Intellectual Property in the Software Industry: A Practitioner's Perspective

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Intellectual Property in the Software Industry: Overview

- Goal of intellectual property law:

  "To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries." (U.S. Constitution, Article 1 § 8)

- Main areas of intellectual property law:

  - Copyright (protects artistic works)

  - Patent (protects useful inventions)

  - Trademark/service mark (protects brand names of goods and services)

- Other areas of intellectual property law:

  - Trade secrets

  - Plant and industrial design patents

  - Semiconductor Chip Protection Act (protects mask works)

  - Vessel Hull Design Protection Act (protects designs of vessel hulls)

Intellectual Property in the Software Industry: What Do IP Rights Mean for Practitioners?

- How does this area apply to my field?

- What do I need to do to protect my works?

- How do I avoid getting sued (or prohibited from what I want to do?)

- Controversies and open questions?

Copyright (Generally): Overview

- Purpose: Protecting "original works of authorship..." "literary works; musical works; dramatic works; choreographic works; pictorial, graphic, and sculptural works; audiovisual works; sound recordings; architectural works" (17 USC §102)

- Only covers *aesthetic* qualities of a particular work – does not cover: "any idea, procedure, process, system, method of operation, concept, principle, or discovery"

  - *However,* a "compilation" may be covered

- Five rights conferred: Reproduction, distribution, derivatization, public display, public performance

Copyright (Generally):
Digital Millennium Copyright Act (1998)

- Extends rights conferred by copyright into new areas:
  - Criminalizes circumventing a copyright protection measure, or making or selling products that circumvent copyright protection measures
    - Exemptions:
      - Nonprofit libraries determining whether to acquire a copy of a work
      - Reverse engineering in order to achieve interoperability with other programs
      - Incidental, temporary copying during machine maintenance or repair
      - Encryption research, security testing, internet restrictions for minors
- Grants service providers (*e.g.,* web hosts) exemptions to DMCA infringement, *if* they remove links to copyrighted material ASAP
- Criminalizes selling analog copying equipment that does not conform to DVD copy protection measures

Copyright (Generally): How to Obtain a Copyright

- Simply "fix in a tangible medium" (e.g., magnetic or optical memory)

- Marking with "© [year] [name]" is helpful (prevents "innocent infringement"), but not required

- Registration with U.S. Copyright Office is fast (http://www.gocopyright.com) and cheap ($50), but not necessary

- Duration (Sonny Bono Copyright Term Extension Act):
  - Personally owned works: Life of author + 70 years
  - Corporate works: Earlier of 120 years from creation and 95 years from first publication

Copyright (Generally): A Big Stick

- Large damages: Willful infringement = up to $150,000 per infringing incident

- *Capitol Records v. Thomas* (2009): Sharing of 24 songs via Kazaa – verdict: $80,000 per song = $1.92 million

  - Judge described penalty as "monstrous and shocking"; reduced to $9,250 per song = $54,000

- Cease and desist letters

- DMCA takedown notices

- Computers seized; storage searched and wiped

Copyright (Generally):
A Big Stick… But Also A Narrow Stick

- Requires <u>proof</u> of <u>actual</u> copying, not just similarity
- Fair use rights (17 USC §107): Copying permitted "for purposes of criticism, comment, news reporting, teaching, scholarship, or research"
  - Relevant factors: "purpose and character of use," "amount and substantiality of portion used," "effect of use upon potential market"
  - Not a guaranteed right, but simply a defense – can be restricted by copyright protection measures
- "First sale" doctrine: Redistribution of an article sold to a user
  - Does this include registration code?
  - Sale vs. non-transferable license?
- Inalienable "moral rights" in European copyright law: Attribution (or anonymity/pseudonymity), right to define integrity of work

Copyright (Software): What Software Is Copyrightable?

