



Intellectual Property and Invention Protection for Engineers

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- Learn the basics of intellectual property (“IP”) law as it applies to engineers
- Save money in the future: save time, prevent errors
- Learn tips that can help you in your project courses and after graduation

- **Introduction**
- **Who am I?**
- **What is “Intellectual Property” or “IP”?**
- **What are some different types of IP and how do they relate to each other?**
- **Invention Protection: Trade Secrets and Patents**
- **Case Study: US 7,434,177 (The Apple “Dock”)**
- **Conclusion**

- **“Property”**
 - Enforceable rights against the world
 - Real
 - Personal
 - Intellectual
- **“Intellectual”**
 - Creations of the mind
 - Expression, inventions, brands, designs, secrecy

- **Copyright**
- **Industrial Designs**
- **Trade-marks**
- **Invention Protection**
 - Trade Secrets
 - Patents

- **Copyright**

- Prevents unauthorized reproduction of *original* literary, dramatic, musical, and artistic works that required *skill and judgment* to produce.
- Cheap (vests automatically); long lasting (50 years from death of author)
- Software, project documentation, icons, APIs
- Beware limitations: does not protect functionality
- Beware open source licences
- Generally automatically vests in employer

- **Industrial Designs**

- Protects *original* features of shape, configuration, pattern or ornament and any combination of those features that, in a finished article, appeal to and are judged *solely by the eye*
- E.g.: computer icons, Coke bottle
- 10 years of protection; relatively inexpensive (generally \$2,000 - \$3,000 from application to registration) and quick to obtain (~ 1 year from filing)

- **Trade-marks**

- Source identifiers
- Protects the *use* of words/phrases and designs in association with *wares and services*
- Can be very powerful: Apple, Google, Microsoft, Dell
- Can be registered or unregistered
- Registration generally relatively inexpensive: ~ \$2,000 spread over two years

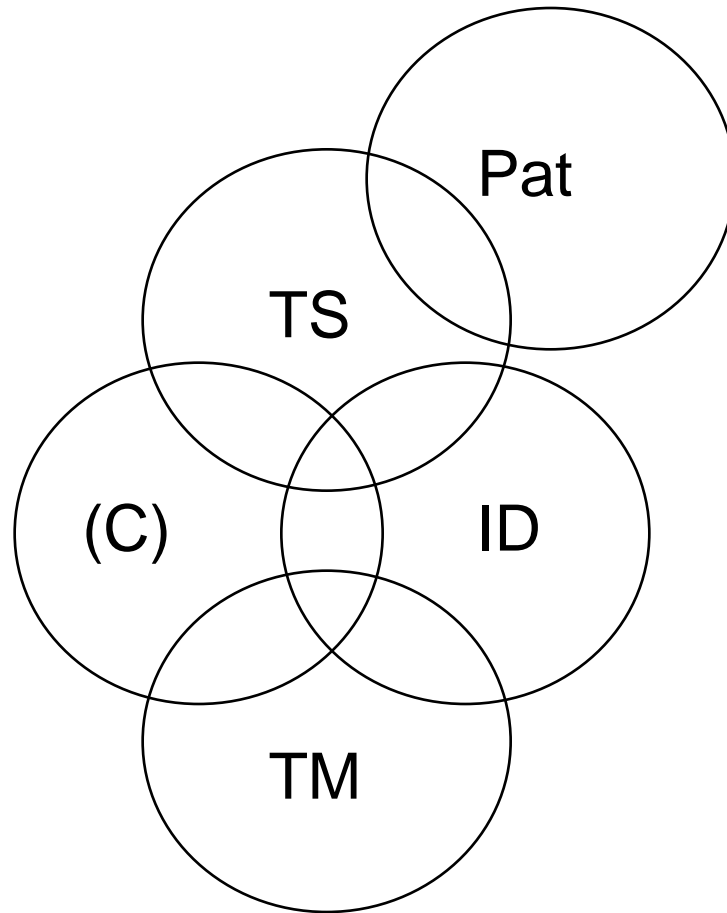
- **Trade Secrets**

- Any information that
 - is or may be used in trade or business
 - is not generally known in that trade or business
 - has economic value from not being generally known
 - is the subject of efforts that are reasonable under the circumstances to maintain its secrecy
- Recipes; manufacturing processes (see Coca-cola)
- Potentially infinite in duration


