PROTECT YOUR INTELLECTUAL PROPERTY RIGHTS

Knowledge is power and nowhere is that more apparent than in today's information-driven, high technology economy. Fueled by the growing demand for new and improved technology, engineers, scientists, and the companies that employ them and manage technology have a vested interest in protecting the wealth generated by their innovative ideas and inventions.

Addressing this growing need, Intellectual Property Law for Engineers and Scientists avoids difficult legal jargon to clearly explain the fundamentals of patent, copyright, trade secret, trademark, mask work, and unfair competition laws, as they apply to the scientific and engineering community. To motivate readers, each chapter begins with an inspirational essay on a famous inventor and invention.

This is the book to read before consulting a lawyer. The author, an experienced patent attorney, educator, and former patent examiner, provides valuable and easy-to-access legal information on a variety of common professional concerns, such as:

- Maintaining confidentiality in new employment contracts
- Obtaining software protection
- Applying for patents, trademarks, or copyrights
- Protecting against unfair competition
- Entering into contracts and employment agreements
- Strategic use and management of intellectual property
- The entrepreneurial use of intellectual property

Replete with sample forms of pertinent documents and helpful points to consider regarding all aspects of intellectual property, *Intellectual Property Law for Engineers and Scientists* provides valuable information every high-tech professional should read to protect themselves against potential loss or liability.

HOWARD B. ROCKMAN is a patent attorney currently practicing in Illinois with Barnes & Thornburg. He is also an adjunct professor at John Marshall Law School and at the University of Illinois at Chicago, College of Engineering.



Subscribe to our free Electrical Engineering eNewsletter at www.wiley.com/enewsletters

Visit www.wiley.com/ieee





Contents

Foreword		xix
Dwofoo		vvi
Preface		XXI
Acknowledgments		XXV
Top Ten List of Intellectual Property Protection		xxvii
Eli Whitney		1
1 Overview of Intellectual Property Law		4
1.1 Defining "Intellectual Property"		4
1.2 Specific Intellectual Property Vehicles		5
1.2.1 Patents		5
1.2.2 Trademarks and Service Marks		6
1.2.3 Copyrights		7
1.2.4 Trade Secrets		7
1.2.5 Mask Works for Semiconductors		8
1.3 Which Form of Intellectual Property Protection to	Use?	8
Cyrus McCormick		9
2 The Use of Intellectual Property in Business		12
2.1 Introduction to Intellectual Property Strategies		12
2.2 Objectives of Intellectual Property Management		12
2.3 Sole Inventor in an Alien Field		14
2.4 Strategic Development of Intellectual Property		15
2.5 Disgorging Patentable Inventions		16
2.6 Determining What and What Not to Patent		17
2.6.1 Search Results		18
2.6.2 Business Factors Determining Whether to Ol	btain Patent Protection	19
2.7 Determining Who Would Be an Appropriate Licen Your Invention	isee to Exploit	24
2.8 Drafting Strategic Patent Claims		24
2.9 Determining Where to Obtain Patents		25
2.10 Determining Other Industries Which May Benefit	from a License	26
2.11 Ensuring Your Product Does Not Violate the Paten		26
2.12 Policing the Market for Potential Infringements of		27
2.13 The Enforcement of Process Patent Claims Agains		27
Product Made Abroad	in the second section in the second	

	4 Trimming the Intellectual Property Tree	27
2.15	Essay on Innovation Management	28
Charle	es Goodyear	31
3 Hov	w to Read and Obtain Information from a Modern U.S. Patent	35
3.1	Information Page	35
3.2	Drawings	43
3.3	Specification	43
3.4	Claims	44
3.5	Warning	44
Georg	e Westinghouse	47
4 Inti	roduction to Patents	51
4.1	Brief History of Patent Protection	51
	4.1.1 Early European Patent Custom	51
	4.1.2 British Patent System	53
	4.1.3 The U.S. Constitution and the Development of the Present U.S. Patent Examination System	55
4.2	Types of Patent Coverage	59
	4.2.1 What Is a Patent?	59
	4.2.2 Article or Apparatus Patents	60
	4.2.3 Method or Process Patents	60
	4.2.4 Design Patents	60
	4.2.5 Plant Patents	60
	4.2.6 New Technologies	61
4.3	How to Determine What to Patent and What Not to Patent	61
	4.3.1 Broadly, What Can and Cannot Be Patented Under the Law	61
	4.3.2 From a Business Standpoint, What Should Be Patented	61
4.4		63
	4.4.1 Describing the Background and Essential Elements of the Invention	63
	4.4.2 Claiming the Invention	64
4.5	What a Patent Is Not	64
	Inventions Relating to Atomic Weapons	65
	The U.S. Government's Right to Practice Your Patented Invention	66
John I		69
5 Pat	entable Subject Matter and Utility	72
5.1	What Constitutes Patentable Subject Matter	72
3.1	5.1.1 Categories of Patentable Subject Matter	72
	5.1.2 The Invention Must Be Useful and Work for Its Intended Purpose	72
	5.1.2 The Invention Must Be Oscial and Work for its intended i dipose 5.1.3 The Invention Must Be Novel Compared to the Prior Art	73
	5.1.4 The Invention Must Be Non-Obvious Compared to the Prior Art	73
	The same and the s	15

