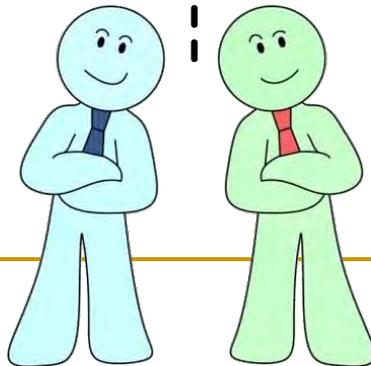
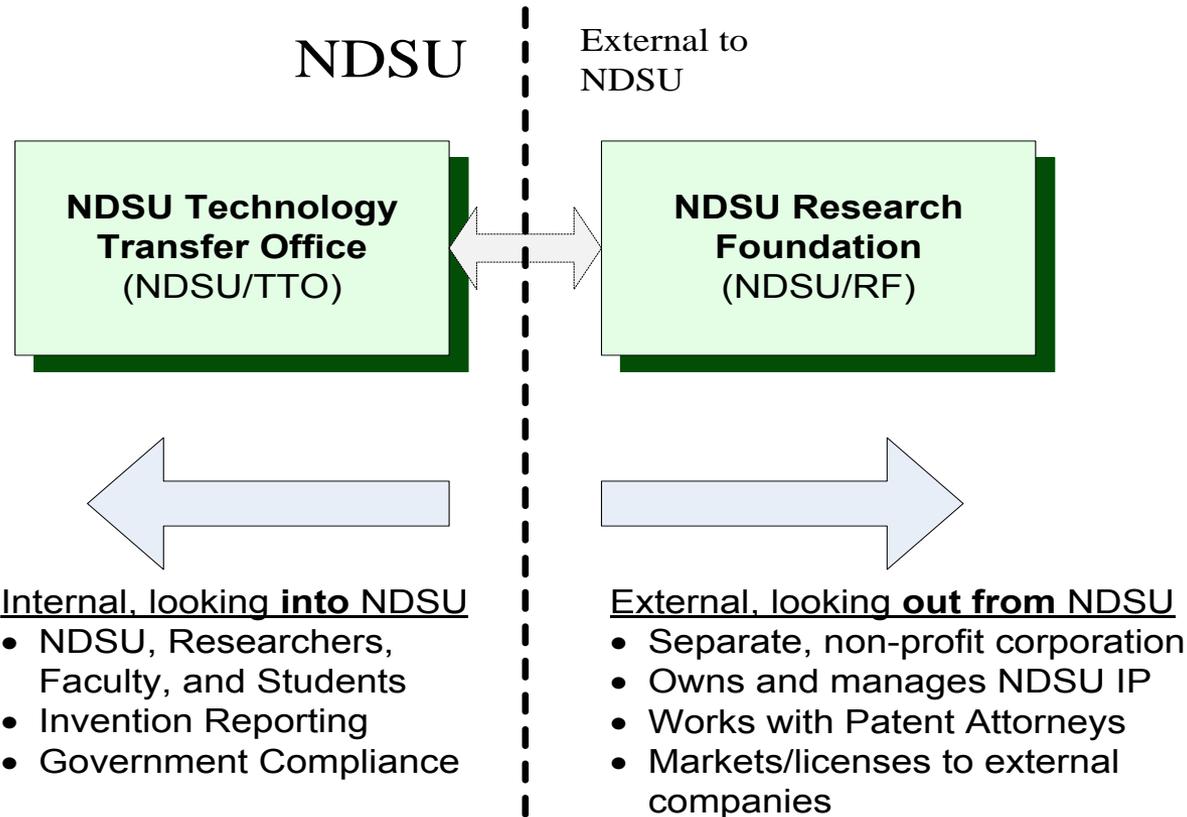

Research and Intellectual Property at NDSU

Purpose of Presentation

- Overview of NDSU TTO and NDSU RF
- Intellectual Property Basics
- Invention Process and Tools
- Reporting Your Invention to NDSU
- Legal Agreements for IP Protection
- Faculty Startup Companies

Overview of NDSU TTO and NDSU RF

Two Different Offices



NDSU Technology Transfer Office

- All intellectual property is reported to TTO
- Invention is evaluated for patentability and commercial potential
- An IP decision is made:
 - Turn back to inventors (if no federal funding)
 - Waive to the government agency
 - Pursue a copyright, trademark, or patent
- Invention is assigned to the NDSU/RF

NDSU Research Foundation

- NDSU Inventions are assigned to the NDSU Research Foundation (NDSU/RF)
- Separate, not-for-profit entity
- Tasked with commercializing technologies
- Works with patent attorneys, does all marketing and licensing of technologies

