement in place? (A non-disclosure agreement is a confidentiality agreement where the parties agree not to use or to disclose to others the subject of their communication.)
- (2) Has the company sold or attempted to sell this invention? (This is a time-barring event in some countries such as the US.)
- (3) Have you or your company published anything about this invention?
- (4) Have you told anyone outside your company or institution about this invention?
- (5) Have you demonstrated the invention in any public forum such as a trade show or conference?

Engineer X initially answers “no” to all these questions. He is not sure when his company plans to begin selling the invention. Believing that there is no pending bar date that would prohibit patenting, you continue to question him about the invention. Towards the end of the interview he remembers that a co-worker displayed the invention at a scientific meeting “a couple of months or so ago.” When you press him for the precise date, he leafs through his calendar, and eventually exclaims: “Wow, that was last October – so a year ago already!” You know that to be valid a patent application in the US must be filed less than one year after its first public disclosure so you ask him to confirm the exact date. Having called a colleague to be certain, he finally answers that today is in fact the first anniversary of the invention’s public disclosure. It is 3 p.m. You know that the inventor’s rights can still be preserved if a patent application can be filed before midnight. But you cannot possibly prepare a full and complete patent application on the invention before midnight. Fortunately, US law provides for provisional (temporary) patent applications. A provisional patent application must disclose the invention but it does not need to include patent claims. A provisional patent application will expire one year after its filing date and effectively serve as a placeholder until a regular utility patent application is filed.

You know that you should not incur legal expenses without prior approval. So you call the president of the company (your contact person for patent work) to explain the situation. He authorizes you to proceed.

Fortunately, Engineer X gave you a good invention disclosure and a technical document explaining the invention and during your interview with him you gained a good understanding of the invention. You ask him for an electronic copy of the document. You inform your co-workers that your schedule for the rest of the day needs to be changed to accommodate this rush provisional application. You spend the rest of the day creating the best provisional application possible in the short time allowed.

After filing the application,¹⁰ you create a file for the provisional patent application, containing a copy of everything you sent to the patent office including all the forms and copies of any checks for fee payment. The file also includes the original mail deposit receipt from the post office that has the date of deposit. Thus, if the patent office does not provide your patent application with the proper date of receipt, you have everything you will need to provide the proper filing date to the patent office – a date that is absolutely crucial in preserving your client’s rights to obtain patent protection. It is essential to note that one day late is too late. Patent agents must strive to protect their client’s patent rights and sometimes protecting the applicant’s rights involves simply making sure that critical dates are observed. If the patent agent above had forgotten to ask about possible bar dates or had not pressed the engineer for precise information, the patent agent might have returned to his office and spent the next two weeks drafting a beautiful legal document for an invention that could no longer be patented.

10. The administrative rules for filing a patent application are described in Section III.B.

Finally, the patent agent must try to understand early if the applicant wants to file in foreign countries. In countries that are Member States of the Paris Convention, applicants have one year to file their patent application abroad after the national filing date (or priority date)¹¹. The filing of a PCT application also operates within the one-year time frame of the Paris Convention. The patent agent should docket the priority application's filing date, and check with the applicant well ahead of the anniversary date. Even when the applicant has initially indicated no interest in foreign filing he may change his mind in a year. Also, remember that the patent agent does not need to wait a full year before filing. The patent agent should also determine if the applicant is interested in obtaining protection in a non-Paris Convention country before filing the priority application. If the applicant is interested in a non-Paris Convention country, the patent agent needs to understand that country's specific priority rules. Non-Paris Convention countries can have very unique rules for inbound foreign applications. In some cases, the patent agent may even need to co-file the application in the non-Paris Convention country and in the inventor's home country at the same time in order to ensure patentability.

A patent agent will likely not be allowed directly to represent his client before foreign patent offices. Foreign associate attorneys will represent the client abroad. There are several models for interacting with foreign associate attorneys. In the "hands off" model the foreign associate sends official correspondence and provides information on local rules but takes little substantive action in the case. The patent agent who filed the original priority application makes all the major decisions. In the "hands on" model the foreign associate drafts proposed responses to office actions and forwards them to the patent agent for approval. The patent agent may use different models for different foreign associate attorneys, e.g. "hands on" in some countries, and "hands off" in others.

1. Obtaining Invention Disclosures from Inventors

A patent agent's clients will likely have different levels of sophistication with respect to their abilities to handle patent documents. Some clients may have fairly sophisticated administrative units that can provide completed invention disclosure packages to patent agents who then conduct a follow-up review as necessary. At the opposite extreme are clients who have no IP infrastructure and require considerable guidance and assistance from the patent agent.

The patent agent will learn over time which approach offers the best results for different types of clients. For some clients, the patent agent may want to provide a blank Invention Disclosure Form and then allow inventor(s) to complete it on their own. See sample form at Appendix B. For other clients the patent agent may want/need to obtain all his information about the invention via one or more interviews with the inventor(s). In any event, the patent agent should always attempt to have at least one meeting either in person or by telephone with the inventors. It is highly unlikely that an inventor will be able to supply a patent agent with enough material for the patent agent to have an unambiguous understanding of the invention without some sort of "live" meeting with the inventor. Similarly, it is unlikely that the inventor will understand the legal/background information being sought about his invention in the absence of a meeting with the patent agent.

In an ideal situation the inventor will provide the patent agent with an Invention Disclosure Form and supporting documents well before the face-to-face meeting between them. The patent agent will review the disclosure materials and note any places where he has questions or where he believes additional disclosure would be helpful. During the meeting between the patent agent and the inventor, the patent agent verifies

The patent agent needs to have fees negotiated and discussed with his clients before incurring charges, especially with individuals.

PROFESSIONAL TIPS

Use the Invention Disclosure Form at Appendix B

11. Article 2.1 of the TRIPS Agreement requires its signatories who are not Paris Convention signatories to honor certain provisions of the Paris Convention such as the one-year period for claiming priority. As noted elsewhere, the patent agent needs to verify the actual practice and procedural requirements being followed in countries of interest to his client.

that he has a complete understanding of the invention, establishes that there is no additional disclosure information that he should also receive (or that he receives the additional disclosure material), determines the most commercially-significant aspects of the invention and confirms that there are either no pending bar dates or verifies the precise bar dates.

The patent agent should review the invention disclosure well prior to meeting with the inventor. This will ensure that the patent agent will have had sufficient time to identify all the parts of the invention disclosure that raise questions – both technical parts (e.g. “how does A function with B”?) and legal parts (e.g. “Who else could be an inventor?”).

A sample Invention Disclosure Form is provided in Appendix B to this Manual. Each patent agent will want to review/modify this form to ensure that it conforms to the legal requirements for his jurisdiction. The patent agent will want to make any necessary changes to this form to provide a full and complete disclosure in the jurisdiction(s) of interest to his clients. He may also wish to provide copies to his clients for them to complete the form and return it to the patent agent well in advance of the disclosure meeting.

2. Identifying Patentable Inventions

In reviewing an invention disclosure and/or in speaking with an inventor the patent agent must keep focused on any/all patentable inventions described. Much of the text in an invention disclosure and/or discussions during the meeting with the inventor will probably not be about a purely patentable novelty but will include other non-patentable technical details. The patent agent should not be surprised to discover that quite often inventors do not know what they have invented, at least in “patentability” terms, as they often think in other terms such as “discoveries.” Thus, the patent agent will often be the one who articulates what constitutes a patentable invention.

For example, imagine that an inventor says he has taken well-known Widget A and combined it with Widget B, then burned the rim of their common edge for 5 to 10 minutes before using epoxy to attach Widget C to the burnished common edge of Widget A and Widget B. The patent agent eventually realizes that he has never heard of a Widget A and Widget B attached to Widget C. Suspecting that this combination may be inventive – new, novel, and non-obvious – the patent agent asks the inventor if he has ever heard of anyone producing this combination of elements. The inventor says that others have tried for years to get this combination

of widgets to combine and that there has been some success but that Widget C had always separated from Widgets A and B after a short time. The patent agent asks if the solution lies in burning the combined edge and the inventor affirms that this is correct. Thus the patent agent recognizes that one invention (for which he should draft claims) is Widget A coupled to Widget B with the combination subjected to heat before application of Widget C.

PROFESSIONAL TIP

Never assume that an inventor actually knows what constitutes his invention. Inventors typically think in terms of products, discoveries or research results and not in terms of inventions or patent claims. You will have to ask questions to understand the invention.

Corollary to Professional Tip: Don't be an arrogant patent agent either. You are not the inventor. Your role is to aid the client by describing the invention and then protecting it.

3. Understanding the Invention

The patent agent should never become the inventor but should strive to have the clearest grasp of the invention needed to obtain a patent with the broadest claims allowed by law. This means the patent agent must understand the invention well enough to draft claims describing the invention with the fewest possible limi-

tations. In other words, the patent agent must understand the invention well enough to know what elements do not need to be recited in the broadest possible claim for the invention.

Understanding the invention also means that the patent agent understands it well enough to prepare a specification for a patent application that discloses all possibly patentable aspects of the invention and enough additional information so that a lay person skilled in the pertinent technical field can understand and make the object invented. Understanding the invention also means that the patent agent can receive a prior art description such as one used as the basis for a claim rejection by a patent office and be able to explain the differences between the invention and the prior art and/or amend the pending claims to highlight these differences in a manner that minimizes the reduction in the scope of claim coverage.

Assume from the example above that the patent agent understands that the invention involves Widget A, Widget B and Widget C. The inventor disclosed that the common edge formed by the combination of Widgets A and B was burned before Widget C was attached. The patent agent may want to probe the inventor to see if the surface could be prepared in any way other than burning. If so, then the invention is possibly broader than just burning the surface material. The patent agent may want to ask the inventor if the surfaces can be burned prior to the attachment of Widget A to Widget B or whether they must be combined first. He will probably be able to think of many other such questions. The answers to these questions help the patent agent understand the invention and allow him to draft the best possible claims and supporting specification.

The patent agent may discover that the inventor does not know the answer to all his questions. The inventor may be able to speculate about alternatives and in some instances may even have the time to conduct some additional research. The patent agent must make sure, however, that the specification discloses a working embodiment of the invention. Thus, if the inventor is uncertain about the answer to any of the patent agent's questions, the patent agent must use his best professional judgment as to how to deal with the uncertainty.

There may be gaps in the technical disclosure that the patent agent can fill but he should always confirm with the inventor that the substitute for any missing material is correct and within the spirit of the invention. The patent agent may assist the inventor in considering possible alternative embodiments for the invention. Often inventors create their inventions for a very specific purpose and have not really considered whether they could be applied to other areas.

B. TYPICAL PARTS OF THE PATENT APPLICATION

Once a patent agent understands the invention he can begin preparing the patent application. The parts of the application are generally:

- claims
- detailed description (or specification)
- drawings
- background
- abstract
- summary

A patent agent will want to consider the patent application's title fairly early. This title should broadly describe the invention. However, titles are not generally examined. Occasionally a patent examiner will decide that a title is not descriptive of the invention. It is best to avoid being overly narrow in the invention's title, although the title should sufficiently indicate the subject matter of the invention.

A patent application as filed should also include the names of the inventors. The inventors should be named after the title, e.g. on the cover page. The patent application itself should also include all priority information, such as the identification of related applications. In the US, for example, priority information should be provided as the first sentence in the application. The patent agent may have other forms to complete that also provide the inventor's name and priority information but there is more certainty when this information is also included as part of the application itself.

Always remember who the audience will be for the patent application. The key audiences include judges and patent examiners. Of course, the patent agent's client and the inventor are also audiences; the patent agent must make sure the inventor understands his own patent application. Other potential audiences include competitors, infringers and investors. Many investors will often scrutinize a technology company's patent portfolio carefully before making an investment.

1. Claims

One of the first things to do is to prepare the claims for the invention. In fact, the patent agent may even want to sketch out the claims in the disclosure meeting with the inventor. This will often provide confirmation to the patent agent that he has understood the invention. The patent agent may wish to use some sort of "picture claim" (see below) in the initial meeting with the inventor since inventors are often unfamiliar with patent claim language. For this reason, the patent agent should avoid using highly abstract language to describe the invention in the disclosure meeting with the inventor.

PROFESSIONAL TIP

Inventors sometimes need help understanding the abstract terms used in the patent claims for their inventions.

The majority of patent agents prepare several draft patent claims as their first step in writing a patent application. The claims are the legally-operative part of a patent application; everything revolves around the claims. Note that three full chapters of this Manual, Chapters V, VI and VII, are devoted to the drafting of claims; here we begin with a general overview of this important part of the application. If the

claims are prepared before drafting the specification (see below) the patent agent will know which terms need to be described in the specification.

While it is generally preferable to draft the claims first, some situations may not provide the patent agent with this luxury. For example, assume a patent agent receives a technical paper from an inventor who tells the patent agent that the patent application needs to be filed immediately because of an imminent public disclosure of the invention. The patent agent will probably not have time to draft his own patent specification but will instead use the inventor's technical paper as the basis for the specification. Even in this circumstance, the patent agent may still want to write some claims before proceeding to edit the technical paper into a patent specification. The patent agent may consider preparing a "picture" claim for an invention. A picture claim is a claim that paints a word picture of the invention. The patent agent will rarely want to file a picture claim although such claims can be useful in helping to understand the invention and may also be helpful in determining all the points of novelty with the inventor. Such claims often contain limitations that do not necessarily provide novelty but are nevertheless part of a product that includes the invention. For example, a picture claim for an automobile having a novel aerodynamic shape might include the vehicle's wheels even though the wheels are not part of the novel shape. In fact, including the wheels in the picture claim may help the drafter to realize that the wheels are not part of the invention and need not be included in the claims. Thus, picture claims may be helpful to the drafter of a patent application but they rarely provide the broadest claims for an invention.

Because of the critical importance of claims, the patent agent should carefully revisit them after drafting the specification. This is because after writing the specification, the patent agent will likely come to an even better understanding of the invention. For example, he will now be in a better position to spot extraneous limitations in the claims that could prevent obtaining the broadest possible claim coverage. Similarly, after preparing the specification the patent agent may now see that the claims do not describe the invention as accurately as they could.

Once the claims are completed the patent agent needs to check the drawings and specification to verify that the claim terms have been appropriately described and disclosed. For example, suppose the patent agent has used a highly abstract term in the claims such as “floor-engaging member” for a “chair leg.” The patent agent may then opt to include this abstract term in the specification. For example, the specification could state: “The seat piece is attached to the first chair leg, which is but one example of a floor-engaging member suitable for use in an embodiment of the invention.”

2. Detailed Description or Specification

The detailed description section, sometimes known as the “preferred embodiment of invention” section or the “disclosed embodiment of the invention” section breathes life into the claims and provides a sufficient explanation of the invention for an ordinary person skilled in the art to make and understand the invention. In some jurisdictions the term “specification” is also used to refer to the description in addition to the summary and background sections of the application; suffice to say that “detailed description” and “specification” are generally the same for purposes of patent drafting.

The detailed description section must be closely tied to the drawings. This section cannot be substantively amended once the application has been filed. Consequently, the patent agent must make sure that the detailed description section provides an appropriate degree of technical disclosure on the day that the application is filed as he won’t have a second chance to alter this part of the application. The patent agent cannot amend his application to include new technical disclosure during prosecution.

If the patent agent uses a highly abstract term in the claims he should consider using the term in the detailed description section, but in a manner that ties the abstract term to a specific embodiment of the invention. For example, if the claims use the term “warning device” for automobile horn, the specification could either say: “One example of warning device 102¹² is an automobile horn. Other warning devices may be used, consistent with the spirit of the invention,” or, “Automobile horn 102 constitutes a warning device. Many other such warning devices may be used consistent with the spirit of the invention.”

As mentioned above, the detailed description section cannot be substantively amended once the application is filed. Thus, a patent agent should take care that the patent application (1) reflects the disclosure material provided by the inventors, (2) provides sufficient information to enable an ordinary artisan to reproduce the invention and (3) provides sufficient depth so that the claims can be narrowed during patent prosecution to avoid close prior art. Further considerations about the scope and importance of the detailed description section will be discussed below and are also illustrated by the following example.

12. In this example “102,” the reference number for a part shown in one or more of the patent application’s drawings, e.g. Fig. 1 might show the warning device 102. Reference number schemes for patent applications will be discussed in more detail later.

EXAMPLE

Assume that the inventor believed his approach to be extraordinarily novel and broadly patentable. He built a working model of the invention prior to filing the patent application and this working model became the prototype for an entire generation of successful products. In the prototype, the inventor used Widget A connected to Widget B with copper wires. In abstract terms, this widget combination represents an example of a Subcomponent X. The other abstract subcomponents in the invention are Subcomponent Y and Subcomponent Z. The claims as filed recite:

A machine, comprising:
 a subcomponent X;
 a subcomponent Y operably coupled to the subcomponent X;
 and a subcomponent Z operably coupled to both the subcomponent X and the subcomponent Y.

The inventor convinced the patent agent that the combination of X, Y and Z was so novel that the application did not need to provide any more details about the invention than necessary to support the broadest possible claims because the inventor wanted to save costs and file the application quickly. Thus, the application makes no mention of Widget A or Widget B. The patent examiner finds prior art to a "Dr. Q" at Acme Corp. that discloses subcomponents X, Y and Z. This prior art anticipates the invention claimed in the application. In reviewing the office action and the cited prior art, the patent agent finds that absolutely every detail of his client's invention was disclosed by the prior art of Dr. Q – except for the fact that the prior art to Dr. Q discloses that Subcomponent X should be made from Widget C and Widget D, and Dr. Q (like so many others) discloses that this is the only known way to make a satisfactory Subcomponent X. Consequently, the patent agent could overcome the prior art cited by the examiner and obtain a patent for his client if he could amend the claims to recite:

A machine, comprising:
 a subcomponent X formed by combining Widget A and Widget B;
 a subcomponent Y operably coupled to the subcomponent X;
 and a subcomponent Z operably coupled to both the subcomponent X and the subcomponent Y.

The patent agent further suspects that not only would this claim be patentable but a claim solely directed to forming Subcomponent X from Widgets A and B might also be patentable and might actually constitute the client's real invention. Unfortunately, the client insisted that the patent application not disclose that Subcomponent X could be formed from Widgets A and B, so the patent agent can neither amend the claims to overcome the prior art reference nor amend the claims to recite a highly novel combination conceived by his client. Consequently, the patent application will likely go abandoned unless the patent agent can think of some other way to amend the claims. The patent attorney could possibly write a new patent application that made the proper technical disclosure provided the new application were not barred from patenting by, among other things, the inventor's own activities.

The patent agent must use his best judgment to balance his concerns about being under-inclusive in the specification section against including too much unclaimed subject matter in the application. In many patent systems, unclaimed subject matter in a patent application is considered to have been "dedicated to the public" by the inventor. Subject matter that is dedicated to the public is not patentable. Many patent systems such as the Patent Cooperation Treaty (See Chapter 3B) also have some sort of "unity of invention" rule¹³ that permits only one invention or one "inventive concept" to be reviewed by application. Consequently, if a patent application includes claims for different inventions, the patent agent will likely be forced to select which claim set he wants the examiner to review.

Similarly, if the patent application's disclosure includes an unclaimed invention, the patent agent may wish to prepare claims for this invention. If necessary, the patent agent can include the claims for any previously unclaimed invention in either a divisional or continuation application as appropriate. The patent agent will want to make sure

13. See Rule 13.1 of the PCT Regulations. For further treatment of the issue of unity of invention, see page 190.

that his client has approved the filing of any divisional or continuation applications. As a general rule, the patent agent should consult his client on every substantive matter pertaining to the client's pending patent application.

In drafting the detailed description section, the patent agent will generally want to err on the side of inclusion for the reasons described above. The patent agent will also want to consider the "best mode" requirement that arises in jurisdictions such as the US and India. The patent application must disclose the best mode of carrying out the invention known to the inventors. Basically, the patent application cannot conceal the optimum aspects of the invention from someone who tries to make and use the invention described in the patent. So, for example, if the inventors know that a precipitate is formed between 115 and 140 degrees, but also know that the greatest volumes of precipitate are formed at 120.5 degrees, they must disclose this information as well. Not all countries have a "best mode" requirement in patent applications.

In drafting the specification, the patent agent should avoid using phrases such as "the invention is..." The patent agent should instead use phrases like "in an embodiment of the invention." This will ensure that patent claims receive the broadest interpretation possible. Without limiting words to the contrary, the detailed description section is generally presumed to disclose "an embodiment" of the invention rather than the invention itself. However, if the patent agent forecloses this broader reading, the scope of the claimed invention may be similarly narrowed.

The patent agent need not include in the patent application well-known material that would be needed in order to make a product associated with the invention. A patent application does not need to be a blueprint and at least one court even stated that a patent should preferably "omit" things that are well-known in the art. For example, if every Polymer X has to be cured for 5 hours at 200 degrees and this is well known in the art, this method of curing Polymer X need not be included in the patent application unless the invention modifies this procedure in some way. The patent agent may generally incorporate material by reference in a patent application, e.g. a well-known chemical handbook. However, incorporation by reference should be used sparingly. Also, the patent agent may wish instead to incorporate material from other sources in the patent application – and the patent application should never incorporate by reference into a patent application any material that will be recited in the claims.

A patent specification filed in the US, for example, must satisfy the three requirements of enablement, written description and best mode. Most of the world's patent laws have requirements identical or very similar to the enablement and written description requirements. The patent law of the US specifically requires that:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention. 35 U.S.C. § 112, 1st ¶.

The best mode requirement was discussed above. The "enablement" requirement means that a patent application must teach ordinary persons skilled in the art how to make and use the invention. Enablement is usually viewed as of the filing date of the patent application. A patent application that is not enabled as of its filing date cannot become enabled by later technical innovations. The "written description" requirement gives notice to the public that the inventors were in possession of their invention, e.g. that the words describing the invention didn't appear accidentally. The written description requirement can become especially interesting when the claims in a patent application (or the claims in a later-filed continuation application) recite an invention that reads directly on a recent competitor device, as the patent examiner (or more likely a judge) may be suspicious as to whether the inventors really understood that they had created that particular invention at the time of their original filing.

Patent specifications filed with the EPO preferably follow a “problem-solution” approach. Thus, the story told by the application is one of outlining a problem first and then describing its solution. The discussion of the problem begins in the Background Section. (See Sec. 4.d below.) Some patent agents find the problem-solution approach easy to follow in crafting their applications and this technique should be suitable for applications filed in most jurisdictions. However, the patent agent should exercise caution as to how the problem is described. The critical aspect of some inventions is a recognition, characterization or re-characterization of a problem, e.g. once the inventor has uniquely formulated the problem, the solution follows fairly easily thereafter. Thus, if the patent agent describes the problem in a manner suggesting that a perfect understanding of the problem was well known in the prior art (when it was not), the patent agent may have inadvertently complicated obtaining patent protection for the client’s invention. Aside from this caution, the problem-solution approach may work quite well for many applications, especially those filed with the EPO.

In addition to describing the components used in an embodiment of the invention and the manner in which those components operate, the patent agent may also wish to consider including in the patent application one or more drawings and related disclosures that provide a context for the invention and/or describe the invention in operation. The patent agent will want to condition this discussion so that the context does not necessarily become part of the invention, e.g. become “limiting.”

The patent agent must be very careful in his use of language in a patent application. The patent agent’s language choices will be important not only during patent prosecution but especially if/when the patent is litigated. The patent agent should be particularly careful in his use of words containing absolutes of any sort. Thus, the patent agent will want to make sure that if a patent application uses words like “must” and “always,” these words very precisely and accurately express the situation at hand. In other words, if an invention disclosure says that a widget “always” does something, the patent agent should make sure this is “always” the case, e.g. the invention won’t work unless this is always true. If the patent agent prepares his applications using a computer, he should probably search the draft application for such absolute words when the application is nearly complete.

How does a patent agent write the detailed description section? Dictation is the preferred method if the patent agent has an assistant who can transcribe the dictation. If the patent agent has prepared his draft drawings and an outline of the detailed description section, he can simply talk his way through the drawings. Most practitioners find that they can at least double their output using this approach.

The patent agent must always research and review the law and relevant rules pertaining to the country where he is seeking patent protection for his client. Many patent laws and rules are available online.¹⁴ For example, the WIPO website provides information about the Patent Cooperation Treaty and practical information relating to the filing of PCT applications; the EPO website provides information about filing and prosecuting applications and the US Patent and Trademark Office website provides information about US patent laws and filing applications in the US.

3. Drawings

The patent agent must prepare good visual supporting materials that describe the invention. In fact, many patent agents would argue that the drawings are the most important part of the patent application after the claims. Some patent laws require that every claimed element be shown in a drawing. Where possible, the drawings should explain the invention in sufficient detail that reading the detailed description section merely confirms in words the information provided in the drawings. This will not be possible with all inventions.

14. See, for example, the WIPO Collection of Laws for Electronic Access (CLEA) at http://www.wipo.int/cfdiplaw/en/laws_section/clea.htm.

In preparing the drawings the patent agent should think of the story he wants to tell and how he wants to tell it. The patent agent should also think about the level of detail necessary to provide an enabling disclosure. A black box labeled “widget engine” with no subcomponents will provide insufficient explanation for a patent application that purports to disclose a “widget engine.” Conversely, the patent agent should avoid providing too much detail in the drawings – unless the accompanying explanation in the detailed description section explains that the additional detail pertains to but one specific embodiment of the invention. Otherwise, someone may later argue (maybe during litigation) that the additional detail is necessary for the invention. This becomes especially true in many countries if the patent agent also uses a means-plus-function claim (see Chapter V: Claim Drafting) since defendants in a later patent infringement case will argue that all the unnecessary details disclosed in the drawings are necessary structures for performing the recited function.

The elements shown in a patent’s drawings are typically accompanied by a short description in words and a reference number such as “clock 102.” The reader will expect to see “clock 102” in the accompanying text of the detailed description section. The patent agent should use a consistent numbering scheme for the reference numbers. In one scheme, a reference number introduced for the first time is given a leading number that matches its figure number followed by two unique digits. For example, assume in “Figure Two” of a patent application that the patent agent has already labeled two previous elements. The third element, a computer memory, could then be given the reference number “203.” All future reference to this computer memory in the patent application’s drawings and specification will then state “computer memory 203” or just “memory 203.” If another computer memory is discussed, it must be given another reference number – otherwise, the reader will assume that they are the same. A variation of this number scheme is to use only odd numbers such as 101, 103, 105 in the early drafts. This simplifies the process of adding new figure elements in later drafts. In a second numbering scheme, a major component will be given a single digit reference number and then any subcomponents will be given additional digits that lead with the component’s reference number. For example, a “computer 8” may have a subcomponent “memory 82” where the “8” in “82” refers to computer 8. Whatever reference scheme the patent agent employs, he must employ it consistently. Similarly, if the embodiment of the invention shown in one figure is different from that shown in another figure, the detailed description section should clearly say this, e.g. “Fig 5 shows another embodiment of the invention...”

The patent application itself should contain a list of the drawings between the summary of the invention section and the detailed description section. The drawing section should begin with a statement indicating that the drawings are illustrative of one or more embodiments of the invention (and not illustrative of THE invention), such as:

BRIEF DESCRIPTION OF THE DRAWINGS

An exemplary embodiment of the present invention is illustrated by way of example in the accompanying drawings in which like reference numbers indicate the same or similar elements and in which:

Figure 1 is a diagrammatic representation of an exemplary widget within which the present invention may be deployed;

Figure 2 is...

The patent agent should make sure that his drawings are complete and omit no critical details. If the patent agent has a drawing that depicts a process flow, for example, then he should ensure that arrowheads are appropriately depicted. For example, if a line has a single arrowhead when it should really have a double arrowhead, the patent agent may have difficulty later convincing a patent office that the flow between the two components was not just in the one way depicted in the figure. The patent agent may provide sufficient written explanation in the detailed description section to overcome the deficiencies in his drawings – but the patent agent should not rely upon having a more detailed description section that compensates for the shortcomings of his drawings.

PROFESSIONAL TIPS

Do not make a habit out of trying to fix patent applications after they have been filed; eventually you will make a mistake that cannot be fixed without re-filing a completely new application that deprives the client of the original filing date.

A patent agent's time and skill should be spent on creating original drawings, not on making them look attractive.

The patent agent should not spend too much time perfecting the artistic quality of his drawings. He is not expected to be a qualified draftsman but will probably want to have access to a qualified draftsman.. Sometimes computer software for drawings can be useful; however it is often faster and cheaper for the patent agent to simply sketch the drawings using a pencil on paper.

The client and/or the inventor may often have drawings related to the invention. Sometimes these drawings can be extremely beneficial to the patent agent but he should only use such drawings when they are helpful to the story that he wants to tell in the patent application. The professional drawings provided by the client will often include other features unnecessary for the disclosure of the invention at hand. For this reason, the patent agent may opt to redraw these drawings and/or tailor them by using scissors, whiteout, etc.

Client-provided computer screen shots that show the invention in operation can be helpful but the patent agent will also want to consider how such screen shots will look in a patent application. By the time many screen shots have been crafted into acceptable patent drawings, they can be almost impossible to read and often very expensive for a draftsman to prepare.

The patent agent will probably want to prepare his drawings immediately after preparing his patent claims. If the patent agent dictates the detailed description section of the invention, then having a set of drawings in front of him will greatly improve his efficiency. He can simply talk his way through the drawings adding important supplemental information where necessary. This approach can often be used quite successfully to prepare an effective detailed description section for the invention.

4. Background

The use of background sections varies among the world's patent regimes. In some patent systems the background section serves to disclose to the public the closest prior art applied against the patent application during examination. This is the situation in most European systems.

In some countries such as the US, the prior art submitted by the patent applicant, as well as the prior art found by the examiner, is printed on the cover of the patent itself. Consequently, patent background sections in many countries suggest caution. Many practitioners attempt to draft the shortest possible background sections out of fear that they will inadvertently and unintentionally deprive their client of the full scope of patent protection by saying too much about the prior art. For example, a patent application on a computer chip could simply state: "faster computers are usually better." Such a short background section might possibly not serve the public's interest but it will not harm the client's patent or foreclose the scope of the client's possible claim protection.

The background section is typically considered prior art disclosed by the inventor. Consequently, if the applicant's own inventive disclosure ends up in the background section, the patent examiner may cite this section in the rejection of the applicant's claims. Some patent offices take a fairly hard line about inventive disclosures in background sections, which is one of the reasons why patent agents should draft them carefully. If the patent is ever involved in litigation, they will probably come under even greater scrutiny than they did during initial prosecution.

A final caution about background sections is that sometimes the invention itself is inextricably linked with a "new understanding" of the prior art. If this new understanding is described in the background section, pos-

sibly the most novel part of the invention has been described there, although it is not the place where the inventor's novelty should ever be described.

Consequently, a good background section should be fairly short and merely set the stage for the technical disclosure to be provided in the detailed description section. The background section could describe the prior art at a very high level. In some jurisdictions it is not generally helpful to mention specific prior art. The background section may conclude with a short, crisp statement about the shortcomings of the prior art but this must be written in a manner that does not disclose the solution to be described later in the application. It should instead be written in a manner that makes the typical reader think: "Wow! I don't know how anyone could ever solve this problem!"

Some older patent applications include "objects of the invention" paragraphs in either the background or summary sections. Avoid these unless they are required by law in the jurisdictions where you file your applications. The danger is that these statements have a tendency to limit the invention, e.g. "The object of the invention is to provide improved safety" when lower cost is also an object. Another danger is that these statements have a tendency to provide "fraud" arguments, e.g. "An object of the invention is to cure cancer" when relieving symptoms of a particular kind of cancer would be more accurate.

In some countries the findings from various patent cases over the past 10-15 years have caused patent agents to stop drafting such "objects" statements for nearly all applications filed in their jurisdictions.

A patent agent should probably *not* write the background section first. There is a temptation to write this section before anything else. After all, it comes first. However, if the patent agent writes the background section first, there is a danger that he will spend too much time on it and the section will end up being far too long and detailed especially since it is one of the least important parts of the application. One should wait until after drafting the detailed description section before drafting the background section.

5. Abstract

The patent abstract should describe the invention very clearly in the fewest possible words. The patent agent could use a version of the first paragraph of the summary of the invention section as the abstract.

In many of the world's patent systems, abstracts are reviewed only for their adherence to certain maximum length requirements and receive little/no substantive review. For the most part, courts will rarely look to the abstract for an explanation of the invention. Of course, this is not to suggest that the abstract should be misleading or poorly written.

The danger with abstracts is that they may disclose some patentable feature of the invention not also found in the specification. This is a common mistake with new patent agents who tend to draft abstracts early on and not review them again once the patent application has been completed. When reading an abstract that he has

The patent agent should always recognize that while his patent application has distinct parts with a precise order, he should not assume that the application will be read in that order by the patent examiner. In many of the world's patent offices the typical examiner simply has too heavy a workload to read the patent application from cover to cover. In understanding the invention well enough to prepare a first office action, many patent examiners simply review the claims and drawings and possibly a few selected parts of the application. Consequently, a verbose and detailed background section might never even be read by the patent examiner.

PROFESSIONAL TIPS

Don't spend too much time preparing the background. A good rule of thumb is no more than a maximum of two pages and/or no more than 10 percent of the total content of the application.

drafted, the patent agent should always ask himself: "Is all this disclosed in the specification?" If the answer is not strongly "yes," then the patent agent should either add to the specification or modify the abstract.

6. Summary

As noted earlier, not all jurisdictions require a summary of the invention section. However, such sections are customarily prepared in many jurisdictions even when not strictly required by national law. The patent agent may find himself reviewing summary sections drafted by foreign patent agents working on his client's foreign counterpart patent applications. Consequently, the patent agent should understand the precise requirements and customary practice regarding a summary of the invention sections in the jurisdictions of interest to his clients.

Patent agents often make terrible mistakes in drafting summary sections because they are lured into a false sense of the section's importance by virtue of its title. In reality, this is not typically an important section of the application and many errors can be avoided by simply writing the summary section from the claims. In fact, some patent agents prepare the summary of the invention section by taking each of the independent claims in the patent application and turning them into paragraphs. This approach also has as an advantage that the precise words used in the claims will be guaranteed to be in the specification. Many patent agents simply draft the summary of the invention section in a manner that highlights the important aspects of the invention using words drawn from the application's claims.