- Source code (as a written document)
- Compiled binaries
- Associated data objects (libraries, databases (as a "compilation"), graphics, configuration files)
- Documentation
- Packaging
- Artistic presentations (music, images, 3D environments)
- User interface designs (*Computer Associates v. Altai*)
  - …but not underlying functions (*Lotus v. Borland*)

Copyright (Software): Software License Types

- Public domain ("freeware"): Copyright explicitly waived
- "Copyleft" license: A license that permits a wide range of uses, but requires derivative works to be released under licenses that are no more restrictive than that of the original work ("viral licensing")
- "Free software" or open source license: A license that permits the free modification and distribution of derivative works with modest conditions
  - "Open source" is a design metholodogy: provide source code so that others may examine, improve, and derivatize software
  - "Free software" is a "social movement": propagate culture of shared software
- "Non-free" licenses

Copyright (Software):
Creative Commons (CC) License

- Creative Commons (CC) license: Permits any use in any context, **IF** attribution to the original work is included

- Variations:
  - "Noncommercial" (NC): Only in noncommercial contexts
  - "NoDerivs" (ND): No derivative works permitted
  - "ShareAlike" (SA): Derivatives permitted only if offered under an identical license

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Copyright (Software): GNU General Public License (GPL)

- Foundations of GPL:
    - Freedom to use the software for any purpose
    - Freedom to change software to suit user's needs
    - Freedom to share software and changes
- GNU General Public License v2: Permits any use in any context, **IF:**
    - Attribution to original work is included, along with warranty disclaimers
    - Derivative works must:
        - Indicate what has changed from original
        - Be released under same license (copyleft)
        - Include, or at least make available, the source code
- GNU General Public License v3: Developed in response to three arrangements considered non-"free":
    - Microsoft/Novell license --> license not available to any company that has entered a restrictive software patent license
    - Tivo --> any hardware incorporating software must not enforce hardware checks against modification
    - DMCA --> GPL'ed software may implement digital rights management (DRM) technologies, but circumvention cannot be punished under DMCA

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Copyright (Software):
Other Common Licenses

- http://en.wikipedia.org/wiki/Comparison_of_free_software_licenses:

License	Author	Latest version	Publication date	Link with code using a different license	Release changes under a different license
Academic Free License	Lawrence E. Rosen	3	2002	Yes	Yes
Affero GPL	Free Software Foundation	3	2007	No	No
Apache License	Apache Software Foundation	2.0	2004	Yes	Yes
Apple Public Source License	Apple Computer	2.0	August 6, 2003	Yes	No
Artistic License	Larry Wall	2.0	2000	Yes	With restrictions
Berkeley Database License	Oracle Corporation	?	February 7, 2008	No	No
BSD license	Regents of the University of California	?	?	Yes	Yes
Boost Software License	?	1.0	August 17, 2003	Yes	Yes
Common Development and Distribution License	Sun Microsystems	1.0	December 1, 2004	Yes	Yes
Common Public License	IBM	1.0	May 2001	Yes	No
Cryptix General License	Cryptix Foundation	?	1995	Yes	Yes
Eclipse Public License	Eclipse Foundation	1.0	?	Yes	No
Educational Community License	?	1.0	?	Yes	Yes
Eiffel Forum License	NICE	2	2002	Yes	Yes
EUPL	European Commission	1.1	January 2009	Yes	With an explicit compatibility list
GNU General Public License	Free Software Foundation	3.0	June 2007	No	No
GNU Lesser General Public License	Free Software Foundation	3.0	June 2007	Yes	No
Hacktivismo Enhanced-Source Software License Agreement	Hacktivismo/Cult of the Dead Cow	?	November 26, 2002	?	?
IBM Public License	IBM	1.0	August 1999	Yes	Yes
Intel Open Source License	Intel Corporation	?	?	Yes	Yes
ISC license	Internet Systems Consortium	?	June 2003	Yes	Yes
LaTeX Project Public License	LaTeX project	1.3c	?	Yes	Yes

- Berkeley Software Distribution (BSD) Licenses, Apache License, Microsoft Public License (MS-Pl): Essentially identical to Creative Commons license, with small variations in attribution requirements and copyleft propagation

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Apache: http://www.apache.org/licenses/ BSD: http://en.wikipedia.org/wiki/BSD_licenses MS-Pl: http://www.microsoft.com/opensource/licenses.mspx

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Copyright (Software):
"Non-free" licenses

- Typical "non-free" license (Microsoft Office™):

> 3(d). Font Components. While the software is running, you may use its fonts to display and print content. You may only
> · embed fonts in content as permitted by the embedding restrictions in the fonts; and
> · temporarily download them to a printer or other output device to help print content.