		CONTENTS	XI
		5.1.5 Brief Commentary on Recent Developments in Categories of	73
		Patentable Subject Matter	
5	5.2	Utility—The Invention Must Be Useful	74
		Louise (Tourist Internal Florida and Elevisia and Elevisia and Elevisia (Elevisia and Elevisia Andrea and Elevisia and Ele	
Alfi	red I	Nobel	75
6 N	Nove	lty—The Invention Must Be New	81
6	5.1	Statutory Requirements	81
		6.1.1 Time Limits for Filing a Patent Application	81
		6.1.2 Prior Art Activities of the Inventor and Others That Can Defeat	82
		Patent Rights	
		6.1.3 Prior Publications, U.S. and Foreign, as Prior Art	84
6		Protecting Foreign Patent Rights	84
		Experimental Use Versus Actual Use of the Invention	85
251			
Lou	is P	asteur	87
7	Req	uirement of Non-Obviousness for Patentability	92
	7.1	Development of the Standard of Non-Obviousness	92
		Historical Background	92
	7.3		93
		7.3.1 Hotchkiss v. Greenwood, Supreme Court, 1850	94
		7.3.2 Atlantic Works v. Brady, Supreme Court, 1882	94
		7.3.3 Goodyear Rubber and Tire Company v. Ray-O-Vac Company,	95
		Supreme Court, 1944	
		7.3.4 Cuno Engineering Corporation v. Automatic Devices Corporation,	95
		Supreme Court, 1941	
		7.3.5 The Great Atlantic and Pacific Tea Company v. Supermarket	96
		Equipment Corporation, Supreme Court, 1950	
	7.4	The 1952 Patent Statute and the Case of Graham v. John Deere Company	97
Ale	xand	ler Graham Bell	103
8	The	Patenting Process	112
			110
	8.1		112
			112
	0.0	8.1.2 True Inventors Must Be Named	114
	8.2		115
			115
			116
	0.2	8.2.3 Witnesses	117
	8.3	The Invention Disclosure and Invention Disclosure Meeting	117
		8.3.1 Preparation of a Complete Description of the Invention, How the	117
		Invention Operates, and What Advantageous Results Are Obtained	
		by the Invention	110
		8.3.2 Dates of First Public Disclosure, If Any, and What Was Disclosed	118

		8.3.3 Advantages of the Invention Over Known Devices/Processes	119
		8.3.4 What Prior Art Is the Inventor Aware of for Disclosure to the	120
		Patent Examiner	
		8.3.5 Additional Matters Discussed During the Invention Disclosure	121
		Meeting Between the Inventor and the Patent Attorney	124
		8.3.6 Invention Disclosure Form	124
The	omas	Edison	129
9	Nove	elty, Infringement, and Other Searches	135
	9.1	The Novelty Search	135
		Search Parameters	136
		Different Types of Searches	137
		9.3.1 Infringement Search	137
		9.3.2 State-of-the-Art Search	138
		9.3.3 Right to Use Search	138
	9.4	Database Searches	139
		9.4.1 U.S. Patent and Trademark Office Patent Classification System	139
Ge	orge l	Eastman	141
10	Pate	nt Application	145
	10.1	Introduction	145
		Registration System Evolving into an Examination System	145
		Goal of a Properly Prepared Patent Application	146
		Provisional Patent Applications	146
		Regular, Non-Provisional Patent Application	147
		Content of a Regular Patent Application	148
		10.6.1 Title of the Invention	148
		10.6.2 Cross-Reference to Other Applications	148
		10.6.3 Background of the Invention	149
		10.6.4 Brief Summary of the Important Elements of the Invention	150
		10.6.5 Brief Description of the Drawings Which Illustrate the Invention	150
		10.6.6 Detailed Description of the Illustrated Embodiment of the Invention	150
		10.6.7 Claims Distinctly and Precisely Pointing Out the Definition of the Invention	152
		10.6.8 The Abstract	152
	10.7	Your Review of Your Patent Application	153
		Execution of Declaration, Power of Attorney, and Assignment When	153
	10.0	Application Completed	
Ot	tmar	Mergenthaler	155
11	Clai	ms of a Patent Application	159
	11.1	Introduction to Patent Claims	159
		Historical Development of Patent Claims	159