Benefits of the NDSU TTO and RF

- NDSU/RF covers all patent costs
 - which can be *considerable*
- The office actively markets invention to industry
- The goal is to license the technology to industry
- If a license is executed, 70% of net revenue is returned to inventors and their department
 - 30% to inventors
 - 40% to department (intent to spur more research)

Laws/Policies Affecting NDSU IP

- **NDUS and NDSU policies**
 - Intellectual Property Policy 190
 - Conflict of Interest Policy
 - Consulting Policy

- **Laws and Regulations**
 - Bayh-Dole Act
 - IRS Rev. Proc 2007-47

- **We Maintain the Right to Publish**

Laws/Policies Affecting NDSU IP

- NDSU Policy Section 190 (<http://www.ndsu.nodak.edu/policy/190.htm>)
 - Policy/practices set by State Board of Higher Ed

“The Institution shall have the right of first refusal to the title of all patentable discoveries derived with the use of facilities, gifts, grants, or contract funds through the university...”
 - Similar to the IP policies of most companies in industry – you’re the inventor, they are the owner.
 - Actually *better* than most corporate policies: at NDSU, 70% of the revenues from an invention go back to the inventors and their department.

The Bayh-Dole Act of 1980

- Gave US universities, small businesses and non-profits control of their inventions, other intellectual property from government funding.
- Previously, the government got title to inventions if even \$1 of government funding was used.
- Universities must share revenue with inventors and give preference to US industry & small business.

IRS Rev. Proc 2007-47

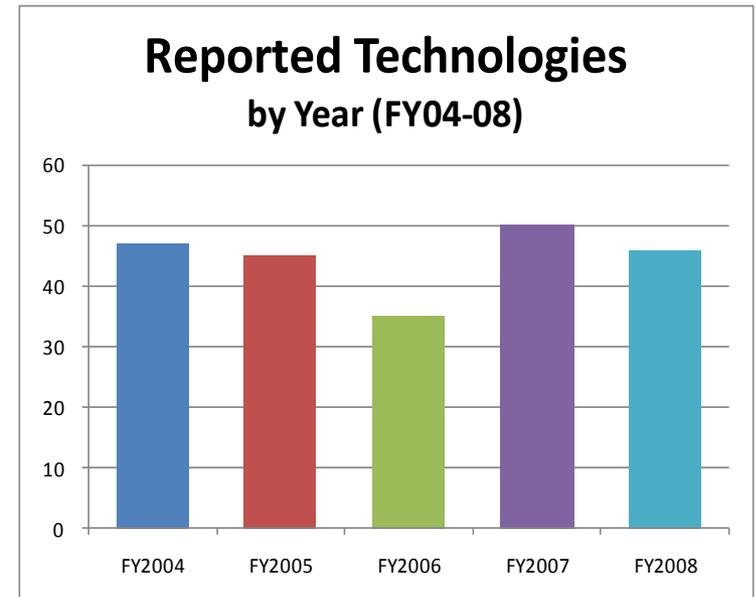
- Universities can not accept funding contracts that have pre-negotiated royalty rates
 - Sponsor must pay competitive rate determined at the time of license or when resulting technology is available, thus rate may not be determined at the time of original contract
- Proceeds of a tax-exempt bond cannot be used primarily for private business

Typical Net Revenue Sharing

- 30% (Minimum) Inventors
- 40% (Maximum) Departments/Colleges
- 30% NDSU Research Foundation
 - 21% NDSU Research Foundation
 - 9% NDSU/RF Endowment

Invention Activity

- Annually average 40+ inventions
- Annually 20-30 applications (Patents, PVP, Trademarks)
- Average licensing income \$1.5 million
- Last year over \$2 million
- Over 250 technologies yielding income



Intellectual Property Basics

Basic Types of Intellectual Property

- Copyrights
- Trademarks
- Trade Secrets
- Patents
- Plant Variety Protection

Basic Types of Intellectual Property

■ Copyrights

- Form of protection provided to “original works of authorship”, both published and unpublished
- Must be “expressed” (written or other tangible form)
- Copyright is automatic, but can be registered
- Life of author plus 70 years
- Examples:
 - Documents, Books, Songs
 - User Manuals, Software Source Code
 - Web Pages, Sculptures, Paintings
- Note about copyrighting source code



Basic Types of Intellectual Property

■ Trademarks

- Protect words, names, symbols, sounds, or colors (and smells!) that distinguish goods and services from those manufactured or sold by others and to indicate the source of the goods
- Can be renewed forever as long as they are being used in commerce



Sounds, Colors, Shapes, and Smells

D'OH!



