

Intellectual Property Teaching Kit

IP Advanced Part I

Patents, utility models and designs

Patents



IP Advanced Part I Patents

Part of the IP Teaching Kit

Table of contents

Content	Slide	Page
Introduction		4
About IP Advanced Part I		5
IP Advanced Part I	1	6
PATENTS		
1 Patents		9
Slides	2 – 37	11
2 Patent case study		85
Slides	38 – 50	87
3 Patent exercises		115
Slides	51 – 79	117
UTILITY MODELS		
4 Utility models		177
Slides	80 – 104	179
DESIGNS		
5 Designs		231
Slides	105 – 129	233
6 Design case study		285
Slides	130 – 147	287
7 Design exercise		325
Slides	148 – 168	327
Terms of use		370
Imprint		371

Introduction

Intellectual property (IP) reaches into everyone's daily lives. A basic awareness and understanding of IP is therefore essential for today's university students, who are the engineers, researchers, lawyers, politicians, and managers of tomorrow.

It is vital that students become acquainted with elementary aspects of IP, so that they can benefit from it fully in whatever career they eventually pursue. Students and universities should be aware too of how they can utilise the incomparable wealth of technical and commercial information to be found in IP documentation, and understand the need for universities to convert their research into IP rights, manage their IP portfolios and engage in technology transfer to industrial partners for value creation and the benefit of society as a whole.

Last but not least, students and universities should be aware of the consequences of failing to protect IP assets correctly, including the risk of reverse engineering, blatant copying and even industrial espionage.

This is where the IP Teaching Kit (IPTK) comes in. Produced by the European Patent Office (EPO) in co-operation with the European Union Intellectual Property Office (EUIPO), the IPTK is a collection of materials – including PowerPoint slides, speaking notes and background information – which can be used to put together lectures and presentations on all kinds of IP, including patents, utility models, trade marks, copyright, designs and trade secrets. The materials can be tailored to the background of the students (science or engineering, business or law), their knowledge of the topic, the time available and their learning objectives.

With the IPTK you have at your disposal an extensive set of freely accessible, professional teaching materials which represents one of the most comprehensive IP teaching resources in the world.

About IP Advanced Part I

IP Advanced Part I is part of the IPTK. It has been designed for teachers of students with little prior knowledge of IP, in order to provide them with advanced teaching material about patents, utility models and designs.

In addition to the main presentations, IP Advanced Part I contains case studies and exercises on patents and designs that demonstrate their use in the real world.

IP Advanced Part I consists of ready-made PowerPoint slides with speaking notes and additional background

information. The speaking notes can be read out as they stand. The background information provides additional details which will help you prepare for the more advanced questions that students might have. It is not intended for this information to be included in the lecture.

For online access to the extensive IPTK collection, plus updates and further learning opportunities, go to www.epo.org/learning-events/materials/kit.html where you will also find a tutorial for teachers and lecturers.

Slide 1

IP Advanced Part I

Title slide



IP Advanced Part I

Intellectual Property Teaching Kit

1

1 Patents

Patents

List of slides

Slide 2	Patents	Slide 21	How to obtain patent protection in Europe (option 3)
Slide 3	Patents are all around us (optional)	Slide 22	The grant procedure before the EPO (animated slide)
Slide 4	The patent system yesterday and today (optional)	Slide 23	What can happen after a European patent has been granted?
Slide 5	The role of the patent system	Slide 24	What is infringement?
Slide 6	Patents as a social contract	Slide 25	How is infringement determined? (I) (optional, animated slide)
Slide 7	Rights conferred by patents	Slide 26	How is infringement determined? (II) (optional, animated slide)
Slide 8	What is a patent? (animated slide)	Slide 27	Advantages and disadvantages of getting a patent
Slide 9	What do patent documents look like?	Slide 28	Alternatives to patenting
Slide 10	What does the description contain? (optional)	Slide 29	What to consider before filing an application (animated slide)
Slide 11	What can and can't be patented? (animated slide)	Slide 30	What might happen if I decide not to apply for a patent? (animated slide)
Slide 12	When is an invention "new"?	Slide 31	How patents are used
Slide 13	Do's and don'ts for safeguarding novelty	Slide 32	The value of European patents (optional)
Slide 14	When is an invention "inventive"?	Slide 33	Re-inventing the wheel – literally
Slide 15	Assessing novelty (animated slide)	Slide 34	Solutions found in patent documents (animated slide)
Slide 16	Assessing inventive step (I) (animated slide)	Slide 35	Searching for patents is easy
Slide 17	Assessing inventive step (II) (animated slide)	Slide 36	... but a basic knowledge of patent jargon is needed (optional, animated slide)
Slide 18	How to obtain patent protection in Europe (options 1 and 2) (animated slide)	Slide 37	Quiz (optional, animated slide)
Slide 19	Key facts about the unitary patent		
Slide 20	Key facts about the Unified Patent Court		