The summary of the invention section should be one of the last parts of the patent application that the patent agent writes. There is a temptation to draft the summary early on – it comes near the beginning of the application – and the patent agent can test himself on his knowledge of the invention. But he should avoid these temptations and delay writing the summary section until after he has completed the detailed description.

In preparing the summary of the invention sections, avoid providing some sort of "big picture" summary that goes beyond the claims in any manner. The dangers of providing such a summary are many. First, a broad "meta" summary will invariably suggest additional prior art that can be applied against the invention. By explicitly linking the invention in writing to a broader subject it will be difficult, if not impossible, to argue later during prosecution that the prior art does not apply. Second, a broad, big picture summary often includes in some seemingly minor or insignificant way, another concept that is otherwise not well explained in the application. This provides arguments for someone to use against the patent especially during litigation, that the inventor did not provide a complete disclosure because the "summary" mentioned topics not otherwise disclosed in the application. Third, a broad "meta" summary vaguely suggests that the claims are not at the fullest scope of the invention. The client may not be pleased if his patent agent has not sought to protect the full scope of the inventive disclosure.

KEY WORDS

>> BACKGROUND >> SUMMARY >> DETAILED DESCRIPTION >> DRAWINGS >> CLAIMS
>> ABSTRACT >> SPECIFICATION >> TIME-BARRING EVENTS >> NON-DISCLOSURE AGREEMENT
>> PROVISIONAL APPLICATION >> INVENTION DISCLOSURE FORM >> EMBODIMENT
>> FOREIGN PATENT OFFICES >> PARIS CONVENTION >> PERSON OF ORDINARY SKILL IN THE ART
>> DEDICATED TO THE PUBLIC >> UNITY OF THE INVENTION >> BEST MODE >> ENABLEMENT
>> WRITTEN DESCRIPTION

SELF TEST

1. List the parts of a patent application.
2. Give some examples of questions a patent agent might ask an inventor when meeting for the first time.
3. How much time does an applicant have to file a patent application in a Paris Convention country after filing his national application? In a non-Paris Convention country?
4. What is an Invention Disclosure Form? When should an inventor use it?
5. The inventor will always know what the invention is. True or False?
6. If the patent agent helps to identify the invention or gives suggestions to the inventor, does this make the patent agent one of the inventors?
7. Why is it important for the patent agent to understand the invention before drafting the patent?
8. The specification must disclose a working embodiment of the invention. True or False?
9. Which part of the patent application should the patent agent prepare first?
10. The detailed description must describe a working embodiment of the invention. True or False?
11. Subject matter that is dedicated to the public is patentable. True or False?
12. What is "unity of the invention?"
13. What is the "best mode" requirement? Do all countries have this requirement?
14. Patent agents should avoid using words containing absolutes such as "must" and "always," in the patent application. True or False?

C. FILING PATENT APPLICATIONS

Before filing, the patent agent should make sure that the inventor has reviewed, understands and approves the patent application. The typical inventor does not understand the legal requirements pertaining to patent applications and fewer inventors understand and appreciate the special language typically associated with them. The patent agent must be ready to explain to the inventor any parts of the application about which the inventor has questions. The patent agent should not change the patent application to make the language more accessible to persons unfamiliar with patent drafting but he must make sure that the language used is correct. Highly abstract patent claims can sometimes be difficult for inventors to understand. The patent agent should explain the claims and good claim drafting procedure to the inventor and he should not remove abstract language from the claims to make them more accessible to the inventor – otherwise they may not be as broad as the law would permit.

The patent agent must understand the requirements for filing patent applications in all countries of interest to his clients. Among other things he should understand the rules related to formatting his patent application and drawings. In fact, the patent agent may wish to consider preparing a checklist for various items – such as the necessary parts of a patent application, and then compare his application against this checklist. Similarly, the patent agent may wish to have a checklist for various format matters related to the filing of patent applications in the jurisdictions of interest. Other useful checklists could be related to reviewing an application prior to depositing it in the mail and/or electronically filing it with a given patent office and checklists containing items that should be attended to prior to filing a response to an office action.

PROFESSIONAL TIP

Don't let all your hard work go to waste because you missed a minor application requirement that could have been easily caught and dealt with.

The patent agent will typically be required to file a declaration, power of attorney and various government filing fees with the patent application. Depending upon the specific legal requirements of his jurisdiction, he may also file an assignment of invention document or otherwise register the patent application's ownership. Some national patent offices will allow these formal papers to be filed after the filing of the initial patent application while

still allowing the application to retain the benefit of its filing date. The declaration is a statement in which the inventor declares that he has read and understood the application and that he believes himself to be an inventor (or the sole inventor) of the invention described in the patent application. The power of attorney document bestows upon the patent agent the authority to represent the inventor of the subject application in proceedings with the patent office. The assignment document is a contract between the inventor and another party (typically his employer) indicating that the inventor's rights have been transferred to another party. The patent agent should be mindful of who his client is and whether he has the right to represent that party before the relevant patent office in the matter at hand.

Other formal papers that the patent agent may need to file include papers related to national defense. Some countries such as the US, the UK, India and France, have requirements relating to the filing of patent applications in other countries. In the US for example, a US-domiciled inventor must obtain the Government's permission in order to file any patent application abroad. Similarly, many countries have rules related to the export of technical data. The patent agent may wish to be familiar with such rules for his own country so that he does not inadvertently participate in any unlawful transmission of technical data across an international boundary.

1. Domestic/Priority Filings

A client will typically ask his patent agent to make the first filing of a patent application in the country where the inventor is located. The first filing of a patent application establishes the priority date for the family of

patent applications on the invention that may be filed worldwide. The priority date represents the date beyond which prior art will not apply, whether in a first-to-invent country or a first-to-file country.¹⁵ Thus, the patent applicant typically wants the earliest priority date, which is another reason why patent agents should strive to complete their assignments as soon as possible. Inventors and their employers often want patent protection in the country where the inventor works, thus the first filed application tends to be in the inventor's country of residence. The inventor or his employer may want to file patent applications in other countries that accord the benefit of the priority date of the domestic filing under the Paris Convention, which is discussed immediately below. The precise filing requirements for patent applications can vary widely around the world. The patent agent should be extremely well versed in the specific requirements of his jurisdiction. This information is frequently available via the Internet and other publicly-available resources such as libraries.

2. Foreign Filings

The patent agent should ask his client in what countries he would like to file his patent application. He should then provide the client with an estimate of the costs for filing a patent application in those jurisdictions, having reviewed the requirements for filing patent applications in all jurisdictions of interest to the client. For example, the patent agent must determine whether any of the jurisdictions of interest are not members of the Paris Convention.

The Paris Convention is an international treaty that provides a right of priority for patent applications. As of April 23, 2007, there were 171 Contracting States of the Paris Convention. The Convention allows a patent applicant from a Contracting State to use his first filing date as the effective filing date when filing in another Contracting State, provided it is filed within 12 months of the first filing date. For example, if a patent application is filed in Japan less than 12 months after the initial patent application is filed in Canada, the Canadian filing date may serve as the effective filing date for the Japanese application. Under the Paris Convention the initial application must be the first application made on the invention. A certified copy of the initial application may also be required in each country in which a claim of priority is made. The Patent Cooperation Treaty is a special agreement under Article 19 of the Paris Convention and incorporates the 12-month priority period. Further details about the PCT are provided elsewhere in this Chapter.

Provided the patent agent has filed the priority application in a country that is a Paris Convention member and provided that the foreign countries of interest to the client are also Paris Convention members, the patent agent will have 12 months after filing the priority application in which to file counterpart foreign applications in those Paris Convention member countries of interest or to file a PCT application.

EXAMPLE

A patent agent in Erehwon (an imaginary country for the sake of this example) files a patent application on March 8, 2005. Erehwon is a signatory to the Paris Convention. The client would like counterpart applications filed in Japan, France and Canada. Since these countries are also Paris Convention signatories, the patent agent can wait until March 8, 2006 to file counterpart patent applications in Japan, France and Canada that will enjoy the benefit of the priority application's March 8, 2005 filing date. Note: This does not however mean that specific requirements of various national laws will be waived. For example, assume that Erehwon has a six-month grace period from first public disclosure before the patent application is barred from filing. France, on the other hand, requires absolute novelty. Assume that the inventor disclosed absolutely every aspect of his invention to the public two weeks before filing the Erehwon patent application on March 8, 2005. Thus, the Erehwon patent application satisfies the disclosure requirements of Erehwon law but does not satisfy the absolute novelty requirements of French law, even when it receives the benefit of the March 8, 2005 filing date provided by the Paris

15. Of course, patent applications not yet published as of the application's filing can still be cited as prior art in accordance with the rules of many jurisdictions. However, in many such jurisdictions, the earlier filed applications will only be cited in novelty rejections. Also, if the inventor files in a first-to-invent jurisdiction, he may still become involved in a contest to determine "priority of inventorship," but this is something very different from a prior art rejection.

Convention. Now suppose that the inventor first publicly disclosed the invention two weeks after filing the application in Erehwon. Thanks to the Paris Convention, the French application will have March 8, 2005 as its priority filing date and, because of this absolute novelty, will not be compromised for the French application due to the public disclosure prior to the filing of the application in France on March 8, 2006.

For every jurisdiction that is not a Paris Convention member, the patent agent must determine the precise requirements for filing applications in each country. The filing requirements for non-Paris Convention members can vary tremendously. If the patent agent's client wants to file a patent application in a non-Paris Convention country, he should know the requirements for filing in that country even before filing the application in his home country and he should provide appropriate counseling to his clients.

Many clients do not know at the time they file their priority application whether they even want to file foreign patent applications or where they might want to file such applications. For those clients, the patent agent should provide appropriate counseling and he should inform them that Paris Convention filings will be available for up to 12 months after the filing of the domestic patent application but counterpart applications may not be available for some non-Paris Convention countries. The patent agent should also explain the benefits of filing a PCT application within the 12-month Paris Convention priority period. As described below in Part B 4, the PCT has the advantage of postponing the main costs of seeking patent protection in multiple countries until a point where the applicant is better informed about the invention's potential patentability (via the PCT international search report and patentability opinion) and gives the applicant more time in which to determine the set of countries that offer the greatest potential for commercial exploitation of the invention.

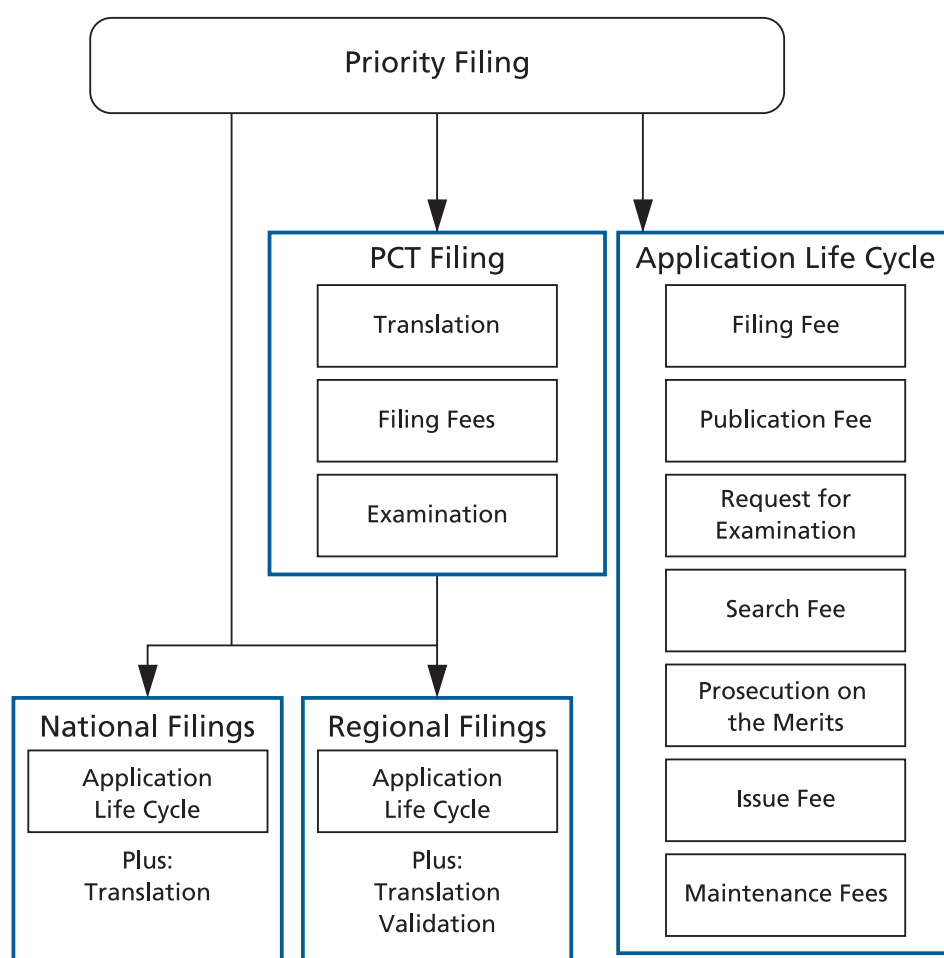
The patent agent should then docket all the foreign filing decision dates and provide reminders to his clients well in advance of any deadlines. The patent agent may also want to establish contacts with foreign associate attorneys in countries where he believes his clients might want to make foreign filings.

3. Fee and Cost Considerations in Application Filings

The patent agent should provide the client with sufficient information regarding fees and costs for him to devise a meaningful patent strategy within his budget constraints. The patent agent should also inform the client when these fees and costs will be assessed. So, for example, it may be helpful to tell a client that filing patent applications in five countries and maintaining the issued patents through to the end of their terms could cost a great deal of money, e.g. to the order of €150,000. But, it may be much more helpful for the client to know that only a portion of the total cost will be assessed during the first five years after filing the priority application, with the remaining cost comprising variable expenses that could be undertaken over a 20-year period.

Some jurisdictions offer reductions in fees for applications filed by certain parties such as, for example, sole inventors, universities, research institutions and/or small companies. The US for example, provides for a 50 percent discount for most of the fees paid by sole inventors, non-profits and small companies. The patent agent should understand the ways in which his client can lower the amount of government fees and provide such information to his client.

The following diagram provides an overview of the filing process and its related fees. The process begins with the preparation of a priority application filing.



The “Application Life Cycle” box in the right column of the figure depicts the typical phases involved in patent prosecution from a cost perspective. These are the phases through which the priority application will pass in the country of its original filing. As discussed above, the priority application is frequently filed in the inventor’s country of residence, although there are other possibilities such as the country of the inventor’s company.

The fees that may be associated with the “Application Life Cycle” include: filing fees, publication fees, request for examination fees, search fees, prosecution-related fees, issue fees and maintenance fees. Each of these fees may have an associated cost for professional service fees (e.g. patent agent fees), and in some instances the professional service fees will be higher than the government filing fees. Some of these fees, such as request for examination fees, are not charged in every jurisdiction. In many jurisdictions there are no specific government fees for prosecution on merit. However, prosecution on merit may incur a significant amount of professional fees as this is the phase where the patent agent is performing tasks such as reviewing prior art cited by the patent examiner and amending the claims to overcome the cited prior art. Most jurisdictions assess an issue fee in order to bring a patent into force and most charge some sort of maintenance fee to keep a patent in force.

The priority application can be used as the basis for national, regional and PCT filings. If the client opts for a PCT filing within twelve months of filing the priority application he can file a PCT application that claims the filing date of the priority application. A translation of the priority application may be necessary if it has been written in a language other than Chinese, English, French, German, Japanese, Russian or Spanish. Translation of complicated technical/legal documents such as patents can be expensive.

Since there is no such thing as a “PCT patent” or a “world patent,” applicants who file PCT applications will eventually have to “enter the national phase” before the national or regional patent offices where they wish to pursue patent protection. The PCT, however, is an effective mechanism for postponing foreign filing decisions, which may save some clients money and/or allow them to make more informed filing decisions later.

The client may opt for directly filing a patent application in a given country or national patent office rather than filing a PCT application. For Paris Convention countries and regional offices these filings will need to be done within a year of the priority application’s filing date in order for the subsequently-filed counterpart applications to claim the priority application’s filing date. There is great variety among the non-Paris convention countries, so the patent agent will need to check if the specific country honors a priority application’s filing date and under what conditions.

The national-phase process in most countries will very much resemble the “application life cycle” process that the priority application will undergo in its home country. The client may need to provide a translation of the priority application in those countries that do not accept applications written in the language of the priority application. The timeline for providing such translations can vary from country to country. As noted above, the costs for obtaining a translation of a complicated legal/technical document like a patent can be expensive. Thus, if the client is interested in filing counterpart applications in five countries other than the priority application’s filing, and none of those five countries accepts applications written in the language of the priority application, the client will need to provide five translations (which can amount to a substantial sum).

The regional-phase process such as applications filed with the EPO, also follows a fairly similar “application life cycle” process. Additionally, the regional offices may also have similar translation requirements to the PCT. The EPO, for example, will accept applications in English, French or German and allow the prosecution of such applications to be completed in one of those three languages. However, once the application has been approved for grant by the regional office, the patent applicant will need to attend to various validation procedures at various national patent offices associated with the regional patent office. This process may also require translation of the application into another language.

For example, assume that an application written in English has been filed with the EPO and assume further that the patent applicant has designed five countries: Spain, Italy, Austria, France, and Portugal on the EPO application. After successful prosecution before the EPO, the patent applicant will need to pay the validation fee for these countries and provide a translation of the English application in Spanish, Italian, German, French, and Portuguese. The validation fees and the translation costs can sometimes be quite substantial. However, the patent applicant can apply business judgment criteria at many points during the foreign filing process. Consequently, the patent agent should be able to provide sound advice regarding fees and costs and their timing to his clients.

4. Application Filing Requirements in Specific Jurisdictions

The application filing requirements vary from country to country. The following information is intended to be informative rather than to provide a step-by-step guideline for filings in these jurisdictions.

a. *European Patent Convention Filings*

The European Patent Convention (EPC) is the treaty that created the European Patent Office (EPO). The EPC provides the framework for the granting of European patents via a single, harmonized procedure before the EPO, which functions as a common examining office for patent applications filed under the EPC. Once the application has been approved, it grants a patent in each of the Contracting States designated by the appli-

cant. All Contracting States still remain responsible for granting or rejecting patents filed directly in their respective countries.

Applications filed with the EPO must include some indication as to in which Contracting States the applicant would like to receive patent protection. The applicant can designate one state, all member states or something in between. As of February 2005, the EPO fee structure has been set so that the fee for designating seven countries is the same as that for designating all 30 Contracting States. Thus, if the applicant contemplates patent protection in at least seven of the Contracting States, the patent agent might as well designate all the states and then let the applicant determine those of interest later when the application has been granted. Once an application has successfully completed the EPO examination process and the opposition time has passed with no successful opposition, the procedure moves to the designated countries. The applicant can then decide in which of the originally-designated countries he wishes to validate the application. For example, the applicant might have originally designated six countries but when the application issues, he may only wish to validate the patent in three of the six countries. A complete discussion of the economics of patent prosecution is beyond the scope of this manual. However, a patent agent should counsel his client regarding the costs of protecting patents worldwide and address the question as to how costs can be limited by filing only where patent protection is necessary for the business objective of his client. For example, validating a patent application in many countries in Europe will require translating the application into that country's national language and paying the country's patent issuance fees. To keep the patent in force in the validated countries the owner will also have to pay various annuity fees throughout the patent's lifetime. While annuity fees and translation costs vary from country to country, the patent agent should not be surprised to learn that the total lifetime costs for any set of five European countries exceed €200,000. In such a case it is important to consider how to strategically limit the number of countries where filing is sought to only those necessary; that is where the client will be making, using or selling products that are covered by the patent.

b. US Patent and Trademark Office Filings

The United States Patent and Trademark Office (USPTO) is the agency responsible for receiving and examining patent applications in the US. The USPTO ultimately decides whether a patent will be granted or rejected. The preparation of a patent application and the accompanying documents may offer a challenging task and the patent agent should know the requisite formalities of the USPTO before undertaking a filing in the US.

In the US, a non-provisional patent application must include claims, an abstract, a specification, drawings and an oath or declaration. A "non-provisional" utility application is an application that includes claims, while a "provisional" application need not necessarily include claims and is primarily used to establish a priority date. A patent application must be in English or be accompanied by an English-language translation and statement that the translation is accurate. All paperwork must be typewritten or produced by a printer.

A "Utility Patent Application Transmittal Form" or a transmittal letter should be filed with every patent application. The purpose of this form or letter is to inform the USPTO as to what types of papers are being filed (e.g. specification, claims, drawings, declaration and information disclosure statement). The transmittal also serves to identify the name of the applicant, the type of application, the title of the invention, the contents of the application and any accompanying enclosures.

A "Fee Transmittal Form" may be used to calculate the prescribed filing fees and indicate the method of payment, whether by check or by credit card. The amount of fees is dependent upon the number and type of claims presented and whether or not a written assertion of small entity status is provided. Small entity status such as for individual inventors typically reduces the government fees by half. In some countries, the fee calculation depends upon other factors such as the number of pages in the application and the number of drawings.

The filing, searching and examination fees for a patent application should be submitted with the application and must be made payable to the "Director of the United States Patent and Trademark Office" if paid by check. If an application is filed without the fees, the applicant will be notified and required to submit the fees within the time period set down in the notice. If the basic filing fee was not paid at the time of filing the application, a surcharge will also be required for late acceptance of the basic filing fee.

The application data sheet contains bibliographic data such as applicant information, correspondence information, application information, representative information, domestic priority information, foreign priority information and assignment information.

The patent application should include an oath or declaration signed by each inventor to the effect that he/she believes himself/herself to be the original and first inventor of the subject matter of the application. The oath or declaration must be in a language that the inventor understands. If the oath or declaration used is in a language other than English and is not in the format provided by the United States Patent and Trademark Office, an English translation and statement that the translation is accurate are required.

c. Patent Cooperation Treaty Filings

The Patent Cooperation Treaty (PCT) is a multilateral treaty that became effective in 1978. The PCT is administered by the International Bureau of the World Intellectual Property Organization (WIPO) whose headquarters are in Geneva, Switzerland. The member countries of the PCT are called PCT Contracting States. As of August 1, 2006, there were 133 PCT Contracting States.

The PCT enables a patent applicant to file one "international" patent application to seek protection in any or all of the PCT Contracting States. The "international" patent application has the effect of filing a regular "national" patent application in each designated state¹⁶ and it is important to understand that WIPO does not issue a "PCT patent" or "international patent" that provides protection in all the Contracting States.

Patents are granted or rejected by each PCT Contracting State or regional office individually under their respective patent laws. Thus, an applicant must still prosecute a patent application in each country or regional office in which he seeks protection and pay the national or regional fees.

The main advantage of filing a PCT application is the additional time gained before having to prosecute applications in other countries after the initial filing. Without the PCT the applicant generally has 12 months to file patent applications in other Paris Convention countries after filing the initial application. In contrast, by using the PCT the applicant has at least 30 months (and more in many countries) from the date of initial filing to begin prosecuting his application in other countries – effectively gaining 18 months. This delay provides time to obtain knowledge as to the patentability and commercial prospects of an invention. It also postpones the major costs of internationalizing a patent application such as paying national/regional fees, translating the patent application and paying fees to local patent agents in the various countries.

In addition to the time gained, the PCT provides applicants with value-added information on which they can base their patenting decisions. The international search report and the written opinion of the International Searching Authority give applicants a high quality, realistic look at the patentability prospects of their invention.

16. The term "designated states" refers to the countries in which the applicant wishes to obtain protection. The filing of a request constitutes the designation of all Contracting States that are bound by the Treaty on the international filing date.

The PCT procedure consists of two main phases: the “international phase” and the “national phase.”¹⁷ The international phase consists of

- (1) filing of the international application either with a national/regional “Receiving Office” or the International Bureau of WIPO,¹⁸
- (2) novelty search on the patentability of the invention (including an international search report and a written opinion on potential patentability),
- (3) publication of both the PCT application and the international search report by WIPO, and
- (4) (optional step) request for an international preliminary examination of the international application.

After the international phase, the application enters the “national” phase, which consists of processing the international application before each Contracting State that has been designated in the international application and in which the applicant wishes to pursue patent protection. Certain requirements must be fulfilled *in order to* enter the national phase. These requirements include paying national fees and, if necessary, furnishing a translation of the application (as filed and/or amended). Note that the filing of the PCT request together with the application constitutes the designation of all Contracting States that are bound by the Treaty on the international filing date. In the national phase, the applicant selects the particular States in which he wishes to obtain protection for his invention.

A PCT application must contain the following elements: request, description, one or more claims, one or more drawings (where drawings are necessary for the understanding of the invention) and an abstract. The request is simply a form that is filed with the international application. It is available in all publication languages and may be downloaded, free of charge, from the PCT website (<http://www.wipo.int/pct/en/forms/index.htm>) in English, French, German, Russian and Spanish. Also, any applicant may obtain copies of the printed request form, free of charge, from a Receiving Office or from WIPO.

Any national or resident of one of the PCT Contracting States may file an international patent application. Where there are two or more applicants, at least one of them must be a national or resident of a Contracting State. The most current list of Contracting States may be found in the *PCT Newsletter*¹⁹ and on the WIPO web site.²⁰

An international patent application may be filed with the applicant’s national patent office or with WIPO in Geneva, Switzerland. The national patent office will in most cases act as a “PCT Receiving Office.” If the applicant is a national or resident of a country which is party to one of certain regional patent treaties (the ARIPO Harare Protocol, the OAPI Bangui Agreement, the Eurasian Patent Convention or the European Patent Convention), he may alternatively file the international patent application with the regional Patent Office concerned if permitted by the applicable national law. National security provisions may however oblige the applicant to first file a national patent application or to request an authorization from his national patent office before filing abroad.

In general, an international patent application may be filed in any language which the receiving office is prepared to accept. At least one of the accepted languages should also be accepted by the International Searching Authority and a publication language, *i.e.* Arabic, Chinese, English, French, German, Japanese, Russian or Spanish. Thus, if the application is filed in a language that is not accepted by the International Searching Authority, a translation of the application for the international search must be furnished.

17. The expressions “national phase” and “international phase” are not actually used in the PCT but are convenient, shorthand expressions customarily used.

18. Hereinafter, the International Bureau of WIPO in Geneva, Switzerland is referred to as “WIPO” for simplicity.

19. See <http://www.wipo.int/pct/en/newslett/>

20. See <http://www.wipo.int/treaties/en/documents/pdf/pct.pdf>

When seeking patent protection through the PCT the applicant will potentially have to pay two sets of fees during the international phase. The first set of fees covers the filing of the application with a PCT Receiving Office or directly with the International Bureau as a PCT Receiving Office, the international search and international publication.²¹ Those fees are paid directly to the PCT Receiving Office. If the applicant opts for an international preliminary examination, additional fees must be paid to the International Preliminary Examining Authority. It is highly recommended that the applicant use the fee calculation sheet to calculate the total amount of fees payable to the Receiving Office when filing an international application.

The second set of fees is comprised of the national or regional fees payable in relation to the Contracting States in which the applicant intends to seek protection. Generally, the national phase-related fees are the most expensive part of prosecuting a PCT application as they contain translation fees, official fees and payments for services to local patent agents. These fees are paid directly to the Offices concerned before entering the national phase. Since the national fees vary from State to State, the patent agent should consult the National Chapters of the *PCT Applicant's Guide* for the exact amounts. National fees must be paid in the currencies and within the time limits listed in the *PCT Applicant's Guide*. If annual or renewal fees have become due by the time the national phase starts, they must be paid before the expiration of the time limit applicable for entering the national phase. The applicant may wish to consider how the number of claims that he has presented in the patent application affects the fees that he has to pay for annuities, examination fees, etc. In some instances, the applicant may wish to cancel some claims rather than pay a high price for maintaining large claim sets of limited strategic value.

The PCT allows fee reductions for certain applicants. An applicant who is a natural person²² and who is a national of and resides in a State whose per capita national income is below \$3,000 USD is entitled to a reduction of 75 percent of the international filing fee and certain patent offices may give similar reductions. This same 75 percent reduction applies to any person, whether a natural person or not, who is a national of and resides in a country classified by the United Nations as a "Least Developed Country." If there are several applicants, each must satisfy those criteria. In the national phase, exemptions, reductions and refunds of national fees may be granted by various designated Offices. The National Chapters in the *PCT Applicant's Guide* contain information on whether fee exemptions, reductions or refunds can be claimed and, if so, under what circumstances and in what amounts.

There are also fee reductions for filing an international application electronically or for using PCT-EASY (part of the PCT-SAFE software). WIPO's electronic filing software, PCT-SAFE, offers PCT users the means to prepare their international applications in electronic form and to file them either via secure on-line transmission or using physical media such as CD-ROM or DVD. Other PCT-compatible filing software is made available by certain Offices. Full electronic filing is possible with a limited number of Receiving Offices and with the International Bureau. About 50 percent of PCT applicants make use of partial or full electronic filing. More information on PCT-SAFE is available on the Internet at <http://www.wipo.int/pct-safe/en>.

21. There is a basic flat fee for filing the international application. In the past, the fee was determined by the number of States an applicant "designated" for protection. As of January 1, 2004, the filing of the PCT request automatically designates all Contracting States.

22. A natural person refers to an individual not a corporation or partnership.

Timeline for Filing a PCT Application

The timeline below shows the basic steps in filing a PCT Application.



0-Months

Typically, the start of the PCT application timeline occurs when an applicant files a national patent application in his home country. In his subsequent PCT application he may claim the date of filing of the local application as the “priority” date. The priority date means the filing date of the earliest application whose priority is claimed. For each priority claimed, a certified copy of the earlier application must be furnished before the end of the 16th month from the priority date. If no priority application is claimed, the PCT filing date will serve as the priority date.

12-Months

Under the Paris Convention an applicant has 12 months from the filing date of his first application to file a PCT international application for the same invention. This application is typically filed in the same national patent office as the local application but may also be filed with the Receiving Office of the International Bureau.

16-Months

After a PCT application has been filed, the International Searching Authority (ISA) (which has qualified to be appointed as a PCT ISA and which has been selected by the applicant to carry out the search) will carry out an international search on novelty and inventive step and issue an international search report and a written opinion on patentability. Where a choice of ISA is possible the patent agent must indicate the choice of ISA on the request form (PCT/RO/101) that is filed with the international application.²³ The report should be available to the applicant by the fourth or fifth month after the international application is filed. The international search report contains no comments on the value of the invention but lists prior art documents relevant to the claims in the application, indicating the respective patentability criteria to which the prior art documents correspond. The written opinion mainly provides an initial patentability opinion based on the findings in the search report. The search report and written opinion are valuable to the applicant because they enable him to evaluate his chances of obtaining patents in the countries in which he desires to seek protection. A favorable search report may assist an applicant in subsequent prosecution of the application during the national phase. However, if a search report is unfavorable (lists prior art documents that question the novelty and/or inventive step of the invention), the applicant has the possibility to amend the claims within a certain time limit (to better distinguish the invention from the prior art) or may withdraw the application before publication. Claims which are amended at this point will be published with the international application.

23. The following are the International Searching Authorities: the National Offices of Australia, Austria, Canada, China, Finland (not yet operational) Japan, the Republic of Korea, the Russian Federation, Spain, Sweden, and the US, and the EPO. The Nordic Patent Institute (an inter-governmental organization established by the Governments of Denmark, Iceland and Norway) has been appointed by the PCT Assembly and will begin functioning as an ISA and IPEA in the near future.

18-Months

If the international application has not been withdrawn it is published, together with the international search report and any amended claims, by WIPO shortly after 18 months from the priority date. The publication uniformly discloses to the world the content of the international application. Note, however, that the written opinion of the International Searching Authority is not published.

22-Months

In the next step, the applicant has the option of requesting an international preliminary examination of his application by filing a demand form (PCT/IPEA/401) and paying the relevant fees. The preliminary examination is based upon novelty, inventive step (non-obviousness) and industrial applicability (utility) and is carried out by an International Preliminary Examining Authority (all the same patent offices which act as International Searching Authorities). For applications filed on/after January 1, 2004 the time limit for filing a demand for an international preliminary examination is the later of (a) three months after the International Searching Authority issues its report/written opinion, (b) three months from the date of the declaration under Article 17(2)(a) that no search will be carried out, or (c) 22 months from the priority date.

28-Months

The international preliminary examination report should be provided by the 28th month after the priority date. Even though the report is not binding on National or Regional Offices, it is valuable to applicants because it provides a strong basis on which to evaluate the chances of obtaining patents. The international preliminary examination procedure provides applicants with an opportunity to amend the full application – amendments to the description, claims and drawings can be filed together with the demand. Applicants most often request international preliminary examination when they would like to have the as-amended application reviewed. It is important to remember that the granting of a patent in each Contracting State remains the responsibility of each National or Regional Office.

30-Months

Applicants must enter the national phase before the expiration of the time limit set in PCT Article 39(1). The minimum time limit is 30 months from the priority date but many Contracting States extend that time limit to 31 months or even more.²⁴ Designated Offices usually do not issue any reminders to applicants that the time limit for entering the national phase is about to expire (or has just expired). It is the applicant's responsibility to monitor the applicable time limit(s) in order for the application not to lose its effect before the designated Offices. If an applicant fails to complete all of the required acts to enter the national phase before the time limit expires, the international application loses the effect of a national application and the procedure comes to an end before each Office not completed. Reinstatement of rights in case the applicant fails to meet the time limit for entering the national phase is provided for in the PCT and in some national laws.

When entering the national phase the applicant must fulfill certain national requirements. They include paying national fees and, where necessary, filing translations of the application as filed and/or amended. Many countries require additional acts to be completed upon entering the national phase such as the appointment of local agents. Please refer to the National Chapter relating to each designated Office in the *PCT Applicant's Guide* for more information.²⁵

For complete information about filing a PCT application, please refer to the *PCT Applicant's Guide* and the *PCT Newsletter*.²⁶ A significant amount of information is available on the PCT website: www.wipo.int/pct/en/.

24. As of August 2006, the National Offices of the following States do not apply the 30-month time limit for entering the national phase under Chapter I as fixed in PCT Article 22(1): CH Switzerland, LU Luxembourg, SE Sweden, TZ United Republic of Tanzania, and UG Uganda [announced in the November 2005 PCT Newsletter]. Note, however, that with respect to the *regional* designation of all those States, the time limit under PCT Article 22(3) of 31-months applies.