SOUNDS



SMELLS



COLORS



JOHN DEERE



SHAPES

NDSU/RF Trademark Examples

■ Plants:

- ❑ Dakota Centennial
- ❑ Prairie Torch
- ❑ Northern Flare
- ❑ Prairie Spirit
- ❑ Roughrider Genetics



■ Other:

- ❑ NDSU Research Foundation



Basic Types of Intellectual Property

■ Trade Secrets

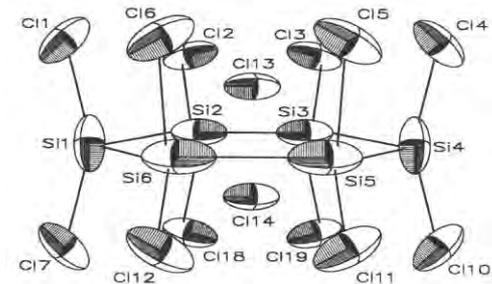
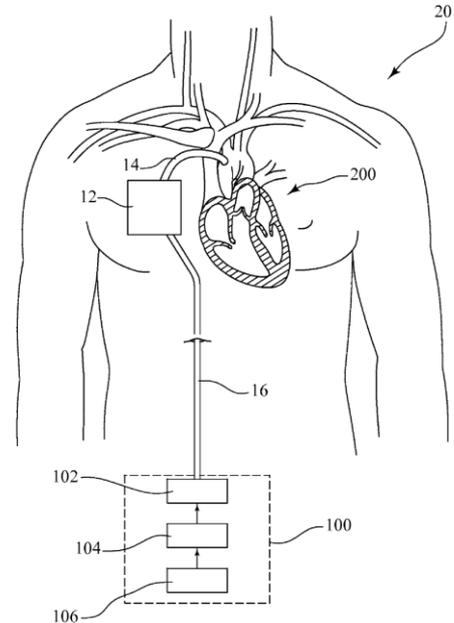
- ❑ Information that companies keep secret to give them an advantage over their competitors
- ❑ Must make an effort to keep secret, must not be disclosed
- ❑ Protection lasts only as long as secrets are kept
- ❑ Trade Secret Examples:
 - Secret Formula for Coca Cola
 - ❑ Merchandise 7X is the "secret ingredient"
 - ❑ Executives who know formula can't fly on the same plane or be left alone
 - The Colonel's Secret Blend of 11 Herbs and Spices
 - ❑ Locked in a file cabinet with two combination locks in a vault and behind three more locked doors
 - ❑ Samples of the 11 herbs and spices kept, also



Basic Types of Intellectual Property

■ Patents

- ❑ A granted property right that allows inventor “to exclude others from making, using, offering for sale, or selling the invention throughout the United States or importing the invention into the United States”
- ❑ Does NOT grant you the right to practice the invention
- ❑ FULL, enabling disclosure (opposite of trade secret)
- ❑ 20 years from first filing date



Basic Types of Intellectual Property

■ Plant Variety Protection (PVP)

- Offers protection that a plant patent cannot
 - A plant patent covers plants that can only be made through asexual reproduction (grafting, budding, using cuttings, layering, or division without using seeds – offspring substantially identical to parent). NOT tuber-propagated.
 - A PVP gives breeders up to 25 years of exclusive control over new, distinct, uniform, and stable sexually reproduced or tuber-propagated plant varieties.
 - Administered by USDA instead of USPTO

Basic Patent Law

- Patent law is defined in part in Section 35 of the United States Code (35 USC)
 - An invention must be useful (35 USC 101)
 - An invention must be novel (35 USC 102)
 - An invention must be non-obvious (35 USC 103)
 - An invention must be fully disclosed (35 USC 112)