Slide 2

Patents

The following slides provide a basic introduction to patents



Slide 3

Patents are all around us (optional)

The aim of this slide is to show students that patents are relevant in almost every walk of life, not just in high-tech industries. There are a huge number of patents covering almost every product you can buy, so patents are of interest to everyone.

This slide shows the number of patents in three different technical fields.

1. Superconductors

Patent applications are filed for breakthrough innovations. The chart shows applications relating to superconductors, a class of materials that conduct electric current without any loss. The discovery of superconductivity dates back to 1911, when it was first observed by a Dutch physicist. In 1986, a breakthrough discovery was made by Alexander Müller and Georg Bednorz at an IBM laboratory in Switzerland. They created a ceramic compound that superconducted at the highest temperature then known: 30 K (-243°C). What made this discovery so remarkable was that ceramics are normally insulators. A year later, Müller and Bednorz received the Nobel Prize in Physics. A number of patent applications resulted from their research activities. Their discovery opened up the possibility of real applications for superconductors.

As you can see, their discovery was followed by a huge increase in patent applications in the field and a phase of high inventive activity. However, even today superconductors are still not a mass-market product and most of these patents did not turn out to be valuable at all. It is no wonder, therefore, that research interest has decreased and the number of patent applications for superconductors has fallen almost to the level it was at before the discovery of high-temperature superconductivity.

2. Bicycles

Many patent applications relate to simple inventions that concern things we use every day. You might think that bicycle technology is quite old and that there won't be many bicycle patents today, but the opposite is true. In fact, during the last decade more patents have been applied for for inventions relating to bicycle technology than for superconductor technology! Incidentally, more than 130 million bicycles are produced every year worldwide, including 25 million electric bikes, so no wonder there are a large number of companies in fierce competition in this market. By way of comparison, the number of cars manufactured per year is around 50 million (2012).

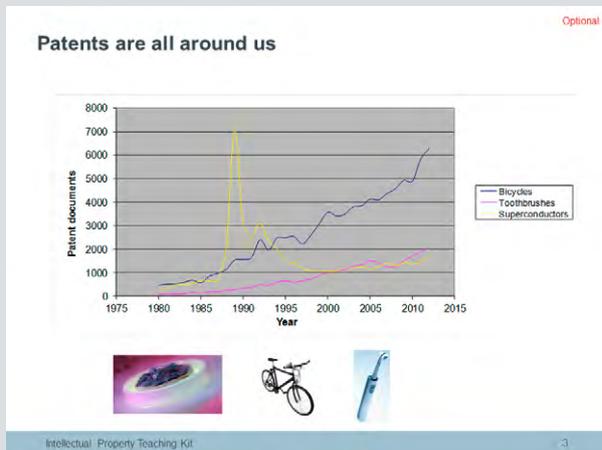
3. Toothbrushes

Even seemingly trivial things such as the opening of a tetra pack, a razor blade or a toothbrush may be covered by patents. In 2012, more than 2 000 patent documents relating to toothbrushes were published. Colgate's largest production site (Colgate Sanxiao in China, 2013), for example, makes 1 500 million toothbrushes a year, which is around one tenth of the total global toothbrush production.

