

Index

- 3D print shops, 24, 40
 - as direct patent infringers, 87
 - as infringers of design rights, 192, 200
 - attempts to limit liability, 87
 - exposure to litigation costs, 88
 - need for safe harbor against patent infringement, 88, 89
- 3D printers
 - binder printers, 34
 - material jetting, 35
 - metal deposition, 33–34
 - plastic deposition, 33
 - sintering, 34
 - SLA, 34–35
- 3D printing applications
 - 3D selfie, 14
 - aerospace, 10
 - art, 13–14
 - construction, 11
 - electronics, 23
 - food, 11
 - furniture, 16
 - jewelry, 13
 - medical, 12–13
 - museums, 15
 - prosthetics, 16
 - shoes, 11
- 3D printing file formats. *See* DMF
- 3D printing materials, 35–37
- 3D printing services. *See* 3D print shops
- 3D printing users (specific examples)
 - Cal Tech, 11
 - GE, 10, 11, 60, 205
 - NASA, 10, 60
 - TU Wein University, 11
- 3D scanners
 - as part of 3D printing ecosystem, 40
 - explained, 37
 - used in copying, 95, 157
 - used in reverse engineering, 59
- Actavis UK Ltd v. Eli Lilly & Co.*, 114
- Adam Opel AG v. Autec*, 130
- Adidas Futurecraft, 35
- Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 78, 79
- appropriability mechanisms
 - contracts, 219, 220
 - copyrights, 215–17
 - design rights, 218
 - lead time, 224
 - patents, 207
 - social norms, 225
 - TPMs, 222
 - trademarks, 217
- attribution, 213, 214
- Auction Method/Hitachi*, 70
- Australia, 56, 58, 136, 140, 166, 169, 193, 198, 200
- Baker v. Selden*, 163
- Berne Convention, 6, 50, 52
- bioprinting, 13
- Brean, Daniel, 66, 67
- Brexit, 51, 77, 167
- Breyer, Justice Stephen, 109, 221
- Burstein, Sarah, 179, 181
- Canada, 53, 54, 56, 58, 136, 140, 166, 176
- China, 85
- CLIP (Continuous Liquid Interface Production), 34
- contracts
 - and complex DMFs, 220–22

- and public policy, 220
- as an appropriability mechanism, 219, 220
- defined, 219
- limitations of, 219
- notice, 219, 220
- prohibiting copying of DMFs, 219
- Controlling Pension Benefits System/PBS Partnership*, 70
- copying
 - and lead time advantage, 224
 - and social norms, 225
 - effects on recognition incentive, 213
- copyright
 - and reverse engineering, 216
 - boundary with patent law, 145
 - copy (explained), 146
 - copyright misuse, 173
 - creativity
 - and DMFs of useful articles, 155–56
 - as required in the EU, 167
 - DMFs lacking creativity, 159
 - in DMF text, 169
 - photographs lacking creativity, 170
 - recipes lacking creativity, 159
 - requirement of, 154
 - design of a useful article, 150
 - DMFs
 - and boundary between copyright and patent, 161–62
 - as copies of copyrighted works, 146
 - as manufacturing tools, 161
 - dictated by utilitarian concerns, 159
 - duration, 216
 - fair dealing and DMFs, 175
 - fair use and DMFs, 174, 175
 - lockout codes and DMFs, 173, 174
 - merger and DMFs, 165
 - merger doctrine, 163
 - originality in the EU, 167
 - pictorial, graphic, and sculptural works (PGS works), 145
 - private copying exception, 176
 - protection for surface ornamentation, 151
 - skill, labor, and judgment, 167
 - slavish copy, 157
 - technical drawings dictated by utilitarian concerns, 159
 - textual comments in DMF code, 172
 - typefaces, 170
 - useful article (explained), 147, 148
 - useful article exclusion, 150
 - work (explained), 145
- copyright law basics
 - copyrightable subject matter, 50–51
 - fair use (fair dealing), 52–53
 - infringement, 51
 - moral rights, 51–52
 - overview, 49–50
 - utilitarian justification, 49
- creative commons, 97, 213, 219
- Dastar Corp. v. Twentieth Century Fox Film Corp.*, 126, 127
- Decorative Aides Corp. v. Staple Sewing Aides Corp.*, 164
- Deepsouth Packing Co. v. Laitram Corp.*, 98
- design file
 - as not patentable subject matter (Europe), 77
 - as not patentable subject matter (Japan), 78
 - as not patentable subject matter (U.S.A.), 76
 - economic value of, 74
 - explained, 28–29
- design patents. *See* design rights
- Design Regulation, 57, 58, 192, 193, 194, 195, 196, 198, 200, 201
 - Explanatory Memorandum to the EU Design Regulation, 194
- design rights
 - article of manufacture, 179, 180, 181
 - basics
 - in EU, 57–58
 - in U.S.A., 56–57
 - computer screen as an article of manufacture, 186
 - computers as multifunctional articles of manufacture, 188
 - definition of design under EU Design Regulation, 193
 - definition of product under EU Design Regulation, 193, 195
 - graphic symbol, 194
 - Guidelines for Examination of Design Patent Applications for Computer-Generated Icons, 181
 - Guidelines for Examination of Registered Community Designs, 195
 - harmful consequences of broad rights in digital icons, 182
 - infringement
 - citation/teaching exception, 199
 - experimental use exception, 199