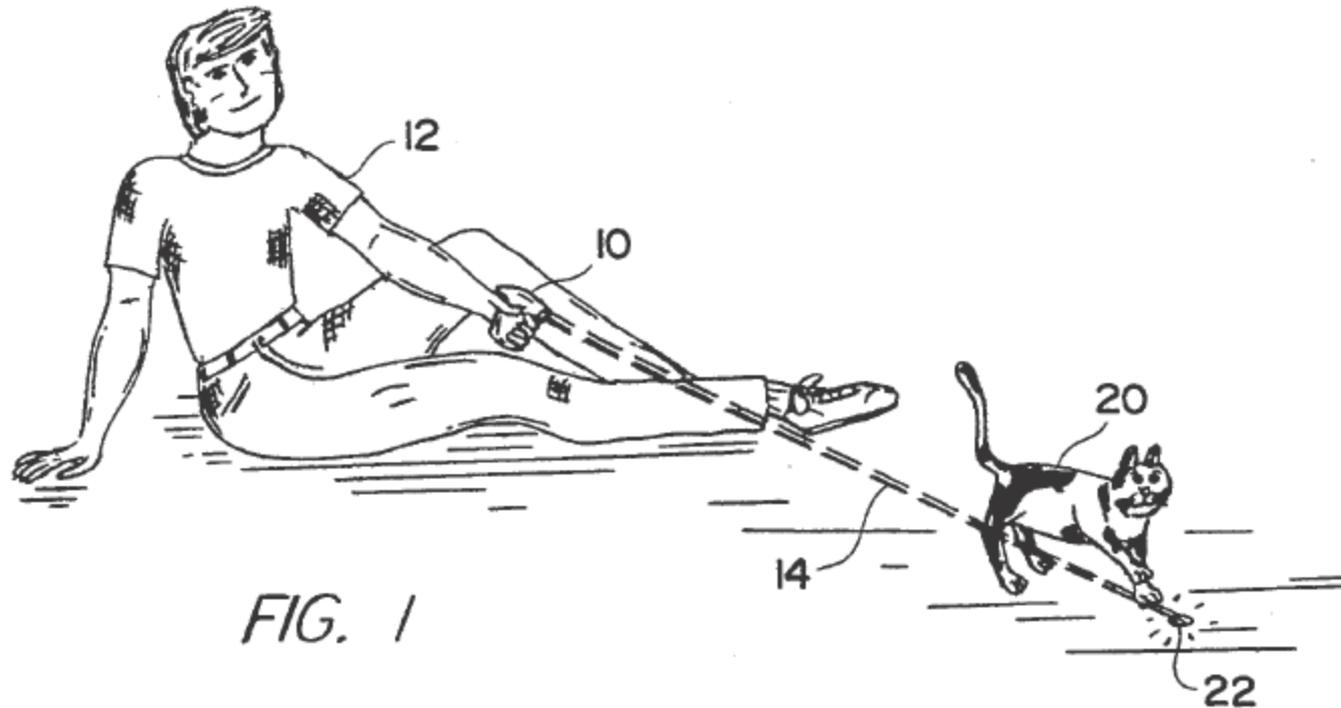
An invention must be useful

■ 35 USC 101

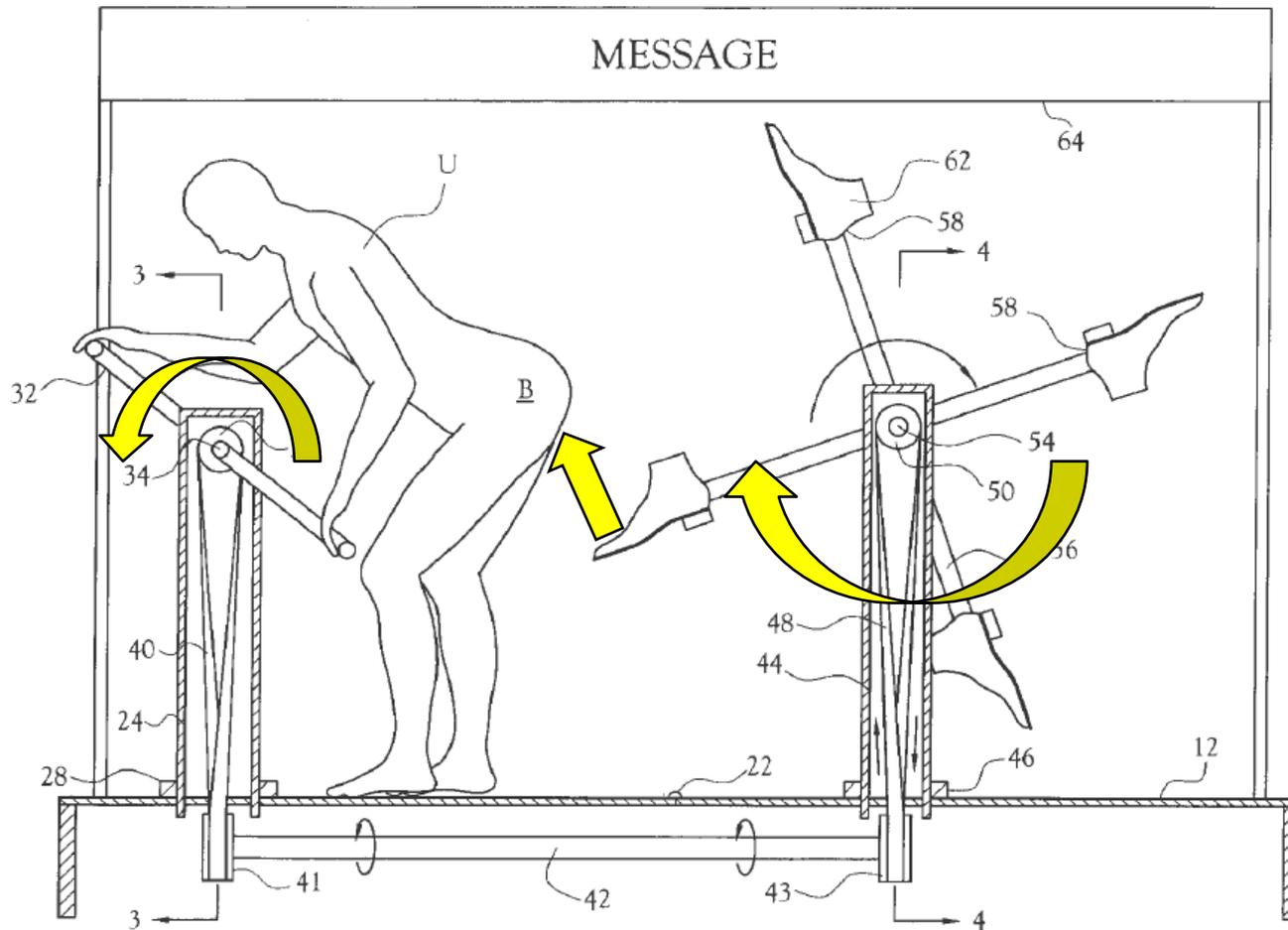
- *“Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.”*
- Must be man-made
- Cannot patent:
 - Newly discovered minerals or plants found in nature
 - Laws of nature or physical phenomena
 - Abstract ideas
- Very few patents are rejected as being non-useful