Despite the large number of patents, no company has a monopoly on bicycles or toothbrushes – or even on superconductors. Instead, many companies have small proprietary technologies that make their bicycles, toothbrushes or superconductors a little bit better than those of the competition and thus help them to stay competitive.

Data source

The chart shows the number of patent documents found on Espacenet, the free worldwide patent database at www.espacenet.com, for the keywords 'bicycle? or bike? or bicyclette? or Fahrrad?? or Fahrräder?', 'toothbrush?? or Zahnbürste? or brosse? à dents' and 'superconduct* or supraleit* or supraconduct*'.



There are a huge number of patents covering almost every product you can buy, so patents are of interest to everyone.

Here are some examples of patents in three different technical domains.

The first is superconductors. In 1987 the Nobel Prize in Physics was awarded for high-temperature superconductors, which had been discovered in 1986. Patent applications followed, along with a phase of high inventive activity in this field. Most of these patents turned out to have very little value. Research interest has since decreased, and the number of patent applications for superconductors has fallen.

The second example is bicycles. Many patents concern simple inventions used every day. During the last ten years, more patents have been applied for in the field of bicycle technology than in superconductor technology.

More than 130 million bicycles are sold every year. There are a large number of companies in fierce competition in this market.

The third example is toothbrushes. This is another example of simple things covered by patents. In 2012, more than 2 000 patents relating to toothbrushes were published. One plant alone reportedly manufactures 1 500 million toothbrushes a year, which is around a tenth of total global production.

Despite the high number of patents, no one company has a monopoly on bicycles or toothbrushes.

Instead, many companies have small proprietary technologies that make their bicycles or toothbrushes a little bit better than others and thus help them to stay competitive.

Slide 4

The patent system yesterday and today (optional)

The first account we have of a formal patent law dates back to AD 1474, when the Senate of Venice introduced a law aimed at promoting innovation and protecting the honour of inventors. Venice is believed to have issued about 600 patents (approximately five patents a year) from 1474 to 1594, the year when Galileo was granted a patent.

Galileo was granted a patent on a water pump he invented. He did not provide the details of his invention before the patent was granted; he merely stated its prospective use and performance. He was given the privilege of using the invention exclusively, provided he made the device within a year. The requirement to actually make the invention in order not to lose the patent was common in the Venetian patent system.

The text of Galileo's patent reads as follows:

"That by the authority of this Council is granted to Mr Galileo Galilei that for the space of the next twenty years others than him or his agents are not allowed in the city or any place in our state to make, have made, or, if made elsewhere, to use the device invented by him for raising water and irrigating fields, by which with the motion of only one horse twenty buckets of water that are contained in it run out continuously; under pains of losing the devices which will go to the supplicant, and 300 ducats, a third of which will be for the accuser, a third for the magistrate who undertakes the prosecution, and a third for our Arsenal; the supplicant being obligated, however, to have made known this new type of device within one year, and that it has not been invented or recorded by others, and that a patent has not been granted [on the same device] to others; otherwise the present grant will be void."

The main goals of today's patent system are to promote innovation (by offering protection to the results of the inventive work) and to provide an incentive to share knowledge (by requiring the publishing of the invention's details when a patent is sought), so that people can learn from each other. This dual nature of the patent system is sometimes referred to as a contract between society – which gets the knowledge - and the inventor, who gets the exclusive rights.

Optional

The patent system yesterday and today

Senate of Venice, 1474

*"Any person in this city who makes any new and ingenious contrivance, **not made heretofore in our dominion**, shall, as soon as it is perfected so that it can be used and exercised, give notice of the same to our State Judicial Office, it being **forbidden up to 10 years** for any other person in any territory of ours to make a contrivance in the form and resemblance thereof".*



Today:

- New to the world
- Up to 20 years of protection
- Publication
- Incentive to innovate and to share knowledge

Intellectual Property Teaching Kit 4

Under the Venice patent law of 1474, an invention had to be new to a certain region. The resulting patent was valid for up to 10 years. The details of the invention were not published.

Galileo Galilei obtained a patent on a water pump in 1594.

