

Module 4

Patents in Physics

Deliverable: IO1.A4.1



5.11.21

INOVA+

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Project Number: 2020-1-UK01-KA201-078934



Co-funded by the
Erasmus+ Programme
of the European Union

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

REVISION HISTORY

Version	Date	Author	Description	Action	Pages
1.0	20/01/2021	HESO	Creation	C	TBS

(*) Action: C = Creation, I = Insert, U = Update, R = Replace, D = Delete

REFERENCED DOCUMENTS

ID	Reference	Title
1	2020-1-UK01-KA201-078934	IPinSTEAM Proposal
2		

APPLICABLE DOCUMENTS

ID	Reference	Title
1		
2		

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1. Patens in Physics

1.1 Learning Outcomes

This module and the lesson plan that accompanies it aim to introduce the key concepts of patents and, particularly, its application in the field of Physics, as well as identify the importance of protecting inventions in the field of Physics. By patent, we refer to the legal title attributed to an invention with an innovative and inventive character and with the potential to be applied to the industry¹.

After completing this module, you will be able to:

- Understand the key concepts of patents and its application within the field of Physics
- Identify the importance of protecting inventions in the field of Physics
- Identify the criteria that an invention needs to present to be patentable
- Understand the process of applying for a patent
- Cooperate with your peers to discuss the importance of protecting inventions in a practical situation and the process of applying to patents

Estimated seat time: 1 hour.

1.2 Main Content

1.2.1 Terms and Definitions

A patent comprises the legal title attributed to an invention with proven innovative and inventive technical characteristics and with the potential to be applied to the industry sector. All authors who produce an innovative and inventive creation with the potential to be useful to the industry sector are able to apply to a patent. The authors may apply to a patent for different aspects of their invention: its functioning, function, process or the materials it is made with¹.

The patent of an invention assures to its author the exclusive right of producing, using or selling it. Others can only produce, use or sell an invention protected with a patent under the author's permission¹.

¹ https://ec.europa.eu/growth/industry/strategy/intellectual-property/patent-protection-eu_en

In the USA, there are three different types of patents²:

Utility patent: usually granted for new and useful processes, articles of manufacture, a machine, or a composition of matter.

Design patent: usually granted for original, new, and ornamental designs/looks for manufactured products.

Plant patent: usually granted for plants able to be reproduced.

However, it is important to have in mind that patents are territory based, which means that they are valid for the country/territory in which the owner applies to it. In the case of Europe, authors may apply to:

1. National patents through their competent national IP authorities
2. European patents through the European Patent Office (<https://www.epo.org/index.html>) that comprises the competent authority to search and analyze patent applications and grant European patents, while also providing important information and training services³.

In Europe, patents have a maximum duration of 20 years since the application process³. The European Commission is invested in introducing (1) a uniform patent protection across the European territory and (2) effective measures to promote patent exploitation. When it comes to patent protection in the EU, it is important to be aware of different concepts¹:

1. Unitary Patent

The European Commission aims at introducing a patent package that assures a unified protection across Europe. This will include the Unitary Patent, which comprises a uniform protection across all EU participating countries. The introduction of the Unitary Patent will bring several benefits, as it will help to reduce time and costs to the patent process itself¹.

² <https://www.investopedia.com/terms/p/patent.asp>

³ <https://www.epo.org/about-us/services-and-activities.html>

2. Utility model

It comprises the exclusive right of using a technical invention to its owner, with the economic impact of its legislation being supervised by the European Commission. Utility models often refer to smaller innovations applied to mechanical or electrical devices¹.

3. Supplementary protection certificates

It comprises an extension to the patent right and were created by the EU in order to protect pharmaceutical and plant protection products of losing their protection after long testing and clinical trials¹.

1.2.2 Theory behind the IP implementation

The main benefits of protecting an invention with a patent include¹:

- Enhancing the companies' investment in innovation;
- Promoting the investment in research and development;
- Promoting the dissemination of innovation.

The patent package

The patent package comprises a legislative initiative of the EU countries and the European Parliament with the objective to assure a unifying patent protection across Europe. This legislative initiative, set in 2012, includes⁴:

1. Two regulations, namely:
 - a. The regulation behind the creation of the unitary patent;
 - b. The regulation setting the applicable regime to the unitary patent.
2. An international agreement between the EU countries defining the applicable patent jurisdiction, namely:
 - a. The 'Unified Patent Court'

⁴ https://ec.europa.eu/growth/industry/strategy/intellectual-property/patent-protection-eu/unitary-patent_en

Several benefits may be pointed to the creation of a unitary patent protection, including:

1. The existence of a unified patent application to protect inventions that will be valid in all EU participating countries;
2. The simplification and the reducing of costs of the system;
3. The enhancement of research and innovation;
4. A more robust protection for European patents.

1.2.3 Practical examples

As described before, inventors in all fields and particularly in the field of Physics may apply either to a national or to a European patent. Below we describe in detail the process of European patent application.

How can an inventor in the field of Physics apply for a European patent in the European Patent Office?