US Patent 5,443,036

Method of Exercising a Cat [with a Laser Pointer]



Useful?



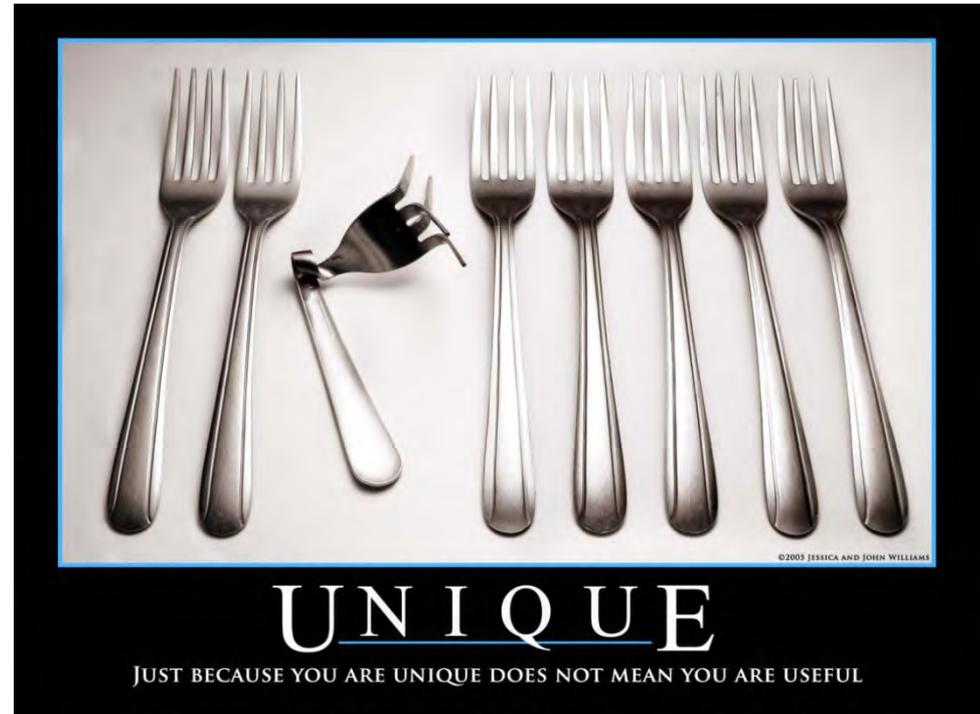
US PATENT 6293874: *User-operated amusement apparatus for kicking the user's buttocks*

35 USC 101 – What You Need to Know

- Most things man-made will be considered “useful”
- Discoveries in nature not patentable
- Mathematical algorithms are not patentable, per se
 - Must pass the MOT test
 - Machine or Transformation

An invention must be novel

- 35 USC 102
 - The invention must be new
 - Different from anything known previously
 - May not get a patent if the invention was:
 - known or used by others
 - patented or published anywhere
 - in public use or on sale
 - not invented by you