25. The *PCT Applicant's Guide* exists as a free, online publication at <http://www.wipo.int/pct/guide/en/>.

26. <http://www.wipo.int/pct/en/newslett/>.

5. Comparative Laws and Requirements

The patent agent must be able to research and understand the different application and filing requirements that arise from jurisdiction to jurisdiction. The following table illustrates some of the differences between three jurisdictions – the EPO, the US and India. The information provided here is not exhaustive but is representative of the differences between these three jurisdictions.

Comparison of Patent Filing Requirements and Patenting Issues in the Indian Patent Office, the European Patent Office and the US Patent Office

TOPIC PATENT OFFICE	EPC EPO	US USPTO	IN IPO
Conditions for Filing			
Who is the Inventor	First to file	First to Invent	First to file
Time period	Absolute novelty, however, some variations may be found in the national laws or practices of the convention countries	1-year grace period	Absolute novelty, see Sec. 29-32
Sale Bar	No	Yes, 1-year grace period	No
Application	As EP direct filing; As EP regional filing from Paris Convention and/or PCT	As US direct filing; As US national filing from Paris Convention and/or PCT	As IN direct filing; As IN national filing from Paris Convention and/or PCT
International filing in the absence of a first national filing	None <i>per se</i> , but the UK and France (and possibly others) have such requirements	Foreign filing review required	Permission from controller required for all applications, see Sec. 8
Application Types			
Provisional	No	Yes, but a provisional may not claim the priority of another provisional	Yes, multiple provisional filings allowed, but a provisional may not claim the priority date of another provisional
Utility	Yes	Yes May claim priority date of a provisional filing	Yes May claim priority date of a provisional filing
Divisional	Yes	Yes ("divisional" if lack of unity in parent, "continuation" if for more claims)	Yes
Continuation-in-part	No	Yes	Yes, patents of addition are improvements of existing patents
Design	No, but there is a European community design right	Yes	Yes, industrial design registration
Utility model	Yes, existent in AT, DE, IT and FR; not granted by EPO but nationally	No	Yes
Filing date	Date of submission of description, claims and request for patent at the EPO; Note: no fees necessary to obtain a filing date	Date of submission of description, claims and request for patent; Note: no fees necessary to obtain a filing date	Date of submission of description, claims and request for patent

TOPIC PATENT OFFICE	EPC EPO	US USPTO	IN IPO
Publication	18 months, usually published with search report	18 months unless request non-publication (and not foreign filed)	18 months, facility for early publication upon payment of fee
Application Contents			
Language	English, French, or German	English	English, Hindi
Background	Short description	Terse as possible	Does not appear to be required by the law or rules; if not required, write tersely
Objects of invention	"Problem to be solved by the invention" needs to be formulated	Advisable to avoid	Does not appear to be required by the law or rules
"Best Mode" disclosure required?	No	Yes, best mode at the time of filing	Sec. 10(4)(b) requires disclosure of best method for performing the invention
Problem/solution format	Yes	Not required	Not required by the law or rules
Summary of Invention and Abstracts	As concise as possible, should not exceed 150 words in any case	Should equal scope of claims be sought, the abstract may not exceed 150 words	Not required by the law or rules; should not exceed scope of claims. The abstract should summarize the invention
Substantive issues	Exclusions from patentability, such as methods of treatment/diagnosis, software <i>per se</i> ; inventions against " <i>ordre public</i> " or morality. New use of known substance patentable. Inventive step present if not obvious. Standard: "could-would" approach; secondary indicia for the presence of an inventive step, such as surprising effect, fulfillment of long-felt need, overcoming a prejudice in prior art	No explicit exclusion for inventions against " <i>ordre public</i> " Obviousness judged from the viewpoint of the average person skilled in the relevant art; secondary characteristics of non-obviousness include economic success, long-felt need etc.	Exclusions from patentability, per Chapter 2, Article 3 include methods of treating the human body, business methods, software " <i>per se</i> " (e.g., s/w embedded in hardware is okay), plants, animals (but microorganisms and gene sequences is okay), inventions against the " <i>ordre public</i> ," methods of agriculture or horticulture. Polymorphs, metabolites, salts, esters, ethers, pure form, particle size, isomers, mixtures of isomers, complexes, combinations and other derivatives of known substances shall be considered to be the same substances, unless they differ significantly in properties with regard to efficacy
Claims			
Types Available	Apparatus, method, composition, use, product-by-process, Swiss-type format	Apparatus, system, method, composition, product-by-process, data structure, computer-readable medium	Apparatus, method, product, process (new use of a known substance not available.)
Format	2-part format preferred; usually one claim per category; multiply dependent claims common	No format preferred by USPTO, but practitioners prefer not to use 2-part form	No format specified by the law or rules.
Numbera	Filing fee provides 10 claims, additional claims can be purchased on payment of fee	Filing fee provides 20 claims – 3 independent and 17 dependent; additional claims may be purchased	Filing fee provides 10 claims, additional claims can be purchased on payment of fee

TOPIC PATENT OFFICE	EPC EPO	US USPTO	IN IPO
Disclosures			
Prior art disclosure	No duty to disclose	Duty to disclose	No duty to disclose
Deposit requirement	Yes	Yes	Yes
Examination			
How examined	Upon request; request needs to be filed within six months of publication of search report	As soon after filing as possible	Upon request, request needs to be filed within 48 months of the application's filing
Time for Responding to Office Action	Typically four months, one extension by two months possible; further extensions possible only under exceptional circumstances	Typically, three months with extension to six months possible, extensions are granted after the fact	six months, plus three months with payment of fee, extensions must be requested before the deadline
Opposition	Post-grant	No, but reexamination	Pre-grant and post-grant
Rights Conferred	Must seek validation in designated member countries; validation by filing a translation of granted patent in national patent office; once validated in a country, a European patent confers the same rights as a national patent in this country – provides 20 years of protection from the filing date of the earliest priority application – but no enforceable rights until grant	Protection in US and territories for 20 years from the filing date of the earliest priority application – but no enforceable rights until grant	Protection in India for 20 years from the filing date of the earliest priority application – but no enforceable rights until grant
Maintenance Fees			
Pre issuance	1 st annuity due is for the third year from filing date; annuities paid to EPO	None	None <i>per se</i>
Post issuance	Annual payment to respective national offices	Paid three times during patent lifetime.	Annual payment, paid before the beginning of the year, but with extensions possible with payment of late fee escalating month by month
Laws and Regulations	Law = EPC Rules/Admin = Guidelines for Examination, Ancillary Regulations to the EPC	Law = 35 USC Rules = 37 CFR Admin = MPEP	Law = Patent Act of 1970, amended 1999, 2002 and 2005 Rules = Patent Rules of 2003 Admin = Draft MPPP

KEY WORDS

>> DECLARATION >> POWER OF ATTORNEY >> ASSIGNMENT >> PARIS CONVENTION
>> US PATENT AND TRADEMARK OFFICE >> EUROPEAN PATENT CONVENTION >> CONTRACTING STATE
>> PATENT COOPERATION TREATY >> PRIORITY DATE

SELF TEST

1. What is a declaration?
2. An assignment document is a contract between the inventor and another party that indicates that the inventor's rights have been transferred to the other party. True or False?
3. What effect, if any, does the Paris Convention have on an application's priority date?
4. The European Patent Office functions as a common examining office with each Contracting State ultimately responsible for granting patents. True or False?
5. What are the functions of the US Patent and Trademark Office?
6. Explain the difference between a non-provisional utility application and a provisional utility application.
7. What are the advantages of filing a PCT patent application?
8. If a patent is granted under the PCT, WIPO will issue a "PCT Patent" that is effective in all Contracting States. True or False?
9. If a patent applicant uses the PCT, does he still need to prosecute the application in each country in which he seeks protection?
10. What are Receiving Offices as per the PCT?

IV. PROSECUTING PATENT APPLICATIONS

In addition to preparing and filing a high quality patent application, a patent agent must skillfully and articulately advocate the patentability of his client's invention before the patent office reviewing the application. This process is called "patent prosecution." Once a patent examiner has reviewed the pending patent application and prepared an office action, the patent agent must prepare a respectful response to the patent examiner's objections and rejections in the office action. In the response the patent agent must explain the differences between the invention and the prior art cited by the examiner.

The period between filing a patent application and receiving a first office action is at least two years for many patent offices. For most patent applications in most patent offices there is typically a long period of inactivity following the applicant's completion of the necessary filing formalities, although eventually the application will be reviewed by a patent examiner. The patent examiner will consider any prior art cited by the applicant and will typically conduct his own search of the prior art and apply this against the claims pending in the application.

Most patent offices assign their examiners in groups related to specific technical subjects. The examiners in these groups tend to review a vast number of patent applications for closely-related inventions. Not surprisingly, these examiners tend to become familiar with the prior art in their subject area. Some patent offices even supply their examiners with access to collections of prior art specially focused on their area of technical expertise. Of course, the patent examiners themselves typically hold engineering degrees related to the technology field of the applications that they review. Many patent examiners hold advanced degrees in science and engineering and some even have legal training.

The prior art cited by an examiner does not necessarily constitute the earliest, best or even most original technical disclosure. The patent examiner has no duty to find the earliest teaching on a given technical subject. All he has to do is find a disclosure prior to the patent application's effective date that discloses the invention the applicant is trying to claim. It is not uncommon for an examiner to find a particularly favored piece of prior art that he cites over and over again in the applications that he reviews. Patent examiners often cite earlier patents and published applications as pertinent prior art, although examiners may also cite technical articles, books, treatises, etc. as well.

The effective date for the prior art that can be applied against a pending application varies from country to country. Most countries have "first-to-file" systems. In such countries any technical disclosure made public just one day prior to the filing of an application is pertinent prior art – including the applicant's own public disclosure. The "non-disclosure before filing" aspect of such systems is known as an "absolute novelty" requirement. In other words, the applicants' first public disclosure of an invention (without a confidentiality agreement in place) must be to the relevant patent office in order to qualify for patent protection.

The requirements of "absolute novelty" vary from country to country, so even when the patent agent learns that his client has publicly disclosed his invention without the recipient being subject to a confidentiality agreement, he should see if the facts of the disclosure fall within one of the exceptions to the "absolute novelty" requirement. For example, in some countries having an absolute novelty requirement, inventions whose operation cannot be discerned from a public disclosure represent an exception to the absolute novelty requirement and the invention may still be available for patenting. The precise requirements of every nation's "absolute novelty" requirement are beyond the scope of this manual.

A few other countries, most notably the US, have "first to invent" systems. In a "first to invent" system an inventor is legally defined to be the first person to conceive of an idea and reduce it to practice. In such a system, prior public disclosure of an invention before the filing of a patent application becomes less important (since the focus is on the conception date), and "first to invent" regimes do not typically require "absolute novelty" prior to the filing of a patent application but provide a grace period for the inventor (who has already conceived of the invention before its public disclosure). Accordingly, the inventor may publicly disclose his

invention and then wait a while before filing his patent application. In such countries, any technical disclosure made public prior to the application's filing may be cited as prior art – but the inventor will be accorded a time period in which to show that he completed his invention prior to the public disclosure cited against him. First-to-invent systems also typically have an absolute time bar for filing a patent application after public disclosure of the invention. For example, in the US the absolute time bar for filing an application after first public disclosure is one year. This bar prevents an inventor from filing a patent application many years after its creation. Similarly, such first-to-invent patent systems have an absolute time bar for the inventor to show that the invention had been completed prior to the disclosure of the prior art cited against him. In the US the time period for both barring events is one year. One reason behind these rules is simply the level of effort that would be required to administer such a system. Remember that first-to-file systems typically maintain no grace period, unlike first-to-invent systems, so an invention can potentially be time barred by any publication or patent application prior to its filing, including the inventor's own publications.

EXAMPLE

Assume that on March 1, 2005 an engineer produces an invention and completes a working prototype three days later. He goes to a local trade show²⁷ and publicly discloses his invention on May 5, 2005. He takes orders for the invention at the trade show and devotes substantial amounts of time to building a business around the sales of the invention. In October 2005 the engineer begins to wonder if he should patent the invention. He speaks with a patent agent who tells him that he can still file a patent application in a first-to-invent patent system such as the US. Since his first public disclosure of the invention was on May 5, 2005, he has until May 5, 2006 to file his patent application in the US. The engineer instructs the patent agent to prepare and file a patent application. The application is filed on Dec. 1, 2005 in the US. However, the engineer cannot file his patent application in any country having an absolute novelty requirement because of the disclosure of the invention at the trade show in May 2005.

The patent examiner reviewing the patent application finds prior art that discloses the engineer's invention completely. This prior art was published on April 1, 2005. To overcome the prior art rejection, the patent agent files a declaration signed by the engineer stating that he completed his invention prior to April 1, 2005. The patent examiner removes the rejection.

Assume further that the patent examiner conducts another patentability search and finds prior art that discloses the invention as claimed. Assume further that this prior art was published on November 31, 2004 – more than a year before the engineer's filing date. The patent agent cannot argue that this cited prior art (published on November 31, 2004) occurred after the date of invention (March 1, 2005). The patent agent cannot file a declaration of prior inventorship for any prior art published before the engineer's invention date of March 1, 2005. However, the patent agent can still argue that the invention differs from the prior art, and can amend the pending claims to highlight these differences.

Generally, a patent application filed prior to one's own patent application becomes pertinent prior art upon its publication or issuance as a patent. The effective date of such applications/patents as a prior art date will not be its publication date or its issue date, but rather its filing date even though the application itself was not made public until after the filing of the pending application. Example: A files a patent application on January 1, 2005 with the EPO. B files a patent application on November 1, 2005. A's patent application is published on July 7, 2006 according to EPO rules. A's published patent application is prior art to B's patent application, even though A's patent application was not published until after the filing of B's patent application. In other words, the effective date of A's application is the filing date, not the publication date. However, according to the EPO's rules A's published application can only be cited for novelty destroying purposes against B's application. (Note: this pertains to A's patent application as "prior art" to B's patent application

27. Article 11 of the Paris Convention provides an exception for "international exhibitions." The patent agent should inquire further if the inventor has demonstrated the invention at an exhibition that might be deemed "international." If so, then the patent agent should understand further the precise procedural and substantive requirements that he will have to satisfy to show that the disclosure occurred at an "international" exhibition with respect to each national patent office that may be of interest to his client.

and is a consideration completely separate to “priority of invention” should A and B happen to have identical patent claims. Priority of invention arises in first-to-invent systems when it becomes necessary to determine which inventor of two or more inventors first conceived their respective inventions since only one of them can receive the patent for the invention. As discussed, the EPO is not a first-to-invent jurisdiction.)

A. RESPONDING TO OFFICE ACTIONS

Most of the world’s major patent offices have a backlog of patent applications waiting to be reviewed. For some patent offices and for some technical areas the wait can be several years. Additionally, some patent systems allow applicants to defer examination for a period of time. However, eventually a patent examiner will review a pending application and issue an “office action” also known as an “official action,” “official communication” or “examination report.”

An office action represents the government’s official position on the pending patent application. The office action may address almost any aspect of the application from its title to the length of abstract. The most important parts of the office action touch upon the basic questions related to the patentability of the pending claims. The patent agent should inform his client immediately when an office action has arrived and should explain the patent office’s findings to his client.

The examiner may question whether the specification provides sufficient disclosure for an ordinary person skilled in the art to understand and practice the invention as claimed – such questions are known as “enablement” rejections. The examiner may also question whether the specification provides sufficient disclosure for a particular feature recited in the claims. The patent agent can rebut these rejections by showing where the specification actually discloses the allegedly missing subject matter, arguing that the missing subject matter was sufficiently known in the prior art that its disclosure was not necessary for enablement and/or amending the pending claims so that they no longer recite this missing subject matter.

The examiner will almost always have conducted a review of the prior art and will typically find prior art that arguably reads on the claims. (This term means that the prior art is within the scope of the claims in the application as they are presently drafted.) If the examiner finds a single piece of prior art that reads on one of the claims, the examiner will reject the pending claim as having been “anticipated” by the prior art. If the examiner finds that a combination of references in the prior art together disclose the claimed invention and that a person of ordinary skill in the art would have been motivated to combine these references, the examiner will reject the pending claim as being “obvious” over the prior art. In some jurisdictions “obviousness” is known as “lack of inventive step.” The patent agent can rebut these rejections by doing one or more of the following:

- arguing that the examiner has misunderstood the cited reference(s);
- arguing that the examiner has misunderstood the applicant’s invention and/or the pending claims;
- arguing that the references cited by the examiner cannot properly (legally) be combined, and/or
- amending the pending claims so that they recite an invention not disclosed in the cited references.

B. DRAFTING RESPONSES

The patent agent’s reply to an office action is known as a “response.” In the response, the patent agent must fully answer (respond to) all the examiner’s comments regarding the application in the office action. If the patent agent does not respond to all the rejections made by the examiner, the patent agent’s response will likely be considered “non-responsive” and not further considered by the patent examiner. A patent agent must always strive to file a complete response to an office action, as a non-responsive office action response can seriously impair the client’s rights.

Most of the world's patent offices place time limits on the filing of responses to office actions. In some countries the applicant will have X months to respond to an office action without payment of an extension fee and Y months to respond to an office action with payment of an extension fee. In a typical office action in the US, for example, X represents three months and Y three months. In other countries the applicant may be allowed a single extension period throughout the entire time that the examination is being reviewed. Collectively, the world's patent offices probably exhibit every possible combination of timing periods for responding to an office action; so the patent agent needs to understand what the local rules are for every country in which his client has pending patent applications. The patent agent should also inquire whether the "mailing date" or the date of office action is the date for responding to the office action. This may vary depending on the country.

The patent agent will want to provide his draft response to the office action to his client and should explain the office action to him. The patent agent's client may be extremely knowledgeable in the field of the invention and may be able to identify distinctions between the prior art cited by the examiner and the invention described in the pending patent application and/or the pending claims. Also, there are often choices to be made in making claim amendments – amendments which typically add narrowing limitations – and the patent agent should give his client the opportunity to make these choices. The client may know better than the patent agent which choice of claim limitations will still allow the claims to retain commercial significance.

C. GETTING CLAIMS ALLOWED

The patent examiner will review the patent agent's response to the office action. Frequently, the patent examiner will conduct a supplemental search for pertinent prior art. The patent agent will often respond to the patent examiner's first office action by pointing out that either the prior art cited by the examiner is inappropriate for a set of very specific reasons and/or the patent agent will argue for the patentability of a feature that the examiner did not notice or appreciate in the claims as originally filed. Consequently, the examiner may decide to conduct a supplemental search for pertinent prior art in preparing the next office action.

The patent examiner may not find the patent agent's response persuasive either in light of newly-found prior art or in view of the prior art originally cited. Patent examiners are typically trained to read the pending patent claims in their broadest reasonable interpretation: such procedures result in having more rather than less prior art to read on the claims. If the examiner is not persuaded that the claims are patentable – giving the claims their broadest reasonable interpretation in view of the prior art – then he will issue another office action that explains the reasons he cannot allow the application and/or the claims in their present form.

The Interview. Many patent offices allow patent agents and inventors to speak with the patent examiner about the pending application. This process is known as an "interview" with the examiner. Because official business will be discussed, both parties may be required to submit complete and accurate written descriptions of the interview, these records typically becoming part of the file history for the patent application. In preparing for the interview with the patent examiner, the patent agent should thoroughly review the office action and the prior art cited, and be ready to explain to the patent examiner in clear, concise and persuasive language why the pending claims are patentable over the prior art. The patent agent may want to prepare some possible additional claim amendments and share these with the patent examiner. For example, if the patent examiner and the patent agent can work out a set of acceptable claim amendments during the interview, the review process can be successfully concluded.

During the interview the patent agent may learn that the examiner has been interpreting the prior art cited in a different way, or with a different nuance, from the interpretation of the patent agent and his client. Once the patent agent fully understands how the examiner sees the prior art, the former is in an excellent position

either to: 1) educate the examiner about the prior art (if the examiner has misinterpreted the prior art) or 2) see more clearly what range of claim amendments would put the application in condition for allowance. In some countries, the patent agent is permitted to bring the inventor to the interview and many patent examiners find comments and explanations made by the inventors to be very persuasive. Of course, the patent agent will want to counsel the inventor before the interview. Patent examiners are not typically allowed to conduct interviews prior to the issuance of the first office action but they may conduct interviews thereafter.

Responding to a Second Office Action. As mentioned above, the patent examiner may issue a second office action. The patent agent will need to prepare and file a response to the second office action. The second and subsequent office actions should, hopefully, involve a narrower set of issues than the first office action. Additionally, if the second office action involves some of the prior art cited in the first office action, the patent agent should be able to complete the second office action response much more quickly than he completed the first office action response.

The process of office action and response may be repeated until either the patent examiner agrees to allow the applicant's pending claims or until the applicant decides that no meaningful claim coverage can be obtained and he abandons the application. For financial/administration reasons many patent offices do not allow the office action/response cycle to continue too many times before additional payment of fees is required.

Final Office Action. The potential for additional payment of fees is sometimes signaled by a "final" office action. As noted previously, the world's patent offices often operate differently with respect to the specific procedural aspects of patent prosecution. In US practice, the response to a final office action requires that the application either be placed in condition for allowance, appealed or abandoned. In responses to final office actions, patent examiners will not typically entertain the applicant's further arguments regarding the prior art. Basically, the pending claims need to be amended to place them in an allowable condition based upon the patent examiner's comments. If the applicant disagrees with the patent examiner's characterization or the prior art or the patent examiner's interpretation of the patent claims, he may appeal the patent examiner's opinion.

The patent examiner will sometimes allow some claims while rejecting others. The patent examiner may also merely object to some claims because they depend on a rejected base claim. In such situations the patent agent can obtain a patent for his client by canceling the rejected claims and then allowing a patent to issue on the claims that have not been rejected. The patent agent could even file a continuation (or divisional application) containing the rejected claims and continue to argue for their patentability in a subsequent case. Deciding whether to take the claims allowed by the examiner rather than continuing to fight is a strategic decision that must be made by the client after appropriate counseling from the patent agent.

Deadlines. The final office action will have a deadline for response. Again, the specific procedural requirements of the world's patent offices vary. In the US this deadline is six months, with the first three months not requiring the payment of an extension fee. The patent agent may file a response to the final office action. The patent examiner will review the response and issue either a "notice of allowance" or an "advisory action," which is typically a short one-page form in which the examiner states his objections to the application. The patent agent may even prepare and submit one or more supplemental responses to the patent examiner in view of the advisory action. However, the patent agent must understand that the application goes abandoned on a certain date and that all prosecution must be completed by that date.

If, for example, a patent agent in the US submits his reply to a final office extremely close to the six-month deadline date (e.g. on the last day), then it is highly unlikely that the examiner will even review the response before the six-month deadline arises, in which case the patent application will simply go abandoned. This is because,

as noted above, unlike filing a response in a non-final office action, the filing of a response in a final office action does not itself satisfy the deadline requirements. The only actions that actually stop the deadline are:

- 1) having the examiner issue a notice of allowance;
- 2) having the examiner issue a new, non-final office action;
- 3) abandoning the application;
- 4) re-filing the application as some form of continuing application;
- 5) filing a notice of appeal.

Consequently, the patent agent must closely watch the dates related to final office actions. Even when the patent agent files a timely response to a final office action (e.g. within three months), the application can still go abandoned if one of the four actions above has not transpired. Thus, in some instances the patent agent may need to take additional steps to keep a patent application pending just because he has not received a reply from the patent office (even when the response that he filed, if reviewed, would have placed the application in condition for allowance).

Appeal. In responding to a final office action, the patent agent typically prepares a formal response and if the examiner does not find the response persuasive, the patent agent can either file an appeal or some form of continuing application (usually known as a "divisional" application outside the US). An appeal typically involves review of the patent application by a board comprising several senior patent examiners. Most of the world's patent offices provide some form of appeal for decisions made by individual patent examiners. The specific procedures followed in appeals vary from country to country. In the US, the patent agent first submits a document known as an "appeal brief" and then the patent examiner will submit his brief. The patent examiner's brief has to be approved by his supervisor and it is not uncommon for a patent agent to receive a notice of allowance in a case because a patent examiner's supervisor would not approve the examiner's brief. The patent agent may request an oral hearing for the appeal. Bear in mind that the appeal procedure typically involves the payment of various fees.

Divisional application. As mentioned above, an alternative to filing an appeal in many jurisdictions is the filing of some form of "divisional application." The term divisional application is used internationally to cover a variety of situations. In many countries, a divisional application is any application filed subsequent to the priority application. The definition of divisional application varies from country to country. In the US the term divisional application is typically limited to describing an application whose claims have been withdrawn from a patent application because the examiner did not find "unity of invention" in the pending application (e.g. the claims recited more than one invention). In the situation where an application has received a final office action and the time for response has run out, the patent agent will typically file a "continuing" application of some sort. The US offers several types of continuing applications. The most common is known as an "RCE" or "Request for Continued Examination." An RCE will retain the same serial number as its parent application – basically, the RCE is a mechanism that allows the review of the patent application to continue past the last final office action. Another form of application is the "continuation" application. This type of application will receive a different serial number from the parent application and is typically used when the applicant wants to pursue the patentability of a completely different set of claims from those in a parent application.

Many practitioners will file one or more RCEs in an application before they file an appeal. The advantage of filing at least one RCE prior to an appeal is that by the time the RCE itself is under final rejection, the patent agent and the patent examiner will sometimes have reached a point where the discussion is exhausted and an appeal is appropriate. This point may be reached either earlier or later depending on the prior art, the pending claims and the parties involved.

D. OPPOSITION PROCEEDINGS

Many countries' patent laws provide for public opposition to the issuance of a patent. Some regional patent offices, such as the EPO, also allow for opposition proceedings. Depending on a country's laws, the opposition may be conducted before the examiner reviews the patent application (pre-grant opposition) or after the examiner approves the application (post-grant opposition), or both.

EXAMPLE of Pre-Grant Opposition.

Assume that a country has a pre-grant opposition procedure. The patent examiner sends the applicant a notice that his claims have been approved and then publishes the final, approved claim set for public opposition. Assuming no one files an opposition to the application within a set time period, the patent will issue. If someone does file an opposition, this party must also provide arguments as to why the patent should not be granted. The opponent may argue that the examiner has not considered a key piece of prior art and provide arguments as to why the claims are invalid in view of this prior art. The patent applicant is typically allowed to rebut the opponent's arguments. The opposition may be heard by either the patent examiner in charge of the application or by a special panel of examiners. The opposition results may typically be appealed by the losing party and in many instances the appeals can ultimately be heard by a court of law.

Oppositions are quite common in some jurisdictions. The patent agent should be aware that some companies routinely use oppositions as a mechanism for delaying issuance of their competitors' patents and/or for reducing the scope of the claims issued to their competitors. Some public interest groups routinely oppose the issuance of patents in particular technical fields. Opposition papers are typically prepared by patent agents and for many patent agents, maintaining an opposition practice is simply a normal part of their regular work. Consequently, the patent agent should counsel his client that the mere receipt of an intention to grant a patent sent from a patent office does not necessarily mean that the client will receive his patent without further delay.

E. ISSUANCE OF THE PATENT

Once the patent examiner issues a "Notice of Allowance" or similar paperwork, the patent agent will need to complete various formalities related to issuance of the patent application as a patent. The patent agent may wish to ask his client if any form of continuation application is desirable. A continuation application will retain the filing date of its parent. For strategic reasons, it is often desirable to have a pending application where the patent agent can add new claims specifically tailored to a particular infringer. Alternatively, a continuation application will allow the inventor to pursue patentability for claims rejected during the first application.

In many patent offices, applications may issue as patents many months after the patent agent has paid all the necessary government fees. (Patent issuance may be even longer if the jurisdiction provides an opposition process.) Unfortunately, there is not usually a way to speed up the printing and issuance of a given patent. Once the patent issues, the patent agent will not typically need to take any action with it beyond the payment of any periodic maintenance/annuity fees that may be required. The patent agent may wish to docket the dates for payment of annuity/maintenance fees as a service to his client.

KEY WORDS

>> PROSECUTION >> OFFICE ACTION >> ABSOLUTE NOVELTY >> FIRST-TO-FILE PATENT SYSTEM
>> FIRST-TO-INVENT PATENT SYSTEM >> UNITY OF THE INVENTION >> ISSUANCE
>> REQUEST FOR CONTINUED EXAMINATION (RCE)

SELF TEST

1. What is patent prosecution?
2. If an invention has been published or presented at a conference, a patent application on the invention filed in a country with an absolute novelty requirement is likely to be unpatentable. True or False?
3. What is the difference between a "first-to-file" system and a "first-to-invent" system? Which system generally requires absolute novelty?
4. What is an office action?
5. What does it mean when a claim has been rejected as "anticipated" by prior art?
6. When drafting a response to an office action, the patent agent only needs to respond to the most important rejections, not all of them. True or False?
7. The patent agent should explain the office action to the inventor/applicant. True or False?
8. During patent prosecution, can the patent agent speak with the patent examiner? True or False? If true, what is this process called?
9. When should a patent agent file a continuing application?
10. After a patent has issued, the patent owner may still need to pay periodic maintenance/annuity fees to keep the patent in force. True or False?

V. PATENT CLAIM DRAFTING

When an inventor tells a patent agent that he wants to file a patent application, the first questions that a patent agent asks himself is: What has been invented? What are the claims to this invention? Does the inventor know what he wants to protect? How should we claim the invention?

A. THEORY OF THE PATENT CLAIM

The claims mark the boundaries of the protection provided by a patent, just as a physical boundary such as a fence, marks the limits of a parcel of real property. Thus, the claims are a written approximation of the abstract inventive concept created by the inventor. The claims define the scope of protection provided by a patent. While jurisdictions around the world may apply differing legal doctrines for claim interpretation, in the most prevalent theory the claims set forth the outer limits of patent protection. The claims clearly and concisely tell the world what the patent applicant claims to be his invention.

The patent agent needs to understand the differences between three legal constructs related to patents: inventions, embodiments and claims. An “invention” is a mental construct inside the mind of the inventor and has no physical substance. An “embodiment” of an invention is a physical form of the invention in the real world. The “claims” must protect at least an “embodiment” of the invention – but the best patent claims will protect the “invention” itself so that no physical embodiments of the invention can be made, used or sold by anyone without infringing the claims.

Assume that an inventor invents the first cup to have a handle. He makes a physical embodiment of his invention in the form of a red clay cup with a handle. His patent agent could simply claim just the physical embodiment of the red clay cup with a handle but this would still allow others to make non-infringing cups, such as plastic cups with handles. If the patent agent understands the invention, he will claim the “invention” of the cup with a handle in his broadest claim and subsequently claim the red clay cup embodiment in a narrower claim. The concepts of narrow and broad claims will be explored further in the following pages.

Early patents did not have claims and the scope of the patented invention was determined in court proceedings during patent infringement litigation by reviewing the specification filed by the inventor. Not surprisingly, this process eventually became unworkable and the process of patent claiming was born as a means for providing greater notice of the boundaries of the patent. Additionally, in a substantive examination patent system the claims are reviewed by a patent examiner, which provides the courts and the public with some assurance that a typical patent claim does not exceed the maximum scope of protection the inventor should receive. Thus, the claims were originally based on the concept that they were to serve as a guideline to explain what the inventor perceived as his invention at the time he made his invention and filed his patent application. Today, the claims define the protection given by a patent and lie at the heart of any invention. In fact, claims are typically the first portion of the patent application examined and scrutinized by a patent examiner or anyone studying the patent.

If the patent examiner’s role is to prevent a typical patent claim from exceeding the scope of its invention (the claim’s theoretical maximum), whose role is to make sure that the claims approach their theoretical maximum? Answer: The patent agent. Not surprisingly, claiming strategy is a complicated task that we will address in detail in Chapter VII. The quick answer, however, is that the patent agent will generally strive for a broad set of claims that cover various aspects of the invention at various levels of detail. The patent agent will probably not want all the claims to meet the apparent theoretical maximum of protection since subsequent litigation will likely raise invalidity arguments not contemplated by the patent examiner. Thus, the patent agent will want to draft some narrower claims in the event that the broadest claims are invalidated. A narrower set of claims will often be upheld as valid during litigation but will still be “broad enough” to prove infringement against the patent infringer.

As noted throughout this Manual, the patent application's specification must support the patent claims. Consequently, once the claims have been drafted and the specification has been written, the patent agent must re-read the specification and claims to ensure that every single claim has adequate support in the specification. The choice of words and terminology used in claims should be traced back to the specification to ensure that the specification and claims are consistent and that the same terminology is used throughout. A claim that is not supported by the specification can easily be thrown out for lack of support. For instance, if a patent agent claims a glass table with four legs, he must ensure that there is support for a glass table with four legs in the specification.

Patent claims may be amended during patent prosecution. Some jurisdictions place limits on the degree to which claims may be amended and/or canceled and replaced with new claims. Nevertheless, the patent agent will typically have some flexibility in adjusting the pending claims to avoid newly-discovered prior art or to satisfy other legal requirements. Similarly, hindsight may sometimes suggest to a client and/or the patent agent that the initially-filed claims could have been more broadly recited. Accordingly, the patent agent may also amend the claims to give them greater breadth.

While jurisdictions may differ over format and interpretation issues regarding patent claims, the theory of what a good patent claim should accomplish is essentially the same worldwide. For instance, the following advice originated largely from claims construction guidelines provided by the EPO: The application must contain "one or more claims." These claims must

- i. "define the matter for which protection is sought;"
- ii. "be clear and concise;" and
- iii. "be supported by the description."

Since the extent of the protection conferred by a patent is determined by the terms recited in the claims (interpreted with the help of the description and the drawings), clarity of the claims is of the utmost importance.

The EPO recommends that claims be drafted in terms of the "technical features of the invention." This advice means that claims should not contain statements relating, for example, to commercial advantages or other non-technical matters although statements of purpose are allowed when they assist in defining the invention. This is sound advice for claims drafters in any jurisdiction.

B. PATENT CLAIM FORMAT

A patent claim is traditionally written as a single sentence in most jurisdictions. Each of these "sentences" is preceded by a number that becomes the claim's identifier, e.g. "Claim 1." Although a patent claim is a single sentence, it is a heavily punctuated single sentence. The patent claims typically appear in a separate section towards the end of the application and the issued patent.