		CONTENTS	s xiii
		11.2.1 Court Decisions	159
		11.2.2 1836 Patent Law	160
	11.3	What Claims Are	161
	11.4	Your Review of the Claims of Your Patent Application	163
		Distinguishing Different Types of Claims	164
		More on Method or Process Claims	165
	11.7	Composition of Matter Claims	166
	11.8	Design Patent Claim	166
		Dependent Claims	167
	11.10	How to Read and Understand Patent Claims Drafted by Your Patent Attorney	167
		11.10.1 Preamble	168
		11.10.2 Transition Phrase	168
		11.10.2 Thansition Thruse 11.10.3 The Body of the Claim	169
Nic	colaus	Otto	171
Ru	dolf D	iesel	175
12	Pros	ecution of a Patent Application	180
	12.1	U.S. Patent Examination Process	180
	12.2	The Patent Examination System—A Little More History	180
	12.3	Filing the Patent Application With the U.S. Patent and Trademark Offic	e 180
	12.4	Examination of the Patent Application	182
	12.5	Results of the Examination Are Reported in an "Office Action"	183
	12.6	Your and Your Attorney's Response to the Office Action	184
	12.7	Further Patent Prosecution	186
	12.8	Issuance of the Patent	186
	12.9	Infringement During Dependency of the Patent	187
	12.10	Additional Probable Patent Prosecution Events	188
		12.10.1 Continuation Patent Applications	188
		12.10.2 Continuation-in-Part Patent Applications	189
		12.10.3 Divisional Patent Applications	189
	12.11	Re-Examination By the Applicant, the Infringer, or the	190
		Commissioner of Patents	
	12.12	2 Re-Issue Patents	191
Nil	cola To	esla	193
13	Desig	gn Patents	203
	13.1	Coverage of Design Patents	203
	13.2	Infringement of a Design Patent	204
	13.3	Importance of Design Patents	204
	13.4	Examples of Design Patents	205
	13.5	Design Patents on Computer Screen Icons	205
	13.6	Design Patents Contrasted With Copyrights	206
He	rman	Hollerith	211

14	Prote	ction of	Computer-Related Inventions	215
	14.1	Introdu	ction	215
	14.2	Torturo	ous Path Through the Courts	215
			Gottschalk v. Benson, 1972	215
			Diamond v. Diehr, 1981	216
			Arrhythmia v. Corazonix, 1992	217
ā01			In re: Alappat, 1994	218
			The Guidelines	218
			The State Street "Finale"	219
			The "Mathematical Algorithm" Exception Analysis of	220
		17.2.7	State Street	220
		1/128	AT&T v. Excel Communications	220
	1/12		Protection of Computer-Related Software	221
	14.3	-		
		14.5.1	How to Prepare a Proper Patent Application Covering Computer-Related Inventions	221
		14.3.2	Claims	230
28.1		14.3.3	Determination of Whether a Computer-Related Invention	231
			Defines Patentable Subject Matter Under the Patent Laws	
		14.3.4	Functional Descriptive Material: "Data Structures"	232
			Representing Descriptive Material per se or Computer	
			Programs Representing Computer Listings per se	
		14.3.5	Non-Functional Descriptive Material	233
			Natural Phenomena Such As Electricity and Magnetism	234
	14.4		ry Subject Matter	234
			Types of Claimed Subject Matter	234
			Safe Harbors	235
			Computer-Related Processes Limited to a Practical	237
			Application in the Technological Arts	CT TOT
	14.5	Prepari	ng a Patent Application for the Computer-Related Invention	238
		14.5.1		239
			Invention Must Set Forth the Subject Matter the Inventor	
			Considers as the Invention	
		1452	Computer-Related Patent Application Must Contain an	239
		11.0.2	Adequate Written Description and an Enabling Disclosure	23,
	14.6	The Co	omputer-Related Invention Must Still Be Novel and	241
	14.0	Non-O		271
	14.7		iter Programming and a Sufficient Disclosure	242
	17.7		What Constitutes an Adequate Disclosure in Computer	242
		17.7.1	Programming Patent Applications	272
		1472	Affidavit or Declaration Practice	245
				245
		14.7.3	Referencing Prior Art Documents	243
He	dy Lai	narr		255
15	Pater	tability	of Biotechnology Inventions	259
	15.1		pment of Biotechnology	259
	15.2		preme Court, the U.S. Patent Office, and Biotechnology	260
		Inventi		IROSTO FI
	15.3	DNA		263