35 USC 102 – What You Need to Know

- If something exists or was already described publicly (by someone else), you cannot patent it
- Allows one-year grace period to get a patent in place in the US after your own publication
 - Most other countries have no grace period
 - Meaning of one-year grace period will change on **March 16, 2013!**
- You can't get a patent if you were not the inventor

An invention must be non-obvious

■ 35 USC 103

- The invention must not be obvious to a person “skilled in the art”
- Must not be easily created or suggested by combining two or more known inventions
- There are a lot of novel inventions in the world, but not as many non-obvious ones
- Be careful of these assumptions:
 - I’ve never seen anything like this before
 - Patent examiners have access to databases that you don’t
 - There may be things that have been filed that you can’t access
 - No one has anything exactly like this
 - That invention uses Method X, but we use Method Y (Doctrine of Equivalents)



35 USC 103 – What You Need to Know

- If an expert in the field would find your invention obvious, you can't get a patent on it
- If the features of your invention are covered in two or more patents, it might be obvious to combine them
- Very difficult to prove non-obviousness

An invention must be fully disclosed

■ 35 USC 112

- ❑ You get 20 years of patent protection in exchange for disclosing everything you know about the invention
- ❑ A patent application must have a full, enabling disclosure
- ❑ “Enabling” means that a person in the same field of expertise (one skilled in the arts) could make the invention based solely on your patent application
- ❑ You must also disclose the best mode of your invention

What does it mean to be fully disclosed?

- Enough information so that someone can implement the invention
- Nothing held back
- Written in really specific and confusing “legalese”



Patent Timing

- Potentially years of research
- File a provisional application
- File a utility application within 12 months
- Get first Office Action after 2 to 3 years
- Respond to Office Action
- Get second Office Action
- Respond
- Final rejection or allowance



Patent Costs (Cha-ching!)

- Including patent agent/attorney fees
 - Coversheet provisional - \$500 to \$1000
 - Provisional application - \$2000 to \$8000
 - Full utility patent application - \$10,000 to \$40,000
- Above costs are just to FILE the patent
 - No guarantees the patent will issue
 - More fees to respond to rejections, pay maintenance fees, file in other countries, etc.

Invention Process and Tools

Document Everything

- **Best bet is an invention notebook**
 - Permanently bound
 - Pre-printed page numbers
- **Document the entire process in the notebook**
 - How conceived? Where conceived? What circumstances?
 - “Dumb” ideas
 - Description should be “enabling”
 - Draw a line through empty pages and blank areas
- **Get the notebook pages witnessed/signed**
 - At least two witnesses, sign and date they have read and understood
 - A notary public is even better (for key ideas)

Know the Prior Art

- “Prior art” includes:
 - Any existing information that may affect the patentability of your invention
 - Patent applications and publications
 - Magazine articles and websites
 - Masters’ and Doctoral Theses
 - Technical papers and abstracts
 - Student presentations and design competitions

Patent Searching Tools (for free)

- www.uspto.gov
- www.google.com/patents
 - Easy PDF versions of any published application or issued patent
- www.wipo.org
 - World Intellectual Property Organization
 - PCT patents (Patent Cooperation Treaty)
- www.epo.org
 - European Patent Office
- www.jpo.go.jp
 - Japan Patent Office
- www.pat2pdf.org
 - If you know the patent number, fetches patent and converts to PDF format
- www.google.com (non-patent searching)
 - <insert favorite search engine here>

Beware of Public Disclosures

- Talking to someone about your invention without a confidentiality agreement in place
- If you publicly disclose an invention without protection you immediately lose foreign patent rights
- The United States currently has a one-year grace period after a disclosure
- Always best to get protection in place before presenting, publishing, or sharing information

Examples of Public Disclosures

- An open thesis presentation or publication of thesis or dissertation
- Discussing it with potential customers without a confidentiality agreement in place
- Technical paper presentation or abstract publication
- Student design competition or student presentation
- An offer for sale or license of an invention

Inventorship vs. Ownership

- An inventor is any person who has contributed to even one claim in a patent
- Inventorship can **NEVER** change
 - Which inventors listed on a patent could change
 - Inventorship determined on a claim-by-claim basis
- Ownership **CAN** change
 - Patents are property, just like real estate
 - Can be easily assigned to others



Inventorship vs. Authorship

- Writing a paper or book is an act of authorship, not inventorship
- Protected by copyright, not a patent
- Writing a paper on an invention does not make you an inventor
- Publishing is very important
- Need to be aware of how it affects IP rights

Who is an inventor?