1. Parts of a Claim: Preamble, Transitional Phrase and the Body

A patent claim has three parts: the preamble, the transitional phrase and the body.

The Preamble: A preamble is an introductory phrase that identifies the category of the invention protected by that claim. For example, the invention may be an apparatus, article, composition, method or process. It is a good idea to keep the preamble consistent with the title of the invention. The claim can also recite an object of the invention in the preamble, but for the same reasons noted in the specification writing section the patent agent must use caution to avoid accidentally limiting the scope of the invention.

Let's take a look at some examples.

Example 1. A patent applicant has invented a rice cooker. Since an object of this invention is to cook rice, the preamble and title might read as follows:

An apparatus for cooking rice.

But suppose that the patent applicant knows his invention could be used for cooking all kinds of grains, a broader preamble might read:

An apparatus for cooking grains.

Suppose further that the patent applicant knows his invention could be used for cooking vegetables, or even melting cheese for fondue, an even broader preamble might simply read:

An apparatus for cooking.

Example 2. A patent applicant wants to claim a unique method of making tea. Here, the preamble might read:

A method for making tea.

Again, assume that the inventor believes his method would be applicable to making any beverage arising from a plant substance, a broader preamble might read:

A method for making a plant-based beverage.

Assume that the inventor instead believes his method would be applicable to making any warm beverage, a preamble broader than the first preamble above might read:

A method for making a warm beverage.

Note that the second and third preambles are equally broad – the second preamble applies to any plant-based beverage whether warm or cold and the third preamble applies to any hot beverage whether plant-based or non-plant based. The patent agent can add claims to the patent application with any or all of these preambles – assuming they accurately reflect the invention. The worst outcome for using these preambles, assuming their accuracy, would be for the patent office to find multiple inventions in the application and request that certain claims be moved to a divisional application, which would simply increase the amount of fees paid. (See, “Unity of Invention” below in Chapter VII, Sec. K.)

Example 3. An applicant has invented a compound to treat malaria; the preamble might read as follows:

A composition for treating malaria.

The patent application could also contain method claims, device claims, etc.

The patent agent must relate the preamble to the invention. This does not alter the patent agent's goal of drafting broad claims. It simply means that if an invention is supposed to cover “bicycles,” and the inventor believes his invention is adaptable to all kinds of non-motorized vehicles, it is a good idea to keep the preamble broad enough to cover all forms of non-motorized land vehicles but perhaps not motorized flying vehicles.

The preamble may not necessarily be accorded the same weight during patent litigation as the body of the claim and the weight given to preambles can vary from jurisdiction to jurisdiction. In some jurisdictions the courts will look at whether the preamble “breathes life” into the claim as a whole and, if so, the preamble will be accorded patentable weight. Consider, for example, an invention that comprises a mounting for attaching a telephone to a wall. The patent agent will likely not want to claim a telephone as part of this invention as this could narrow the range of potential infringers to persons who sold telephones and infringing mountings, rather than just mountings. Consequently, the preamble for the mounting could read:

A device for mounting a telephone.

In this way, making, using or selling telephones will most likely not be judged necessary for infringement of the claim.

Transitional Phrase

There are two types of transitional phrases: open-ended and closed phrases. Open-ended phrases do not exclude any additional, unrecited elements or method steps. In other words, open-ended phrases are inclusive, not exclusive. In the US for example, open-ended phrases include the terms "comprising," "including," "containing," and "characterized by." These terms have been construed or interpreted to mean "including the following elements but not excluding others." The words "comprising" and "including" are the most commonly used transitional phrases in the US.

Let us now take a look at a sample claim using the phrase "comprising." The invention relates to a pencil with an eraser and a light attached to it. A claim may read as follows:

1. *An apparatus, comprising:
a pencil;
an eraser attached to one end of the pencil; and
a light attached to the center of the pencil.*

In this claim, by using the open-ended phrase "comprising," we have expanded its scope to allow for other elements or limitations. For instance, this claim leaves open the possibility of including a cap for the pencil. Put another way, an accused infringer could not avoid a finding of infringement by asserting that his product also had a pencil cap. To reiterate, while in everyday language the word "comprise" may have both the meaning "include," "contain" or "comprehend" and "consist of," in drafting patent claims legal certainty normally requires it to be interpreted by the broader meaning "include," "contain" or "comprehend."

Closed phrases are the opposite of open-ended phrases. Closed phrases, such as "consisting of," limit the claim to nothing more than the specifically-recited elements. The claim covers only the elements named and nothing more.

The previous open-ended example can be rewritten in closed form as follows:

1. *An apparatus, consisting of:
a pencil;
an eraser attached to the pencil; and
a light attached to the pencil.*

By using the phrase "consisting of," this claim has become a closed claim that only includes the three recited elements of pencil, an eraser, a light and nothing more.

The patent agent may sometimes draft a claim for a chemical compound that refers to it as "consisting of components A, B and C" by their proportions expressed in percentages. Such claims are acceptable in most jurisdictions. However, the presence of any additional component will be excluded and therefore the percentages should add up to 100%. In drafting such a claim, the patent agent must know for certain that infringement cannot be avoided by including another chemical compound; however small its percentage. Alternatively, the patent agent could make sure that one of the terms included in the percentage is so broad that it could be many things, or the claim could be drafted to a portion of compound that goes into a larger solution.

A patent agent will rarely write a closed claim – because infringers can easily avoid infringement by simply adding another element. In essence, a patent agent must think twice and maybe even thrice before filing such a claim. In some jurisdictions a patent agent could possibly use a closed transitional phrase when an invention is a simplification of an apparatus that is already used. Since the simplification has fewer elements

than the original, some jurisdictions might consider that a closed phrase overcomes the prior art of the original for anticipation (e.g., novelty) purposes. However, the patent office might still consider the original reference as invalidating prior art for obviousness (e.g. inventive step) purposes. The patent agent will need to inquire if the laws of the jurisdictions of interest support an interpretation of closed transitional phrases that will help the client to achieve its goals. In short, a patent agent will almost always better serve his client's interests by amending claims to avoid the prior art but in a manner that still makes it difficult for a competitor to avoid the claim easily; the best way for accomplishing this is usually to add clarifying amendments to the claims instead of using a closed transitional phrase. There may be particular instances where for a specific technological invention type such as biotechnology closed phrases may be slightly more likely to arise. When drafting claims, it is important for the patent agent to know which transitional phrases are considered open-ended or closed in the jurisdictions of interest. The patent agent's foreign associate colleagues can be of great help in informing him about local rules. For example, in Australia, the term "comprising" has sometimes been interpreted as a narrow closed transitional phrase – precisely the opposite of its interpretation in many countries. Thus, an open-ended claim in the UK might use the transition "comprising" while a claim of precisely the same scope in Australia might use "including" as its transitional phrase. It is extremely important that patent agents learn which terms are considered open-ended and closed under their country's laws and practices. Using the wrong phrase could significantly limit the scope of protection provided by the patent.

The Body of the Claim

The body of a claim is the portion that follows the transitional phrase. The body of the claim recites the elements and limitations of the claim. The body also explains how the different elements exist in relationship to one another. Basically, the body of the claim recites and inter-relates all the elements of the claim. For example, the body of an apparatus claim covering a table might read as follows:

1. *An apparatus for holding items, comprising:
at least one leg; and
a top configured to support at least one leg.*

In this claim the body recites the two elements, "at least one leg" and "a top" that is supported by the one leg. The body of the claim also connects the leg to the top. A patent claim cannot be merely a list of parts: they must be connected in some manner as most patent offices will not knowingly allow patent claims that are merely parts lists. Thus, the claim above would likely be rejected if written this way:

1. *An apparatus for holding items, comprising:
four legs;
16 screws; and
a top.*

Most countries follow a "peripheral claiming" doctrine in which the claims set the outer boundaries for the scope of patent protection. Unless you happen to file the claims in a jurisdiction that follows a "central claiming" doctrine where the claims identify the "center" of the patented invention, it is critically important to use the claims to set the limits of the scope of protection.

2. Two-Part Claims or Improvement Claims

In a two-part claim (also known as an improvement claim or a Jepson claim), the preamble of the claim sets out the most relevant known prior art, and the body characterizes the improvement of the invention. The preamble and body are connected by a specific transitional phrase that signals the claim is a two-part claim or Jepson claim. Thus, two-part claims still have a preamble, a transition and a body, as discussed in “Parts of a Claim” above, but with a two-part claim, the preamble is the statement of the prior art, the transition is a phrase such as “characterized by,” and the body provides the novelty.

In Europe, for example, the preamble is followed by the transition “characterized in that” or “characterized by.” In the US the preamble is typically followed by the transition “wherein the improvement comprises...” The preamble should typically reference only a single piece of prior art since the preamble is considered an implied admission that it is prior art.

An example of a two-part or Jepson claim is as follows:

1. *A pencil having an eraser, wherein the improvement comprises a light attached to the pencil.*

Thus, in this claim a pencil having an eraser is the relevant known prior art and the claimed improvement is the attached light.

Some jurisdictions such as the EPO have a preference for two-part claims. The EPO advises that applicants should follow the two-part formulation in claims where, for example, it is clear that the invention resides in a distinct improvement in an old combination of parts or steps. As with many rules created for bureaucratic efficiency this “preference” is somewhat flexible in actual practice. (A cursory review of EPO-issued patents will reveal many claims not in a two-part format.) Thus, patent agents need to consider whether conformity with the two-part preference is in their client’s best interest given that it requires an explicit admission that certain parts of the claims are definitely in the prior art. Some patent agents may wish to recite their claims initially in a conventional form and then see if (and/or how determined) the examiner is in requiring the two-part form. On other occasions, the client may be best served by drafting claims in the two-part format from the beginning, given the nature of the invention and the prior art.

The EPO recommends that the first part of such claims contain a statement indicating “the designation of the subject matter of the invention,” *i.e.* the general technical class of apparatus, process, etc. to which the invention relates followed by a statement of “those technical features which are necessary for the definition of the claimed subject matter but which, in combination, are part of the prior art.” This statement of prior art features applies only to independent claims and not to dependent claims. Thus, such statements are necessary only to refer to those prior art features which are relevant to the invention.

For example, if the invention relates to a photographic camera but the inventive step relates entirely to the shutter, it would be sufficient for the first part of the claim to read: “A photographic camera including a focal plane shutter” and there is no need to refer also to the other known features of a camera such as the lens and view-finder. The second part or “characterizing portion” should state the features that the invention adds to the prior art, *i.e.* the technical features for which, in combination with the features stated in the first part, protection is sought.

While expressing a preference for two-part claims the EPO concedes that such claims are inappropriate in some circumstances. Thus, the nature of an invention may be such that this form of claim is unsuitable, *e.g.* because it would give a distorted or misleading picture of the invention or the prior art. Examples of the kind of invention which may require a different presentation are:

- i. the combination of known integers of equal status, the inventive step lying solely in the combination;
- ii. the modification of, as distinct from addition to, a known chemical process e.g. by omitting one substance or substituting one substance for another; and
- iii. a complex system of functionally inter-related parts, the inventive step concerning changes in several of these or in their inter-relationships.

In examples (i) and (ii) the two-part form of claim may be artificial and inappropriate while in example (iii) it might lead to an inordinately lengthy and involved claim. Another example in which the two-part form of claim may be inappropriate is where the invention is a new chemical compound or group of compounds. The EPO further advises that other cases will arise in which the applicant is able to provide convincing reasons for formulating the claim in a form other than the two-part form.

3. Means-Plus-Function Claims

Means-plus-function claims recite elements that do not have specifically-defined structures but instead recite functions performed by structures disclosed in the specification. The interpretation of means-plus-function claims varies from jurisdiction to jurisdiction and even varies within jurisdictions over time. For example, a given jurisdiction may interpret a means-plus-function claim as the means disclosed in the patent's specification for performing the recited function plus the reasonable equivalents of those means. Means-plus-function claims could receive either a broad or narrow interpretation in a given jurisdiction since the claims do not specifically define the structure. Litigants in patent infringement cases sometimes expend considerable energy arguing over whether or not an asserted claim even is a means-plus-function claim.

The format of a classic means-plus-function claim is the word "means" followed by a function. For instance, if the invention is a rice cooker, a claim in the means-plus-function format might read as follows:

1. *An apparatus for cooking rice, comprising:
a means for holding rice; and
a heater configured to heat the rice-holding means.*

In this example, notice that instead of reciting a rice-holding structure by name (e.g. a bowl), we have referenced a device that performs the function of holding rice. By doing so, we have avoided using a specific name and have instead recited the function that it performs.

Not all the elements in a means-plus-function claim need to be means elements. In other words, each element of a claim can receive different treatment. Assume, for example, that a claim recites three elements, two in means-plus-function format and one that recites a structural element (such as the "heater" above). The structural element will typically be construed according to its ordinary meaning in the art. Each of the two means-plus-function elements will be construed by first determining the recited function and then respectively determining the structure disclosed in the specification for performing the function.

Means-plus-function claims are helpful in jurisdictions where such claims receive broader interpretation than claims that specifically recite a structural element. Means-plus-function claims are even helpful in jurisdictions that do not necessarily afford a broad interpretation to means-plus-function claims but nevertheless interpret such claims differently from claims where the structural limitations are affirmatively recited. The "difference," whatever it might be, allows for a more complete range of claim coverage – assuming the patentee includes both types of claims in his application. Also, claims interpretation by courts has a tendency to change over time. Thus, in the approximately 20-year lifetime of a patent, a court that narrowly interpreted means-plus-

function claims in the patent's first year might have adopted a relatively broader interpretation by the patent's eleventh year (when the patent is actually litigated for the first time).

However, the patent agent must keep in mind that if means-plus-function clauses are used, they must typically be accompanied by an adequate description in the specification that clearly defines a structure for carrying out the recited function. The patent agent must always set forth sufficient structure in the patent application regardless of the claim type being used. A more special concern for the patent agent when using means-plus-function claims is to avoid reciting unnecessary structure and/or not making it clear in the specification precisely which set of structures perform the function, thus inadvertently giving a defendant in patent litigation arguments for a narrow claim interpretation.

For instance, if the claim uses the phrase "means for fastening" then the specification should clearly define what those fastening means are, *e.g.* whether they are tapes, adhesives, rivets and/or any one of these fasteners. Otherwise, if the claim is litigated in court, the patent holder may be at the mercy of the court (and his opponent) for interpretation of the term "means for fastening" and might end up receiving a much narrower interpretation than that which the inventor actually had in mind.

4. Claim Punctuation

To the novice, it might seem illogical, confusing or perhaps even insulting to discuss something as basic as how a patent claim is to be punctuated. Many topics related to patent claims are certainly much more exciting than punctuation. However, nearly every patent office sets forth strict requirements for how patent claims are punctuated and will not grant a patent application unless/until these seemingly arbitrary rules are followed to the letter. Thus, if the patent agent solely focuses on matters such as attuning his patent claims to the client's business needs, while not understanding proper patent claim format, he will find that his otherwise well-crafted patent claims will never be issued by any patent office anywhere in the world.

A comma typically separates the preamble from the transitional phrase and a colon typically separates the transition from the body. The body itself is typically broken into small paragraphs that define the logical elements of the claim. Many jurisdictions do not have specific laws requiring such punctuation but the patent agent should strive to make sure that the claim will be interpreted as he intends. Similarly, in many jurisdictions a claim "element" might not have a precise and/or legal meaning, with all the words of a claim simply being "limitations" to the claim. That said, the patent agent must write the claim in a manner that does not complicate claim interpretation by the patent examiner and later by courts and potential licensees. Thus, the "elements" of a claim are typically separated by semi-colons and the penultimate element ends with "; and."

Example 1. Preamble, transition:
 Element (#1);
 Element (#2); and
 Element (#3).

Example 2. An apparatus, comprising:
 a plurality of printed pages;
 a binding configured to hold the printed pages together; and
 a cover attached to the binding.

5. Proper Antecedent Basis

The elements in a patent claim must have the correct antecedent basis. This means that the first time an element is introduced, the indefinite article “a” or “an” should be used. Later when referring back to previously introduced elements, the definite article “the” or “said” should be used. Proper antecedent basis is not just a good idea; like gravity, it is the law. The following set of claims will help explain proper antecedent basis:

1. *A device, comprising:
a pencil; and
a light attached to the pencil.*
2. *The device recited in claim 1 wherein the light is detachably attached to the pencil.*
3. *The device recited in claim 2 wherein the pencil is red in color.*

Notice that in Claim 1, we introduced the “pencil” for the first time by referring to it as “a pencil.” In the same claim, we also introduced the light for the first time as “a light.” However, when we wanted to specify that the light was attached to the pencil, we referred to the pencil as “the pencil.” The use of the word “the” signaled that the pencil was the one we had previously defined in the claim. Otherwise, there would be ambiguity as to whether it was the same pencil or another pencil. The words “the” and “said” are interchangeable in claims drafting. (“Said” is old-fashioned legalese for the most part, while “the” is an attempt to make language more accessible to non-lawyers.)

If we wanted to draft another dependent claim with that which refers to another pencil, then we will need to distinguish the first-recited pencil from the second-recited pencil. This is usually done by reciting a “first” element and then reciting a “second” element, and so on. An alternative where there will just be a small number of elements is to refer to the first as “an” element and the second as “another” element. Here are some examples:

A first widget, connected to a second widget, wherein the first widget...
A foomerantz, coupled to another foomerantz, wherein another foomerantz has a higher capacitance than the foomerantz...

In each new claim set the antecedent basis must be re-established. Thus, in another claim set the patent agent will need to provide a proper antecedent basis for the element “pencil” all over again.

In essence, each independent claim needs to be drafted independently and with proper antecedent basis. For instance, if a new claim were to be drafted as an independent claim for the above invention, it might read as follows:

4. *A device, comprising:
a pencil;
a light attached to the pencil, wherein the light is detachably attached to the pencil.*

6. Reference Numerals and Bracketed Expressions

In some jurisdictions, claims are encouraged and/or required to recite the reference numerals associated with particular elements in the patent application’s drawings. Thus, if Figure 1 of the patent shows a computer memory and this computer memory is labeled “123,” for example, if the claims recite this particular computer memory, the computer memory element will be followed by the reference number “123.”

Example 1. An apparatus, comprising:
 A plurality of printed pages (11);
 A binding (14) configured to hold the printed pages (11) together; and
 A cover (21) attached to the binding (14).

The numbers in parenthesis are the reference numbers from the patent application's drawings.

Thus, if the application contains drawings and the comprehension of the claims would be improved by establishing the connection between the features mentioned in the claims and the corresponding reference signs in the drawings, appropriate reference signs should be placed in parentheses after the features mentioned in the claims. If there are a large number of different embodiments, only the reference signs of the most important embodiments typically need be incorporated in the independent claim(s).

Where claims are drafted in the two-part form, the reference signs should be inserted not only in the characterizing part but also in the preamble of the claims according to recommendations from the EPO. This advice may not apply to all jurisdictions.

Reference signs are not typically treated as limiting the extent of the matter protected by the claims; their sole function is to make claims easier to understand. The patent agent may even want to make a comment to that effect in the description.

If text is added to reference signs in parentheses in the claims, lack of clarity can arise. Expressions such as "securing means (screw 13, nail 14)" or "valve assembly (valve seat 23, valve element 27, & valve seat 28)" may not be considered as mere reference signs but as "special features." Consequently, it is unclear whether the features added to the reference signs are limiting or not. Accordingly, such bracketed features are not generally permissible or recommended. However, additional references to those figures where particular reference signs such as "(13 – Figure 3; 14 – Figure 4)" are unobjectionable in many jurisdictions are to be found.

In some jurisdictions a lack of clarity can also arise with bracketed expressions that do not include reference signs, e.g. "(concrete) molded brick." In contrast, bracketed expressions with a generally accepted meaning are allowable, e.g. "(meth)acrylate" which is known as an abbreviation for "acrylate and methacrylate." Thus, the use of brackets in chemical or mathematical formulae is typically unobjectionable.

7. Claim Phrases

We have already seen that words like "comprising" have a special meaning when applied to claims. Similarly, other words can have special meanings when applied to patent claims. Some words are used to further define a structure or provide a function associated with a given structure. Some of these words are "wherein," "whereby," and "such that," and "so as to." The patent agent must know how the courts in the jurisdictions of interest have opted to interpret these words and then he must use them in a manner appropriate to their legal interpretation.

For example, a "wherein clause" is generally used to describe either a function, operation or result that flows from the previously-recited structure or function of the claim. Thus, "wherein clauses" should be used where the result necessarily follows the recited structure or function. For instance, if we want to claim a folder for keeping files, the claim in a wherein format might read as follows:

1. *A folder for keeping files, wherein the folder is configured to receive the files...*

8. Multiple Elements

Many patent offices require claims to recite at least two elements. A patent claim without many limitations can be impossibly broad. One can readily see the necessity for this rule by comparing the following two claims:

Example 1. A computer, comprising:
a processor.

Example 2. A computer, comprising:
a processor;
a memory; and
a bus configured to transmit data between the memory and the processor.

The claim from the first example above does not tell the reader much about a computer other than that it is something containing a processor. Of course, the specification will define a processor for us and we can also assume that processors exist in the prior art. Thus, the applicant appears to be claiming anything that contains a processor especially if the preamble is not considered to be limiting. Such a claim is impossibly broad – it reads on a box in which a processor is shipped since we don't know anything more about computers other than that they are structures that contain processors. The second claim provides a lot more structure and definition for computers.

9. Alternative Elements

Many jurisdictions allow a single patent claim to contain alternative elements. These are often referred to as “Markush groups.” Such claims can simplify the patent agent's task in preparing a full claim set. We will discuss “claim sets” and “dependent claims” below. A claim, whether independent or dependent, may refer to alternatives, provided that the number and presentation of alternatives in a single claim does not make the claim obscure or difficult to construe and provided that the claim meets the requirements for unity of invention. (See, Chapter VII, Section K below.) In case of a claim defining (chemical or non-chemical) alternatives, *i.e.* a so-called “Markush grouping,” unity of invention should be considered to be present if the alternatives are of a similar nature and can fairly be substituted for one another.

Assume, for example, that a chemical process could be performed with either “copper,” “lead,” or “gold.” The patent agent could think of a more abstract term that unites the three choices, such as “metal.” However, the patent agent (and the inventor) might not be certain that the process would work with any metal. In fact, the inventor may know for certain that the process would not work with mercury. Consequently, the patent agent cannot use the more abstract term “metal” in the claim. The patent agent and the inventor may not know a better abstract term for the three metals that work with the invention. The patent agent could write three independent claims – one directed toward “copper,” one directed toward “lead” and one directed toward “gold.” But thanks to Markush groupings, the patent agent can simply draft one independent claim that reads “a metal selected from the group consisting of copper, lead, and gold.” The use of Markush groupings is not limited to chemical inventions, although the technique originated in chemical patent practice and is probably more commonly employed in chemical practice than in other technology areas.

A Markush group must not be ambiguous. Additionally, the patent agent must be certain that a Markush group is the most appropriate method of claiming the invention before he employs it. In the example above, for instance, assume that iron would also work with the invention – the proposed Markush grouping would not directly protect embodiments of the invention that used iron. Thus, the patent agent should always strive to draft claims that cover all patentable embodiments of the invention.

C. CLAIM SETS

A set of claims in a patent specification will normally include one or more independent (or main) claims and a number of dependent or subsidiary claims (or sub claims) which depend on one or more preceding independent claim(s). All patent applications must contain at least one “independent” claim directed to the essential features of the invention, *i.e.* those features necessary to satisfy the legal requirements of novelty and inventive step. Each independent claim may be followed by one or more dependent claims concerning more specific embodiments of the invention recited in the independent claim. Any claim relating to a particular embodiment includes also the essential features of the invention recited in the corresponding independent claim.

Any claim which refers to another claim will include all features of the other claim, even if they are not explicitly recited. Claims containing references to other claims are called “dependent claims.” Since a dependent claim does not by itself define all the characterizing features of the subject-matter which it claims, expressions such as “characterized in that” or “characterized by” are not necessary in such a claim but are nevertheless permissible. A claim defining further particulars of an invention may include all the features of another dependent claim and should then refer back to that claim. Also, in some cases a dependent claim may define a particular feature or features which may appropriately be added to more than one previous claim (independent or dependent). It follows that there are several possibilities: a dependent claim may refer back to one or more independent claims, to one or more dependent claims or to both independent and dependent claims.

1. Independent Claims

The independent claims in a patent represent the broadest claims. Some independent claims are broader than other independent claims but a given independent claim is always broader than any claim that depends on it. An independent claim is a claim that stands alone and does not need a limitation from another claim in order to be complete. Each claim set begins with an independent claim.

A patent application may have more than one independent claim. For instance, sometimes a single invention might encompass several different inventive concepts, in which case it may not be possible to have one broad claim that covers all the different inventive concepts. In general, it is wise to have several independent claims, each of which separately covers a different inventive concept.

The various types of claims, which we discuss below, are a different issue than claim breadth. Thus, a patent agent may want to write several different independent apparatus claims, each claim covering a different inventive concept, even for the same inventive concept, the patent agent may want to draft several of the claims to have differing scope or breadth.

Some jurisdictions such as the EPO may prefer that the number of independent claims be limited to one independent claim in each category. However, the EPO provides various exceptions to this preference, such as the following situations where deviation from this principle can be readily accepted:

- (i) examples of a plurality of inter-related products:
 - (a) plug and socket;
 - (b) transmitter – receiver;
 - (c) intermediate(s) and final chemical product;
 - (d) gene – gene construct – host – protein – medicament.
- (ii) examples of a plurality of different inventive uses of a product or device:
 - (a) second or further medical uses in the claim format of a “second medical use”-type claim.

- (iii) examples of alternative solutions to a particular problem
 - (a) a group of chemical compounds;
 - (b) two or more processes for the manufacture of such compounds.

As mentioned previously, some “rules” exist for bureaucratic efficiency. Many patent agents find that claim-limiting rules are not particularly well enforced and/or that exceptions are easy to find. As a general rule, among the world’s three large patent offices, US patents tend to have the most claims; Japanese patents tend to have the fewest claims and the EPO tends to be in the middle. As with all patent matters, the patent agent should strive to make sure that his client has been accorded the appropriate number of claims for his invention. Experience will teach him the moment when adding more claims reaches the point of diminishing returns in terms of the additional cost in excess claim fees, annuity fees, etc.

Varying claim breadth provides strong support against arguments that all the claims in a patent are invalid over the prior art. Even after a patent examiner approves an application for grant as a patent, a third party may attempt to invalidate the patent later. Thus, having claims of varying scope provides insurance against the possibility of invalidity arguments arising from prior art not known to the inventor, the patent agent or the patent examiner during patent prosecution. In fact, it is not uncommon for the best prior art to be found by the defendant during patent infringement litigation.

An independent claim should typically specify the essential features needed to define the invention except insofar as such features are implied by the generic terms used, e.g. a claim to a bicycle does not typically need to mention the presence of wheels. Where patentability depends on a technical effect the claims should typically be drafted so as to include all the technical features of the invention which are essential for the technical effect. In other words, claims must be clear and be directed to the heart of the invention.

If a claim is to a process for producing the product of the invention, the process as claimed should be one which, when carried out in a manner which would seem reasonable to a person skilled in the art, necessarily has as its end result that particular product; otherwise, there is an internal inconsistency and therefore lack of clarity in the claim. In the case of a product claim, if the product is of a well-known kind and the invention lies in modifying it in certain respects, it is typically sufficient that the claim clearly identifies the product and specifies what is modified and in what way. Similar considerations apply to claims for an apparatus.

2. Dependent Claims

A dependent claim is one that depends from another claim – either an independent claim or another dependent claim. Such dependencies are signaled by the identification of parent claim. For example: “2. The apparatus of Claim 1, further comprising...” indicates that Claim 2 is dependent from Claim 1.

The format of a dependent claim really provides little more than a time and money-saving mechanism. By reciting another claim, the dependent claim is saying that it includes everything from the parent claim plus whatever is newly-recited in the dependent claim itself. Dependent claims tend to be considerably shorter than independent claims and patent novices sometimes mistakenly believe that dependent claims are broader than independent claims when the complete opposite is correct.

Assume an independent claim reads:

1. *An apparatus, comprising:
a pencil; and
an eraser attached to the pencil.*

Assume a dependent Claim 2 reads:

2. *The apparatus of Claim 1, further comprising:
a light attached to the pencil.*

Assume a dependent Claim 3 reads:

3. *The apparatus of Claim 2, further comprising:
a pencil lead release button attached to the pencil.*

The entirety of Claim 2 includes all the text affirmatively recited in Claim 2 plus all the text of Claim 1. Thus, Claim 2 actually reads:

2. *An apparatus, comprising:
a pencil;
an eraser attached to the pencil; and
a light attached to the pencil.*

Similarly, Claim 3, which depends from both Claim 1 and Claim 2, actually reads:

3. *An apparatus, comprising:
a pencil;
an eraser attached to the pencil;
a light attached to the pencil; and
a pencil lead release button attached to the pencil.*

Dependent claims should be grouped together in the most appropriate way possible. The arrangement must, therefore, be one which enables the association of related claims to be readily determined and their meaning in association to be readily construed. In no way can a dependent claim extend the scope of protection of the invention defined in the corresponding independent claim.

A patent examiner will sometimes allow a dependent claim over the prior art and merely object that the claim depends from a rejected independent claim. This means that the patent applicant can obtain a patent by simply canceling the rejected independent claim (and any other intervening dependent claims) and add the cancelled limitations to the allowable dependent claim. The patent agent can also amend the other claims in the application to depend from the newly independent (formerly dependent) claim. Of course, a patent agent and his client may decide not to accept the allowance of the dependent claim and continue to fight for the patentability of the parent claim.

EXAMPLE

Assume that Claims 1-3 above come from an application that contains 10 dependent apparatus claims that depend, ultimately, from Claim 1 (for a total of 11 claims). Assume further that the patent examiner has rejected Claim 1 but has found Claim 2 allowable and merely objected to Claim 2 because it depends from rejected Claim 1. Assuming the client approved, the patent agent could rewrite Claim 2 to specifically recite all the limitations of Claim 1 (just as we did above). Claim 3 already depends from Claim 2, so Claim 3 doesn't need to be amended. But Claims 4-11 depend from Claim 1, so these claims need to be amended to depend from Claim 2. (Alternatively, Claim 1 could be rewritten to include the limitations of Claim 2 and Claim 2 could be cancelled). Once the patent agent files his amendment, the patent examiner will likely allow the patent application and the client will eventually obtain a patent having 10 claims with Claim 2 as the independent claim. (Note: all issued patents begin with Claim 1 because once patent prosecution for an application has ceased, the world's patent offices renumber the claims to begin with Claim 1; e.g. our Claim 2 will be Claim 1 in the issued patent.)

While formats vary from jurisdiction to jurisdiction, the request to amend claim 2 to have independent form could look as follows:

2. (Amended) *An [The] apparatus, [of Claim 1, further] comprising:
a pencil;
an eraser attached to the pencil; and
a light attached to the pencil.*

Where “amended” indicates a change to the claim, the brackets show deleted words and the underlining shows newly-added words.

Dependent claims are always narrower than the claim from which they depend. For example, a competitor’s pencils that do not include any sort of a light will not infringe Claim 2. However, such pencils might still infringe Claim 1, which is the broader claim.

A dependent claim can only add elements or limitations to the claim to which it refers. It cannot subtract any elements or limitations from the same. In other words, a dependent claim may only narrow the scope of the claim to which it refers, not broaden it. For example, dependent Claim 4 cannot read as follows:

4. *The apparatus in Claim 2 wherein the light is not attached to the pencil.*

This claim would be incorrect because it subtracts an element from the independent claim, namely the light. Again, dependent claims may not subtract any elements or limitations from the claim on which it depends. It is important to remember that if the independent claims are considered allowable over prior art by a patent examiner, the dependent claims will also be allowable over prior art.

Dependent claims can be used to make independent claims more clearly broader. For example, if Claim 1 recites “a box” and dependent Claim 2 recites “wherein the box is wooden,” then clearly Claim 1 can be made of any material, including those not made of wood. Of course, one could always argue that the box in Claim 1 could be a non-wood material. However, it’s also possible that an opponent could argue that the specification provided no support for a non-wooden box. By reciting “wooden box” in Claim 2, it becomes much clearer that Claim 1 refers to any kind of box. An opponent can still argue that there is no support in the specification for non-wooden boxes but the patentee can now additionally argue that the patent examiner himself must have considered the enablement argument when he allowed Claim 1.

In some jurisdictions such as the EPO, a claim may also contain a reference to another claim even if it is not a dependent claim. In other jurisdictions such as the US, an independent claim cannot contain a reference to any other claim. An example of such claims accepted in the EPO is a claim referring to a claim of a different category (e.g. “Apparatus for carrying out the process of claim 1...” or “Process for the manufacture of the product of Claim 1...”). Similarly, in a situation like a plug-and-socket example, a claim to the one part referring to the other co-operating part (e.g. “plug for co-operation with the socket of Claim 1...”) is not a dependent claim. In all these examples one should carefully consider the extent to which the claim containing the reference necessarily involves the features of the claim referred to and the extent to which it does not. The patent agent should verify that this approach is permissible in the jurisdiction(s) of interest to his client before employing it.

In some jurisdictions such as the EPO, in the case of a claim for a process which results in the product of a product claim, if the product claim is patentable, no separate examination for the novelty and non-obviousness of the process claim is necessary, provided that all features of the product as defined in the product claim inevitably result from the claimed process. This also applies in the case of a claim for the use of a product when the product is patentable and is used with its features as claimed. In all other instances, the patentabil-

ity of the claim referred to does not necessarily imply the patentability of the independent claim containing the reference. (See, *also* "Claim Point of View" in Chapter VII, Subsection L below.)

3. Multiple Dependent Claims

Multiple dependent claims provide another format for dependent claims. The preamble of a multiple dependent claim refers to more than one claim in the alternative. For example, a preamble of a multiple dependent claim might read "the apparatus of Claim 1 or Claim 2" or "the apparatus of one of Claims 1 and 2." Here, Claims 1 and 2 are referred to in the alternative – meaning the claim depends on Claim 1 or Claim 2 but not both. Like dependent claims, the body of a multiple dependent claim must narrow the claim from which it depends. In some jurisdictions multiple dependent claims may not depend on another multiple dependent claim. Like many aspects of patent practice, different jurisdictions may have different formatting requirements for multiple dependent claims and the patent agent must make his claims conform to the precise requirements for the jurisdictions of interest to his client.

