

The background of the slide is an aerial photograph of the EPFL campus in Lausanne, Switzerland. The image shows a large, modern building with a distinctive white, undulating roof and circular skylights. The campus is surrounded by greenery and other university buildings. In the distance, a lake and mountains are visible under a dramatic, cloudy sky at dusk or dawn.

# Inventions and Patents: giving value to your research

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# Presentation **Outline**

- Intellectual Property Rights overview
- What is a patent and what is an invention?
- Patentability criteria
- Patentability vs. freedom to operate: can I use my invention?
- Discoveries vs. inventions: how to pick the best from your lab work

# What is an Intellectual Property Right?

- ✓ It is the **protection** granted by a country/region **for creations of the mind** (in the artistic or technical fields) and for symbols or names used in commerce.
- Patents (inventions)
- Copyright (art work, software)
- Trademarks (names, logos)
- Designs (2D/3D shapes)
- New plant varieties
- IC layouts (designs of e.g. semiconductor chips)
- Know-how

## Patents: three main concepts

- ❖ **Patent** vs **invention**: a patent is a legal title protecting the subject-matter of an invention.
- ❖ Patent **application** vs **granted** patent: you apply for a patent, and after an examination and possible amendments, the patent is finally granted (or not...). The claims of a patent define the final scope of protection, and the patent examination turns substantially around them (clarity, amendments etc.).
- ❖ **Inventor** vs **owner** vs **author**: an **inventor** contributed to the conception and implementation of the inventive concept (defined the technical solution to the technical problem); an **owner** is the legal holder of the patent right; an **author** is someone listed in a scientific paper. The three concepts are independent and not necessarily linked.

# Inventions and Patents

- ✓ An **invention** is a technical solution to a technical problem.

If it is:

- new ('novel')
- not obvious

it may be protected by a patent.

- ✓ A **patent** is a national, exclusive **right to stop others** from exploiting the subject matter of an invention
- ✓ A patent document comprises of:
  - description and drawings
    - to explain and illustrate 1+ ways in which the invention may be used
    - how the invention may be 'embodied' in a product
  - set of claims that define:
    - the invention
    - what the patent protects

# What is a Patent?



A patent is a legal title, granted by a State in which it is issued, which provides the holder with an exclusive right for an invention that is new, involves an inventive step and is capable of industrial application – **GEOGRAPHICALLY LIMITED**



The exclusive right given by a patent is that of preventing others from making, using or offering for sale, selling or importing a product that infringes the subject matter of the patent without the patent owner's authorization – **LIMITED IN SCOPE**



Sanctioned monopoly for a set number of years in exchange for disclosure to the public – **LIMITED IN TIME**



Does not give the inventor the right to exploit (make, use or sell) the patented invention

# **Patent** as a tool: what is a patent used for?

- Protecting products and processes
- Increasing turnover and profits
- Attracting investors
- Licensing / deals with competitors
- Cross-licensing
- Blocking competitors
- Building reputation

# Discoveries vs. inventions

## *Invent*

*create*, generate *a new and useful* idea which may be realized  
(process, machine, apparatus, device, substance, system, ...)

## *Discover*

*find*, explain, demonstrate, make *something* known *which*  
*already existed but which was not known* before

# Discoveries vs. inventions

A discovery is cognitive in nature, e.g. finding a plant or mineral

An invention is:

- **technical** in nature
- consists of a reproducible technical teaching

e.g. manufacturing, use of something with a technical effect, item *per se*

- **solves a** meaningful **technical problem** (Article 56 EPC)
- it has to be industrially applicable (Article 57 EPC)

# Discoveries vs. inventions

Discoveries  $\neq$  inventions

- finding something already that exists in nature is a *discovery*
- do **not** represent **technical** solutions to a problem  
ie. observing a new biochemical or signalling pathway

**However!**

the *application* of a discovery with a technical character can be an *invention*

- can be correlation of the discovery to a problem to be solved; «**technical flavour**»
- a discovered biological pathway can be linked to a disease
- **the use** of an element of the pathway **can represent a technical solution** for a problem as long as a technical character is associated  
i.e. isolated protein used to treat a disease