In order to apply for an European patent, inventors must fill in an online form for the patent grant – EPO Form 1001 – that must be accompanied by a "Designation of the inventor" form (EPO Form 1002) in case of inventions authored by multiple authors⁵.

A European patent application must comprise different elements:

- Request for the grant of a European patent (EPO Form 1001)
- Description of the invention
- One or more claims
- Drawings (when referred in the description or the claims)
- An abstract.

An "[European Patent Guide](#)" was also developed and is available at the European Patent Office aiming at presenting to the inventors, companies and their representatives the procedure regarding the application to a European patent. This Guide also provides practical advices to help inventors and make the application process easier⁶.

⁵ <https://www.epo.org/service-support/faq/procedure-law.html>

⁶ <https://www.epo.org/applying/european/Guide-for-applicants.html>

1.2.4 Case studies

European patents in the field of Physics

"HoloLens" by Alex Kipman

Alex Kipman, a Brazilian software engineer and hardware inventor created the HoloLens and applied for a European patent. With the HoloLens, Alex Kipman assured a nomination for finalist of the European Inventor Award 2018 within in the category "Non-EPO countries".

HoloLens are "a computer-powered headset featuring holographic lenses for an immersive, "mixed-reality" experience. In contrast to virtual reality technology, which replaces the physical world with a wholly simulated environment, his mixed-reality headset combines views of the real world with layers of digital information, including holographic images perceived by the human eye as actual objects. By transforming how users can interact and work with digital content, and doing away with the need to stare at a screen, Kipman's "HoloLens" allows for applications such as computer-assisted surgeries, holographic teleconferencing and guided navigation"⁷.



HoloLens, invention of Alex Kipman (Brazil)

Source: <https://www.epo.org/news-events/press/european-inventor-award/2018/kipman.html>

⁷ <https://www.epo.org/news-events/press/releases/archive/2018/20180424g.html>



Alex Kipman (Brazil) and his invention HoloLens

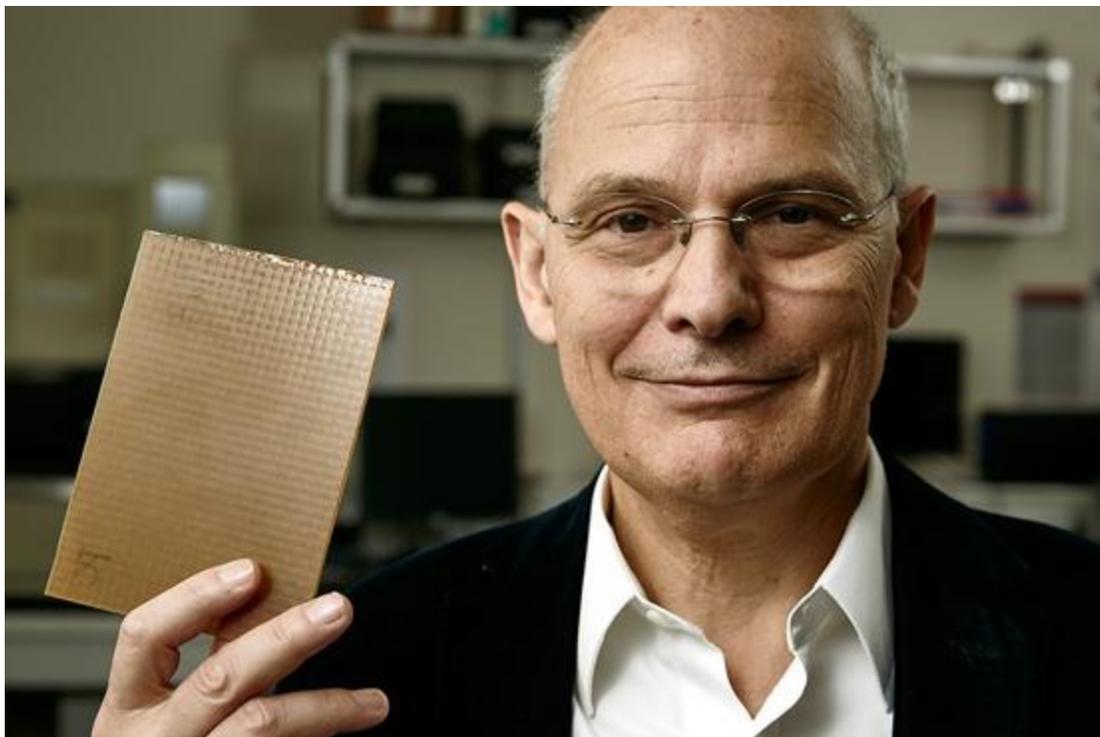
Source: <https://www.epo.org/news-events/press/european-inventor-award/2018/kipman.html>

"Vitrimers" by Ludwik Leibler

Ludwik Leibler, a Polish-born French physicist created Vitrimers – a new class of polymers, being awarded with the European Inventor Award 2015 in the category research.