- **Patents**

- A statutory right of exclusivity that prevents others from using a *new, non-obvious, and useful* method, machine, manufacture or composition of matter
- 20 years of protection; can be expensive (anywhere from \$6,000 to \$15,000 to draft and file an application, depending on invention complexity)
- Includes digital and analog hardware designs; firmware (DSP; microcontrollers configured to enable a certain device); many types of software (XML appliances, wireless devices, software that runs on personal computers), although US/CA law on this point currently unclear

Different Types of IP



Different Types of IP

IP Right	What is Protected	How to Protect	Term of Protection	Examples
Copyright	Original works	Automatic upon creation of work; reg. optional	Typically 50 yrs + life of author	Operation manuals, software
ID	Designs as applied to useful articles	Registration	10 years from registration date	iMac shape
Trade Secrets	Confidential business information	Non-disclosure	Indefinitely so long as secrecy maintained	Schematics, customer lists
Patents	New and inventive innovations	Registration	20 years from filing	Robotic Arm
TM	Source identifiers used w/wares and services	Common law use and/or registration	Indefinite if use continues (and, for registrations, renewals paid)	

- **Why use Trade Secrets?**
 - Not time limited
 - Not territorially limited
 - No “springboard”
 - Lower upfront costs
 - Lower enforcement costs
 - Immediate protection
 - Can be used to protect innovations not protectable by patents (e.g.: innovations that aren’t inventive)

- **Why use Patents?**

- Trade secret protection may be unfeasible
- Exploitation: a patent is a clearly identifiable asset that may be sold or licensed
- Trade secret protection destroyed as soon as another party learns of trade secret through legitimate means
 - E.g.: independent creation, innocent recipients of information
- Protection - protect your development path
- Deterrence - discourage others from using your proprietary technology
- Optics

- **Anatomy of a Patent Application**

- A patent is a bargain between the State and Inventor to provide a time limited exclusive right in an invention to the Inventor in exchange for a useful disclosure of the invention from the Inventor to the public.

- **Two Requirements of a Patent**

- enabling disclosure of the invention to the public
- a clear definition of the boundary of the invention claimed

- **Enabling Disclosure - the “Specification”**
 - Must be sufficiently detailed to teach a “skilled person in the art” how to make an embodiment of the invention
 - Disclosure describes embodiments of the invention, not the invention
 - Best mode requirement
 - Must be a useful disclosure: disclosed invention must work as advertised

- **Claims are the only part in patent application where invention is defined**
- **Claims define the boundaries of the exclusive right**
- **Overly broad claims will result in invalid patent; overly narrow claims are commercially useless**

- **Helpful to know what's out there already - from a legal standpoint, can't claim what's already know**
- **Do your own prior art searching – be cognizant of issues surrounding knowledge of competitors' patents (willful infringement; inequitable conduct).**
- **Important to know what's out there at the time of drafting the patent so you can explain to the Patent Examiner why what you're doing is new and inventive. Can't add “new matter” later.**

- **You think you have valuable technology. What do you do?**
 - identify the elements that give your company its competitive advantage
 - ask: are these elements innovative?
 - determine: are these elements protectable?
 - acquire patent protection
 - exploit your patents to full advantage

Case Study: The Apple “Dock”



Case Study: The Apple “Dock”

- You’re working at Apple in 1999. You’ve developed the Apple “Dock”. What gives the “Dock” its competitive advantage? I.e., what is the “prior art” and how is the “Dock” better?