- design rights (cont.)
 image of DMF triggering direct infringement (EU), 197
 image of DMF triggering direct infringement (U.S.A.), 190
 indirect infringement (EU), 200
 indirect infringement (U.S.A.), 191
 private, noncommercial use exception, 198
 intended use as limitation on rights, 186–88
 private, noncommercial use exception, 199
 protection gap when digital file is offered for sale or sold, 190
 selling a DMF without displaying its image, 197
 software as an article of manufacture, 183, 184
 teleological approach to digital icons, 188–89
- digital manufacturing file. *See* DMF
- digital patent infringement. *See* patent infringement, *subheading*: digital patent infringement
- digital rights management. *See* DRM
- digital watermarking, 222
- Digitech Image Technologies, L.L.C. v. Electronics for Imaging, Inc.*, 66, 67
- dilution. *See* trademarks, *subheading*: dilution
- DMCA (Digital Millennium Copyright Act), 223
- DMF
 as software, 63–64
 explained, 33
 formats (explained), 28–32
- DRM (explained), 39
- e-Commerce Directive, 102, 140
- Elam, Viola, 195
- encryption, 222
- Enterprises International, Inc. v. International Knife & Saw, Inc.*, 159
- EPC (European Patent Convention), 62, 63, 69, 74
- EPO (European Patent Office), 63, 69, 70, 72, 73, 76, 77, 78
- Ex parte Strijland*, 181
- Federal Circuit, 65, 66, 68, 72, 79, 93, 95, 96, 99, 184
- Feist Publications, Inc. v. Rural Telephone Service Co.*, 154
- France, 52, 85
- GCODE files, 31
- Geomagic Design (software), 29
- German Federal Supreme Court (Bundesgerichtshof), 131
- Germany, 85, 96, 130, 137
- Grokster, 84
- Holbrook, Tim, 92
- Hull, Charles, 9
- IBM/Computer Program Product*, 69
- innovation
 and social norms, 225
 and trade secrets, 210
 copyright as possible incentive to innovate, 215–17
 how 3D printing lowers copying costs, 208
 how 3D printing lowers innovation costs, 207
 nonmonetary motivations to innovate, 212
 recognition as an incentive, 213
- innovation cycle
 building a prototype, 206
 conceiving of the invention, 206
 manufacturing, 207
 product distribution, 207
 revising prototypes, 206
- intellectual property. *See* IP
- Inwood Laboratories, Inc. v. Ives Laboratories, Inc.*, 139
- IP basics
 infringement, 43–44
 remedies, 44–45
 territoriality, 43
 validity, 43
- Israel, 53, 174
- Japan, 7, 72, 73, 74, 80, 85, 119
- Japanese Patent Act, 63
- JPO (Japanese Patent Office), 63, 64, 71, 72, 73
- Kern River Gas Transmission v. Coastal-Corp.*, 164
- Korea, 53, 174
- L'Oréal SA v. Bellure NV*, 135
- L'Oréal SA v. eBay International AG*, 141
- lead time advantage, 224
- liquidated damages, 219