# What kind of **information** is included in a patent?

(19)  (11)  EP 1 741 472 A2

(12) **EUROPEAN PATENT APPLICATION**

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|                                                                                                                 |                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| (84) Designated Contracting States:<br>DE FR GB IT                                                              | • Taylor, Frank, P<br>Dayton, OH 45409 (US)                                                                                                 |
| (30) Priority: 03.03.2000 US 517919                                                                             | (74) Representative: Asquith, Julian Peter<br>Marks & Clerk,<br>4220 Nash Court,<br>Oxford Business Park South<br>Oxford OX4 2RU (GB)       |
| (62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC:<br>01912744.8 / 1 259 294 | Remarks:<br>This application was filed on 16 - 10 - 2006 as a<br>divisional application to the application mentioned<br>under INID code 62. |
| (71) Applicant: LION APPAREL, INC.<br>Dayton, OH 45413-0576 (US)                                                |                                                                                                                                             |
| (72) Inventors:<br>• Aldridge, Donald<br>New Carlisle, OH 45344 (US)                                            |                                                                                                                                             |

(54) **Firefighting garment**

(57) A protective garment comprises an outer shell of an abrasion, flame and heat resistant material a thermal barrier/moisture barrier composite positioned between the outer shell and a wearer of the garment, the thermal barrier/moisture barrier composite including a substantially liquid-impermeable membrane bonded to one surface of a heat and flame resistant fabric substrate,

and a first layer of heat and flame resistant insulating material attached to an opposite surface of the fabric substrate; a face cloth positioned between the thermal barrier/moisture barrier composite and a wearer of the garment; and a second layer of heat and flame resistant insulating material attached to the face cloth and positioned between the thermal barrier/moisture barrier composite and face cloth.

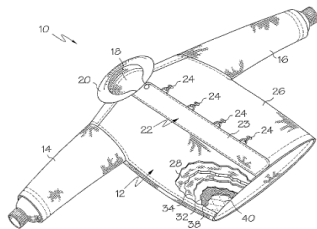


FIG. 1

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- **Title** of the invention with name of the inventor
- **Detailed description** of the invention:
  - how is it constructed
  - how is it used
  - benefits in comparison to what already exists
- **Claims** providing a precise definition of what the patent protects
- **Drawings** if any
- **Abstract**: summary of the invention
  - useful for search engines

The **invention protected** by a patent is defined **by the claims**

A set of claims comprises of:

**Main claim:**

- ✓ defines the broadest scope of protection for the invention described in the patent document
  - ❖ **1. A device comprising features A, B and C**

**Dependent claim(s):**

- ✓ includes additional features that are embodiments of the invention and are considered useful to protect
- ✓ “fall back” positions in the event that the main claim is subsequently shown to be unpatentable
  - ❖ **2. The device of claim 1, further comprising feature D**
  - ❖ **3. The device of any one of claims 1 or 2, wherein feature A is selected among A', A'' and A'''**

# Which are the **requirements** for **patentability**?

## ➤ **Novelty**

- not previously made available to the public (not in the state-of-the-art)

## ➤ **Inventive step**

- not obvious

## ➤ **Industrial application**

- use, function

## ➤ **Sufficiency of disclosure**

- invention must be repeatably described

## ➤ **Clarity of claims**

# Patentability requirements: **Novelty**

## ➤ **Novelty**

- An invention is novel as long as there is a difference between it and the prior art
- difference can be trivial
- it is absolute and never use “slightly novel”

e.g. pregnancy

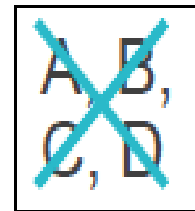
you would never say “she’s slightly pregnant” so either she is or isn’t

- ❖ The prior art discloses a device comprising features A, B and C
- ❖ To be **novel**, it is sufficient to claim a device comprising **a further feature D**
- ❖ A device comprising features A, B and C, **characterized in that it further comprises feature D**

# Patentability requirements: **Novelty**

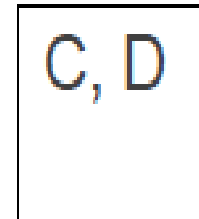
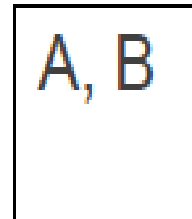
## ➤ Novelty

- assessed by looking at one prior art document at a time
- novel if **all** features of the claim are **not in a single document**
- novel if features can **only be found spread among 2 different documents**



## ❖ Careful!

it may be obvious to combine the contents of 2 documents or embodiments in an **obviousness** argument





## ➤ **Inventive step (non-obviousness)**

An invention is **obvious** if it:

- ✓ does not go beyond the normal progress of technology
- ✓ merely follows plainly or logically from the prior art