Case Study: The Apple "Dock"

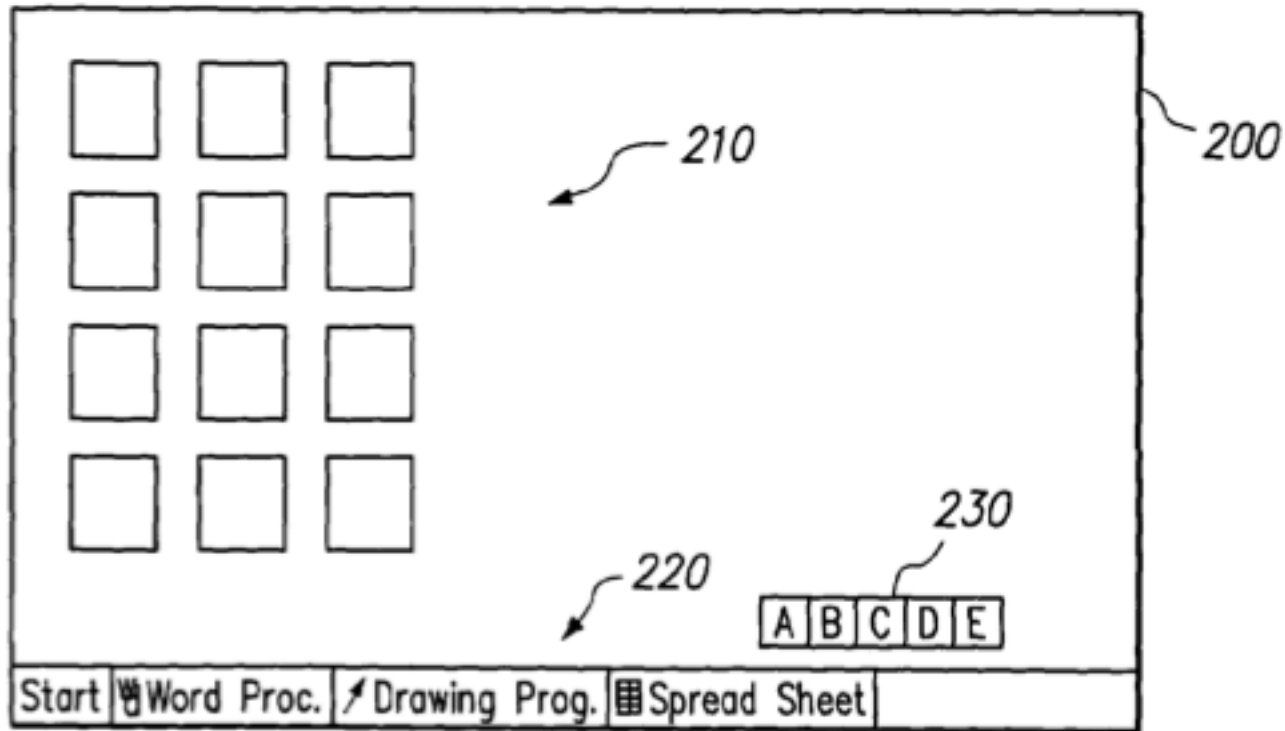


FIG. 2 (PRIOR ART)

Case Study: The Apple "Dock"