Recall the pencil example from above:

1. *An apparatus, comprising: a pencil and a light attached to the pencil.*
2. *The apparatus of Claim 1, wherein the light is detachably attached to the pencil.*

Here, a multiple dependent claim may be recited as follows:

3. *A pencil as recited in Claims 1 or 2, further comprising an eraser.*

This multiple dependent claim covers a pencil comprising either:

- a. *a light attached to the pencil and an eraser; or*
- b. *a light detachably attached to the pencil and an eraser.*

Thus, in order to infringe this claim an accused pencil will have to contain either the limitations of a. or b. above.

Other examples of multiple dependent claim wordings are as follows:

- A pencil as in any of the preceding claims in which...
- A pencil as in either Claim 1 or claim 2, further comprising...
- A pencil as in any one of Claims 1, 3 or 9-13 inclusive, in which...
- A pencil as in any of Claims 1, 4, 5-7 in which...
- A pencil as in any of Claims 2 or 3, further comprising...

KEY WORDS

>> INVENTION >> EMBODIMENT >> PREAMBLE >> TRANSITIONAL PHRASE >> BODY >> ELEMENT
>> LIMITATION >> ANTECEDENT BASIS >> INDEPENDENT CLAIM >> DEPENDENT CLAIM
>> MULTIPLE DEPENDENT CLAIM >> IMPROVEMENT CLAIM >> MEANS-PLUS-FUNCTION CLAIM.

SELF TEST

1. Distinguish between an invention and an embodiment (of the invention).
2. Which part of the patent defines the scope of protection provided by a patent?
3. Why does a patent agent want to include both broad and narrow claims in a patent?
4. Name the three parts of a claim. Explain each part.
5. What is the difference between an open-ended transitional phrase and a closed transitional phrase?
6. A patent claim may be simply a list of parts (of the invention) having no apparent relationship to each other. True or False?
7. Explain what constitutes proper antecedent basis with respect to a patent claim.
8. A dependent claim may depend from another claim, either an independent claim or another dependent claim. True or False?
9. What is a multiple dependent claim? An improvement claim? A means-plus-function claim?

VI. SPECIFIC TYPES OF CLAIMS

For many inventions, claims in more than one category are needed for full protection. The section explores some of the various types or categories of claims that the patent agent may draft to provide his clients with a complete scope of claim protection. One could argue that there are only two basic kinds of claim: claims to a physical entity (product, apparatus) and claims to an activity (process, use). The first basic kind of claim (product claim) includes a substance or compositions (e.g. a chemical compound or a mixture of compounds) as well as any physical entity (e.g. object, article, apparatus, machine or system of co-operating apparatus) which is produced by a person's technical skill. Examples are:

- i. "a steering mechanism incorporating an automatic feed-back circuit...";
- ii. "a woven garment comprising...";
- iii. "an insecticide consisting of X, Y, Z"; and
- iv. "a communication system comprising a plurality of transmitting and receiving stations."

The second basic kind of claim (process claim) is applicable to all kinds of activities in which the use of some material product for effecting the process is implied; the activity may be exercised upon material products, upon energy, upon other processes (as in control processes) or upon living things.

If a claim commences with such words as: "Apparatus for carrying out the process etc..." this may be construed in many jurisdictions as meaning merely apparatus suitable for carrying out the process. Accordingly, in such jurisdictions an apparatus which otherwise possesses all the features specified in the claims but which would be unsuitable for the stated purpose or would require modification to enable it to be so used should normally not be considered as anticipating the claim or an infringement of the claim.

Similar considerations apply to a claim for a product for a particular use. For example, if a claim refers to a "mold for molten steel," this implies certain limitations for the mold. Therefore, a plastic ice cube tray with a melting point much lower than that of steel would not come within the claim. Similarly, a claim to a substance or composition for a particular use should be construed as meaning a substance or composition which is in fact suitable for the stated use; a known product which *prima facie* is the same as the substance or composition defined in the claim but which is in a form that would render it unsuitable for the stated use, would not deprive the claim of novelty. However, if the known product is in a form in which it is in fact suitable for the stated use, though it has never been described for that use, it would typically deprive the claim of novelty in many jurisdictions. An exception to this general principle of interpretation is where the claim is to a known substance or composition for use in a surgical, therapeutic or diagnostic method in those jurisdictions that have special rules related to inventions in these fields.

In contrast to an apparatus or product claim, in the case of a method claim commencing with such words as: "Method for re-melting galvanic layers," the part "for re-melting..." should not be understood as meaning that the process is merely suitable for re-melting galvanic layers but rather as a functional feature concerning the re-melting of galvanic layers and, hence, defining one of the method steps of the claimed method.

A. APPARATUS OR DEVICE CLAIMS

An apparatus or device claim protects embodiments of an invention in the form of a physical apparatus, system or device. For instance, a claim that covers a tripod for a camera or a window crank is an apparatus claim. When drafting an apparatus claim, the patent agent can begin by reciting in a preamble what the apparatus is and what it does. Next, the patent agent can list the essential elements of the invention. Essential elements are ones required for the functioning of the inventive device in its most basic form, e.g. the essence of the invention. The novelty of the invention lies in the essential components.

Let us now look at a sample apparatus claim:

1. *An apparatus for supporting a camera, comprising:
a pivotal mounting configured to hold the camera;
and
a plurality of legs arranged to support the pivotal
mounting.*

Once the patent agent believes he has reasonably captured the essence of the invention, he should review and re-review the claim to see how many words he can remove from it while still preserving the essence of the invention.

PROFESSIONAL TIP

In this example the preamble recites that it is an apparatus for supporting a camera. The body of the claim recites that the essential elements of this apparatus are a pivotal mounting for the camera and legs arranged to support the pivotal mounting. As an aside, the patent agent should always look for words to remove from claims and, in Claim 1 above, the patent agent should consider whether the adjective “pivotal” is strictly necessary for the mounting of his client’s tripod.

B. METHOD CLAIMS OR PROCESS CLAIMS

Method claims are claims that recite a sequence of steps which together complete a task such as making an article of some sort. An example of a method claim is as follows:

1. *A method for making tea, the method comprising:
boiling water;
adding sugar to the boiling water;
adding tea leaves to the boiling water to form a mixture;
adding milk to the mixture; and
filtering the mixture.*

In this example the series of steps performed in the process of making tea are stated sequentially in the order they are performed. However, note that in many jurisdictions the steps performed in a method claim are presumed to occur in any order, unless otherwise stated, for both prior art and infringement purposes. As set forth in the claim above, for example, the step of boiling water must occur before the step of adding sugar to the water. However, the step of adding sugar to the water could occur at any other step, e.g. after adding the milk. As an aside, the patent agent will always want to look for words and limitations that can be removed from claims. In the above claim the patent agent will want to consider whether adding milk and sugar is always necessary for making tea in accordance with his client’s invention.

In some jurisdictions such as the EPO, a “use” claim in a form such as “the use of substance X as an insecticide” will be treated as equivalent to a “process” claim of the form “a process of killing insects using substance X.” Thus, a claim in the form indicated should not be interpreted as directed to the substance X recognizable (e.g. by further additives) as intended for use as an insecticide. Similarly, a claim for “the use of a transistor in an amplifying circuit” would be equivalent to a process claim for the process of amplifying using a circuit containing the transistor, and it should not be interpreted as being directed to “an amplifying circuit in which the transistor is used,” nor to “the process of using the transistor in building such a circuit.”

Not all jurisdictions would allow such “use” claims. More importantly, the patent agent should consider the degree of protection that this claim form provides his client. For example, even if approved, will it be easy for his opponents to defeat the claim with prior art unknown at the time of prosecution? Again, the patent agent needs to consider how best to protect his client’s invention and achieve his client’s business objectives; two goals which are often significantly more difficult than achieving a minimally-acceptable claim format in a given jurisdiction. More information about “use” claims is provided below.

C. PRODUCT-BY-PROCESS CLAIMS

Claims for products defined in terms of a process of manufacture are allowable in some jurisdictions provided that the products as such fulfill the requirements for patentability, *i.e.* they are new and inventive. A product is not typically rendered novel merely by the fact that it is produced by means of a new process. A claim defining a product in terms of a process will be construed as a claim to the product as such in many jurisdictions. The claim may for instance take the form "Product X obtainable by process Y." Irrespective of whether the term "obtainable," "obtained," "directly obtained" or an equivalent wording is used in the product-by-process claim, it is still directed to the product *per se* and confers absolute protection upon the product.

In some jurisdictions such as the EPO, if the subject-matter of a patent is a process, the protection conferred by the patent extends to the products directly obtained by such process. Many jurisdictions apply similar tests for product-by-process claims as described above. Other jurisdictions treat product-by-process claims as method claims. Consequently, the patent agent should verify that a product-by-process claim is the best approach for protecting his client's invention before employing this type of claim. Such claims may be employed as part of a mix of claim formats.

D. RESULT TO BE ACHIEVED AND PARAMETER CLAIMS

The area defined by the claims must be as precise as the invention allows. As a general rule, claims which attempt to define the invention by a result to be achieved will not be allowed, particularly if they only amount to claiming the underlying technical problem. In fact, many jurisdictions will never allow such claims under any circumstances. Additionally, the patent agent must strive to capture the essence of his client's invention and characterizing a product by its parameters may easily lead to a claim that is significantly narrower than the client's invention.

Some jurisdictions such as the EPO, may allow such claims if the invention can either only be defined in such terms or cannot otherwise be defined more precisely without unduly restricting the scope of the claims and if the result is one which can be directly and positively verified by tests or procedures adequately specified in the description or known to the person skilled in the art and which do not require undue experimentation.

For example, the invention may relate to an ashtray in which a smouldering cigarette end will automatically be extinguished due to the shape and relative dimensions of the ashtray. The latter may vary considerably in a manner difficult to define whilst still providing the desired effect. So long as the claim specifies the construction and shape of the ashtray as clearly as possible it may define the relative dimensions by reference to the result to be achieved, provided that the specification includes adequate directions to enable the reader to determine the required dimensions by routine test procedures.

Similarly, where the invention relates to a product, it may be defined in a claim in various ways, such as a chemical product by its chemical formula, as a product of a process (if no clearer definition is possible) or, exceptionally, by its parameters. However, the patent agent is advised to use caution when drafting such claims as they may not be accepted and/or may be subject to later misinterpretation.

Parameters are characteristic values which may be values of directly measurable properties (*e.g.* the melting point of a substance, the flexural strength of steel, the resistance of an electrical conductor) or may be defined as more or less complicated mathematical combinations of several variables in the form of *formulae*.

The EPO for example, will allow characterisation of a product mainly by its parameters in those cases where the invention cannot be adequately defined in any other way, provided that those parameters can be clearly

and reliably determined either by indications in the description or by objective procedures which are usual in the art. The same applies to a process-related feature which is defined by parameters. The EPO suggests that sometimes such claims actually disguise lack of novelty. Accordingly, the patent agent can likely expect that the patent examiner will heavily scrutinize such claims before allowing them.

E. DESIGN CLAIMS

In those jurisdictions that allow design patents, generally only one claim is permissible. The drawings are usually the critical element for a design patent since the protection provided pertains to ornamental design. For instance, if the claimed invention is a novel design for an umbrella, the claim may read as follows:

1. *The ornamental design for an umbrella, as shown and described.*

Fig. 1



F. PLANT PATENT CLAIMS

As noted earlier, some jurisdictions allow patenting of new varieties of plants. Not all jurisdictions permit such patents. Some jurisdictions allow for protection of new plants using essentially the same type of claims that one would use for a biotechnology invention, e.g. a deposit made according to the Budapest Treaty as discussed below in Section I.

Other jurisdictions allow for the patenting of plants under certain conditions such as by asexual propagation. For instance, if the claimed invention is a new variety of the plant Chrysanthemum, the claim to the invention might read as follows:

1. *A new and distinct cultivar of Chrysanthemum plant named 'White Norwoodstock', as illustrated and described.*

G. COMPOSITION CLAIMS

Claims related to compositions are used where the invention to be claimed has to do with the chemical nature of the materials or components used. For instance a claim related to a zinc electroplating solution might read as follows:

1. *A copper electroplating solution, comprising:*
 - a. *an alkaline solution of copper sulfate, from 30-50 grams per liter;*
 - b. *sulfuric acid, from 2-4 times the copper acetate solution; and*
 - c. *an aqueous solution of a pH-modifying substrate in an amount sufficient to adjust the pH to a value of from 3.5-5.0.*

While drafting claims it is up to the patent agent to claim each of the elements as narrowly or as broadly as necessary in view of the prior art, the scope of the invention and other relevant factors. For example, in the

claim above, elements a. and b. are narrower than element c. insofar as the claim spells out the exact name of the compound in elements a. and b., whereas element c. states the compound in a generic manner. Thus, any pH modifying substrate that performs the function of adjusting the pH of the solution to a value of from 3.5 to 5.0 will fall within the limitation as stated in c.

H. BIOTECHNOLOGY CLAIMS

Biotechnology in general relates to all practical uses of living organisms. In 1873, Louis Pasteur received US Patent 141,072, claiming “yeast, free from organic germs of disease, as an article of manufacture.” This patent is sometimes considered the first patent concerning a micro-organism. Uses for biological/life science inventions may be either commercial or therapeutic. Thus, biotechnology inventions may include cDNA, recombinant DNA, DNA fragments, protein, monoclonal antibodies, anti-sense DNA and RNA, recombinant vectors and expression vectors.

A set of sample biotechnology claims to cover an invention related to nucleic acids and encoded proteins may read as follows:

1. *An isolated polynucleotide comprising a member selected from the group consisting of:
(a) a polynucleotide encoding a polypeptide comprising amino acid 1 to amino acid 255 as set forth in SEQ ID NO:2; and
(b) a polynucleotide which hybridizes to and which is at least 95% complementary to the polynucleotide of (a).*
2. *The polynucleotide of claim 1 comprising nucleotide 1 to nucleotide 1080 of SEQ ID NO: 1.*

In the above example, note that the gene sequence is referenced in the claim and not spelled out in full. Many jurisdictions have special requirements for inventions related to biotechnology inventions and for sequence listings and deposit rules. (See, also Chapter VII, Section N on exclusions from patentability and Section O on the requirement for industrial application below.)

Where an invention involves a biological material and words alone cannot sufficiently describe how to make and use the invention in a reproducible manner, access to the biological material may be necessary for the satisfaction of the statutory requirements for patentability. This requirement provides opportunities for claims drafting, such as:

1. *A seed of cotton cultivar designated PHY 78 Acala, wherein a representative sample of seed of said cultivar was deposited under ATCC Accession No. PTA-5666.*

The Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure was established in 1977 to facilitate the recognition of deposited biological material in patent applications throughout the world. The Treaty requires signatory countries to recognize a deposit with any depository which has been approved by WIPO.

I. USE CLAIMS

Some jurisdictions permit claims to new uses of known substances, particularly second or subsequent medical uses or indications of known substances and compositions. These use claims are also known as Swiss-type claims since Switzerland was the first country to allow them.

Suppose chemical compound XYZ is already known and has been used to treat diabetes. Assume that Inventor A discovers that compound XYZ is an effective medicament for the treatment of malaria. Inventor A's patent agent could draft a use claim as follows:

1. *The use of compound XYZ in the manufacture of a treatment for malaria.*

Use claims are not permitted in all jurisdictions. Such claims are permitted in the EPO, even though the EPO generally does not allow claims directly to a method of treating the human body. Such claims, however, are not permitted in the US or India, for example.

J. SOFTWARE CLAIMS

Patent applications related to computer software and/or hardware devices that execute specialized algorithms typically include apparatus and method claims. Such applications also often contain some specialized claim formats for software inventions. The acceptable claim formats for computer software inventions may vary from country to country. Some acceptable formats may include computer-readable medium claims, data structure claims and propagated signal claims. The software arts have some other specialized claim types but these are typically modifications of more basic claim types and best left for an advanced treatise.

A computer-readable medium claim, also known in the US as a Beauregard claim, attempts to protect an invention when it is embodied in a particular medium, e.g. a CD ROM. Such claims, which can have several different formats, would allow a patent holder to seek damages not only against persons who made infringing software and persons who used infringing software but also to seek damages against sellers of such software, including retail sellers and wholesalers. One of the more common formats is to take the body of a method claim for the invention and add a "computer-readable medium" preamble. For example:

1. *A computer-readable storage medium storing instructions that when executed by a computer cause the computer to perform a method for using a computer system to [a specified function], the method comprising:*

A data structure claim, also known in the US as a Lowry claim, attempts to provide protection for novel computer data structures. Of course, not every computerized invention includes a unique data structure but some inventions do include new data structures. While several formats are possible, one of the more common formats is:

1. A memory for storing data for access by an application program being executed on a data processing system, comprising:
a data structure stored in the memory, the data structure including information resident in a database used by the application program and including:
a first data object configured to...
a second data object configured to...; and
a third data object configured to...

K. OMNIBUS CLAIMS

"Omnibus" claims include a reference to the description or the drawings without providing any specific limitations. Omnibus claims can be quite simple to write:

1. An apparatus for harvesting corn as described in the description.
2. A juice machine as shown in Figure 4.

Not all patent offices allow omnibus claims. The USPTO does not allow omnibus claims, and the EPO only allows such claims when they are absolutely necessary. However, omnibus claims are acceptable in patent offices such as the UK, Australia and India, for example.

Before including an omnibus claim, the patent agent should understand how such claims will be interpreted in the specific jurisdiction where the claim will be filed. If the jurisdiction's laws provide favorable interpretations to omnibus claims, the patent agent may wish to consider including at least one such claim in the application. If the relevant jurisdiction does not treat such claims favorably or if its interpretation might have an adverse impact on other claims in the patent application, the patent will likely not want to include such a claim.

KEY WORDS

>> APPARATUS OR DEVICE CLAIMS >> METHOD OR PROCESS CLAIMS
 >> PRODUCT-BY-PROCESS CLAIMS >> DESIGN CLAIMS >> COMPOSITION CLAIMS
 >> BIOTECHNOLOGY CLAIMS >> USE OR SWISS-TYPE CLAIMS
 >> COMPUTER-READABLE MEDIUM CLAIMS >> DATA STRUCTURE CLAIMS >> OMNIBUS CLAIMS

SELF TEST

1. Distinguish between an apparatus claim and a method/process claim.
2. Biotechnology patents have only existed for about 20 years. True or false?
3. Result-to-be-achieved-by or parameter claims are easy to draft and provide good protection. True or false?
4. How does a computer-readable medium claim resemble a method claim?
5. What does the Budapest Treaty provide with respect to biotechnology patents?
6. A claim having the format "The use of substance ABC as a..." would be acceptable in all jurisdictions. True or false?
7. What's wrong with the formatting of the following claim?
 1. An apparatus for harvesting corn, comprising:
 a thrasher for cutting corn;
 moving the cut corn into a hopper; and
 a rotating pivot attached to the thrasher.
8. What is an omnibus claim?

VII. PATENT CLAIM DESIGN

A. PREPARE THE CLAIMS FIRST

When preparing a patent application, the patent agent should start drafting the claims first because doing so helps the patent agent and the inventor better refine the idea of the invention in their minds. Once the invention is clear to them, drafting the specification will flow naturally.

B. BROAD AND NARROW CLAIMS

A patent agent should draft a combination of broad and narrow claims that effectively capture the complete scope of an invention's novelty. An ideal approach is to draft a set of claims that range from the broadest to the narrowest in terms of coverage. As a practical matter, it might be easiest to start with a narrow claim first and then remove limitations and/or replace narrow terms with broader ones to arrive at the broadest claim. Once this has been done, the patent agent can draft a set of dependent claims.

EXAMPLE

Assume the client has invented a novel apparatus for turning lead into gold. The physical embodiment of the invention made by the client has a box-like metal frame, an electric motor, a bowl for retaining scrap lead and a lead-gold zapper element that causes the matter transition. The physical embodiment of the invention is what the client shows the patent agent and it is this that the patent agent used in writing the specification for the patent application. The patent agent knows that "the invention" is really an abstract concept and something broader than the client's physical embodiment. However, for the first draft claim the patent agent decides to describe what he knows best – the client's embodiment. So, he writes the following claim:

1. An apparatus for turning lead into gold, comprising:
a box-like metal frame;
an electric motor mounted inside the box-like metal frame;
a bowl for retaining scrap lead housed on a surface of the box-like metal frame; and
a lead-gold zapper element attached underneath the bowl and inside the box-like metal frame and configured to receive electric power from the electric motor.

The patent agent reviews his first draft claim. He finds that it broadly and accurately describes the inventive aspects of the physical embodiment of the client's invention. In writing even this first draft claim he has already omitted some features that he knows could not represent patentable novelty for this particular invention, such as the color of the housing. However, he carefully reviews the claim to see if it could possibly be broader. The patent agent first notes that reciting the "box-like metal frame" likely provides no patentable novelty and since he has used the transition "comprising," he can probably eliminate this element altogether; after all, a competitor could avoid infringement by housing the device in something other than a "box-like metal frame." So, the patent agent rewrites the claim as:

1. An apparatus for turning lead into gold, comprising:
an electric motor;
a bowl for retaining scrap lead; and
a lead-gold zapper element operably coupled to the bowl and configured to receive electric power from the electric motor.

The patent agent reviews the claim again – still trying to make it as broad as possible in order to fully capture the invention. He notes that "electric motor" is fairly specific. The patent agent decides to use a broader term. He thinks of all the broader terms that come to mind, such as "motor," "power source" and "electric power source." For various reasons he decides to use the term "power source." So, he re-writes the claim as:

1. An apparatus for turning lead into gold, comprising:
a power source;
a bowl for retaining scrap lead; and
a lead-gold zapper element operably coupled to the bowl and configured to receive power from the power source.

The patent agent reviews the claim once again. He notices that the "bowl" element does not really have to be a bowl in order for the invention to retain lead properly, and he also notices that he has referred to the "lead" as "scrap lead" rather than just "lead." Since he knows that the invention will work with any kind of lead, he decides to delete the "scrap" adjective as being unnecessarily limiting. As for the "bowl" element, he realizes that any shape of retainer will work properly. Consequently, the patent agent decides to use the abstract term "lead retainer" to cover any vessel for retaining lead. The patent agent rewrites the claim as follows:

1. An apparatus for turning lead into gold, comprising:
a power source;
a lead retainer; and
a lead-gold zapper element operably coupled to the lead retainer and configured to receive power from the power source.

The patent agent continues reviewing the claim. He eventually realizes that the "power source" is not novel and does not really work in combination with the other elements to produce a novel apparatus. Consequently, he decides to eliminate this element from his broadest claim. The patent agent has similar thoughts about the inventive contribution provided by the "lead retainer," no matter how abstract a term he chooses. But if the patent agent deletes both the "power source" and the "lead retainer" from his claim, the only element left will be the "lead-gold zapper," and the patent agent knows that in the jurisdictions of interest to his client, patent claims must recite more than one element. At this point, the patent agent begins studying the "lead-gold zapper" in greater detail and realizes that such elements themselves do not exist in the prior art at all. Consequently, the patent agent decides to keep the three-element apparatus claim above in his patent application for strategic purposes but more importantly, he realizes that the principal claims will focus entirely on the novel elements that comprise the lead-gold zapper.

Assume that after the patent agent drafts his "lead-gold zapper" claims, he does decide to keep the apparatus claim directed towards an entire device containing the lead-gold zapper. Such claims can be helpful for strategic purposes. Recall that this claim reads:

1. An apparatus for turning lead into gold, comprising:
a power source;
a lead retainer; and
a lead-gold zapper element operably coupled to the lead retainer and configured to receive power from the power source.

The patent agent can easily add dependent claims to this apparatus by looking at the changes that he made while trying to arrive at the broadest possible claim. Not every limitation removed from a draft claim is worth keeping. However, the full set of dependent claims that could be written from the limitations removed and/or altered by the patent agent would lead to the following set of dependent claims:

2. The apparatus of Claim 1, further comprising:
a box-like metal frame, wherein the power source and the lead-gold zapper element are retained inside the box-like metal frame.
3. The apparatus of Claim 1 wherein the power source is an electric motor.
4. The apparatus of Claim 1 wherein the lead retainer is a bowl.
5. The apparatus of Claim 4 wherein the lead retainer is configured to receive scrap lead.

The patent agent in the above example has now drafted a complete claim set for an apparatus for turning lead into gold and he has realized that he should draft a claim set that focuses on just the lead-gold zapper element (e.g. "A lead-gold zapper, comprising..."). Thus, the patent agent will provide the patent application with two independent claim sets. The patent agent could add a third claim set by drafting a series of method claims that cover the operations of the lead-gold zapper element and possibly another series of claims that cover the entire process of turning lead into gold (e.g. an analog to the apparatus claim). Together, this would give the patent application four independent claim sets.

The patent agent in the above example could even decide to take one of his claim sets such as the apparatus claim set above and turn it into two separate claim sets that each focuses more on one point of novelty over another. For example, he could take the independent Claim 1 and rewrite it once so that it included the limitations of dependent Claim 3. He could next rewrite independent Claim 1 to include the limitations of independent claim 4. This would give the patent agent two claim sets, each with a slightly different focus. To be clear, the new claims would be:

1. An apparatus for turning lead into gold, comprising:
an electric motor;
a lead retainer; and
a lead-gold zapper element operable coupled to the lead retainer and configured to receive electrical power from the electric motor.
1. An apparatus for turning lead into gold, comprising:
a power source;
a lead retaining bowl; and
a lead-gold zapper element operable coupled to the lead retaining bowl and configured to receive power from the power source.

In reality, the patent agent should only pursue two alternatives paths such as those provided above, when each optional path truly represents independent novelty of commercial significance or when the prior art is unclear or ambiguous.

In drafting the broadest possible claims, the patent agent will always want to verify that the scope of the invention envisioned by the inventor is not narrower than the scope of the claims drafted by the patent agent. For instance, if the inventor has invented a car with three wheels and he absolutely does not see this invention being adaptable to any other kind of vehicle, the patent agent will be well-advised to keep the scope of the claims narrow and specific to cars and not unnecessarily extend it to all vehicles or moving objects. On the other hand, if the inventor thinks that the invention is adaptable or if the patent agent can foresee potential infringers adapting this invention to other devices, it will be prudent to keep the claims broad enough to cover any vehicle and not just cars. Sometimes the patent agent will need to help the inventor himself realize the potential for his invention. Many inventors are extremely focused on a particular problem and miss the full scope of their invention. For example, spread spectrum communications, one of the most pioneering communications technologies from the 20th century, was originally conceived as merely a way to avoid signal jamming of radio-controlled torpedoes. This technology was later used to develop CDMA cellular telephones, a technology considerably different from torpedoes.

As a patent agent, always ask: What are the goals of this invention? What is the inventor trying to protect? Who/what is likely to infringe? Who/what could license the patent? Am I adequately protecting the invention by drafting the claims this way or that way? As a patent agent you need to be very creative and try to get the maximum possible protection for the invention.

The patent agent should note that some jurisdictions have requirements related to “conciseness” in the number of claims. Such requirements that the claims must be concise may refer to the claims in their entirety as well as to the individual claims. Thus, in such jurisdictions the number of claims must be considered in relation to the nature of the invention the applicant seeks to protect. For example, undue repetition of wording, e.g. between one claim and another, should be avoided by the use of the dependent claim form.

As for dependent claims, while most jurisdictions have no objection to a reasonable number of such claims directed to particular preferred features of the invention, some patent examiners may object to a multiplicity of claims of a trivial nature. What is or what is not a reasonable number of claims depends on the facts and circumstances of each particular case. The patent examiner may also feel that he has a responsibility to take account of the interests of the public at large. Accordingly, the presentation of the claims should not make it unduly burdensome to determine the matter for which protection is sought. The patent examiner may also raise objections where there is a multiplicity of alternatives within a single claim if this renders it unduly burdensome to determine the matter for which protection is sought.

However, the patent agent should note that the rules regarding limitations on the number of claims have been provided largely for bureaucratic efficiency within various patent offices. The patent agent should always be willing to fight for the most appropriate scope of protection for his client. Limitations on the number of claims are not found in every jurisdiction. Of course, the patent agent will often recognize the point at which adding additional claims will not (on balance) help his client within a given jurisdiction. He may be guided in this determination by developing an appreciation of how many claims are typically considered adequate in a given jurisdiction. Patents in the US for example, tend to have more claims than patents granted by the EPO, which tend to have more claims than patents granted by the JPO.

C. CLARITY, CLAIM WORD CHOICE AND INCONSISTENCIES

The patent agent must be very cautious about the words he chooses to describe the invention. Choose words that will not only capture the invention in its most specific form but also capture variants that a competitor might choose to get around a patent in order to reap some of the benefits of the invention without infringing the patent or being required to pay for a license. In many ways, the patent agent needs to anticipate the future and imagine how potential infringers will think of getting around the claims of this particular patent.

The clarity of patent claims is of the utmost importance in view of their function in defining the matter for which protection is sought. The meaning of the terms of a claim should typically be clear for the person skilled in the art – or at the very least the claim terminology should not normally appear alien to a skilled artisan in the pertinent field. In view of the differences in the scope of protection which may be attached to the various categories of claims, the patent agent should ensure that the wording of a claim leaves no doubt as to its category while also providing the client with the appropriate scope of protection.

The patent agent should consider reading each claim giving the words the meaning and scope which they normally have in the relevant art as this is most likely how the claim will be interpreted. If in a particular case the description gives the words a special meaning, by explicit definition or otherwise, the patent agent should make sure that such new or alternative, definition(s) are clear. The claim should also be read with an attempt to make technical sense out of it. On occasion, such a reading may involve a departure from the strict literal meaning of the wording of the claims.

When a claim is directed to a further therapeutic application of a medicament and the condition to be treated is defined in functional terms, e.g. “any condition susceptible of being improved or prevented by selective occupation of a specific receptor,” the claim can be regarded as clear in many jurisdictions (such as the EPO)

only if instructions in the form of experimental tests or testable criteria are available from the patent documents or from the common general knowledge, allowing the skilled person to recognize which conditions fall within the functional definition and accordingly within the scope of the claim.

Be precise in drafting claims and avoid relative words. Avoid words like “fast,” “slow,” “long,” “short,” “tall,” “wide,” “perfect,” etc. Such words do not often provide clear limitations unless they are used with reference to another claim element. For example, never write in a claim “a long piece of wood.” However, the patent agent might want to write:

- a first piece of wood;
- a second piece of wood, wherein the first piece of wood is longer than the second piece of wood.

If a patent agent does use an absolute term in a stand-alone mode, the patent examiner will likely ignore it – in other words, the patent examiner will likely treat “a long piece of wood” no differently from “a piece of wood” or for that matter, no differently from “a tiny piece of wood.” But even worse, should such a claim end up in an issued patent, an accused infringer can avoid infringement by saying: “while we use wood, we don’t use long pieces.” As a real life example, an accused infringer once noticed that the asserted claim stated that two elements were “perfectly aligned” and responded to the patent owner that while the accused infringer aligned the elements, he did not do so “perfectly.”

Similarly, it is preferable not to use a relative or similar term such as “thin,” “wide” or “strong” in a claim unless the term has a well-recognized meaning in the particular art, e.g. “high-frequency” in relation to an amplifier and this is the meaning intended. Where the term has no well-recognized meaning it should, if possible, be replaced by a more precise wording found elsewhere in the original disclosure. Where there is no basis in the disclosure for a clear definition and the term is not essential with regard to the invention, the patent agent may wish to consider retaining the term in the claim because to excise it might lead to an extension of the subject-matter beyond the content of the application as filed that is not allowed. However, an unclear term cannot be allowed in a claim if the term is essential with regard to the invention. Equally, an unclear term cannot be used by the applicant to distinguish his invention from the prior art.

Particular attention is required whenever the word “about” or similar terms such as “approximately” are used. Such a word may be applied, for example, to a particular value (e.g. “about 200 C°”) or to a range (e.g. “about x to about y”). Patent examiners will often only permit such words if their presence does not prevent the invention from being unambiguously distinguished from the prior art with respect to novelty and inventive step. Even when a patent examiner accepts such a term, the patent agent should still be wary of its use, given that a court may later find the term uncertain.

Terms related to “optional features,” such as expressions like “preferably,” “for example,” “such as” or “more particularly” should be looked at carefully to ensure that they do not introduce ambiguity. In some jurisdictions such as the EPO, expressions of this kind may have no limiting effect on the scope of a claim; that is to say, the feature following any such expression is to be regarded as entirely optional. But the patent agent cannot guarantee that this will be the interpretation as some jurisdictions may be stricter than the EPO in their acceptance of such terms. More importantly, the patent agent is advised to avoid such terms because a defendant in a patent litigation will likely argue that such expressions do have a limiting effect, arguing that otherwise they would not have been recited in the claim. The patent owner may ultimately win the battle but the patent agent should strive to reduce his client’s potential headaches in any possible litigation.

In many jurisdictions the patent agent will want to take particular care when drafting claims that employ the word “in” to define a relationship between different physical entities (product, apparatus), or between entities and activities (process, use), or between different activities. Examples of claims worded in this way include the following:

- i. Cylinder head “in” a four-stroke engine;
- ii. “In” a telephone apparatus with an automatic dialer, dial tone detector and feature controller, the dial tone detector comprising...;
- iii. “In” a process using an electrode feeding means of an arc-welding apparatus, a method for controlling the arc welding current and voltage comprising the following steps: ...; and
- iv. “In” a process/system/apparatus etc... the improvement consisting of...

In examples (i) to (iii) the emphasis is on the fully-functioning sub-units (cylinder head, dial tone detector, method for controlling the arc welding current and voltage) rather than the complete unit within which the sub-unit is contained (four-stroke engine, telephone, process).

Many jurisdictions will find it unclear whether the claim protection sought is limited to the sub-unit *per se* or whether the unit as a whole is to be protected. For the sake of clarity, claims of this kind should typically be directed either to “a unit with (or comprising) a sub-unit” (e.g. “four-stroke engine with a cylinder head”), or to the sub-unit *per se*, specifying its purpose (for example, “cylinder head for a four-stroke engine”).