- Often includes many non-copyright contract terms

> 3(i). Language Version Selection. If the computer manufacturer provides you with a one-time selection between language versions, you may use only the one language version you select. If the computer manufacturer provides you with a "MLP" or "LIP", your use of language versions is not limited. A "MLP" is a Multi-language Pack. A "LIP" is a Language Interface Pack. MLPs and LIPs offer additional language version support of the software. The MLP and LIP are a part of the software, and may not be used separately.

- Often foisted upon users in the form of a "shrinkwrap" or "clickwrap" license

* Note: This is <u>definitely</u> not a complete summary of the Microsoft Office™ license.
Visit http://office.microsoft.com/en-us/products/ha102103171033.aspx for more information.

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Copyright (Software): Protecting Your Works: You vs. World

- Step 1: Choose a license (or choose to waive copyright)

- Step 2: Marking

  - Source code

  - Executable

  - Websites

  - Documentation

- Copy protection technologies?

- Enforcement: Active vs. passive

Copyright (Software):
Protecting Your Works: You vs. Your Organization

- Academic works: Copyright usually owned by student, but university might share ownership (*e.g.,* if university has donated resources to development)
    - CWRU Technology Transfer Office: http://ora.ra.cwru.edu/techtransfer/
- Company works: Copyright usually owned by employer, either under employment agreement or "work for hire" doctrine
- Internships: Depends on the nature of the internship

* Note: These are <u>general</u> considerations that <u>may</u> apply. Your circumstances may vary (a lot!) Consult an attorney if you have questions.

Copyright (Software): How Not To Get Sued

- Simple rule: Pay attention to license terms!

  - Examine license before using a library/tool/module, and make sure that you're OK with its terms and conditions

  - Alternatively, look for freely available resources: http://search.creativecommons.org/

  - Reexamine terms and conditions of libraries upon releasing works

* Note: These are <u>general</u> considerations that <u>may</u> apply. Your circumstances may vary (a lot!) Consult an attorney if you have questions.
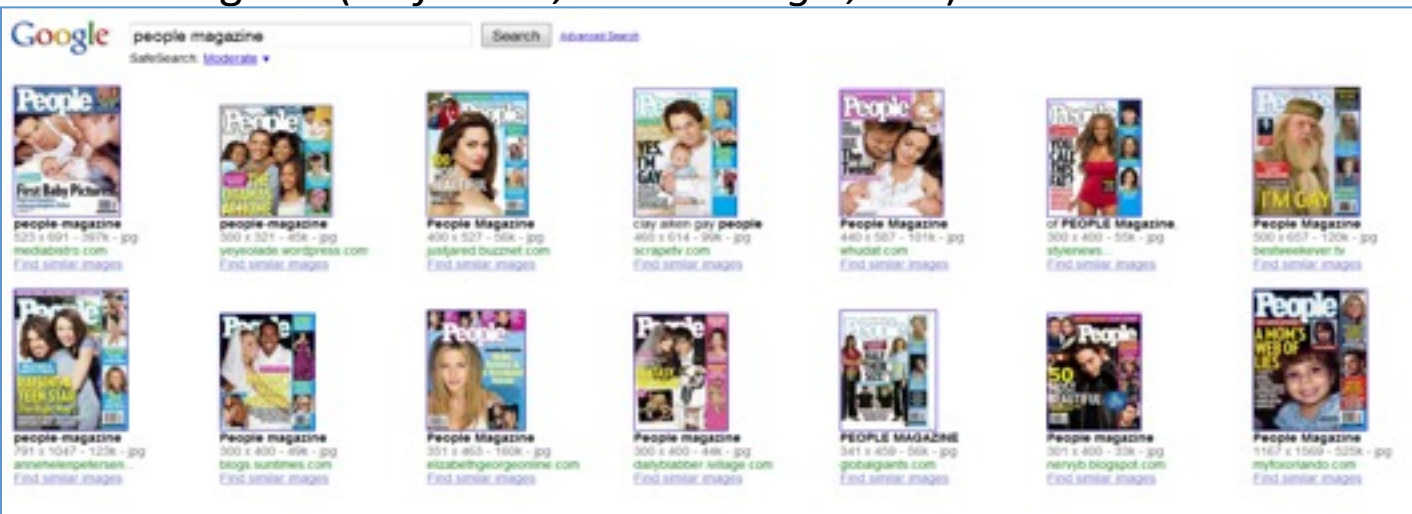
Copyright (Software): Controversies and Open Questions