- machine-instruction file
 as patentable subject matter (Europe), 77
 as patentable subject matter (Japan), 78
 as patentable subject matter (U.S.A.), 75
 economic value of, 80
 explained, 31–32
 maker movement, 206
 making. *See* manufacturing
 Malaquias, Pedro, 195
 Malaysia, 174
 manufacturing
 anonymized by 3D printing, 19
 as an act of patent infringement, 83
 commoditized by 3D printing, 19, 123
 democratized by 3D printing, 18
 does not result in trademark
 infringement, 122
 separated from design, 121
 Margoni, Thomas, 195
Menashe Business Mercantile Ltd v. William Hill Organisation Ltd, 115
Meshwerks, Inc. v. Toyota Motor Sales U.S.A., Inc., 157
Microsoft/Clipboard Formats, 70
 moral rights, 144
Morrissey v. Procter & Gamble Co., 164
 MP3, 5, 26, 143, 197
- nanoprinting, 11
 Napster, 26, 84
 New Zealand, 166
Nintendo v. BigBen, 199
Nuijten (In re), 65, 66, 67, 72
- open source, 3, 16, 28, 206, 210
- Paper Converting Machine Co. v. Magna-Graphics Corp.*, 99
 Paris Convention, 6, 54
 passing off. *See* trademarks, *subheading*: passing off
- patent
 abstract ideas, 48, 62
 Beauregard claim, 73, 78, 79. *See also* Patent, *subheading*: CRM claim
 claims, 60–61
 composition of matter, 65
 CRM (computer readable medium) claim, 73, 74, 78
 further technical effect test, 70, 77
 machine, 65
 manufactures, 65
 patentable subject matter, 61–62
 signal claims, 71–73
 tangibility requirement (Europe), 70–71
 tangibility requirement (Japan), 71
 tangibility requirement (U.S.A.), 65–68
 technical effect test, 69, 77
 Patent Act of 1790, 65
 patent infringement
 based on offer to sell, 95–96
 contributory infringement and components, 112
 costs of litigation, 85, 88
 digital patent infringement, 92, 94, 95, 97
 direct infringement
 by 3D print shops, 87
 by file repositories, 99
 by individuals, 83–84
 with machine-instruction file, 100–1
 with surface-mesh file, 102
 doctrine of equivalents, 91
 exceptions, 85–87
 indirect infringement
 active inducement, 111
 essential element test, 113, 116
 knowledge requirement, 106–7, 117
 underlying direct infringement, 110, 118–19
 proposed safe harbor for 3D print shops, 88–90
 patent law
 basics
 claims, 47
 infringement, 48–49
 overview, 45–46
 patentable subject matter, 48
 boundary with copyright law, 145
 fairness justification for a private, noncommercial use exception, 211
 utilitarian justification, 45
 patent system
 as an incentive to innovate, 204
 disclosure function, 210
 how to analyze 3D printing technology's effects, 205
 Philippines, 174
 physitization, 3, 6, 17, 121, 145, 179, 208, 228
 physitization (explained), 17
 print shops. *See* 3D print shops
 prototyping, 1, 9, 20, 206, 207, 214

- PTO. *See* USPTO
- public domain, 81, 128, 129, 135, 143, 177, 216
- rapid prototyping, 9
- RepRap, 3, 36
- reverse engineering, 21, 37, 220
 and contracts, 220, 221
 and copyright, 216
 software, 161, 216
 using 3D scanners, 59
- Shapeways, 13, 24, 87
- Singapore, 174
- slicer software, 32
- Sri Lanka, 174
- Star Athletica, L.L.C. v. Varsity Brands, Inc.*, 151
- stereolithography file*. *See* STL file
- STL file (explained), 30
- streaming DMFs, 222
- surface-mesh file
 as not patentable subject matter (Europe), 77
 as not patentable subject matter (Japan), 78
 as not patentable subject matter (U.S.A.), 75–76
 economic value of, 74, 80
 explained, 29–31
- Taiwan, 174
- technological protection measures. *See* TPM
- tessellations, 29
- Thingiverse, 25, 40, 88, 124, 125, 214
- three-dimensional. *See* 3D
- Tiffany (NJ) Inc. v. eBay, Inc.*, 139
- TM Directive, 130, 135, 137
- TPM
 and the DMCA, 222
 as appropriability mechanisms, 222
 explained, 38–40
- trade secrets, 210
 role with 3D printing, 218
- Trademark Directive. *See* TM Directive
- trademark law basics
 infringement, 55
 overview, 53–55
- trademarks
 as indicators of DMF quality, 217
 as indicators of origin, 123
 contributory (indirect) infringement, 138, 139
 dilution, 136, 137
 DMFs and the origin function, 124–25
 effect on recognition incentive, 214
 fair use and dilution, 137
 increased role with DMFs, 142
 passing off, 141
 post-sale confusion, 132, 133
 producer incentive rationale, 131, 132
 sponsorship and affiliation confusion, 134
 unfair competition, 141
- Transocean Offshore Deepwater Drilling, Inc. v. Maersk Contractors USA, Inc.*, 93, 94
- TRIPS Agreement, 6, 45, 54, 86, 96, 205
- Turbosquid, 25, 124
- U.S. Court of Appeals for the Federal Circuit.
See Federal Circuit
- UK, 51, 54, 70, 85, 96, 116, 118, 167, 176, 180, 192, 200
- UK Patents Act, 96, 113, 118
- unfair competition. *See* trademarks,
subheading: unfair competition
- United Kingdom. *See* UK
- USPTO (U.S. Patent & Trademark Office), 56, 74, 75, 180, 181, 182, 183, 186, 190, 191, 192
- utilitarian objects (explained), 144