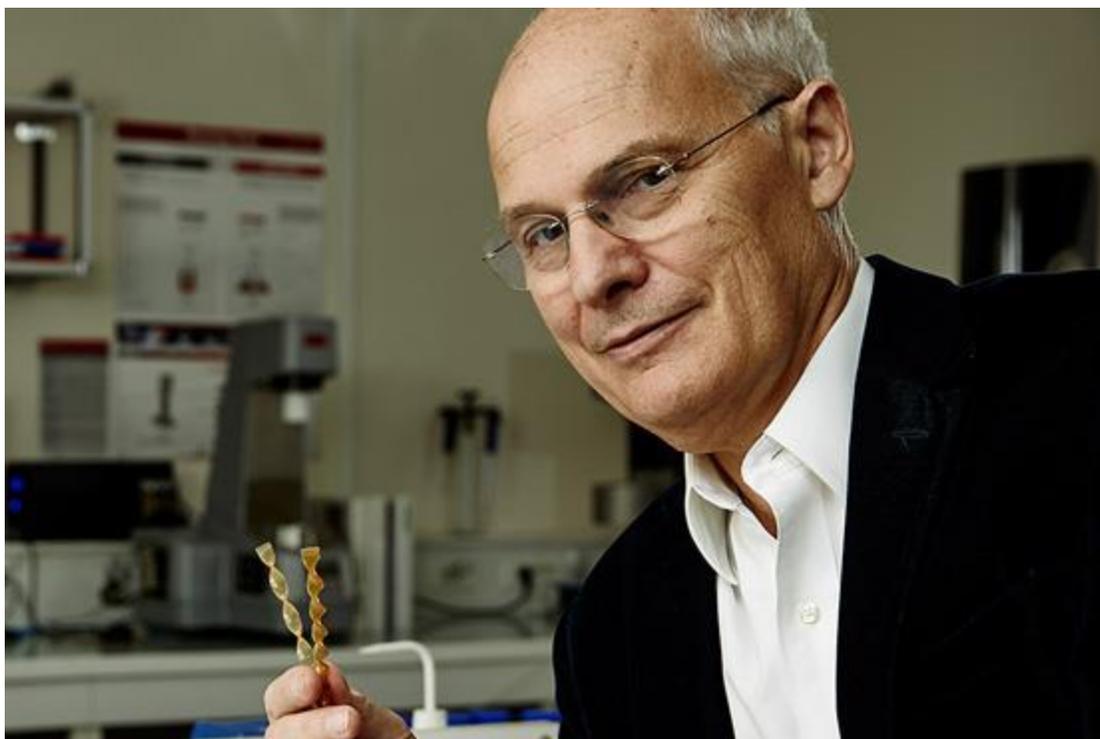
“With their ability to switch from a solid to a pliable consistency – achieved through changes in temperature – vitrimers unlock applications such as self-healing plastics that can repair themselves, with future applications reaching all the way into surgery and restorative medicine”⁸.

⁸ <https://www.epo.org/news-events/events/european-inventor/finalists/2015/leibler.html>



Ludwik Leibler (France) and his invention Vitrimers

Source: <https://www.epo.org/news-events/events/european-inventor/finalists/2015/leibler.html>



Ludwik Leibler (France) and his invention Vitrimers

Source: <https://www.epo.org/news-events/events/european-inventor/finalists/2015/leibler.html>

1.3 Knowledge Assessment

Quiz-like assessment based on the main content. Please mark the correct answer with bold when required. Include 10 questions for your module. Increase gradually the level of difficulty.

Question 1: A patent comprises the legal title attributed to an invention with proven innovative and inventive technical characteristics that may or not be useful to be applied to the industry sector.

[True] **[False]**

Question 2: In the USA, Utility, Design, and Plan comprise the three types of patents.

[True] [False]

Question 3: The European Patent Office is the competent authority to grant national patents.

[True] **[False]**

Question 4: What is the designation of the single and specialized patent jurisdiction created by the European countries?

[Unified Patent Court] [Unitary patent] [Utility model]

Question 5: Supplementary protection certificates were created to protect the design of manufactured products.

[True] **[False]**

Question 6: When applying for a patent, single authors must submit the "Designation of the inventor" form.

[True] **[False]**

Question 7: It aims to help inventors, by presenting the procedure regarding the application to a European patent.

[European Patent Book] [European Patent Model] **[European Patent Guide]**

Question 8: Match the terms with their definitions.

Unitary Patent: A unified protection across Europe countries

Utility model: The exclusive right of using a technical invention to its owner

Supplementary protection certificates: An extension to the patent right created by the EU in order to protect pharmaceutical and plant protection products of losing their protection after long testing and clinical trials.

1.4 Skills Assessment

Critical thinking skills: In the proposed exercise for lesson plan of this module “The invention school fair”, the students are invited to develop their critical thinking by roleplaying a scenario where they have to (1) present an invention able to be patentable and (2) discuss the benefits of protecting an invention and the procedures involved in the application for a patent.

2. References

https://ec.europa.eu/growth/industry/strategy/intellectual-property/patent-protection-eu_en
https://ec.europa.eu/growth/industry/strategy/intellectual-property/patent-protection-eu/unitary-patent_en
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