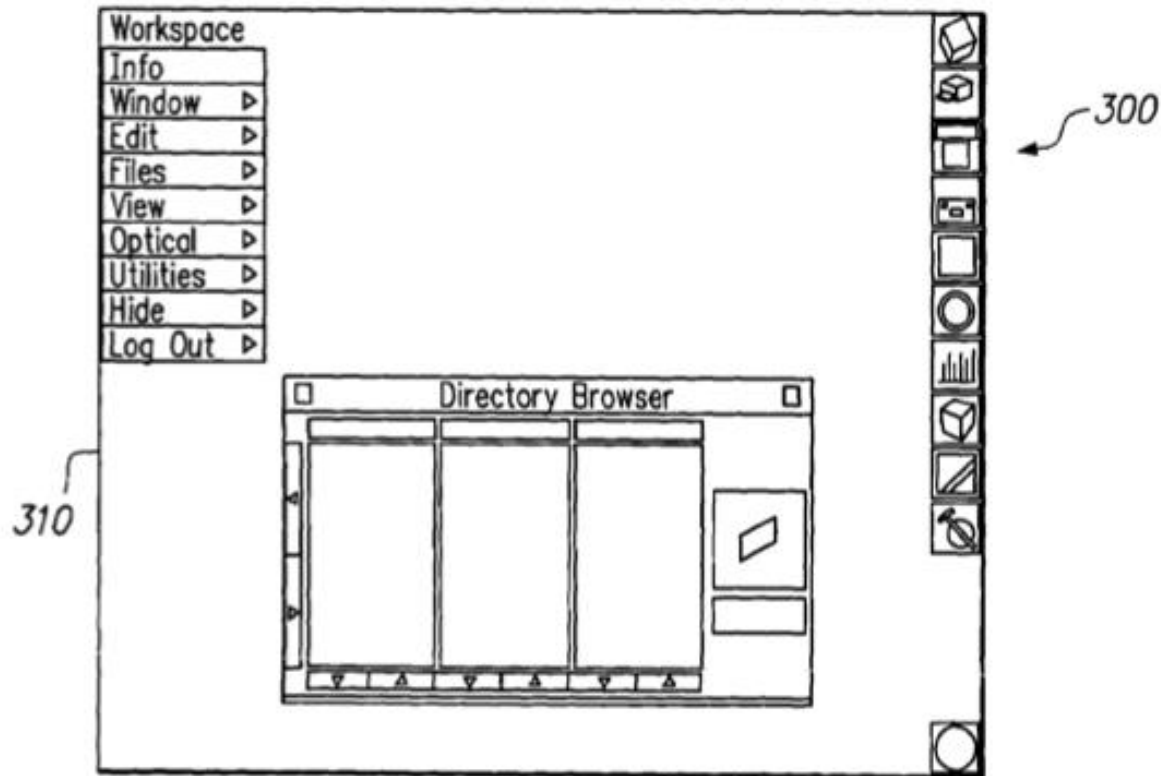


FIG. 3 (PRIOR ART)

Case Study: The Apple “Dock”