- Orphan Works: Copyright *may* still exist, but owner can't be identified
- Does current copyright term comport with "for limited times?"
    - "Happy Birthday To You" was first copyrighted in 1935, and won't expire until 2030! – is this what the Framers of the Constitution had in mind?
- Copyright holder abuses
    - "License" as anti-reselling tactic
    - Reselling same media in different format
- Draconian enforcement measures
    - RIAA: Business model based on suing customers!
    - DMCA takedown notices: Service providers (Flickr, YouTube) can't properly review, but automated processes are often unfair
    - RIAA forcing YouTube to remove audio track from videos including music
    - Fox News utilizing DMCA takedown notices to remove unflattering segments
- *Should* copyright apply to *all* aspects of software? What is "artistic" about a compiled binary or an XML configuration file read only by a machine?

Copyright (Software):
Controversies and Open Questions

- The Big Question: Is copyright law out of sync with 21st century life?
    - Sharing purchased media with family and friends
    - Music collection: A 60gb iPod can hold about 15,000 tracks = $1.2 billion if shared... "only" $138 million under non-"monstrous" penalty
    - Format translation
    - Archiving media and applications
    - Mashups
    - Search engines (*Perfect 10, Inc. v. Google, Inc.*)
- Res
    - ▪
    - ▪
- Or
    - ▪   en for

Patent (Generally): Overview

- **Purpose:**
  - Protecting useful inventions
    - Machines, manufactures, compositions, processes
  - Compelling public disclosures in patent documents
- **Prerequisites:**
  - Utility
  - Novelty
  - Non-obviousness
  - Sufficient disclosure
- **Right conferred: Exclude others from using patented invention**

Patent (Generally): Contents

- Title

United States Patent

Coffin, Sr.

5,473

1993

Abstract

Corrugated beverage containers and holders are which employ recyclable materials, but insulating air. These products are easy to hold and have a lesser impact on the environme

Description

SUMMARY OF THE INVENTION

DETAILED DESCRIPTION OF THE INVENTION

This invention provides corrugated beverage container holders and beverage containers which are environmentally friendly and which provide adequate insulation properties approaching those of polystyrene. The corrugated tubes of these products preferably contain longitudinally extending flutes and include a generally tapered or conical structure, typical of beverage containers. The corrugation can be made of cellulosic materials, including craft paper, sulfite paper, or recycled paper. Ideally, the fluting and liners of this invention are adhered to one another with a recyclable, and preferably, a biodegradable adhesive, for example, R130 adhesive by Fasson Inc., Grand Rapids, MI.

With reference to FIGS. 1-5, there is shown, in multiple views, a preferred beverage container holder 100 of this invention. The preferred holder 100 includes a tubular structure having an inner liner 12 and sinuous fluting 11 disposed around the periphery of the liner 12.

The preferred material of this invention, corrugated cardboard, is generally available in rather large widths of about 5 to 7 feet. The corrugated medium, a web of paperboard, or more preferably, virgin kraft or similar easily recycled cellulosic material, is heated
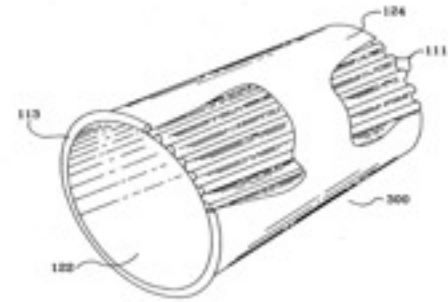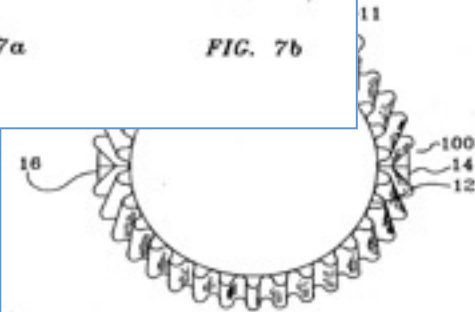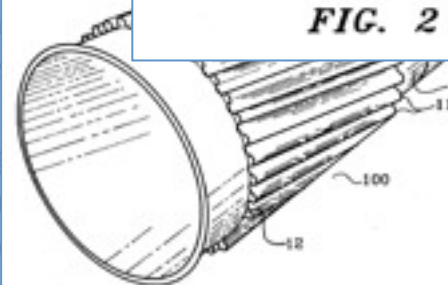
FIG. 13