With claims of the type indicated by example (iv) the use of the word “in” sometimes makes it unclear whether protection is sought for the improvement only or for all the features defined in the claim. Here, too, it is essential to ensure that the wording is clear. However, claims such as “use of a substance... as an anti-corrosive ingredient in a paint or lacquer composition” may be acceptable on the basis of second non-medical use in jurisdictions such as the EPO.

Always strive for clarity in drafting patent claims. One could argue that the “in” claims above unnecessarily limit the client’s scope of protection. For example, was the patent agent positive that the claimed “cylinder head” would only work in a four-stroke engine? The patent agent should seriously consider whether the “in” phrase is even necessary for protecting his client’s invention before using it.

When using a claim term that has an established meaning in the relevant art, the patent agent must make sure that the meaning is appropriate in the specific circumstances in which he or she seeks to use that term. Also, the patent agent should make sure that the words he has selected convey the meaning he wants them to convey and that they also adequately cover the invention.

For instance, a patent agent might have selected the term “board” in the claims. The word “board” can have different meanings. If the patent agent chooses the word “board” without clarifying whether he means a “circuit board” or a “wooden board” there is possible ambiguity. It is therefore advisable to choose a word with a clear meaning and convey that meaning in the specification so that there is no room for confusion; however the word selected must be as broad as necessary in order to provide appropriate claim protection.

A patent agent can be his own lexicographer and may define terms. However, in doing so he must clearly explain the meaning of the term that he has defined in the specification so that there is no room for ambiguity and the meaning of the term he has coined will be clear to the patent examiner and to the courts in which the patent may be litigated.

Any inconsistency between the description and the claims should be avoided. Inconsistencies may throw doubt on the extent of protection and therefore render the claim unclear or unsupported or, alternatively, render the claim objectionable. Inconsistencies can arise in the following ways:

i. Simple Verbal Inconsistency

For example, there is a statement in the description which suggests that the invention is limited to a particular feature but the claims are not thus limited; also, the description places no particular emphasis on this feature and there is no reason for believing that the feature is essential for the performance of the invention. In such a case the inconsistency can be removed either by broadening the description or by limiting the claims. Similarly, if the claims are more limited than the description, they may be broadened or the description may be limited. [Note: A description cannot be broadened after the application's filing in many jurisdictions – even when “broadening” means deleting material from the specification.]

ii. Inconsistency Regarding Apparently Essential Features

For example, it may appear, either from general technical knowledge or from what is stated or implied in the description, that a certain described technical feature not mentioned in an independent claim is essential to the performance of the invention or, in other words, is necessary for the solution of the problem to which the invention relates. The opposite situation in which an independent claim includes features which do not seem essential for the performance of the invention is not objectionable. This is a matter of the applicant's choice. The examiner will therefore not suggest that a claim be broadened by the omission of apparently inessential features. [Note: This last comment actually sets forth the essence of the patent agent's duty to obtain broad claim protection. The government examiner only has a duty to say when a claim is “too broad;” he has no duty to say when a claim is too narrow.]

iii. Part of the Subject-Matter of the Description and/or Drawings is Not Covered by the Claims

For example, the claims all specify an electric circuit employing semi-conductor devices but one of the embodiments in the description and drawings employs electronic tubes instead. In such a case, the inconsistency can normally be removed either by broadening the claims (assuming that the description and drawings as a whole provide adequate support for such broadening) or by removing the “excess” subject-matter from the description and drawings. However, if examples in the description and/or drawings which are not covered by the claims are presented, not as embodiments of the invention but as background art or examples which are useful for understanding the invention, the retention of these examples may be allowed.

These examples highlight the requirement (already repeated many times) that the specification must support the claims.

D. CLAIM VARIATIONS AND MODIFICATIONS OF THE INVENTION

While drafting claims, it is important to think constantly about variations of the invention. In legal terms, these variations are known as “embodiments.” A patent agent should think like a potential competitor who wishes to get around the claims. Think about what variations of a claim could be introduced that would allow someone to avoid infringement, and then try to incorporate those variations or alternative embodiments in the specification and draft claims covering each of those embodiments. It is important not to overlook alter-

native embodiments that can perform the same function. Claims relating to these alternative embodiments are critical in providing a broad scope of protection. The patent agent must be mindful not to exceed the client's budget in developing alternatives and not to exceed the inventor's own scope of invention.

For instance, if the inventor has developed a device that covers a pencil with an eraser attached to the pencil, claims directed to the main or the preferred embodiment might be drafted as follows:

1. *A device, comprising:
a pencil; and
an eraser attached to the pencil.*
2. *The device of Claim 1 wherein said eraser is detachably attached to the pencil.*
3. *The device of Claim 2 wherein the pencil is red in color.*

For the same invention, claims directed to an alternative embodiment might read as follows:

1. *A device, comprising:
a crayon; and
an eraser attached to the crayon.*
2. *The device recited in Claim 1, wherein said eraser is attached detachably to the crayon.*
3. *The crayon of Claim 2 wherein the crayon is red in color.*

Comparison of the "crayon" claim set with the "pencil" claim set suggests that perhaps the patent agent could draft an even broader claim set directed to "a writing implement" and then draft dependent claims directed towards a crayon and a pencil.

E. AVOID UNNECESSARY LIMITATIONS

A basic rule for claim drafting, as already discussed, is to continually review the claims and delete unnecessary limitations. As already mentioned, one technique is to draft a claim in the form of a paragraph and include all reasonable limitations to an embodiment of the invention in this description. Once the patent agent has captured the invention in its entirety, he reviews the paragraph and eliminates all limitations that hinder a description of the invention in its broadest possible form. By doing so, the patent agent will be able to phrase a claim that captures the invention in its broadest form and is devoid of any unnecessary limitations. This can be followed by drafting more sets of claims that have a different scope from the first set. This technique should result in a broad set of claims for the invention.

Similarly, the claims must not, with respect to the technical features of the invention, rely on references to the description or drawings except where absolutely necessary. For example, according to EPO rules, the claims must not rely on such references as "as described in part... of the description," or "as illustrated in Figure 2 of the drawings." The emphatic wording of the excepting clause should be noted. Thus, the onus is upon the applicant to show that it is "absolutely necessary" to rely on reference to the description or drawings in appropriate cases. An example of an allowable exception would be that in which the invention involves some peculiar shape illustrated in the drawings but which cannot be readily defined either in words or by a simple mathematical formula. Another special case is that in which the invention relates to chemical products, some of whose features can be defined only by means of graphs or diagrams.

Note: The caution provided here regarding figures and drawings does not pertain to the use of mere reference signs in claims discussed in Chapter V, Sec. C(6) above.

F. NEGATIVE LIMITATIONS AND DISCLAIMERS

A claim's subject matter is normally defined in terms of positive features indicating that certain technical elements are present. On rare occasions, the patent agent may restrict the subject matter using a negative limitation expressly stating that a particular feature is absent, e.g. "non-wooden." Such negative limitations may be done, for example, to remove non-patentable embodiments disclosed in the application as filed or if the absence of a feature can be deduced from the application as filed.

Furthermore, in some jurisdictions such as the EPO, a prior-art disclosure may be excluded by using a "disclaimer" to re-establish the novelty of an inventive teaching which accidentally overlaps with the disclosure. A disclaimer with no basis in the application as filed can only re-establish novelty; it cannot make an obvious teaching inventive. Care should be taken to ensure that the wording of the disclaimer does not extend beyond the content of the application as filed.

Negative limitations or disclaimers may be used only if adding positive features to the claim either would not define more clearly and concisely the subject matter still protectable or would unduly limit the scope of the claim. The patent agent should strive to limit the use of negative limitations and disclaimers to situations that cannot be easily explained in a positive way, e.g. a chemical process that could utilize every known metal except "copper" (and the inventor herself doesn't really know why copper cannot be used) could be expressed in a form such as "a metal, excluding copper..." However, the patent agent will generally find that after long and serious consideration, a suitable word can be found that expresses the limitation in a positive manner. Negative limitations and disclaimers should generally be avoided because they do not provide the elegant and artful claim language that offers the best protection for inventions.

G. THE CLAIMS AND COMPETING PRODUCTS

A patent agent should ask his client about competing products. As the patent application is being prosecuted (remember this may take several years), the patent agent should keep abreast of competing products in the field of invention. While drafting claims, this background knowledge should be put to good use by drafting claims that cover competing products that might be available in the market – provided the competing products are not prior art. Additionally, if the patent agent learns of a new competing product while the patent application is pending, the patent agent may wish to amend the pending claims to make them read better on both the client's invention and the competing product (assuming that the competing product is definitely not prior art). This way, the issued patent claims may be so close to the competitor's product that the competitor will have no option but take a license from the client when the patent issues.

H. THE CLAIMS MUST OVERCOME THE PRIOR ART

The patent agent must draft claims that overcome the prior art related to the invention that he already knows about. Otherwise, the patent will be invalid. The ideal strategy is to draft a claim that is narrower than the presently-known prior art but broader than competing products. Also, bear in mind that some jurisdictions such as the US, require the patent agent, the inventor and other parties associated with the patent application to disclose to the patent office all pertinent prior art; failure to comply can in some circumstances end the patent agent's license to practice.

I. USE MULTIPLE CLAIM TYPES FOR THE SAME INVENTION

If the same invention can be claimed as a method and as an apparatus, do not hesitate to do so. Do not feel restricted to capture the invention in only one form. In fact, in order to get the broadest possible protection for the invention, it is advisable to claim the invention in different forms. Let us look at some sample claims.

For instance, assuming an invention pertains to software for searching the Internet, a system claim for the invention might read as follows:

1. *A system for searching the Internet, said system comprising:
a software module configured to perform a search;
a database configured to store results produced by the search; and
a user interface configured to present the search results to a user.*

Notice that in Claim 1, we have enumerated the different components of the invention and the way they interact with one another. We stated the three elements and recited the function performed by each of the elements. For instance, we stated that the software module performs the search, the database stores the search and the interface makes the search available to a user.

A method claim for the same invention may read as follows:

2. *A method for performing an Internet search, the method comprising:
transmitting a search request over the Internet from a software module;
receiving search results over the Internet from the search request by the software module;
storing the search results in a database; and
presenting the search results to a user through a user interface.*

Notice that in Claim 2, we have introduced the different steps involved in performing this search and at the same time, we have introduced the components that perform each of the functions stated. For instance, the first step is stated as being performance of the search conducted by the software module.

J. MAKE SURE THAT THE SPECIFICATION SUPPORTS THE CLAIMS

The claims must be supported by the specification and drawings, as noted throughout this text. This means that there must be a basis in the description for the subject matter of every claim. The scope of the claims will typically not be interpreted more broadly than is warranted by considerations such as the extent of the description and drawings and in some jurisdictions the contribution to the art.

Most claims are generalizations from one or more particular examples. The extent of generalization permissible is a matter which the examiner must judge in each particular case in the light of the relevant prior art. Thus, an invention which opens up a whole new field is typically entitled to more generality in the claims than one which is concerned with advances in a known technology. A fair statement of a claim is one which is not so broad that it goes beyond the invention nor yet so narrow as to deprive the applicant of a just reward for the disclosure of his invention. The applicant is typically allowed to cover all obvious modifications of, equivalents to, and uses of that which he has described. In particular, if it is reasonable to predict that all the variants covered by the claims have the properties or uses the applicant ascribes to them in the description, he should be allowed to draw his claims accordingly.

The patent agent should bear in mind that the only restriction on the breadth of claims that an applicant may obtain relates to the prior art (novelty and inventive step) and not to a given patent examiner's "hunch" about the significance of the client's invention. The patent agent will typically wish to appeal rejections made by patent examiner hunches that are not solidly based on the prior art and the precise legal requirements for patentability.

The patent agent must not be a passive actor in the patenting process. The patent agent may find from time to time that a patent examiner has exceeded his legal authority in making a rejection. The patent agent should be

ready to counsel his client regarding the applicability of an appeal in such instances. Experience will teach the patent agent when a rule is a rule and when he should fight for better protection for his client. The patent agent should be similarly mindful of when his foreign associate attorneys are working sufficiently hard on his client's behalf and when they are simply conforming to a mere suggestion created for bureaucratic efficiency. (The "tips" in the last two sentences apply equally to every patent application and every jurisdiction in the world.)

The following represent examples of support or lack of support for claim language:

- i. a claim relates to a process for treating all kinds of "plant seedlings" by subjecting them to a controlled cold shock so as to produce specified results, whereas the description discloses the process applied to one kind of plant only. Since it is well-known that plants vary widely in their properties, there are well-founded reasons for believing that the process is not applicable to all plant seedlings. Unless the applicant can provide convincing evidence that the process is nevertheless generally applicable, he must restrict his claim to the particular kind of plant referred to in the description. A mere assertion that the process is applicable to all plant seedlings is not sufficient.
- ii. A claim relates to a specified method of treating "synthetic resin moldings" to obtain certain changes in physical characteristics. All the examples described relate to thermoplastic resins and the method is such as to appear inappropriate to thermosetting resins. Unless the applicant can provide evidence that the method is nevertheless applicable to thermosetting resins, he must restrict his claim to thermoplastic resins.
- iii. a claim relates to improved fuel oil compositions which have a given desired property. The description provides support for one way of obtaining fuel oils having this property, which is by the presence of defined amounts of a certain additive. No other ways of obtaining fuel oils having the desired property are disclosed. The claim makes no mention of the additive. The claim is not supported over the whole of its breadth and objection arises.

A patent agent should never attempt to claim something that he does not know for certain falls within the scope of the invention. He must seek valid patents for his clients. The rule provided above is stated in terms of protecting the public (which is fair), but attempting to patent something that is not supported by the applicant's specification is similarly a disaster for the patent applicant as well.

The discussion above reinforces a topic that has constantly been repeated throughout this text. The patent agent must always provide adequate support for his client's claims in the application's specification. The patent agent should also anticipate narrower limitations that he may need to add to the claims during prosecution and make sure that support will be provided for those limitations should they become needed.

K. UNITY OF INVENTION

A patent application must typically relate to one invention only or to a group of inventions so linked as to form a single general inventive concept. The second of these alternatives, *i.e.* the single-concept linked group may give rise to a plurality of independent claims in the same category although the more usual case is a plurality of independent claims in different categories.

The concept of unity of invention has been discussed throughout this text. If a patent examiner determines that the claims in a patent application lack unity of invention, the patent agent will typically be required to elect certain claims and cancel or remove the non-elected claims. However, the patent agent will typically be allowed to file another patent application with the unelected claims from the first application. The rule for unity of invention is essentially a fee-regulation mechanism that prevents patent offices from having to exam-

ine a plethora of separate inventions for an applicant who has only paid for examination of a single invention. As such, the finding of a lack of unity of invention is not typically a fatal flaw for a patent application, although it may incur additional fees for the client as well as additional delay. Accordingly, the following discussion is intended to help the patent agent understand where a lack of unity of invention may be found. The examples provided primarily pertain to chemical inventions; however, the concepts may be extended to applications in all technical domains.

In some jurisdictions such as the EPO, the unity of invention is considered to be present in the context of intermediate and final products where:

- i. the intermediate and final products have the same essential structural element, *i.e.* their basic chemical structures are the same or their chemical structures are technically closely interrelated, the intermediate incorporating an essential structural element into the final product, and
- ii. the intermediate and final products are technically inter-related, *i.e.* the final product is manufactured directly from the intermediate or is separated from it by a small number of intermediates all containing the same essential structural element.

Unity of invention may also be present between intermediate and final products of which the structures are not known – for example, as between an intermediate having a known structure and a final product with unknown structure or as between an intermediate of unknown structure and a final product of unknown structure. In such cases, there should be sufficient evidence to lead one to conclude that the intermediate and final products are technically closely interrelated as, for example, when the intermediate contains the same essential element as the final product or incorporates an essential element into the final product.

Different intermediate products used in different processes for the preparation of the final product may be claimed provided that they have the same essential structural element. The intermediate and final products should not be separated in the process leading from one to the other by an intermediate which is not new. Where different intermediates for different structural parts of the final product are claimed, unity should not be regarded as being present between the intermediates. If the intermediate and final products are families of compounds, each intermediate compound should correspond to a compound claimed in the family of the final products. However, some of the final products may have no corresponding compound in the family of the intermediate products so the two families need not be absolutely congruent. The mere fact that besides the ability to be used in producing final products the intermediates also exhibit other possible effects or activities should not prejudice unity of invention.

Where a single claim defines (chemical or non-chemical) alternatives, *i.e.* a so-called “Markush grouping,” unity of invention should be considered to be present if the alternatives are of a similar nature. When the Markush grouping is for alternatives of chemical compounds, they should be regarded as being of a similar nature where:

- i. all alternatives have a common property or activity, and
- ii. a common structure is present, *i.e.* a significant structural element is shared by all of the alternatives, or all alternatives belong to a recognized class of chemical compounds in the art to which the invention pertains.

A “significant structural element is shared by all the alternatives” where the compounds share a common chemical structure which occupies a large portion of their structures or, in case the compounds only have in common a small portion of their structures, the commonly-shared structure constitutes a structurally distinctive portion in view of existing prior art. The structural element may be a single component or a combination

of individual components linked together. The alternatives belong to a “recognized class of chemical compounds” if there is an expectation from the knowledge in the art that members of the class will behave in the same way in the context of the claimed invention, *i.e.* that each member could be substituted one for the other with the expectation that the same intended result would be achieved. If it can be shown that at least one Markush alternative is not novel, unity of invention should be reconsidered.

In some jurisdictions such as the EPO, a lack of unity may be directly evident *a priori*, *i.e.*, before considering the claims in relation to the prior art, or may only become apparent *a posteriori*, *i.e.* after taking the prior art into consideration – *e.g.* a document within the state of the art shows that there is lack of novelty or inventive step in an independent claim, thus leaving two or more dependent claims without a common inventive concept.

As noted above, the concept of “unity of invention” has been discussed throughout this manual. (See also discussions of the phrase “restriction requirement,” which is US terminology related to a finding of lack of unity.) The patent agent should bear in mind that the absence of unity of invention is not a fatal flaw; it is simply a mechanism that allows the government to collect additional fees. The patent agent will typically file a divisional application with the claims that have been restricted out of the application due to lack of unity of invention.

L. CLAIM POINT OF VIEW

A patent claim should have a consistent “point of view.” The point of view signals the set of parties which could directly infringe a patent claim. The patent agent must be careful to avoid including limitations/elements in a single claim that reflect another point of view. While this may seem like commonsense advice, it can sometimes be very difficult in practice where the nature of an invention is such that inventive components are spread across a range of physical components or a range of physical activities. Having a single point of view also becomes important when the commercial activity associated with the invention is divided among multiple parties.

Example 1. Assume that an invention relates to a new compartment for holding the batteries used to power a flashlight. Let us assume that the inventor has discovered that if a small periwinkle-shaped piece of copper having a male receptacle is snapped onto a conventional D-cell battery, when the combined unit is inserted into a flashlight also having a small periwinkle-shaped piece of copper with a female receptacle, the D-cell battery's operational life lasts three times longer than normal. A patent agent could write the following claim:

1. An apparatus for extending flashlight battery life, comprising:
a periwinkle-shaped copper piece having a male receptacle and adapted for being operably coupled to a battery;
a battery-operated flashlight having electrical wiring; and
a periwinkle-shaped copper piece having a female receptacle, the periwinkle-shaped copper piece fastened to the electrical wiring of the battery-operated flashlight, wherein the periwinkle-shaped copper piece having a male receptacle is adapted for operable coupling to the periwinkle-shaped piece having the female receptacle.

While the claim above may provide an adequate description of the invention, the student will notice that it does not have a consistent point of view. Some portions of the claim pertain to components related to the battery and some portions of the claim pertain to components related to the flashlight. (If the battery lasted for the flashlight's lifetime there would be fewer problems with the claim's point of view.)

But what if the person/entity responsible for the battery was not the same person/entity who provided the flashlight? What if one company sold just batteries and another company sold just flashlights? This means that neither the person responsible for the battery nor the person responsible for the flashlight directly

infringe the claim. Direct infringement is often necessary in order to find any type of infringement such as contributory infringement or inducement and many legal systems require that a single entity be responsible for the direct infringement. Of course, it is often possible for skilled litigators to argue direct infringement even for claims like the one above in some jurisdictions, but the patent agent should draft claims with sufficient skill so that his client will not need to find the best litigation attorneys in order to set out a basic infringement case and/or spend considerable amounts of the client's money to determine how they can set forth a legally-sufficient argument for infringement.

Aside from litigation concerns, the patent agent must also draft his claims so that they are easy to license. Assume, for example, in the commercial world related to the claim above that one company sells flashlights and another company sells batteries. In this situation, not one of these parties may feel the least bit inclined toward taking a license to the claim above as each party may genuinely believe that it has legally sufficient grounds to avoid infringement because it only practices a portion of the claim.

Now suppose that the patent agent had also drafted three more sets of claims – one directed only toward the flashlight portion of the system, one directed only toward the battery part of the system and another directed toward the combination of the periwinkle-shaped copper pieces. (The patent agent would still be advised to keep the original claim above.) These three claims might each read:

Flashlight Claim

2. An apparatus for extending flashlight battery life, comprising:
a battery-operated flashlight having electrical wiring; and
a periwinkle-shaped copper piece having a female receptacle, the periwinkle-shaped copper piece fastened to the electrical wiring of the battery-operated flashlight, wherein the periwinkle-shaped copper piece having a female receptacle is adapted for operable coupling to a periwinkle-shaped piece having a male receptacle fastened to a battery.

Battery Claim

3. An apparatus for extending flashlight battery life, comprising:
a battery; and
a periwinkle-shaped copper piece having a male receptacle, the periwinkle-shaped copper piece operably coupled to the battery,
wherein the periwinkle-shaped copper piece having a male receptacle is adapted for operable coupling to a periwinkle-shaped piece having a female receptacle that is connected to electrical wiring in a flashlight.

The Connector Pieces

4. An apparatus for extending flashlight battery life, comprising:
a periwinkle-shaped copper piece having a male receptacle and adapted for being electrically coupled to a battery; and
a periwinkle-shaped copper piece having a female receptacle, the periwinkle-shaped copper piece being adapted for operable coupling to electrical wiring of a battery-operated flashlight,
wherein the periwinkle-shaped copper piece having a male receptacle is adapted for operable coupling to the periwinkle-shaped piece having the female receptacle.

The student will notice that while Claims 2-3 mention both the battery and the flashlight, the "point of view" in each claim has been shifted exclusively to either the battery or the flashlight or the combination of the two connector pieces. Thus, Claim 2 should be easier to license or assert against an infringing provider of flashlights than Claim 1, and Claim 3 should be easier to license or assert against an infringing provider of bat-

teries than Claim 1. Claim 4 focuses on the two periwinkle pieces themselves and could be used against a company that made the periwinkle parts for later assembly by either battery or flashlight manufacturers.

Example 2. Assume an invention relates to a client and server computing system such as the Internet. Let's assume that the invention is a novel way of ordering candy over the Internet where the customer can use a camera and a robotic arm to fill a candy bag that is then mailed to him. A client computer (e.g. a home personal computer) makes a request to a server computer (e.g. a computing system of an Internet service provider), and the server computer finds the information, processes it and sends the results to the client. A patent agent could write the following claim:

1. A method for dispensing candy, comprising:
 sending a request from a client computer to a server computer for candy located in a candy store;
 sending candy store video data from the server computer to the client computer;
 displaying the candy store video data on the client computer, wherein the displayed candy store video data provides a visual representation of the candy store to enable a user of the client computer to provide directions for a robotic arm located in the candy store;
 sending robotic arm direction instructions from the client computer to the server computer;
 converting the robotic arm direction instructions into native machine robotic arm direction instructions for the robotic arm at the candy store, wherein the native machine robotic arm direction instructions actuate the robotic arm to fill a candy bag with candy;
 sending a shipping instruction from the client computer to the server computer; and
 converting the shipping instruction into a native machine robotic arm shipping instruction for the robotic arm, wherein the native machine robotic arm shipping instruction actuates the robotic arm to place the candy bag in an open box and seal it for shipping.

While the claim above may provide an adequate description of the invention, the student will notice that the claim does not have a consistent point of view. Some steps are performed by the client computer and some steps are performed by the server computer. This means that neither the person responsible for the client computer nor the person responsible for the server computer directly infringe the claim. Direct infringement is often necessary in order to find any type of infringement such as contributory infringement or inducement and many legal systems require that a single entity be responsible for the direct infringement. As discussed above, the patent agent should draft claims using sufficient skill so that his client will not need to find the best litigation attorneys in order to set out a basic infringement case and/or spend considerable amounts of the client's money to determine how they can set forth a legally-sufficient argument for infringement.

Aside from litigation concerns, the patent agent must also draft his claims so that they are easy to license. Assume, for example, in the commercial world related to the candy store claim above that one company provides the candy store and the robotic arm, another company provides the server computer and a third company provides the client computer software. Assume further that while the candy store and the server computer company have a commercial arrangement with each other, the client computer software company has no contract with either party and the server computer is available to anyone who provides a credit card number for payment for services. In this situation, not one of these parties may feel the least bit inclined toward taking a license to the claim above as each may genuinely believe that it has legally-sufficient grounds to avoid infringement on the grounds that it does not completely practice the claim.

Now suppose instead that the patent agent had also drafted two more sets of claims – one directed only toward the client portion of the system and another directed only toward the server part of the system. (The patent agent would still be advised to keep the original claim above.) These two claims might each read:

Client Computer Claim

2. A method for dispensing candy, comprising:
 receiving at a client computer candy store video data;
 displaying the candy store video data on the client computer, wherein the displayed candy store video data provides a visual representation of a candy store to enable a user of the client computer to provide directions for a robotic arm located in the candy store;
 sending robotic arm direction instructions from the client computer, wherein the robotic arm direction instructions cause the robotic arm at the candy store to fill a candy bag with candy;
 and
 sending a shipping instruction from the client computer, wherein the shipping instruction causes the robotic arm to place the candy bag in an open box and seal it for shipping.

Server Computer claim

3. A method for dispensing candy, comprising:
 sending candy store video data from a server computer to a client computer, wherein the candy store video data provides a visual representation of a candy store to enable a user of the client computer to provide directions for a robotic arm located in the candy store;
 receiving robotic arm direction instructions at the server computer from the client computer;
 converting the robotic arm direction instructions into native machine robotic arm direction instructions for the robotic arm at the candy store, wherein the native machine robotic arm direction instructions actuate the robotic arm to fill a candy bag with candy;
 receiving a shipping instruction at the server computer from the client computer; and
 converting the shipping instruction into a native machine robotic arm shipping instruction for the robotic arm, wherein the native machine robotic arm shipping instruction actuates the robotic arm to place the candy bag in an open box and seal it for shipping.

The student will notice that while Claims 2 and 3 mention both the server and the client computer, the action in each claim has been shifted exclusively to either the client or the server. Thus, Claim 2 should be easier to license or assert against an infringing provider of client software than Claim 1, and Claim 3 should be easier to license or assert against an infringing operator of server software than Claim 1.

As we have discussed, drafting patent claims requires many steps of review. Rarely will a patent agent draft an excellent patent claim on the first try – even after years of experience. But what the experienced patent agent learns is a procedure for reviewing and editing patent claims that ultimately produces solid patent claims that capture the full scope of the client's invention.

M. NARROWING A PATENT CLAIM DURING PROSECUTION

A claim may be narrowed either by: 1) adding new elements, 2) adding a limitation to previously recited element and/or 3) further defining how the previously recited elements operate together. (Please note that “elements” are a subset of “limitations” and often more of an intellectual practicality than a genuine legal distinction.)

The pencil example above may be narrowed by adding an extra element, like a cap for the pencil. The claim might read as follows:

1. *An apparatus, comprising:
 a pencil;
 an eraser attached to one end of the pencil;
 a light attached to a proximal center of the pencil; and
 a removable cap attached to one end of the pencil.*

The additional element of the cap narrows the claim. Thus, the claim no longer reads on a pencil with only a light attached and an eraser. All three elements must be present in an infringing device for the claim to read on it.

Most patent offices require that the patent agent clearly show the changes being made to amend a claim. Thus, depending on local patent rules, the amendment to the claim above might be submitted to the patent office as:

1. (Amended) *An apparatus, comprising:*
a pencil;
an eraser attached to one end of the pencil; [[and]]
a light attached to the center of the pencil; and
a removable cap attached to one end of the pencil.

Where “amended” indicates a change to the claim, [[]] show deleted words, and underlining shows newly added words.

When narrowing a claim by adding a new limitation, the new limitation should further define either an element or the relationship between elements. The limitation must be one found in the specification – the patent agent cannot create new relationships between parts that have not been disclosed in the specification. Additionally, the patent agent should not add limitations that will significantly reduce the breadth of a claim without first considering alternative possible amendments and without counseling the client about the likely impact of such amendments. Of course, it is often necessary to significantly amend the claims in order to render them patentable.

A patent agent can often overcome the prior art without adding a completely new limitation to a claim but by simply further defining the elements already recited – or by further interrelating the elements previously recited such as amending a claim to add that “A receives the output of B.” In the previous example, the claim could be narrowed further by defining the light element.

1. *An apparatus, comprising:*
a pencil;
an eraser attached to one end of the pencil; and
a light attached to a proximal center of the pencil wherein the light is directed to shine away from the end of the pencil having the eraser.

Here, the direction of the light further defines the element.

N. EXCLUSIONS FROM PATENTABILITY

Most jurisdictions exclude certain subjects from patent protection. Some jurisdictions have substantially longer lists of exclusions than others. The US for example, excludes only a minimal number of subjects such as scientific theories. From time to time, the patent agent will find that his patent claims have been rejected on the grounds of some exclusion from patentability. In some cases he can still obtain patent protection for the subject invention by re-drafting the patent claims to recite an acceptable format. Again, this is another example where the patent agent must apply diligence and creativity in order to protect his client's valuable inventions.

For example, the European Patent Convention (EPC), the treaty that established the EPO, does not define what is meant by “invention,” but instead contains a non-exhaustive list of things which are not regarded as inventions. The items on this list are all either abstract (e.g. discoveries, scientific theories etc.) and/or non-technical (e.g. aesthetic creations or presentations of information). In contrast to this, an “invention” must be of both a concrete and a technical character. It may be in any field of technology. The EPO further advises that:

- (1) European patents shall be granted for any inventions which are susceptible of industrial application, which are new and which involve an inventive step.
- (2) The following in particular shall not be regarded as inventions:
 - (a) discoveries, scientific theories and mathematical methods;
 - (b) aesthetic creations;
 - (c) schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers;
 - (d) presentations of information.
- (3) The provisions of paragraph (2) shall exclude patentability of the subject-matter or activities referred to in that provision only to the extent to which a European patent application or European patent relates to such subject matter or activities as such. **[Note: For example, software inventions are protectable in Europe, but not “as such.” This simply means that the patent agent needs to alter slightly the format of the claim. One could likely find EPO-issued patents on all of the items listed under (2) above, but they would not have been claimed “as such.”]**
- (4) Methods for treatment of the human or animal body by surgery or therapy and diagnostic methods practiced on the human or animal body shall not be regarded as inventions which are susceptible of industrial application. This provision shall not apply to products, in particular substances or compositions, for use in any of these methods.

As discussed above, many jurisdictions place limits on the types of inventions that can be patented. Some jurisdictions consider “morality” issues in determining whether an invention can be patented. Finally, as seen above with regard to computer programming inventions, some prohibitions are matters of “form over substance.” The patent agent should recognize that sometimes he must word (or re-word) his claims in a particular way to avoid an exclusion from patentability – even though the invention is ultimately described in a manner that is substantively the same as a form that would not be acceptable.

The patent agent will often find that he must exercise particular care with respect to biotechnology inventions. Issues with respect to these inventions may arise because some biotechnology inventions appear to be unprotectable scientific discoveries and because certain biotechnology inventions provoke concerns among some people regarding issues of morality.

“Biotechnological inventions” are typically defined as inventions which concern a product consisting of or containing biological material or a process by means of which biological material is produced, processed or used. “Biological material” means any material containing genetic information and capable of reproducing itself or being reproduced in a biological system.

In principle, biotechnological inventions are patentable under the EPC, in the US and in Japan, for example. Biotechnological inventions are not excluded from patent protection by the EPO either if, for example, they concern an item on the following non-exhaustive list:

- (1) biological material which is isolated from its natural environment or produced by means of a technical process even if it previously occurred in nature. (Hence, biological material may be considered patentable even if it already occurs in nature.)

Although the human body, at the various stages of its formation and development, and the simple discovery of one of its elements, including the sequence or partial sequence of a gene, cannot constitute patentable inventions, an element isolated from the human body or other-

wise produced by means of a technical process, which is susceptible of industrial application, including the sequence or partial sequence of a gene, may constitute a patentable invention, even if the structure of that element is identical to that of a natural element. Such an element is not *a priori* excluded from patentability since it is, for example, the result of technical processes used to identify, purify and classify it and to produce it outside the human body, techniques which human beings alone are capable of putting into practice and which nature is incapable of accomplishing itself.

The examination of a patent application or a patent for gene sequences or partial sequences should be subject to the same criteria of patentability as in all other areas of technology. The industrial application of a sequence or partial sequence must be disclosed in the patent application as filed.

- (2) plants or animals if the technical feasibility of the invention is not confined to a particular plant or animal variety;

Inventions which concern plants or animals are patentable provided that the application of the invention is not technically confined to a single plant or animal variety. A claim wherein specific plant varieties are not individually claimed is not excluded from patentability even though it may embrace plant varieties.

The subject-matter of a claim covering but not identifying plant varieties is not a claim to a variety or varieties. In the absence of the identification of a specific plant variety in a product claim, the subject-matter of the claimed invention is neither limited nor directed to a variety or varieties

- (3) a microbiological or other technical process, or a product obtained by means of such a process other than a plant or animal variety.

"Microbiological process" means any process involving or performed upon or resulting in microbiological material.

In the area of biotechnological inventions, the EPO provides the following list of exceptions to patentability. The list is illustrative and non-exhaustive and is to be seen as giving concrete form to the concept of "*ordre public*" and "*morality*" in this technical field. Not all jurisdictions will follow these same exclusions; consequently, the patent agent must understand the specific rules for the jurisdictions where he is filing a patent application. At the EPO, for example, patents are not to be granted in respect of biotechnological inventions which concern:

- (1) processes for cloning human beings;

For the purpose of this exclusion a process for the cloning of human beings may be defined as any process, including techniques of embryo splitting, designed to create a human being with the same nuclear genetic information as another living or deceased human being;

- (2) processes for modifying the germ line genetic identity of human beings;
- (3) uses of human embryos for industrial or commercial purposes;

The exclusion of the uses of human embryos for industrial or commercial purposes does not affect inventions for therapeutic or diagnostic purposes which are applied to the human embryo and are useful to it.