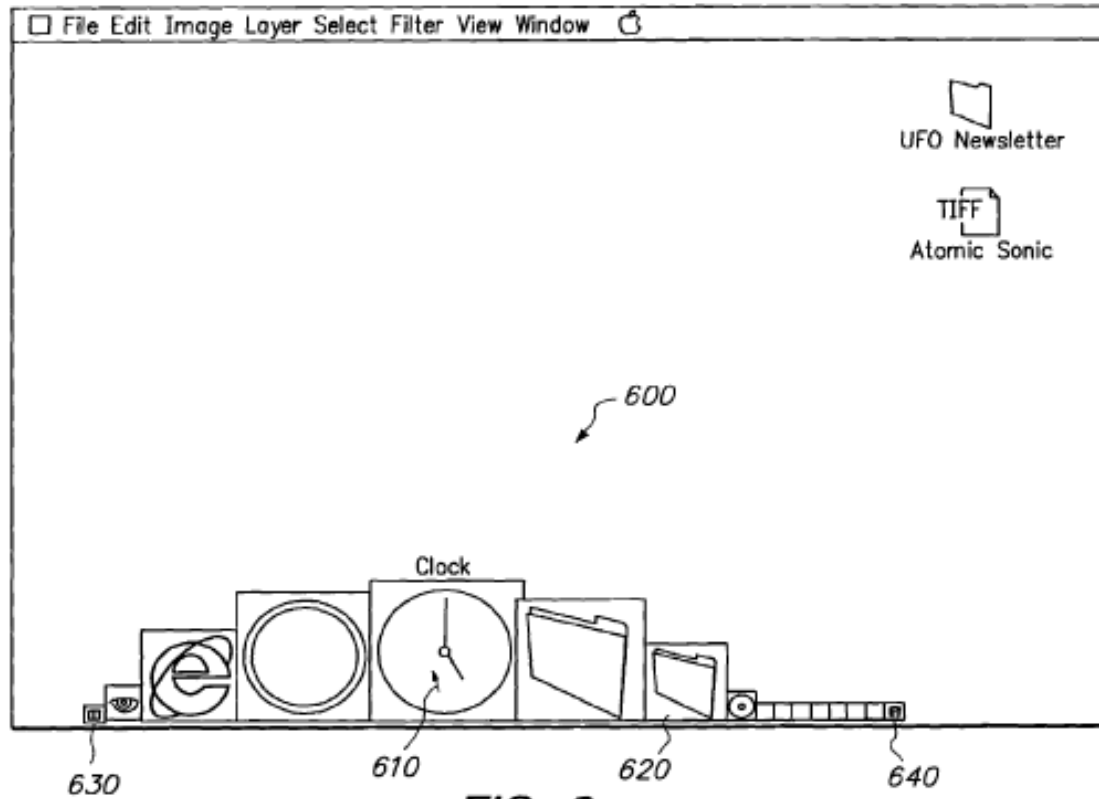


FIG. 6

Case Study: The Apple “Dock”

1. A computer system comprising:
 - a display;
 - a cursor for pointing to a position within said display;
 - a bar rendered on said display and having a plurality of tiles associated therewith; and
 - a processor for varying a size of at least one of said plurality of tiles on said display when said cursor is proximate said bar on said display and for repositioning others of said plurality of tiles along said bar to accommodate the varied size of said one tile.

Case Study: The Apple “Dock”

36. A computer system comprising:
- a display;
 - a cursor for pointing to a position within said display;
 - a userbar rendered on said display and having a plurality of tiles associated therewith; and
 - a processor for varying a position of at least one of said plurality of tiles on said display when said cursor is proximate said bar on said display, in accordance with a predefined relationship between an effect width W , a default height h of said at least one of said plurality of tiles and a selected maximum height H of said at least one of said plurality of tiles wherein said predefined relationship includes a function S defined as:

$$S = ((H-h) \div 2) \div \text{sine}(\pi \times (h+2) \div (W \times 2)).$$

Case Study: The Apple “Dock”

69. A method for displaying items in a graphical user interface comprising the steps of:
providing a plurality of said items in a region of said graphical user interface, each of said items having a default height associated therewith;
moving a cursor along said region; and
selectively magnifying at least one of said items closest to said cursor to a first level and magnifying items proximate to said one item to other levels less than said first level.

Case Study: The Apple “Dock”

104. A computer-readable medium containing program instructions for displaying items in a graphical user interface that, when executed by a computer, cause the computer to perform the following operations:

providing a plurality of said items in a region of said graphical user interface, each of said items having a default height associated therewith;

detecting movement of a cursor along said region; and

selectively magnifying at least one of said items closest to said cursor to a first level and magnifying items proximate to said one item to other levels less than said first level.

Case Study: The Apple “Dock”

When the cursor **610** enters the userbar region, two distances (d_1 and d_2) are calculated for each tile. More specifically, for each tile the distance d_1 from the cursor **610**'s position to the left edge of tile and the distance d_2 from the cursor to the right edge of the tile are calculated as seen in FIG. 8(c). If the value of either d_1 or d_2 lies outside the range $\{-W, W\}$, then the value is changed to be the closest of $-W$ and W . Scaled values d_1' and d_2' are then calculated using the following sine functions:

$$d_1' = S \times \text{sine}(\pi + 2 \times d_1 \div W) \quad (2)$$

$$d_2' = S \times \text{sine}(\pi + 2 \times d_2 \div W) \quad (3)$$

Each tile is then redrawn between d_1' and d_2' having a size which is scaled equally in both width and height from the lower left hand corner by a factor:

$$1 + (d_2' - d_1') \div (d_2 - d_1) \quad (4)$$

- You will be encountering IP in your careers. IP is how companies protect and monetize technology.
- Have business awareness: know what's out there (the prior art).
- Identify how you've improved on the prior art.
 - Useful for trade secrets, patents, business, and ENSC 340/440.
- Understand the pros and cons of trade secrets and patents, and keep in mind other forms of IP.
- Protect and exploit your technology.

Thank You

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