		CONTENTS	XV
	15.4	Science, Religion, and Living Organism Patents	264
	15.5	Examples of Biotechnology Patent Claims	265
	15.6	Enablement and Written Description Requirements in Biotechnology	267
	13.0	Patent Applications	207
	15.7	Biotechnology Industry and Patents	268
	15.8	Medical Procedures	269
Ros	salind	Franklin, James Watson, Francis Crick, and Maurice Wilkins	273
16	Busin	ess Method Protection	278
	16.1	Business Methods Constitute Patentable Subject Matter	278
	16.2	Foreign Business Method and Software Patents	280
	16.3	Preparing a Proper Business Method Patent Application	282
	10.5	1 repairing a reoper Dusiness wiethour attent reprietation	202
Wil	lbur aı	nd Orville Wright	287
17	Foreig	gn Patent Protection	294
iel		Appropriately means Contract Provisions Relation to Intellectual Department Library	
	17.1	Introduction	294
	17.2	Traditional System of Obtaining Foreign Patents	295
	17.3	Patent Cooperation Treaty (PCT)	296
	17.4	Broad Provisions of the Patent Cooperation Treaty	296
	17.5	National Patent Laws and the PCT: Differences and Alterations	298
	17.6	European Patent Convention (EPC)	299
	17.7	Communications to Foreign Non-Attorney Patent Agent	300
Rol	bert G	oddard	301
18	Enfor	cement of the Patent Right	306
	18.1	Patent Clearance Process	306
	10.1	18.1.1 Infringement Search and the Non-Infringement Opinion Letter	306
		18.1.2 "Right-to-Use" or "Knock-Out" Search	309
	18.2	Attempt to Design Around a Patent; Most Infringers Do Not Slavishly	309
	10.2	Copy the Patented Invention	30)
	18.3	Literal Infringement of a Patent Claim	310
	18.4	"Doctrine of Equivalents," Where the Claim Is Not Literally Infringed	311
	10.1	18.4.1 How the Doctrine of Equivalents Works	311
		18.4.2 Limits on the Doctrine of Equivalents	312
	18.5	Defenses to a Charge of Infringement	313
	10.5	18.5.1 Non-Infringement	313
		18.5.2 Patent Invalidity	313
		18.5.3 Unenforceability of the Patent	314
	18.6		315
	18.7	Marking the Patented Product with the Patent Number	316
Ch	orlos L	Kettering	317
CII	aries r	taomos Practicing	317
19	Owne	ership and Transfer of Patent Rights	322
	19.1	Inventorship, Ownership, and Assignment of Patent Rights	322

xvi	CONTENTS
-----	----------

		19.1.1	Patent Right as an Asset	322
		19.1.2	Initial Ownership of the Patent Right	323
		19.1.3	Shop Rights	324
	19.2	Patent 1	Licensing	324
		19.2.1	Difference Between a Patent Assignment and License	324
		19.2.2	When to Think "License"	325
		19.2.3	Developing a Relationship With a Licensee	327
			Selection of an Appropriate Licensee	328
			Primary License Negotiation and Agreement Considerations	329
			Additional License Considerations	332
		19.2.7		335
		19.2.8	Grant Back Clauses	335
	19.3	Conclu		336
Phi	ilo Far	nsworth		337
20	Emml	over on t	Contracts and Non Compate Destrictions	250
20	Empi	1433	Contracts and Non-Compete Restrictions	350
	20.1	-	yment Contract Provisions Relating to Intellectual Property	350
	20.2		ship of Intellectual Property	351
		20.2.1		351
			Copyrightable Works of Creative Authorship	352
	20.3		entiality Agreements and Provisions	353
	20.4		e Information Received by the Employee or Employer	355
	20.5		ompete Provisions	356
	20.6		eability of a Non-Compete Agreement	356
	20.7		ble Disclosure	359
	20.8		Agreements	359
	20.9	Consul	tants	359
Wi	lliam l	Lear		369
21	The I	Engineer	and Scientist as Expert Witness; and Ethics	372
	21.1	The En	ngineer and Scientist as Expert Witness	372
		21.1.1	Need for Experts	373
		21.1.2	Expert Assistance by Engineers and Scientists in Complex	373
			Litigation	
	117	21.1.3	Expert Depositions	376
		21.1.4	Deciding Whether You Can Provide the Requisite Expert Assistance	376
		21.1.5	Expert Witness Fees	376
	21.2	Ethics		377
			Professional Societies	378
			Code of Ethics	378
			Brief Comments Regarding the National Society of	378
			Professional Engineers (NSPE) Code of Ethics for Engineers	
			Comparing the Law and Ethics	380
		21.2.5	Recruiting Practices	381
Lu	ther B	urbank		383