- (4) processes for modifying the genetic identity of animals which are likely to cause them suffering without any substantial medical benefit to man or animal, and also animals resulting from such processes.

The substantial medical benefit referred to above includes any benefit in terms of research, prevention, diagnosis or therapy. In addition, the human body, at the various stages of its formation and development, and the simple discovery of one of its elements, including the sequence or partial sequence of a gene, cannot constitute patentable inventions. Such stages in the formation or development of the human body include germ cells. Also excluded from patentability are processes to produce chimeras from germ cells or totipotent cells of humans and animals.

Also excluded from patentability at the EPO are: "plant or animal varieties or essentially biological processes for the production of plants or animals." Thus, a patent will not be granted at the EPO if the claimed subject matter is directed to a specific plant variety or specific plant varieties. However, if the invention concerns plants and animals and if the technical feasibility of the invention is not confined to a particular plant or animal variety it is patentable.

Hence, a process claim for the production of a plant variety (or plant varieties) is not *a priori* excluded from patentability merely because the resulting product constitutes or may constitute a plant variety. In some jurisdictions new plant varieties produced as the result of a biotechnological invention could be patented. Also, compare with "Plant Patents" (Chapter 2, Subsection A(2)(c)) that discusses the US requirements for a special class of patent for "asexually reproduced plants."

Despite the general prohibition above, a process for the production of plants or animals is essentially biological, at least in the EPO, if it consists entirely of natural phenomena such as crossing or selection. Thus, this situation provides examples of where a patent agent may need to re-craft patent claims in order to obtain patent protection. To take some examples, a method of crossing, inter-breeding or selectively breeding, say, horses involving merely selecting for breeding and bringing together those animals having certain characteristics would be essentially biological and therefore non-patentable at the EPO. On the other hand, a process of treating a plant or animal to improve its properties or yield or to promote or suppress its growth, e.g. a method of pruning a tree, would not be essentially biological since although a biological process is involved, the essence of the invention is technical; the same could apply to a method of treating a plant characterized by the application of a growth-stimulating substance or radiation. The treatment of soil by technical means to suppress or promote the growth of plants is also not excluded from patentability.

O. THE REQUIREMENT FOR INDUSTRIAL APPLICATION

Some jurisdictions maintain a requirement that patents must be suitable for industrial application. Other jurisdictions such as the US have a requirement for utility but generally assume that most otherwise patentable inventions have some utility. As noted throughout the text, the concepts of utility and industrial application are synonymous but not identical. The necessity of having "industrial application" in order to obtain a patent will from time to time compel a patent agent to re-craft his client's claims from one form to another in order to satisfy the requirement for industrial application.

For example, the industrial application requirement at the EPO states that "an invention shall be considered as susceptible of industrial application if it can be made or used in any kind of industry, including agriculture." "Industry" should be understood in its broad sense as including any physical activity of "technical character," i.e. an activity which belongs to the useful or practical arts as distinct from the aesthetic arts. "Industry" does not necessarily imply the use of a machine or the manufacture of an article and could cover, e.g. a process

for dispersing fog or for converting energy from one form to another. One further class of “invention” which would be excluded, however, would be articles or processes alleged to operate in a manner clearly contrary to well-established physical laws, e.g. a perpetual motion machine.

The “industrial application” requirement as it pertains to computer software renders computer software slightly less patentable in Europe than in the US and some other jurisdictions. For example, the EPO examiner may determine that a given software invention does not have “industrial application.” This rejection does not apply to all (or even most) software inventions, and in many cases the patent agent can overcome the rejection by simply revising the format of the claims and/or explaining to the examiner how the invention as expressed in the revised claims now satisfies the tests for industrial application.

At the EPO as with many other jurisdictions, methods for treatment of the human or animal body by surgery or therapy and diagnostic methods practiced on the human or animal body are not regarded as inventions which are susceptible of industrial application. This provision does not apply to products, especially substances or compositions, for use in any of these methods. Hence, patents may be obtained for surgical, therapeutic or diagnostic instruments or apparatuses for use in such methods. Note: the US and some other jurisdictions do not maintain this particular exclusion.

The manufacture of prostheses or artificial limbs could be patentable even under the general exclusion stated above for the EPO. For instance, a method of manufacturing insoles in order to correct posture or a method of manufacturing an artificial limb should be patentable. In both cases, taking the imprint of the footplate or a molding of the stump on which an artificial limb is fitted is clearly not of a surgical nature and does not require the presence of a medically-qualified person. Furthermore, the insoles as well as the artificial limb are manufactured outside the body. However, a method of manufacturing an endoprosthesis outside the body, but requiring a surgical step to be carried out for taking measurements, would be excluded from patentability.

Despite the general exclusion stated above for the EPO, patents may still be obtained for new products for use in these methods of treatment or diagnosis, particularly substances or compositions. However, a known substance or composition may only be patented for use in these methods if the known substance or composition was not previously disclosed for use in surgery, therapy or diagnostic methods practiced on the human or animal body (“first medical use”). The same substance or composition cannot subsequently be patented for any other use of that kind. A claim to a known substance or composition for the first use in surgical, therapeutic and/or diagnostic methods should in EPO applications have a form such as:

“Substance or composition X” followed by the indication of the use, for instance “...for use as a medicament,” “...as an antibacterial agent” or “...for curing disease Y.”

In contrast, these types of claims will be regarded as restricted to the substance or composition when presented or packaged for use. Product claims can only be obtained for novel products. However, this does not mean that product claims for the first medical use need not fulfill all other requirements of patentability, especially that of inventive step.

A claim in the form; “use of substance or composition X for the treatment of disease Y...” will be regarded by the EPO as relating to a method for treatment explicitly excluded from patentability and therefore will not be accepted. If an application discloses for the first time a number of distinct surgical, therapeutic or diagnostic uses for a known substance or composition, then independent claims each directed to the substance or composition for one of the various uses may be allowed if they are otherwise patentable.

In some jurisdictions such as the EPO, a claim in the form – “Use of a substance or composition X for the manufacture of a medicament for therapeutic application Z” – is allowable for either a first or “subsequent” (second or further) application (“second medical use”-type of claim or “Swiss-type” claim), if this application is new and inventive. The same applies to claims in the form – “Method for manufacturing a medicament intended for therapeutic application Z, characterized in that the substance X is used” – or the substantive equivalents thereof. In cases where an applicant simultaneously discloses more than one “subsequent” therapeutic use, claims of the above type directed to these different uses are allowable in the one application but only if they form a single general inventive concept. Regarding use or method claims of the above type, it should also be noted that a mere pharmaceutical effect does not necessarily imply a therapeutic application. For instance, the selective occupation of a specific receptor by a given substance cannot be considered in itself as a therapeutic application; indeed, the discovery that a substance selectively binds a receptor, even if representing an important piece of scientific knowledge, still needs to find an application in the form of a defined, real treatment of a pathological condition in order to make a technical contribution to the art and to be considered as an invention eligible for patent protection.

As noted earlier in this text, several jurisdictions exclude methods of treating the human body as patentable inventions. However, for many inventions, patent protection can still be obtained by simply revising the claims to have a slightly different format.

Methods of testing generally should be regarded as inventions susceptible of industrial application, at least by the EPO, and are therefore patentable if the test is applicable to the improvement or control of a product, apparatus or process which is itself susceptible of industrial application. In particular, the utilization of test animals for test purposes in industry, e.g. for testing industrial products (for example for ascertaining the absence of pyrogenic or allergic effects) or phenomena (for example for determining water or air pollution) would be patentable.

In general, the EPO requires that the description of a patent application should, where this is not self-evident, indicate the way in which the invention is capable of exploitation in industry. In relation to sequences and partial sequences of genes, this general requirement is given specific form in that the industrial application of a sequence or a partial sequence of a gene must be disclosed in the patent application. A mere nucleic acid sequence without indication of a function is not a patentable invention. In cases where a sequence or partial sequence of a gene is used to produce a protein or a part of a protein, it is necessary to specify which protein or part of a protein is produced and what function it performs. Alternatively, when a nucleotide sequence is not used to produce a protein or part of a protein, the function to be indicated could, e.g. be that the sequence exhibits a certain transcription promoter activity.

P. “READING” A PATENT CLAIM ON SOMETHING

A claim may “read on” prior art or an accused product or process. Claims are read on prior art to evaluate the patentability or validity of the claims. During litigation, claims are read on an accused product or process to evaluate infringement.

In order for a claim to read on prior art or an accused product, every element of the claim must be present in the prior art or accused product. A claim with elements A, B and C reads on prior art that discloses elements A, B, C and D. Here, the prior art contains all the elements of claim, namely A, B and C.

The patent agent should make sure that at least one claim in the patent application, and possibly all of them, reads on the embodiments of the invention made, used and sold by the client. Among other things, if the claims

do not read on the client's embodiment of the invention, then the patent agent has probably misunderstood the invention. Additionally, once the patent issues, the client cannot honestly take advantage of the patent marking statutes to proclaim that the product is protected by patent. Worse still, the client may have difficulty collecting lost profit damages against an infringer, although he will still be likely to collect a reasonable royalty – however, the difference between reasonable royalty and lost profits can amount to a considerable sum.

Q. CLAIM CONSTRUCTION BY COURTS

The greatest test of a patent agent's claims will likely come not before the patent examiner but before the courts if the patent is ever litigated. In patent litigation, the interpretation of the claims is typically the most critical factor in determining whether the patent has been infringed or is even valid over the prior art. The process of interpreting the claims is known as "claims construction." The scope of protection provided by a given patent is often determined by the meaning of just a few specific terms used in a claim.

While construing claims, particularly in the United States, courts have increasingly used dictionaries. The United States, however, begins by reading the claims, giving them their ordinary meaning and reviewing the specification and prosecution history to see if the claims have some different or special meaning. For ordinary words with no specialized meanings, courts often use a standard dictionary to define the words. In contrast, technical dictionaries, encyclopedias and treatises may be used for establishing specialized meanings of terms in a particular field of the invention.

A court will generally give a claim term the full range of its ordinary meaning as understood by a person with ordinary skills in the field of the invention. For instance, if the invention is a chemical invention and the term "amorphous" needs to be construed, the court will likely be persuaded to take into account the ordinary meaning of the term as understood by an average chemist. Likewise, if an invention relates to software and the claim term to be construed by the courts is for "cache," for instance, then the court may be persuaded to take into account the ordinary meaning of the term as understood by an average software programmer.

It is common to find that words used in claims have multiple dictionary meanings. Some of the meanings have no relation to the claimed invention. If a particular term has more than one possible meaning, in the absence of any other factors, courts will more likely be persuaded to interpret the term by its customary meaning in a specific art rather than its ordinary meaning. In construing claims, the court may be persuaded to examine the intrinsic evidence carefully and ascertain the meaning of the term that is most consistent with the selection of words made by the patent agent in preparing the specification and in prosecuting the patent application. Intrinsic evidence means evidence that is specific to the patent. Examples of intrinsic evidence are the patent itself (claims, description, drawings etc.) and the prosecution file or history of the patent. Thus, the patent agent must always be extremely careful about what he writes in the patent application and in responses to office received during patent prosecution.

The laws of some jurisdictions provide legal protection beyond the literal scope of the words used in a patent claim. This additional protection is known as the "doctrine of equivalents." The doctrine of equivalents does not necessarily provide the same scope of protection from one jurisdiction to the next.

EXAMPLE

A patent claim recites that a "nail" holds Widget A to Widget B. An accused infringer literally infringes the patent claim except that the accused infringer uses a "screw" to hold Widget A to Widget B instead of a nail. Under the doctrine of equivalents, the patentee could argue that a screw was equivalent to a nail for purposes of the patented invention. If the court accepted the patentee's arguments, then infringement would be found.

Some countries believe that it is entirely up to the inventor to set forth in his claims what he considers to be his invention and maintain no doctrine of equivalents. In reviewing the example above, judges in such countries would find that the patentee could have simply drafted his patent claims using a term that encompassed both nails and screws, such as "metal fastener."

Other countries believe that it can be nearly impossible to find words that adequately describe the full scope of a complicated invention and maintain a doctrine of equivalents. In a broad doctrine of equivalents regime, the patentee might even be able to argue that "glue" was equivalent to a nail for purposes of the invention.

The doctrine of equivalents is a complicated legal topic whose requirements vary significantly from country to country. The patent agent should be aware of the doctrine, however, and should know what the courts require in the jurisdictions where he prosecutes patent applications. For example, in many jurisdictions, the patent agent's communications during patent prosecution can be used to foreclose application of the doctrine of equivalents. If, in the example above, the patent agent had written in an office action response that "only" nails are used in the invention, it would be difficult for the patentee to argue later that either "glue" or "screws" were equivalent to nails.

KEY WORDS

>> CLAIM SET >> POINT OF VIEW >> "READ ON" >> CLAIM CONSTRUCTION

SELF TEST

1. Why should the patent agent prepare the claims first?
2. Give examples of how a patent agent might broaden a patent claim.
3. When drafting claims, the patent agent should avoid relative words like "fast," "slow," "short," "tall" and "perfect." True or False?
4. A patent agent may define words in the patent. True or False?
5. Why is it important to avoid unnecessary limitations when drafting claims?
6. Explain how a claim can "read on" prior art.
7. What is claim construction? What is the point of view or reference point used in claim construction?
8. Why is it important that a claim have a single point of view?

VIII. PATENT STRATEGY

Assume that a government patent office has approved your patent. What next? What can you do with your patent? In a few rare instances, a single patent will be so revolutionary and pioneering that its owner can control a particular industry or a given industry segment throughout the life of the patent. However, this rarely happens.

The common reasons for the failure of a patent are often poor claims and close prior art. In fact, some “famous” patents were not nearly as successful at cornering a market as is commonly believed. For example, Thomas Edison received several patents related to light bulbs. However, an English inventor named Joseph Swan obtained the first patent on the light bulb and over the years Edison had to pay royalties to Swan for the rights to use his patent. Remember from Chapter 1 that patents do not give the patent owner the right to practice the invention, rather the right to exclude others from making, using, offering for sale or selling the invention without permission. Thus, Edison had to seek permission from Swan to use his patent.

As an aside, a common misconception about patents is that the patent office considers infringement issues when awarding patents. In reality, patent offices only look at prior art pertinent to the pending patent application. You will likely have to remind your clients of this fact from time to time.

Patent strategy also becomes more complicated and typically more lucrative as the number of patents in a portfolio increases. Holding a single patent rarely provides the same power and flexibility that holding a dozen or a hundred patents provides.

Imagine, for example, that Company A holds a single Patent Y related to Product X. If Patent Y has been well drafted, it will likely cover several embodiments of Product X as well as several key features/components of Product X including the use of these features and components in different/unrelated products. Assume that Product X is highly useful but not the first product of its kind, e.g. Product X is not the very first automobile or the very first telephone or the very first computer. If this is the case, it is quite possible that Competitor B could make a product very similar to Product X that did not infringe Patent Y. In other words, Competitor B could “design around” Patent Y in order to produce a non-infringing Product X. (Note: this doesn’t mean that Competitor B’s design around would be commercially viable.)

Now imagine that Company A holds ten patents related to variations of Product X in addition to Patent Y. The other patents could provide claim coverage for additional features/components of Product X beyond those covered by Patent Y. In addition, the other patents owned by Company A might provide coverage related to the use of Product X, the commercial environment related to Product X and/or alternative variations of Product X etc. Competitor B will now have a much more difficult time in designing around Company A’s patent portfolio in order to produce a non-infringing Product X. Indeed, the legal expenses related just to studying Company A’s portfolio well enough to understand the coverage provided by Company A’s patent claims will eventually become prohibitively expensive for many competitors.

Company A’s patent portfolio will eventually become large enough that it can either force its competitors to take royalty-bearing licenses to its patents or force competitors out of the market by suing them for patent infringement. If Company A’s competitors have large patent portfolios of their own, Company A and these competitors can cross-license each other’s patent portfolios. Such cross-licenses may either be free or royalty-bearing, depending on the patents and the competitive market. A cross-license with its competitors will allow Company A to manufacture its products without fear of a lawsuit from its major patent-holding competitors. Of course, Company A could still use its patent portfolio against a new competitor in the market who had no pertinent patents.

As noted above, Company A’s patents are likely to provide coverage for key features/components of Product X even when they are not used in Product X. This situation can arise when a key feature/component is particularly novel and has been claimed so as not to limit the scope of coverage just to Product X. In addition to the use of

its patents against competitors, Company A could also consider using its patents against other parties who make products that include the key features/components protected by Company A's patents. Company A's licensing of patents outside its own "field of use" could be quite lucrative. Typically, Company A's only costs for licensing its patents in new fields of use will involve a small amount of time from one or more licensing attorneys or licensing executives and may possibly involve occasional patent litigation. Company A may hesitate to litigate its patents against third parties due to concerns that the patent in suit may be declared invalid (e.g. "revoked"), and once the patent has been invalidated, Company A will no longer be able to enforce it against anyone, including its own competitors.

PROFESSIONAL TIP

In any licensing campaign, it is rarely a good idea to pursue first the biggest player in any given industry. Licensing campaigns are typically more successful when they start with medium-to-small players in a given industry and build momentum by working towards larger ones.

Patent valuation is a complicated topic that relates to patent strategy. A thorough discussion of patent valuation is outside the scope of this manual. However, the student may appreciate what is known as the "real property" metaphor. Intellectual property bears many similarities to real property. Prior art is analogous to public lands (non-patented prior art) and/or lands

already claimed by others (issued patents that are still in force). The real estate catch phrase "location, location, location" applies equally to patents – a patent whose claims fall squarely on top of a valuable invention is worth much more than a patent whose claims map to a less lucrative space. A patent as a legal instrument is analogous to the quality of a home's construction – a patent located on top of a valuable invention can still be worthless if the patent has not been properly constructed. The legal remedies associated with patent infringement are similar to the legal remedies associated with encroachment on another's real property.

A. OFFENSIVE BLOCKING PATENTING TO MOUNT ATTACKS ON COMPETITORS

A patentee may employ his patents directly against any and all infringers. A patent typically does not give its owner any rights to make, use or sell the invention covered by the patent. In fact, it is quite possible to obtain a patent for an invention that could not be made, used or sold due to the infringement of someone else's patent or without approval from a government regulatory agency. Fortunately, a patent cannot infringe another patent.

Selling a product is often, although not always, more lucrative than licensing the intellectual property necessary to manufacture the product. Consequently, many patent owners who also manufacture products use their patents to force competitors either to design around their patents (and produce, hopefully, an inferior product) or to license their patents.

Some companies apply their patent royalties to their research departments as a matter of policy. This makes some sense in that the company's research and development department probably created the invention that resulted in the patent being used to generate royalties – and by giving the R&D department "extra" money from the patent licensing, the company may end up better enabled to create new products and services.

When a company aggressively licenses its patents to competitors, it takes money away from the competitor that the competitor could have been applied to programs like its own R&D. This is sometimes known as "the \$2 swing" – in the sense that every inbound licensing dollar from a competitor takes one dollar away from the competitor's programs and adds one dollar to the licensing company's programs – thus, creating a relative two-dollar difference between the two companies.

In developing an offensive patent strategy, the patent owner should continually consider the nature of the licensing target's infringement. The infringer could be guilty of direct infringement, contributory infringement and/or inducement of infringement. The nature of the damages may also vary based on the use of the infring-

ing technology. Direct infringers do not necessarily incur greater damages than contributory infringers. Some country's patent laws also recognize infringement under the doctrine of equivalents. Thus, a defendant who is not directly infringing a patent claim might still be considered an infringer by virtue of his use of a substantially similar component used in a substantially similar manner. Analysis under the doctrine of equivalents is quite complicated; however, one key factor is whether the patent's prosecution history includes statements that would indicate that the patentee surrendered claim coverage for the substantially similar component during patent prosecution. This is another reason why responses to office actions need to be carefully worded and preferably short.

B. DEFENSIVE PATENTING TO DEFEND ONESELF FROM INFRINGEMENT ACTIONS

Patents are "swords" and not "shields" in the sense that a patent does not give its owner the right to manufacture a product protected by the patent. A patent provides a negative right that allows the owner to say who cannot practice the invention protected by the patent. Holding a patent will provide its owner with little assurance that his manufacture of a product covered by the patent will not infringe another patent owned by someone else. However, patents can sometimes effectively operate as shields with respect to patent-holding competitors who will refrain from suing you for infringement out of fear that you will counter-sue them for patent infringement. In defending oneself against claims of patent infringement, it is frequently of little help for the defendant to say that he has a patent and that his own products fall within the scope of protection accorded by the patent – unless the defendant's patent is so different from the plaintiff's patent that a legal fact finder (e.g. a judge or jury) could readily see the differences between the two inventions. However, even in such situations it is often easier for the defendant simply to explain why he doesn't infringe the claims in suit.

In certain circumstances a patent or group of patents may provide a defensive shield for a patentee against his own competitors. Assume Company A holds 5,000 patents related to Product X and assume that Company A's top three competitors each hold 1,500 patents. The competitors might sue Company A to achieve some business objective, but they would most likely refrain from suing Company A for fear that Company A would counter-sue for patent infringement using its much greater patent portfolio. Certainly, whether a given company will benefit from having more patents depends somewhat on the company's industry segment and the company's particular technical characteristics and business strategy. There is typically little reason for a company to acquire patents without a specific business purpose.

In many industries where the major players each hold substantial numbers of patents, it is quite common for these competitors to cross-license their patent portfolios to each other. Such cross-licenses may include some royalty formula or they may be completely free. Additionally, the cross-licenses may include a major limitation such as a field of use limitation which would still permit infringement litigation outside the field of use. For example, assume that Company A and its major competitors cross-license their patent portfolios in a non-royalty-bearing license pertaining to the manufacture and use of Product X. Company A could not sue its competitors for infringing activity related to Product X, but if one of the competitors produced a new product, Product Z, Company A could sue the competitor for infringement related to Product Z. In fact, if Company A's patents were particularly strong, and Product Z was particularly lucrative, Company A could use its patents to force the competitor to stop the continued manufacture and use of Product Z and begin making its own Product Z – thus, Company A could employ its patents to take a market away from a competitor. Alternatively, Company A could grant a royalty-bearing license to the competitor for the manufacture and use of Product Z, and Company A could set the royalty rate for the license at an amount that would approach its own profits for Product Z manufacture if Company A sold Product Z, e.g. nine percent of the competitor's gross sales revenue for Product Z.

A patent owner can employ many tools in his efforts to determine how best to use his patents. He should probably model various economic scenarios before deciding how to exploit his patents. A simple matrix may be helpful in some situations. For example, the company can list its products and decide on a per-product-basis how to exploit the intellectual property related to the product. For some products, the company may decide to use the related patents in a purely defensive manner to block out all competitors – while for other products, the company may decide to follow a licensing strategy. At a high level, the company can provide estimates of its likelihood of success following each path and/or the likelihood of senior management agreeing to follow a particular approach. The options that receive the highest ratings for a given product can then be analyzed further to arrive at the company's ultimate intellectual property strategy for the product. This analysis will also likely require analysis of the strengths/weaknesses of the patents involved as well as the values of the relative markets. In the end a well-developed patent portfolio focuses on the company's core businesses and protects particular features and functions that transcend the company's specific product offerings. A well-developed patent portfolio will also likely create barriers to market entry and/or success for actual and potential competitors.

C. DESIGN-AROUND TECHNIQUES

As mentioned above, designing around one or more patents involves determining the scope of claim coverage provided by the patent. Designing around also typically involves detailed review of the patent specification, review of the prior art cited and applied during the prosecution and close analysis of the prosecution history of the patent application to see if the applicant made any damaging admissions about the invention during prosecution (e.g. "This invention pertains to improved buggy whips and absolutely nothing else!").

The attorney performing the design around analysis may wish to determine the precise meanings for the terms used in the patent's claims by applying the laws regarding patent claim construction or claim interpretation in the forum jurisdiction. It is essential always to bear in mind that the claims define the scope of the protection. The rules for determining the scope of claim coverage vary from jurisdiction to jurisdiction. In many jurisdictions claim limitations will initially receive the "plain meaning" (or ordinary meaning) of the terms recited, but may be further interpreted in light of their use in the patent's specification and/or in the prosecution history for the patent. If "means-plus-function" claim language is used, the attorney will need to consider how such claims are interpreted in the forum jurisdiction.

The attorney will likely prepare his analysis in the form of an "opinion." In some cases, the opinion may be fairly short while in other cases it may be extremely detailed. "Opinion letters" may be quite helpful in jurisdictions that recognize some form of "willful infringement." Willful infringement arises when an infringer knows of another party's patent and deliberately infringes it and/or when the infringer makes no effort to determine if he infringes the patent. Obtaining a non-infringement or invalidity opinion from a neutral attorney may provide a defense to "willful" infringement in many of the jurisdictions that recognize willful infringement. The damages associated with willful infringement are typically a multiple of the actual or direct damages for patent infringement. Obtaining a non-infringement or invalidity opinion may be helpful even in a jurisdiction that does not recognize willful infringement – since such opinions can provide valuable guidance to a company on the basic question of whether they have an infringement problem with respect to a particular competitor's patent.

Patent agents are not allowed to prepare opinions in many jurisdictions such as the US. Patent opinions are typically written by an attorney, usually by a patent attorney. Many law firms and attorneys will not prepare opinions due to the possibility of a high malpractice claim should the opinion turn out to be inadequately prepared. (Bear in mind that an opinion will never be needed at all in litigation if the client is found not to have infringed the patent. Thus, the opinion's conclusion will always be incorrect when the opinion is actually needed in court and the issue for the court to decide will be the adequacy of the opinion's preparation.) Of course, an attorney will not typically write an opinion for a client if, in the attorney's opinion, the client really

is infringing a valid patent. In such situations, the attorney typically expresses his concerns in a non-permanent medium (e.g. verbally) and not on paper. Because a patent agent typically has in-depth knowledge of a particular technology, the patent agent may assist the attorney in preparation of an opinion.

Opinions of counsel in many countries are typically protected by the attorney-client privilege and do not need to be disclosed to adverse parties. A plaintiff typically must seek special permission from the court in order to compel a defendant to produce an opinion. Accordingly, whenever a company has an opinion prepared by its counsel, the appropriate persons in the company should make sure that the opinion is retained by the company in strictest confidence and not shared with anyone other than the company's key executives on a need-to-know basis. Additionally, the opinion should not be provided to the company's customers. Note that reliance on an opinion of counsel may result in a waiver of attorney-client privilege for all opinions relating to the subject matter of the opinion. In some circumstances, the company may share its opinions with other parties using a vehicle known as either a "common interest agreement" or a "joint defense agreement." The preparation of such agreements is beyond the scope of this manual.

KEY WORDS

>> DESIGN AROUND >> INFRINGEMENT >> BLOCKING PATENT

SELF TEST

1. The patent office considers infringement issues when awarding patents. True or False?
2. What is offensive blocking patenting?
3. A patent gives the owner the right to practice the invention. True or False?
4. Explain how a patent can effectively operate as a "shield."
5. What is meant by the term "design around" with respect to patents?

IX. ORGANIZING, EDUCATING, AND MOTIVATING THE TECHNICAL TEAM

A patent agent will probably find that no two of his clients are alike. Some clients will simply want to obtain one or two patent applications while others will want to establish patenting as a routine, ongoing program. The patent agent should always be willing to educate his clients about the benefits of obtaining patents and he can help clients develop a "patent culture."

Once a patent culture has been established within an organization or company, the scientists, engineers and managers will routinely consider patents and other intellectual property rights in the company's decision-making process. Intellectual property will no longer be an "occasional" endeavor but will become a routine part of its business.

The patent agent will likely want to identify certain key members of his client's organization. In addition to knowing the key decision-makers, the patent agent should also identify the organization's technical "gatekeepers." The technical gatekeepers are those within the organization who are highly adept at introducing new technologies to the company. They are likely to be key inventors of new products and services and are also typically those with whom the other scientists and engineers discuss and brainstorm their own ideas.

The patent agent can help clients establish internal patent program infrastructure. A major component of such an infrastructure is some form of a "patent review committee" that oversees the development of the organization's patent portfolio. Another key component is some form of incentive program to encourage inventors to report their inventions to the patent agents.

The patent agent can also assist clients in developing internal procedures for handling patent-related documents such as Invention Disclosure Forms, patent applications, prior art collections and issued patents. The patent agent can help clients establish patent docketing systems and procedures so that critical dates are not missed. He will also want a docketing system for his own files. A docketing system is basically a calendaring program that provides patent information such as when responses to office actions must be filed, when foreign filing decisions must be made, when annuities must be paid, etc.

The patent agent should not generally create inventions for his clients as this presents conflict of interest problems. However, the patent agent can certainly help his clients establish an environment in which the creation of inventions is likely to flourish. Important parts of this mission are educating and motivating the client's prospective inventors to become "pro patent" and making sure the client has the appropriate infrastructure to organize and control the organization's invention reporting mechanisms so that patent applications can be filed well prior to critical filing deadlines.

A. TRAINING MANAGEMENT PERSONNEL AND MARKETING PERSONNEL TO UNDERSTAND THE SIGNIFICANCE OF PATENTS AND PORTFOLIO BUILDING

The patent agent may find it helpful to offer educational programs to his clients' senior management team. If the offer is accepted, the patent agent will have a perfect opportunity to educate his client about the benefits of patenting and an opportunity to dispel any misunderstandings about patents the client may have. However, many management teams are extremely busy and this opportunity may not readily present itself.

In the alternative, the patent agent can take the initiative to discuss the benefits of patenting with individual managers in the organization as the need arises. The patent agent may also seek opportunities to address larger audiences in the community as a means of spreading interest in patents.

Similarly, the patent agent should seek opportunities to educate his client's engineering, scientific and management teams on the benefits of patenting. Engineers and scientists often do not know the proper proce-

dures to follow in reporting their inventions and many engineers and scientists do not completely understand how patents could make their organization or research institute more successful. Marketing staffs often do not appreciate the strategic value of patents and frequently their expertise and input is overlooked in decisions about what should be patented. Often there are more potential inventions available for patenting than the organization has the resources to patent.

Many patent agents often find that some key managers within their client's organization are either extremely ignorant about the value of patenting or are downright hostile to the notion of patenting at all. Admittedly, not every organization can benefit from patents. However, even companies in the beverage industry, such as Coca Cola®, hold fairly substantial patent portfolios even though their primary product is not itself patentable.

The patent agent can also supply his clients with Invention Disclosure Forms. These forms are filled out by researchers or engineers and briefly describe a potentially patentable invention. (A sample Invention Disclosure Form has been provided with this manual in Annex B.) The patent agent may learn over time of additional questions that should be asked on invention disclosure forms with specific clients and/or with clients in particular industries. The patent agent may want to tailor the Invention Disclosure Forms for clients to include the company's logo or other company-specific information, such as its internal docketing numbers for patents and patent applications.

The patent agent will also learn over time how Invention Disclosure Forms should be processed for particular clients. (For some clients, this processing will be conducted before the forms reach the patent agent.) Because of the potential for a time bar to rise (e.g. a public disclosure), Invention Disclosure Forms should initially be accepted in whatever condition they arrive. The patent agent should first determine if a bar has risen or is about to rise and take action accordingly.

The inventor should be encouraged to attend the patent review committee meeting to discuss his invention. If he cannot attend the meeting, an advocate for the invention should attend the meeting because the patent review committee may not understand the importance/significance of the invention and/or may have questions about it.

Organizations with fairly sophisticated patenting programs may have strategic maps to characterize and identify their inventions with respect to a specific product, a product category or an entire industry segment. If the client has developed such a tool, the invention disclosures should be characterized with respect to the client's strategic map. Of course, many small clients will not have such a strategic map.

Invention Disclosure Forms provide evidence of inventorship, especially when they have been co-signed by a non-inventor. The necessary characteristics for proving inventorship may vary from country to country. In some first-to-file countries determining priority of inventorship may not matter outside of theft considerations. Similarly, Invention Disclosure Forms provide evidence of conception and reduction to practice dates. This evidence may become extremely important in a first-to-invent system such as that administered in the US. Invention Disclosure Forms may also provide secondary evidence that the inventor has assigned his rights to an invention to a third party such as his employer.

Some patent systems require that patent applications disclose the best mode known to the inventors for carrying out the invention. Invention Disclosure Forms may be helpful in this regard as well.

Invention Disclosure Forms may also provide some risk to the company. Consider, for example, how a defendant might use the patent holder's Invention Disclosure Form during litigation. A defendant might use an Invention Disclosure Form in arguing for a particular type of claims construction based on some limiting language in the Invention Disclosure Form. Similarly, a defendant might argue that the inventor had engaged in

inequitable conduct in obtaining his patent by not disclosing known prior art to the patent office – assume, for example, that the original Invention Disclosure Form mentions prior art that is not later disclosed to the patent office. Consequently, a patent agent will want to train his client's staff in how to complete an Invention Disclosure Form properly. Similarly, the patent agent will want to make sure that items such as information disclosure issues are properly and professionally handled.

The company should select for patenting those inventions that will result in the highest return on investment to the organization – either through direct licensing of the patent or through higher sales of a product protected by a patent. Assume that Engineer Y has created two inventions A and B. Invention A is an extremely brilliant solution for a minor problem related to the company's least successful product. Invention B is a fairly mundane but still probably patentable enhancement to the company's most successful product. The company can only afford to patent one invention at this time. Because Invention A is so technically brilliant Engineer Y advocates that it be patented. The patent agent discusses the invention with Marketing Manager Z who informs the patent agent that the enhancement provided by Invention B would boost the company's product sales by 75 percent. Taking into consideration the important information provided by the marketing department, the company's management opts to file a patent on Invention B. In reality, this scenario would present other complicated factors, such as the ease with which a competitor could design around a patent on invention B as well as how broadly Invention B is patentable. If Invention B does not appear to be patentable in a meaningful way, the company would be better served by patenting Invention A.