FIG. 6a   FIG. 6b

FIG. 7a   FIG. 7b

FIG. 2

FIG. 3

Patent (Generally): Contents

- Claims: One-sentence description of invention

What is claimed is:

10AAnystabdiff,ainhsatiagbvatiagee,ycdaiplisdingitdegdetolobkceiongagcandgodbetatuhbeacbremoprobiesing
eseoptiahg ofehdyaslideheomeigatid,aidelekansanfinesttepndungt afisingiputmegeveikganaidteskaalogaittifoedagth
oreaydatgeahtobiocdegddehthibhathaside obtattoneprisiingiflighflutimgieeudafougdmaivmegitiatiedtordvgiteadid
faeygadieaxkaveelongegilhetifig addesiaflguitetatidgetaciolatiedsthiparecyonableataddesiveember having a
pair of folding axes; said tubular member collapsible about said axes to form a flattened structure.

52Thehodterinofeloihd1,jivh0r,rfinthersdaoeprisiglaimenstoatiedkivglipadvspseedasingagemphery of
said first opening.

6. The holder of claim 1, wherein said fluting comprises sinuous fluting.

- A claim is allowable if it specifies a working combination of elements that has not existed, and that is not an "obvious" combination of known existing elements

- A product infringes a claim in an allowed patent if it has all of the elements of the claim (or "equivalents" of such elements)

- Thus, each claim should specify the minimum number of elements, each broadly defined, that define a useful, novel, non-obvious invention

Patent (Generally): How to Obtain a Patent

- Identify invention(s); (maybe) search prior art
- Prepare patent application
  - Many substantive requirements: Written description, enablement, best mode
  - Many formal requirements: Oath/declaration, claim-drafting rules, rules for figures
- File patent application with patent office (pay filing fee: $330)
- Wait... wait... wait some more...
- First Offi...
  - Citati...
- Patent p... refine claims; i...
- Notice o... able!")
- Patent is...
- Mark pro...
- Maintenance fees (3.5 years: $980; 7.5 years; $2,480; 11.5 years: $...
- Patent expires (20 years after date of filing)

TABLE 4: PATENT PENDENCY STATISTICS (FY 2009)		
UPR Pendency Statistics by Technology Center (in months)	Average First Action Pendency	Total Average Pendency
Total UPR Pendency	25.8	34.6
Tech Center 1600 - Biotechnology & Organic Chemistry	22.5	35.1
Tech Center 1700 - Chemical & Materials Engineering	25.9	37.4
Tech Center 2100 - Computer Architecture, Software & Information Security	29.4	40.7
Tech Center 2400 - Networks, Multiplexing, Cable & Security	28.6	47.7
Tech Center 2600 - Communications	33.0	42.7
Tech Center 2800 - Semiconductor, Electrical, Optical Systems & Components	20.8	29.7
Tech Center 3600 - Transportation, Construction, Agriculture, & Electronic Commerce	24.4	35.1
Tech Center 3700 - Mechanical Engineering, Manufacturing & Products	26.5	35.5

http://www.uspto.gov/web/offices/com/annual/2009/oai_05_wlt_04.html

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Patent (Generally):
A Big Stick

- Damages: Potentially massive, especially for "willful" patent infringement
  - *Centocor v. Abbott Labs* (2009): $1.52 billion
- Seizure and destruction of infringing products
- Preliminary injunction during trial pendency
- Permanent injunction against using invention