- Contributed to at least one claim
- Can be a co-inventor
 - Co-inventors have same rights, regardless of contribution
 - Can make a legal agreement to change rights
- Person who suggests a result (but not the means) is not an inventor
- Person working under direction and control of another is not an inventor
- Your boss or someone present in the room are not inventors
- Legal issue determined by patent attorney/agent

Reporting Your Invention to NDSU

Disclosing to the TTO

■ Fill out the invention report form

- ❑ As soon as you have sufficiently developed invention
- ❑ Before publicly disclosing (giving enough time for TTO to get protection in place)
- ❑ http://www.ndsu.edu/ndsu/research/tech_transfer/forms.php

■ Don't hold information back

- ❑ Disclosing to TTO is not a public disclosure
- ❑ You can't lose rights by doing so
- ❑ Holding information back may cause delays and limit your ability to get protection in place

Invention Reporting Form – Describe the Invention

NDSU/TTO

NDSU Invention Reporting Form

SECTION 1, INVENTION OVERVIEW: Please complete this form as thoroughly as you can. A full disclosure of the invention to NDSU is required by United States patent law and North Dakota University System (NDUS) policy. A complete, full, and timely disclosure to the NDSU Technology Transfer Office is not considered a public disclosure and will not adversely affect your rights as an NDSU inventor. Completing this invention report is a critical step to seeking protection of your invention and preserving your rights as an NDSU inventor.

Submitted by: _____ Date: _____

1. Title of Invention, Technology, or Copyrightable Material:

2. Status of Project (check all that apply):

Research/Concept	<input type="checkbox"/> Concept/idea stage	<input type="checkbox"/> Organizing research	<input type="checkbox"/> Conducting research
Prototype/Test	<input type="checkbox"/> Prototype design	<input type="checkbox"/> Prototype development	<input type="checkbox"/> Prototype testing
Results Stage	<input type="checkbox"/> Redesign/testing	<input type="checkbox"/> Results reproducible	<input type="checkbox"/> Ready for market

3. Description of Invention: Please summarize in a few sentences your invention and its purpose. Be sure to describe the key inventive concept here. Use additional pages, if necessary, to complete your description.

+ _____

Evaluating Inventions

- Three-prong evaluation
 - Patentability
 - Prior art search is done
 - Invention is evaluated to see if it is useful, novel, and non-obvious
 - Market Potential
 - Patent costs can average around \$25,000 (often more)
 - If market is very small, may not justify the expense of patent costs
 - Stage of Technology Maturity
 - Early/late stage technology, time to market as a finished product

If the invention does not meet one of these criteria, that does NOT mean the idea is not good



Agreements and Other Important Considerations

Just Because You Can....

- Patent Only Commercially Viable Concepts
- Great Science can be Bad Business
 - Police-ability
 - Regulatory Hurdles
 - Public Perception
- Patents Should Encourage Progress

Common Agreement Types

- Confidentiality Agreement (CDA)
- Material Transfer Agreement (MTA)
- License
- Option

Confidentiality Agreement (CDA)

- Also known as CDA (Confidential Disclosure Agreement), NDA (Non-Disclosure Agreement), or PIA (Proprietary Information Agreement)
- Used to protect proprietary information from publication and dissemination



Material Transfer Agreements (MTA)

- Also known as an MTA
- Used to protect proprietary, tangible research materials and information from publication and dissemination

When is a CDA or MTA needed?

- Whenever you anticipate an exchange of proprietary information or materials to anyone outside of your research group

Important CDA/MTA Considerations

- Mutual or One-Way CDA?
 - Generally, both parties will be exchanging information with each other in a CDA
- Incoming or Outgoing MTA?
 - Generally, one party will provide materials to the other party, however the exchange of information may be mutual

Important Considerations Cont.

■ Marking

- ❑ All proprietary information and materials provided to another party should be marked “Confidential”
- ❑ Oral communications should be reduced to writing, marked and provided to the other party within a reasonable period of time (usually 10-30 days)

Important Considerations Cont.

- What information is needed to complete?
- CDA
 - Generally, both parties provide an overview of their proprietary information or their area of expertise that they intend on sharing
- MTA
 - Outgoing – NDSU should provide a narrow definition of the materials it intends to provide

Licenses

- A permission to exercise patent rights – a permission to make, use, offer for sale, sell or import a patented invention.
- Exclusive / Non-exclusive