		CONTENTS	xvii
22	Copyr	rights as a Vehicle for Technology Protection	386
	22.1	Brief History of Copyright Law	386
		22.1.1 Pre-U.S. Constitution English Law	386
		22.1.2 U.S. Constitution and Statutes	387
	22.2	Nature of Copyrights	389
		22.2.1 What a Copyright Is, and Is Not	389
		22.2.2 Intangible Rights in a Work Embodied in a Tangible Medium	389
		22.2.3 Moral Rights	390
		22.2.4 Protecting the Balance Between the Public and the Author	390
		22.2.5 Requirements of Copyrightable Subject Matter	391
	22.3	Exclusive Rights	392
	22.4	Fair Use	393
	22.5	Infringement	394
	22.6	Notice	394
	22.7	Registration and Its Importance	395
	22.8	The Duration of Intangible Rights of Copyright	395
	22.9	Works For Hire	396
		Copyright Registration for Computer Programs	398
		22.10.1 Protecting Computer Programs That Do Not Contain Trade Secrets	398
		22.10.2 Computer Programs Containing Trade Secrets	399
		22.10.3 Screen Displays	399
		22.10.4 Patent, Copyright, and Trade Secret Protection in Computer Software	400
		22.10.5 Contracts and "Shrink-Wrap" Licenses	400
	22.11	Copyright Registration for Automated Databases	401
	22.12	Copyright Registration for Online Works	402
		22.12.1 Revisions and Updates	402
		22.12.2 Databases	402
		22.12.3 Serials and Newsletters	402
	22.13	Architectural Works	403
Joh	n Baro	deen, Walter Brattain, and William Shockley	405
23	The D	Digital Millennium Copyright Act of 1998 (DMCA)—An Overview	412
	23.1	Purpose of the DMCA	412
	23.2	Circumvention of Technological Protection Measures	413
		23.2.1 General Approach	413
		23.2.2 Exceptions to the Prohibitions	414
	23.3	Copyright Management Information	415
	23.4	Remedies	415
	23.5	Additional Provisions of the DMCA	416
	23.6	Example of Potential Conflict	416
Jac	k Kilb	y and Robert Noyce	419
24	Mask	Work Protection	425
	24.1	Introduction	425

	24.2	The Semiconductor Chip Protection Act of 1984	425
	24.3	Mask Works Generally	426
	24.4	Subject Matter of Mask Work Protection	426
	24.5	Ownership, Transfer, and Licensing of the Mask Work	427
	24.6	Duration of Protection	427
	24.7	Rights of Ownership in a Mask Work	427
	24.8	Limitations on Exclusive Rights, Reverse Engineering, and First Sale	427
	24.9	Mask Work Notice	428
	24.10	Infringement of Mask Work Protection Rights	428
	24.11		428
Fed	lerico I	Faggin, Marcian Hoff, and Stanley Mazor	429
25	Trade	Secrets	432
	25.1	Introduction to Trade Secrets	432
	25.2	Development of Trade Secret Law Noture of a Trade Secret	432
	25.3	Nature of a Trade Secret	433
		Definition of a "Trade Secret"	434
	25.5	Establishment of an Enforceable Trade Secret Right	434
	25.6	Even Threatened Trade Secret Theft Can Be Stopped	436
	25.7	Creating a Meaningful Trade Secret Protection Program	437
	25.8	Damages and Injunctions	440
DAL	25.9	Confidence	440
Ste	phen V	Vozniak	443
26	Trade	emarks	447
	26.1	Origin of the Protection of Trademarks and Service Marks	447
	26.2	Trademark Adoption and Selection Process	449
		26.2.1 Creating a Trademark	450
		26.2.2 Screening or Narrowing Step	450
		26.2.3 Clearance Process for Determining the Availability of a Trademark for Your Use	451
	26.3	Filing For Registration of Your Trademark	452
	26.4	Protecting and Maintaining Your Trademark Registration	453
	26.5	Trademark Protection Outside of the United States	454
	26.6	Overview of the Madrid Protocol—The "International" Trademark	455
Per	cy Juli	ian	457
27	Cyber	rsquatting	461
-/	Cybel		401
	27.1	Trademark Venturi Caused by the Internet	461
	27.2	Internet Corporation for Assigned Names and Numbers (ICANN)	462
	27.3	ICANN's Uniform Dispute Resolution Policy	463
Cu	rrent E		467
Bib	liogra	phy	475
Ind	lex		495