- assessed from the perspective of a **skilled person**:

- **unlimited** access to all information made **available to the public** before the filing date of the patent application
- **no ability to invent** **but**
  - has an ability to combine teachings from different publications
  - uses common general knowledge (textbooks and everyday objects are prima facie “common general knowledge”)

- *A lab technician following instructions from a PI and adapting protocols depending on the needs can be considered as a skilled person.*

## ➤ Inventive step (non-obviousness)

the concept of the inventive step can be summarized with the following question:

Is there any teaching in the prior art as a whole that would, not simply could, have prompted a skilled person, faced with the objective technical problem, to modify or adapt the closest prior art while taking account of that, thereby arriving at something falling within the terms of the claims, and thus achieving what the invention achieves?

An inventive step can be acknowledged for any inventions for which the reply to this question will be “**NO**”.

## ➤ **Inventive step (non-obviousness)**

The correct approach to assess an inventive step for an invention is to:

- start from the teachings of 1 prior art document (the closest)
- identify the **problem** with those teachings
- determine whether the **solution** to the problem is self-evident to the skilled person from the teachings of the starting document in combination with
  - common general knowledge or
  - compatible teachings of another document

This is known as the "**problem-and-solution approach**" used to assess inventive step



### ❖ Examples of obvious inventions:

- prior art teaching is incomplete but the "gap" can be filled in a way which would naturally occur to a skilled person
  - **Light weight material vs aluminium**
- choosing from a number of equally likely alternatives
  - **Alternative way to supply heat**
- using a known technique or item in a closely analogous situation
  - **Electric motor vs hydraulic motor**
- new use of a well-known material employing known properties of the material
  
- substituting in a known device a recently developed material with properties that are plainly suitable for that use
  - **Thermal conductor vs graphene**
- juxtaposing known devices functioning in their normal way and choosing from a number of equally likely alternative

## ❖ Examples of non-obvious inventions:

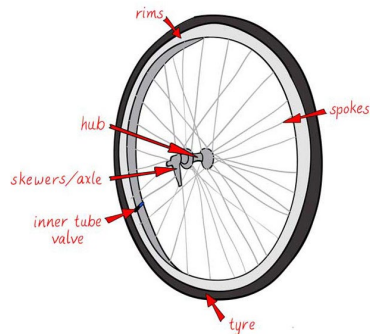
- A **new use** of a **known device** or material involves overcoming technical difficulties not resolvable by routine techniques
- A **known working method** or means when **used for a different purpose** involves a new, **surprising effect**
- The **combined features mutually support each other** in their effects to such an extent that a **new technical result** is achieved
- The invention involves **special selection** in a process of particular operating conditions (e.g. temperature and pressure) within a known range, such selection **producing unexpected effects**
- The invention consists in **selecting particular chemical compounds or compositions** (including alloys) **from a broad field**, such compounds or compositions **having unexpected advantages**
- **Overcoming a technical prejudice** – a person skilled in the art would not even consider carrying out experiments to determine whether these were alternatives to the known way of overcoming a real or imagined technical obstacle.

# Patents do not grant the owner «Freedom to Operate»

If the patent is granted, it does not include the “FREEDOM TO OPERATE (FTO)” or the “right to exploit” the technology covered by the patent

➤ **patents only give the right to exclude others**

- this subtle distinction is essential in understanding the patent system and how multiple patents interact
- patents owned by others may overlap, encompass or complement your patent
- **might need to obtain a license** to other people's invention to commercialize your own patented invention and vice versa