Where possible, the patent agent should always attempt to understand how the patent application that he is preparing will serve his client's needs. This will guide the patent agent in drafting the claims and in making decisions regarding additional claim limitations during patent prosecution. The patent agent will also find that selecting the best inventions for patenting may often involve a wider cross-section of skills within the organization than just the particular team of scientists and engineers who create patentable inventions. The patent agent should also be aware that some persons within the organization are likely to be hostile to patents, either for a philosophical reason or because a patenting program harms them in some way, either actual or perceived.

B. TRAINING SCIENTISTS/TECHNOLOGISTS TO UNDERSTAND WHAT MIGHT BE PATENTABLE, WHO MIGHT BE A CO-INVENTOR AND PREPARING INVENTION DISCLOSURES

In addition to general education related to the value of patents, the patent agent should make sure that key engineers and scientists within the organization understand certain key points about the patent process. A patent agent should strive to create a "patent advocate" within his client's organization. Good patent advocates tend to be key inventors who are well-respected by their peers, e.g. technical gatekeepers. The patent agent will probably not be in his client's engineering laboratory on a daily basis so an internal patent advocate can be an invaluable resource.

The patent agent needs to make sure that his client has someone who can provide Invention Disclosure Forms to the scientists and engineers. These forms are not absolutely necessary but they can be quite helpful in making sure that the basic information relating to an invention has been recorded. The patent agent himself can dispense such forms to his clients if requested. Additionally, for some clients the patent agent may simply conduct an interview with the inventor(s) to obtain all the information contained on a typical disclosure form. The advantage of an Invention Disclosure Form, however, is that the patent agent can quickly determine if any critical dates have passed or are approaching.

Assume, for example, that the client wants to obtain a patent on an invention pertaining to Product W and that the client will be displaying Product W at a trade show within two weeks. Unless a patent application is filed within the next two weeks, the client will lose all rights to patent the product in most countries hav-

ing an absolute novelty bar. This is obviously an important piece of information that the patent agent needs to know immediately. If the patent agent has established a patent advocate within the company, hopefully the patent agent will have been informed of this product disclosure well before the two-week deadline. Also, if the patent agent has established an internal patent advocate, the advocate may be the one who learns of the forthcoming product disclosure and informs the patent agent. Thus, the company or institution will still be able to file the patent application prior to the critical date and avoid the alternative in which the patent agent has to inform his client that patenting is no longer available on a key invention.

A patent agent may find that his clients become significantly more pro-patent when either they realize that they have missed the opportunity to patent a key invention or when they are sued for patent infringement or threatened with suit by a competitor. Either one of these two events may assist the patent agent in the work of protecting his client's valuable inventions.

Whether by Invention Disclosure Form or interview, the patent agent will want to make sure that he has key basic information about an invention before he begins preparing the patent application. The patent agent will want to know certain key dates related to the invention to verify that the invention is still patentable. The patent agent will also want to know who the inventors are. He will not know precisely the complete set of inventors until the claims have been drafted – but he can nevertheless determine the possible universe of inventorship for that application. The patent agent may have to be fairly direct in obtaining the inventorship information; it is not uncommon for senior managers to insist that they have provided an inventive contribution merely by sponsoring or supervising work. However, few of the world's patent laws recognize "supervising" inventors as providing an inventive contribution. (Naming the legal inventors of a patent application bears only a few similarities to the conventions for naming authors of scientific papers.) Conversely, it is not uncommon for a person who provided an inventive contribution not to want to be named as an inventor. Some people are very humble; others just don't want to be bothered for whatever reason. However, the application will not be properly completed if it excludes a key inventor and the resulting patent will not be valid unless corrected.

The patent agent does not help his client by filing an invalid patent application and he may even expose himself to malpractice claims should he knowingly do so. Consequently, the patent agent may frequently find himself having to conduct inventorship investigations to remove from the list of inventors those who did not provide an inventive contribution and to add reluctant inventors to the application. Of course, the patent agent himself may likely have to request assistance from managers within the client's organization from time to time. The patent agent should never file a patent application that he knows to be fraudulent.

C. SETTING UP AN IN-HOUSE PATENT REVIEW COMMITTEE TO PERIODICALLY REVIEW INVENTION DISCLOSURES AND RECOMMEND WHAT SHOULD BE PATENTED

The patent agent should encourage his clients to establish a patent review committee that periodically reviews invention disclosures and provides recommendations on what should be patented. The patent agent should sit on the committee and provide advice regarding patentability and other related matters. However, the patent agent should not himself determine what his client patents. Other members of the patent review committee should be the client's key scientists, engineers and inventors. As discussed above, a member of the client's marketing staff is often a helpful addition to the committee. A key member of the client's senior management team may also be helpful.

The committee should meet with some regularity to be effective. If the committee does not do so regularly, many of the patentability decisions will be made *ad hoc* in order to avoid a patentability bar.

D. INVENTOR INCENTIVE PROGRAMS TO ENCOURAGE INVENTORS TO INVENT AND REPORT

A creative person will typically conceive patentable inventions without having to be asked to do so. However, when their contributions are ignored and unrecognized, inventors have a tendency either to stop inventing or to stop reporting their inventions. Consequently, the organization loses the opportunity to benefit from the work of its talented inventors. To maintain a motivated inventive team, many companies offer some kind of reward to their inventors for their patentable inventions.

The nature of the reward provided to an inventor will vary. Some companies include specific incentives in their employment contracts with particularly important inventors. Compensation schemes can involve: (a) the payment of a small sum for completing an invention disclosure, (b) the payment of a slightly larger sum when a patent application is approved and/or filed with the patent office or (c) the payment of a larger sum when the patent issues. Few companies reward inventors at all of the steps above, with most companies offering either (a) and (c) or (b) and (c) above.

Some organizations provide compensation to their inventors whenever their patent is successfully licensed. This approach is somewhat more common with universities. For example, a university could give its inventors the following choice: either a small fixed percentage of the royalties from their inventions or a larger percentage of the royalties upon condition that these funds be applied for the inventor's laboratory. Some particularly significant inventors have been known to have staff whose salary is paid by the inventor's patent royalties. Licensing compensation is usually in addition to any other incentive payments that an inventor might receive, such as a cash payment when the patent application is filed. This is often a good idea since the inventor's patent might not be successfully licensed.

In addition to compensation schemes, which tend to be somewhat impersonal, many organizations often provide other more personal programs. Some give inventors framed copies of their patents or a special plaque bearing information about the patent. Others provide special clothing to inventors such as a jacket having the patent's number embroidered above the breast pocket. Many organizations hold an annual inventor recognition dinner. This dinner is usually attended by significant members of the organization's senior management team, such as the president or chief executive officer who thank the inventors for their creations and express gratitude for their efforts. These programs add an emotional element to the compensation scheme that may be highly appreciated by some inventors and provide motivation and incentive for other inventive contributions to the organization.

If a client asks the patent agent for advice regarding compensation programs for inventors, he will also want to mention to the client that inventor compensation programs can touch on other areas of the law, such as securities law and employment law. For example, the company will probably want to publish its policy regarding inventor compensation and follow it rigorously. If the program effectively amounts to an *ad hoc* gift provided by the company to an inventor, this may be difficult to explain later to government securities regulators. Similarly, the laws of some countries set forth specific requirements for compensation that must be paid to inventors. The patent agent should understand the relevant laws of his country pertaining to the ownership of inventions. For example, in the US an inventor owns his creations as a matter of law; however, US employment law typically allows employment contracts to include terms that force inventors to assign all inventions created during their employment to the company without any additional compensation necessarily being provided. In contrast, some countries' employment laws, such as those in force in Germany, require that companies provide their inventors with additional compensation for the patentable inventions that they create. The patent agent does not typically counsel his clients regarding employment law matters but he will need to know who owns the inventions that he is patenting. The patent agent should also decline to prepare a patent application for someone whom he knows does not own the subject invention.

E. PROFESSIONAL ETHICS

Many jurisdictions maintain a code of ethics that all patent attorneys and patent agents must follow in order to continue their professional practice. The ethics codes in some jurisdictions have been modeled on the jurisdiction's code of ethics for all legal professionals. Some jurisdictions also track complaints received by the patent office either directly from clients or by referral from other legal organizations such as bar associations. For example, a patent attorney who loses his license to practice law also typically loses his license to represent clients before the patent office.

The patent agent must know and understand the relevant code of ethics for his jurisdiction. Ethics codes typically model common sense. If a patent agent asks herself: "Does this seem proper or fair?" and finds the answer to be "No," then the patent agent should think again about taking the action, whatever it is. (Even if a situation is not covered by an ethical rule, it may still be considered malpractice.)

Ethics rules vary from jurisdiction to jurisdiction so the patent agent should also account for variations in ethics rules when he files applications in other jurisdictions. Here are a few commonsense rules that are often modeled in ethics codes:

1. A patent agent should never knowingly file an invalid patent application (a time-barred invention, a non-enabling specification etc.). From time-to-time, a patent agent may need to file an application that will provoke a challenge from the government, the result of which may be that the application will not be patented. For instance, in the US many early biotech inventions were of questionable patentability at the time they were filed. In fact, the question of patentability of biotech inventions was decided ultimately not by the US Patent and Trademark Office but by the US Supreme Court. It was entirely ethical for the patent agent to file the application that led to the challenge: however, it might have been of questionable ethics for the patent agent not to advise his client beforehand that the application would provoke a challenge.

2. The patent agent must keep his client informed of developments in his applications and patents For example, a patent agent should notify his client that an office action has been received from the patent office well before the due date for response. The patent agent should allow his client to review his response to the office action before he files it with the patent office.

3. The patent agent must keep abreast of changes in the rules and procedures applicable to his practice area The patent agent should also provide notice of these rule changes to his client(s) when they could impact a pending case.

4. The patent agent must always be honest in his communications with the patent office and with his clients This does mean, however, that the patent agent cannot be an advocate for the patentability of his client's invention even when he personally has doubts about its patentability. Compare these two situations: (1) the patent examiner says the client's pending claims are shown completely in Fig. 1 of a prior art reference. The patent agent agrees with the examiner but files a response arguing that the pending claims are not shown in the prior art reference by intentionally mischaracterizing the reference and (2) the patent examiner says the client's pending claims are shown completely in Fig 1 of a prior art reference. The patent agent finds the language used in the reference to be ambiguous and believes that the patent examiner has construed the reference in a manner made possible only in light of the information gleaned from the client's pending application (e.g. a "hindsight" rejection). Situation 1 is probably unethical in most jurisdictions; Situation 2 is probably ethical in most jurisdictions.

5. The patent agent should always perform the work that he has agreed to perform and perform it in a timely manner A patent agent cannot tell a client that he will prepare a patent application and then fail to perform his task. If the patent agent knows that he cannot perform a task in time, he should not accept the work. If the patent agent has already accepted the work, he should notify the client as soon as he knows that he will not be able to complete the work in a timely manner so that the client can find another patent agent. Basically, the patent agent should not be the primary cause of the client's failure to obtain patent protection for his valuable invention.

6. The patent agent must be an advocate for his client Most patent applications are initially rejected by the patent office. The patent agent cannot simply report to his client that the application has been rejected and not inform the client that a response can be prepared. There are certainly times when the prior art cited by the patent office is so compelling that the client would be unlikely to obtain meaningful protection but this is not the typical situation.

The patent agent should not draft only narrow patent claims unless his client has requested only narrow claims. A patent with narrow claims is somewhat more likely to obtain patent protection than a patent application with broad claims. However, a patent application with only narrow claims will likely deprive the client of the full scope of protection to which he is entitled. As noted many times in this manual, the patent office has no duty to tell the patent agent or the inventor that broader claims are possible. The patent office only awards the claims that it receives – it will not object to narrow claims.

Similarly, the patent agent should not conform to the whims of the patent examiner just to expedite allowance of a case; unless he has informed the client and received the client's permission to accept less coverage than the client may be allowed. In short, the patent agent must always be ready to argue on his client's behalf.

Being a patent agent is more than a matter of completing forms and drafting technical documents. The patent agent should essentially prosecute his client's applications with all the care that he would give if he were the inventor. A client places an enormous amount of trust in his patent agent – and the patent agent must prove himself worthy of the client's trust.

7. The patent agent must be mindful of conflicts of interest A patent agent cannot select the interests of one client over the interests of another. Consider, for example, a patent agent who files two applications having similar claims for two different clients. Assume that both applications are pending at the same time and that the patent examiner cites one application as prior art over the other. The patent agent will either need to amend the claims of one application to become patentable over the other and/or argue that one application is not pertinent to the other – but how can the patent agent perform this task while vigorously advocating the best interests of each client? Many ethics codes recognize that the patent agent in such circumstances cannot appropriately perform this task under any circumstances. Consequently, the patent agent must carefully screen the work that he accepts from his clients to avoid the possibility of having a conflict of interest between one or more of them. If a conflict of interest arises between two clients, despite the patent agent's best efforts to avoid such a conflict, the ethics rules of many jurisdictions require the patent agent to transfer the conflict applications to new counsel. The patent agent must steadfastly avoid situations where he will have to choose sides between his own clients.

KEY WORDS

>> INVENTION DISCLOSURE FORM >> PATENT DOCKETING SYSTEM >> CO-INVENTORS
>> INCENTIVE PROGRAM >> TECHNICAL GATEKEEPER >> PATENT REVIEW COMMITTEE

SELF TEST

1. What is a technical gatekeeper?
2. List several persons who should be on a patent review committee.
3. How can a patent agent create a pro-patent environment in an organization?
4. What is an Invention Disclosure Form? How should it be used?
5. A person who only sponsors or supervises work that leads to an invention is generally considered an inventor and should be listed on a patent application as an inventor. True or False?

APPENDIX A INSTRUCTIONS FOR SEARCH OF PATENT DATABASES

- 1) Local Patent Office: The local patent office will likely have a written or electronic database. Such databases are normally public and a patent agent or inventor can use them to search issued patents in his or her country. Note that pending patent applications may not be included in the searchable database in many countries.
- 2) Patent Cooperation Treaty Applications: WIPO publishes new PCT applications every Thursday. The PCT database contains published PCT applications dating back to 1978. In many cases the international search report for PCT applications is also available, which may help a prior art search locate further pertinent prior art. Below is a step-by-step description of how to search the PCT database.
 - a. Go to the PCT database page (English text): (<http://www.wipo.int/pctdb/en/search-adv.jsp>).
 - b. Make the appropriate selections for the search using the radio buttons provided such as in a date range of either "all" available materials or for a specific week.
 - c. Enter the appropriate search query. The search query can be assisted by various field codes which are listed in a hyperlink on the search page. For example, if you want to search for published applications which include an inventor named "Smith" from "Dublin" then enter: "IN/Smith and IAD/Dublin."
- 3) United States Patent and Trademark Office: The USPTO has a large and easy-to-use electronic database that anyone with an Internet connection can access free of charge. It covers issued US patents and published patent applications from 1790 with full text searching available for patents issued from 1976 onwards. Note: New US patents issue on Tuesdays and typically appear in the database on the same day. Below is a step-by-step description of how to search the USPTO database.
 - a. Go to the USPTO home page (www.uspto.gov).
 - b. Go to the **Patents** menu and select **Search**.
 - c. Search issued patents by any of the following means:
 1. Quick search: This allows you to search the full text database of the USPTO by using Boolean queries (a query that uses logical operators and/or not between search terms). You may also limit the search to only the abstract or summary of the patent.
 2. Advanced search: This allows you to modify the search by using command line search syntax.
 3. Patent number search or Publication search: A search can also be performed if the patent number or publication number of the reference being searched is known.
 - d. Search published applications by any of the following means:
 1. Quick search: This allows you to search the full text database of the USPTO by using Boolean queries.
 2. Advanced search: This allows you to modify the search by using command line search syntax.
 3. Patent number search or Publication search: This allows you to search by patent number or publication number of the reference.
 - e. The USPTO also maintains a database of information on currently pending patent applications provided that the application has been published. The "Patent Application Information Retrieval" or "PAIR" database provides office actions, responses, related case and other file history information for patents and patent applications. A portion of PAIR is publicly available. Another portion of PAIR is only available to practitioners so that they can review the status of their cases. To view the public PAIR go to <http://portal.uspto.gov/external/portal/pair>.

- f. The USPTO also makes assignment records available for patents and published patent applications. If you need to know the most recently-recorded ownership information for a patent, visit <http://assignments.uspto.gov/assignments/q?db=pat>. Records can be searched by buyer's name, seller's name, patent number and application number.
- 4) European Patent Office: You can search the European Patent Office database by going to their home page for prior art searching at www.espacenet.com. This database contains patents from all over the world. You can make various types of searches.
 - a. Quick search: Select the database in which you want to search. Enter the keywords that you want to be used for the search.
 - b. Advanced search: Select the patent database in which you wish to search. Enter the search terms that you would want to use. Search terms could include keywords in title or abstract, publication number, application number, priority number, publication date, applicant's name, inventor name(s), European classification number or International Patent classification number.
 - c. Numerical search: Select the patent database in which you wish to search followed by the application number, accession number, publication number or priority number.
 - d. Classification search: A classification search allows you to check the classification of the invention of interest. Classifications include: human necessities, performing operations, transporting, chemistry, metallurgy, textiles, paper, fixed constructions, mechanical engineering, lighting, heating, weapons, blasting engines or pumps, physics and electricity.
 - e. The EPO also maintains a database for pending cases much like the USPTO's PAIR system discussed above. This database, known as EPOLine may be visited at <http://my.epoline.org/portal/public>.
 - 1. Click the "file inspection" button near the top of the page.
 - 2. Enter either the application number or the publication number in the window that appears.
- 5) Scientific Databases: There are different scientific and technical databases that are specific to various fields of technology. It is helpful for a patent agent to become familiar with these databases since they contain articles that discuss technological advances in the field. Since prior art encompasses more than just patents, a scan of these scientific databases is important when conducting a patentability search.

APPENDIX B

Confidential
Disclosure No.: _____
Status: _____

INVENTION DISCLOSURE FORM

Name: _____

Work phone number: _____

Fax number: _____

1. PROPOSED TITLE:

2. FIELD OF INVENTION

This invention relates primarily to:

3. BACKGROUND AND RELATED ART

A. The technical problem addressed by the invention is as follows:

B. The closest related art is described as follows:

C. Advantages presented by the invention are as follows:

4. DRAWING(S)

Drawings for this invention are available/not available. If available, please attach.

Comments about drawings provided:

5. WRITTEN DESCRIPTION

The invention is described as follows:

NOTE 1: Please attach additional pages as necessary.

NOTE 2: If you have other documents and/or drawings related to the invention, please attach copies to this form.

6. CONCEPTION OF INVENTION

Date of conception: _____

Date of first written description: _____

7. REDUCTION TO PRACTICE

Has the invention been reduced to practice (does it work)? _____

COMMENTS, if any, on conception of invention and/or first written description:

8. INVENTOR(S) (this section must be completed)

INVENTOR 1: _____

Name: _____

Residence Address: _____

Citizenship: _____

INVENTOR 2: _____

Name: _____

Residence Address: _____

Citizenship: _____

COMMENTS on inventors or inventorship (please note if any of the inventors resides out of the country).

9. DATES OR PRODUCT TESTING AND RELEASE

Alpha Testing: _____

Beta Testing: _____

General release or sale: _____

Offers for sale: _____

COMMENTS on product testing and release:

10. DISCLOSURE OF INVENTION

Has there been any disclosure or use of the invention by the public? When and to whom? Under a non-disclosure agreement?

Please attach a copy of the disclosure.

11. INTERNAL DISCLOSURE(S)

First internal disclosure date: _____

Name of first person to whom invention was disclosed: _____

COMMENTS about first internal disclosure:

12. ARTICLE(S)

Have any articles been published? _____

DETAILS about publication of article(s): _____

Please attach a copy of any published article(s).

13. ADVERTISEMENTS, PRESS RELEASES AND PRODUCT ANNOUNCEMENTS

Any advertisements, press releases or product announcements? _____

DETAILS about any advertisements, press releases and product announcements: _____

Please attach copies of any advertisements, press releases and/or product announcements.

14. OUTSIDE DISCLOSURE(S)

Have there been any disclosures outside the company? _____

Were all outside disclosures under a non-disclosure agreement? _____

DETAILS about any disclosures outside the company: _____

Please attach copies of any information disclosed.

15. TRADE SHOWS AND CONFERENCES

Are there any upcoming trade shows or conferences? _____

DETAILS about upcoming trade shows and/or conferences: _____

ADDITIONAL COMMENTS BY INVENTOR:

Signed: _____

Witnessed and Understood by: _____

Date: _____

Date: _____

X. GLOSSARY

Absolute Novelty – A condition for patentability in some jurisdictions requiring that no one anywhere in the world has disclosed the invention set forth in a patent application prior to the application's filing date. Thus, an inventor's own actions may cause an invention to lose absolute novelty. Consequently, to preserve absolute novelty, a patent application must be filed before public disclosure of the invention by the inventor, his colleagues or others. Many countries have an "absolute novelty" requirement. See II(B)(1)(a), III(B)(2), III(B)(5), IV (Intro) and IX(B).

Anticipation – A patent claim may be rejected for the lack of novelty on the grounds that all the limitations of the claim can be found in a single prior art reference. See II(B)(1)(a), IV and V(C)(1)(b).

Application – A patent application comprises a technical disclosure, drawings, claims and other materials filed with a patent office. If the patent office approves the application, it will become a patent. See II(B)(1), III and IV.

Best Mode – Some jurisdictions require that patent applicants disclose in their patent applications the best way they know of carrying out their invention. This requirement does not compel applicants to disclose absolutely the best way of carrying out an invention but merely requires that they do not keep key aspects secret. See III(A)(4)(b), III(B)(5) and IX(A).

Blocking Patent – A patent whose claims are so broad and/or so finely tuned to a given invention that it can be used to control an industry or product line. The claims of most patents are not so broad as to control the manufacture of all products in a given product category (e.g. a patent covering all computers). In a similar manner, an entire patent portfolio, a collection of patents in the same field, can sometimes be so significant that they influence an entire industry. See II(A)(3)(d) and VIII(A).

Body – The portion of a patent claim that recites the claim's elements and limitations. The body follows the claim's transitional phrase and explains how the different elements exist in relationship to one another. Basically, the body of the claim recites and inter-relates all the elements of the claim. See V(C)(1)(c), V(C)(2) and V(C)(4).

Claim – A claim defines the scope of protection provided by a patent. The claims are a written approximation of the abstract inventive concept created by the inventor and they typically define the limits of patent protection. Claims are usually written as sets of sentences and commonly appear at the end of the patent. The parts of a patent claim are the preamble, the transition and the body. See III(A)(4)(a), V, VI and VII.

Specific Claim Types:

Apparatus or Device Claims – See III(B)(5) and VI(A).

Method or Process Claims – See III(B)(5) and VI(B).

Product-by-Process Claims – See III(B)(5), VI(Intro), VI(B) and VI(C).

Result to be Achieved and Parameter Claims – See VI(D).

Design Claims – See VI(E).

Plant Patent Claims – See VI(F).

Composition Claims – See VI(G).

Biotechnology Claims – See III(B)(5), VI(H) and VII(N).

Use Claims – See III(B)(5), VI(B), VI(I), VII(C) and VII(O).

Software Claims – See III(B)(5) and VI(J).

Omnibus Claims – See VI(K).

Claim Construction – The process of interpreting the legal meaning of claims. The scope of protection provided by a given patent is often determined by the meaning of just a few specific terms used in a claim. See VII(Q).

Claim Set – A group of claims that begins with an independent claim. All patent applications must contain at least one independent claim. Each independent claim may be followed by one or more dependent claims concerning more specific embodiments of the invention recited in the independent claim. A patent application may have multiple claim sets such as a set of apparatus claims and a set of method claims as well as claim sets of varying breadth. See V(C)(5), V(D), VII(B) and VII(D).

Classification System – An organized system for classifying patent applications and issued patents. Prior art searching in one or more patent classifications can sometimes provide pertinent prior art for a pending application. See II(C)(4).

Dependent Claim – A patent claim that references another patent claim. A dependent claim contains all the limitations of any claim from which it ultimately depends. See V(D), V(D)(2) and VII(B).

Design Around – An attempt to avoid patent infringement by studying the limitations of a competitor's patent claims and then developing a product/service that does not practice all the limitations of the competitor's patent claims. See II(A)(3)(e), II(C)(2) and VIII.

Divisional – A patent application following a parent application's filing in the same jurisdiction. The divisional can be filed because of lack of unity of invention in the parent application or because the applicant seeks additional claims. In US practice, a follow-on application due to lack of unity of invention is known as a "divisional," while an application seeking additional claims is known as a "continuation." In the rest of the world, both types of applications are simply known as divisionals. See III(A)(4)(c), III(B)(5), IV(C) and VII(K).

Embodiment – An embodiment of an invention is a physical form of the invention in the real world. The claims must protect at least an embodiment of the invention. See III(A)(3), III(A)(4)(b), III(A)(4)(c), V(B), VII(B), VII(D) and VII(P).

Enablement – The specification must contain a written description of the invention and of the manner and process of making and using it in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains to make and use the invention. The enablement requirement means that a patent application must teach ordinary persons skilled in the art how to make and use the invention. See III(A)(4)(b).

Grace Period – Some jurisdictions give patent applicants a limited period of time in which to file a patent application following public disclosure of the invention. See II(A)(1), II(B)(1)(a), III(B)(5) and IV(Intro).

Independent Claim – An independent claim stands alone and does not reference another claim. The set of independent claims in a patent application comprises the broadest claims in the application. Some independent claims can be broader than other independent claims. See III(A)(4)(f), III(B)(5), V(B), V(C)(2), V(C)(5), V(D), V(D)(1), VII(B), VII(D) and VII(L).

Infringement – The act of using, making, selling, or offering to sell an invention protected by a patent. To be adjudged an infringer, a party must generally practice all the limitations in at least one claim in a patent. See I, II(A)(3)(d), II(A)(3)(e), V(B), V(C)(1)(b), VII(B), VII(E), VII(G), VII(I), VII(L), VII(P), VII(Q) and VIII.

Invention – An invention is a mental construct inside the mind of the inventor and has no physical substance. The best patent claims will protect the invention itself so that no physical embodiments of the invention can be made, used or sold by anyone without infringing the claims. See II(B)(1)(a)-(c), III(A)(2)-(3) and V(B).

Invention Disclosure Form – A document used by some patent agents and/or companies to collect initial information about an invention from the inventors. The forms can be used to report new inventions to the patent agent and may form the basis of the patent application. See III(A)(1) and IX.

Limitation/Element – The words used in a patent claim to distinguish an invention over the prior art. All words in a patent claim are limitations on the claim. For ease of understanding, some of the limitations may be grouped together in the form of an element. In many jurisdictions no significant legal distinctions exist between limitations and elements; however, it may sometimes be convenient to refer to a particular element in a claim. See II(B)(1)(a), III(A)(3), V(C)(1)(c), V(C)(4), V(D), VII(B), VII(E) and VII(F).

Non-Disclosure Agreement – An agreement between two or more parties to keep information, such as the technical specifications of an invention, secret. A non-disclosure agreement between parties may allow them to exchange information without creating a public disclosure that could void patent rights in some jurisdictions. See III(A) and III(A)(1).

Non-Obviousness/Inventive Step – To be patentable, an invention must be non-obvious or evidence an inventive step. Non-obviousness requires that an invention must not have been obvious to one with ordinary skill in the art (the scientific/technical field of the invention) at the time of the invention. Basically, obviousness means that something cannot be patentable when any person of average skill in the relevant scientific/technical field could put together different pieces of known information and from them arrive at the same result. Non-obviousness differs from novelty in the sense that an invention may be obvious even though it is not precisely disclosed in prior art. Some jurisdictions such as the EPO, employ a “could/would” approach to determining inventive step in the sense that “would” an ordinary artisan arrive at the claimed invention based on review of the known prior art, as opposed to “could” an ordinary artisan have arrived at the claimed invention. See II(B)(1)(c), III(A)(2), III(B)(5), IV, V(B) and VII(B).

Novelty – An invention must be new. In other words, the invention must not be in public use or known by others. In most countries the invention must be new at the time of the patent application’s filing, while in other countries the invention must be new at the time of its creation. A prior patent or publication of the same invention will defeat novelty (prevent a patent from being issued or invalidate it later). Basically, if an invention is not new, it is not patentable. See II(B)(1)(a), II(C)(2), III(A)(2), III(B)(5), IV, V(B), VII(B) and VII(H).

Office Action – An official communication from a patent office on the merits of a pending application, also known as an official action, official communication or examination report. See III(A)(4)(b), IV, VII(M) and IX(E).

Paris Convention – A treaty that provides a right of priority for patent applications. The Paris Convention allows a patent applicant from a Contracting State to use his first filing date as the effective filing date when filing an application in another Contracting State, provided it is filed within 12 months of the first filing date. See III(A) and III(B)(2)-(5).

Patent – A legal document granting its holder the exclusive right to control the use of an invention as set forth in the patent’s claims within a limited area and time by stopping others from, among other things, making, using or selling the invention without authorization. See II(A), II(B), V(B), VII(P)-(Q), VIII and IX(E).

Patent Cooperation Treaty – A multilateral treaty that enables a patent applicant to file one international patent application seeking protection in any or all of the PCT Contracting States. The international patent application has the effect of filing an ordinary national patent application in each designated state. The PCT is administered by the International Bureau of the World Intellectual Property Organization (WIPO), whose headquarters are in Geneva, Switzerland. As of August 2006, there were 133 PCT Contracting States. See II(C)(5), II(C)(2), III(A), III(B)(2), III(B)(3), III(B)(4)(c) and III(B)(5).

Patent Docketing System – A system, usually computerized, for recording key dates related to a patent application and/or an issued patent. The information entered may include deadlines such as the time for responding to a given office action or the date by which an annuity payment must be made. See IX(Intro).

Patent Examiner – A government official who reviews a pending patent application and determines if it should be granted as a patent. Most patent examiners have technical training in the field of the inventions they review. Some patent examiners also have legal training. See II(A)(1), II(B)(1), IV, V(B), VII(B) and IX(E).

Patent Review Committee – An internal committee within some organizations that decides when a patent application should be filed on a reported invention, reviews the progress of pending applications and determines if annuity payments should be made to keep a patent application in force. See IX (Intro), IX(A) and IX(C).

Person of Ordinary Skill in the Art – The “reasonable man” of the patent world. The level of ordinary or average skill in a given technical field may vary considerably. For example, in some fields a year of technical training may be considered ordinary while in other fields a graduate degree may be considered ordinary. Patent applications should be drafted to help an ordinary artisan in the relevant field understand and practice the invention disclosed in the application. Obviousness or inventive step is typically judged in terms of what would be readily ascertainable by a person of ordinary skill. See II(B)(1)(c), III(A)(2), III(B)(5), IV, V(B) and VII(B).

Picture Claim – A patent claim that paints a picture of an invention using words. Picture claims typically contain limitations that should be deleted from a claim in order to improve its breadth. However, picture claims may be useful to the patent agent in coming to understand an invention and/or in preparing initial draft claims for a patent application. See “claim” above and III(A)(4)(a), V, VI and VII.

Point of View – Every patent claim has an actor or a point of view, e.g. who or what performs the steps in a method claim. The patent agent should strive to give each claim a consistent point of view. Different claim sets may have different points of view. See VII(L).

Preamble – An introductory phrase in a patent claim that identifies the category of the invention protected by that claim. See V(C)(1)(a) and V(C)(2).

Prior Art – All the publicly-available information that existed prior to the effective date of a patent application. The effective date for most patent applications is the application’s filing date. In some jurisdictions the effective date may be the invention’s date of creation under particular circumstances. Prior art can include technical papers, scientific treaties, text books, issued patents and other such materials. See II(A)(1), II(B)(1), II(C), IV, VII(B) and VII(H).

Priority Date – The priority date for a patent application is the earliest filing date that the application can claim. For an original application the priority date will be the date of the application's filing. For a subsequent application, filed while a parent application is still pending, the priority date will be the filing date of the parent application. See also Paris Convention. See II(C)(5), III(A)(Intro), III(B)(1)-(3), IV and IX(E).

Prosecution – The process of persuading a patent office to allow an application to issue as a patent. Prosecution may include pointing out to a patent examiner distinctions between the claimed invention and the prior art cited by the examiner, as well as amending the pending claims in the application to further highlight distinctions over the prior art. See II(B)(1), III(A)(4)(b), IV and VII(M).

Provisional Application – Some jurisdictions allow applicants to file simplified patent applications that do not need to have patent claims or conform to other application formatting requirements. Such applications are typically placeholders for subsequently-filed applications that can claim the provisional application's priority date. The patent applicant must usually convert the provisional application to a complete utility patent application within a specified time period, usually within one year of the provisional application's filing date. New material added in the subsequently-filed application will not enjoy the benefit of the provisional application's filing date. See III(A)(Intro) and III(B)(5).

Reduced to Practice – An invention must typically be reduced to practice before it is filed as a patent application. A reduction to practice typically comprises a working prototype or a series of instructions that could be used to make the invention without further experimentation. The filing of a patent application creates in some jurisdictions a constructive reduction to practice that satisfies the requirement – provided that no further experimentation is necessary in order to practice the invention disclosed in the application. See I, III(A)(1), IV(Intro) and IX(A).

Time Bar – A bar to patenting an invention may arise from a variety of behaviors, typically relating to public disclosure of the invention. For example, in a jurisdiction without a grace period, a time bar to patenting will rise once the invention has been publicly disclosed. See III(A)(Intro), III(A)(1), III(B)(2), IV(Intro) and IX(A).

Transitional Phrase – A phrase that links the preamble of a patent claim to the body of the patent claim. The transitional phrase may be open or closed. An open transitional phrase means that the limitations in the body of the claim do not exclude from infringement a product/service that includes other elements, while a closed transitional phrase sets forth the entirety of the protected invention. See V(C)(1)(b).

Unity of Invention – A patent application must typically be for a single invention. In some instances the patent examiner will find multiple inventions recited in a patent application's claims and require the applicant to elect one or more claims for prosecution. The applicant can typically file a divisional application and seek patent protection for the unelected claims. See III(A)(4)(b), III(B)(5), IV(C) and VII(K).

Utility – In order to be patentable, an invention must be useful. In patent language, this is called "utility" in some jurisdictions or "industrial application" in others. A patent application will not be granted if the invention does not perform its designated function. See II(B)(1)(b) and VII(O).