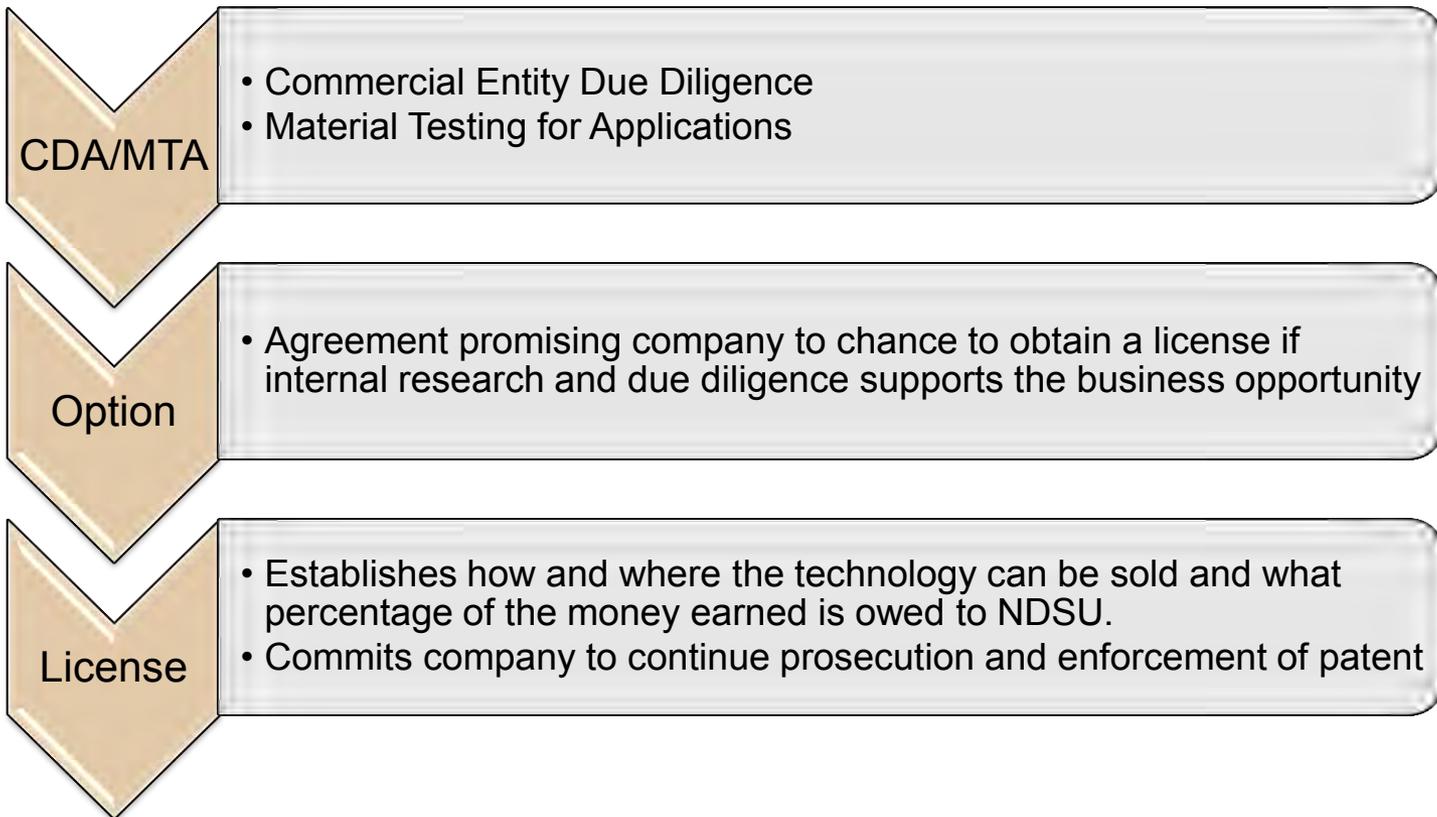
Contents of a License

- Parties/Intentions
- Definitions
- License Grant
- Milestones/Financial
- Technical Assistance
- Warranties
- Term/Termination
- Indemnification
- Arbitration
- Transferability
- Sub-Licensing
- Rights & Obligations

Options

- A right, given in exchange for considerations, to license intellectual property within a specified time.
- Certain Terms Pre-Negotiated

Common Agreement Progression



Faculty Startups

Having a Little Skin in the Game

Important Considerations

- Management Team
- Operation Facilities
- Startup Funding
- Revenue / Exit Strategy
- Time to Develop



Benefits of Faculty Startups

- Financial Benefits to Local Economy
- Alternative Funding Possibilities
- Personal Satisfaction
- Control of Technology Development

Things to Consider

- Am I willing to take the financial risk?
- What happens if the company fails?
- Am I willing to leave my day job?
- Who will run the business?
- How will we make money?
- Does my team have any start-up experience?

What to Expect

- Expenses
 - Attorney Fees
 - Patent Costs
 - R&D Costs
- Criticism
 - Everyone is an Expert
- Set Backs
 - Nothing Goes to Plan



Must Haves

- Clear, Complete Business Development Plan
- Experienced Management
- Access to Capital
- Time



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