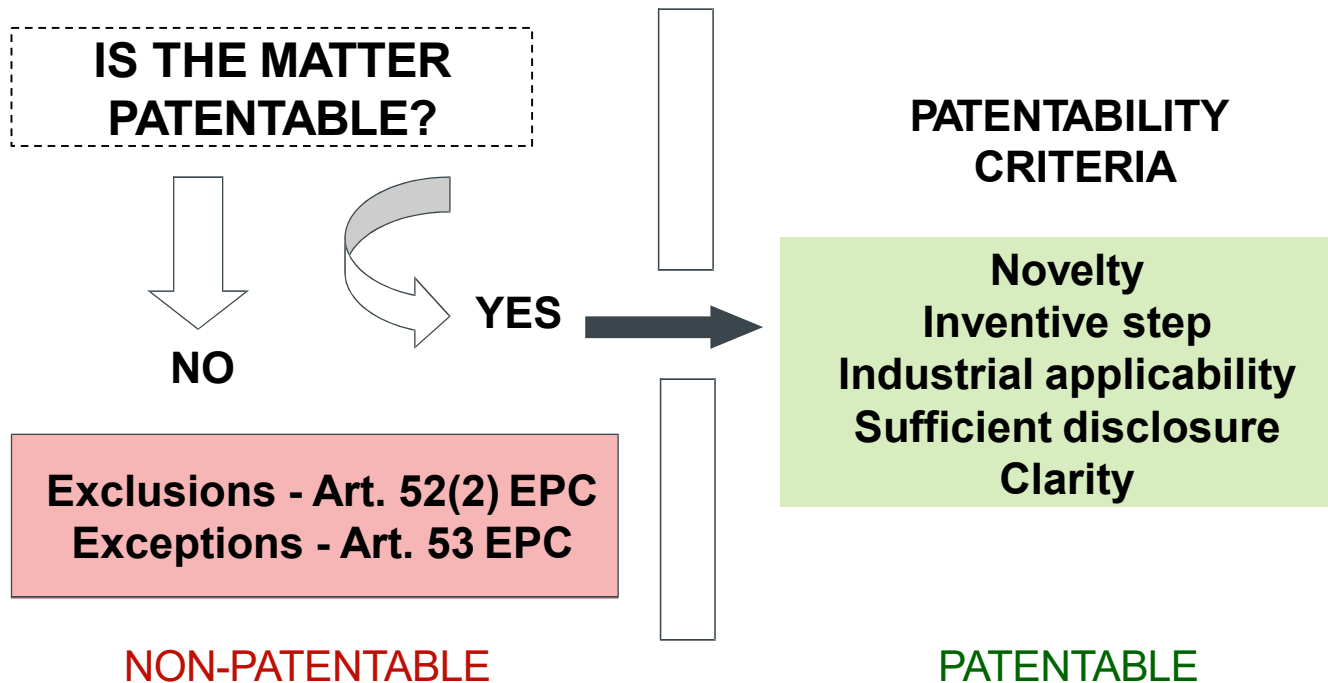


## PATENTABILITY

- is what you want to patent described anywhere in the text of the document?
- has to be described in sufficient detail to allow the “average skilled reader” to put the idea into practice

## FREEDOM-TO-OPERATE

- Identify all the features of your invention – detailed technical description
- is what you want to do **within the wording of the patent claims?**
- the description and examples are irrelevant
- patent must be granted, enforced and valid
- FTO is **geographically limited!!**



- Discoveries, scientific theories & mathematical methods
- Aesthetic creations
- Schemes, rules and methods for performing mental acts
- Computer programs *PER SE*
- Presentation of information
- Invention that may affect public order, good moral or public health
- Diagnostic, therapeutic and surgical methods of treatment for humans or animals
  - medical practitioners should not be hindered in their work by commercial evils such as patents (valid for Europe but not US)

# From discoveries to inventions: how to pick the best from your work

Is it worth to file a patent application?

- ❖ Economic issues

« **Anything that won't sell, I don't want to invent.** » *Thomas Edison*

- ❖ Strategic issues (investors, competitors, trade secret, market)

- ❖ Type of inventions (products vs. methods claims)

## From discoveries to inventions: aspects to consider

- ❖ Understanding what your invention covers
  - Identify the « core » of the invention
    - ✓ is it an invention or a discovery?
    - ✓ is my invention a novel use of known products?
  
- ❖ Envisage all possible declinations of your invention
  - ✓ in which domains can I apply it?
  - ✓ think about alternatives features (which could still work)
  - ✓ think about ranges and preferred sub-ranges (T, concentrations, pH, times, etc.)
  
- ❖ Define how many patentable matters are in the invention
  - did I develop a product or many? Is there a method?
    - ✓ i.e. recombinant proteins example

## From discoveries to inventions: aspects to consider

- Identify the mandatory technical features
  - features which are sufficient and necessary
  - combine said technical features to define a patentable subject matter
  
- Verify whether your invention is inventive
  - is there a surprising, unexpected effect?
  - is there a synergistic combination or just a juxtaposition?
  
- Performing a prior art search to verify patentability
  - online tools (Espacenet, Google Patents, freepatentsonline.com), professional patent searcher (e.g. patent offices such as IPI)
  - analyse novelty first
  
- Try to draft a set of claims!



**Thanks** for your attention!

**Questions?**

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