Patent (Generally): Limitations

- Obtaining is difficult, *very* protracted, and expensive
  - Easy to destroy patentability accidentally through disclosure or sale
- Filing for patent destroys trade secrets, even if no patent issues
- Patentee has no right to use the invention!
- Enforcement is difficult, protracted, and *very* expensive
  - Attorney's fees in pharma infringement trials: up to $30 million for each side!
- Geographic limitations: Only enforceable in country of issuance
- Limited term: 20 years from issue date… less prosecution time, except for patent office delays
- Some limited exemptions to patent infringement:
  - Experimental research to secure FDA approval (35 USC §271(e))
  - Medical and surgical methods (35 USC §287(c))
  - For federally funded research, government may retain some rights to use or reclaim invention (Bayh-Dole Act of 1980)

Patent (Generally):
Uses

- Stopping infringers
- Licensing or sale
- Cross-licensing
- Defensive patenting: establishing an "arsenal"
- Defensive publication: placing references in patent office database
- Controlling a technological standard (*e.g.*, standards body)
- Business asset used to secure investment or add value (independent review of invention novelty)
- Prestige: Inventors recognized as brilliant!

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Patent (Software):
Availability of Software Patents

- Patentability of software has changed as nature of software has evolved
    - *Gottschalk v. Benson* (1972): Software is not patentable if it "has no substantial practical application" and "would wholly pre-empt the mathematical formula, and would be a patent on the algorithm itself"
    - *Diamond v. Diehr* (1981): A novel process or machine does not become unpatentable merely because it involves software (even well-known mathematical formulae)
    - *In re Alappat* (1994): A general-purpose computer programmed in a particular manner is patentable
    - *State Street Bank v. Signature Financial Systems* (1998): No special rules or limits for patentability for software
    - *In re Bilski* (2008): Allowable patents for software are "tied to a particular machine" or "transform an article into a different state"
    - *Bilski v. Doll* (2010): ?

Patent (Software):
Protecting Your Works: You vs. World

- Be careful of disclosures, including publication and sale of products
- As soon as you think you have a patentable invention, talk to a patent attorney!
    - Questions to be determined:
        - To patent or not to patent?
        - What to patent: identify inventions; choose scope and order of filing
        - Where to patent
        - When to patent (too early: invention might not yet be complete; too late: may lose rights to a competitor)
- Mark software with patent numbers
- Monitor for infringement

* Note: These are <u>general</u> considerations that <u>may</u> apply. Your circumstances may vary (a lot!) Consult an attorney if you have questions.

Patent (Software):
Protecting Your Works: You vs. Your Organization

- Same considerations as with copyright:
  - Academic works: Inventions usually owned by student, but university might share ownership (*e.g.,* if university has donated resources to development)
    - CWRU Technology Transfer Office: http://ora.ra.cwru.edu/techtransfer/
  - Company works: Invention rights usually assigned to employer under employment agreement
  - Most companies and virtually all academic institutions have a technology transfer office that will handle (and pay for) patenting your invention – failing to follow company policy may cause serious conflict between you and your institution

* Note: These are general considerations that may apply. Your circumstances may vary (a lot!) Consult an attorney if you have questions.

Patent (Software):
How Not To Get Sued

- Publication as defensive tactic
- To search or not to search?
  - Searching may avoid problems, but may put you at risk of willful infringement
    - Can get a "freedom to operate" opinion from a patent attorney
  - Not searching may reduce willful infringement, but may cause serious problems down the road
- Take cease-and-desist letters seriously – consider licensing, designing-around, *etc.*

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Patent (Software): Controversies and Open Questions

- Patentability of software as "algorithm" (*Bilski v. Doll*)

- Patent office efficiency (pendency, quality)

- Patent "trolls" (*NTP, Inc. v. Research in Motion, Ltd.*)

- Competing business models and philosophies

  - Microsoft vs. Linux

  - Richard Stallman, GPL v3, *etc.*

- Great deal of mainstream misunderstanding about patents

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**Again, don't rely on ANY of this material in real life. Really. These matters are always complicated, and the law is complex and changes daily.
If you need an answer that you can rely on, contact an attorney.**