Today, patents must, according to European patent law, be new to the world. They last for up to 20 years. The details of the invention are published.

The main goals of today's patent system are to provide an incentive to innovate – protecting the results of innovation means that the inventor can reap the benefits, which in turn makes it easier to attract investment – and to provide an incentive to share knowledge. To get protection the inventor must publish the details of his invention.

This dual nature of the patent system is sometimes referred to as a contract between society, which gets the knowledge, and the patent applicant, who gets the exclusive rights.

Slide 5

The role of the patent system

The role of the patent system is to encourage technological innovation by rewarding intellectual creativity. In providing protection for their inventions, patents provide incentives to patent owners by offering them recognition for their creativity and the possibility of obtaining financial rewards if they commercialise or exploit their inventions. (The different ways that a patent owner might benefit financially from a patent are discussed later.)

The patent system also promotes dynamic competition by encouraging investment in the development of new or improved products or processes, and by encouraging research and development. Investors are more likely to provide financial backing if there is the potential for a return on their investment from inventions that can be patented, then commercialised and exploited.

The patent system can also encourage the dissemination of information about new inventions that may be of benefit to society, because the information disclosed in patents is published. The invention described in a patent document will ultimately be available for anyone to use once the patent has expired.

Patents are a good source of information about new technologies. There are free online databases available which can help you find out what inventions have already been patented. These databases also promote technology transfer, because anyone can use them to find patented technologies that they may want to access and use themselves, for example by negotiating a licensing agreement with the patent owner.

The role of the patent system

- To encourage technological innovation
- To promote competition and investment
- To provide information on the latest technical developments
- To promote technology transfer



This slide summarises the role of the patent system.

The patent system encourages technological innovation by rewarding intellectual creativity. In providing patent owners with protection for their inventions, patents offer them recognition for their creativity and the possibility of obtaining financial reward if they commercialise or exploit their inventions.

The patent system can also promote competition and investment in developing new or improved products or processes by encouraging research and development. Investors are more likely to provide financial backing if there is the potential for a return on their investment from inventions that can be patented.

Because the information disclosed in patents is published, the patent system encourages the dissemination of information that may be of benefit to society.

It can promote technology transfer by way of the publicly available information in patent databases. Thanks to these databases, anyone can find patented technologies that they may want to access and use themselves.

Slide 6

Patents as a social contract

As we have seen, patents are sometimes considered as a kind of contract between the applicant and society. The applicant is interested in benefiting (personally) from the invention.

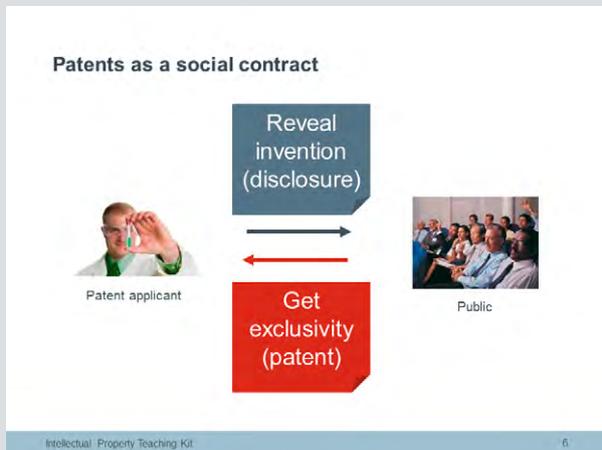
Society is interested in

- encouraging innovation so that better products can be made and better production methods can be used for the benefit of all;
- protecting new innovative companies so that they can compete with large established companies, in order to maintain a competitive economy;
- finding out about the details of new inventions so that others can further improve them; and
- promoting technology transfer (i.e. from universities to industry).

So both parties are interested in a contract that grants protection to innovators (thereby also increasing the motivation to innovate) in exchange for disclosure of the invention. This social contract is institutionalised in the form of patent law.

Two requirements for patent protection emerge almost naturally. Firstly, if the invention is not new to the world, then the applicant does not have anything to disclose, and society has no reason to conclude such a contract with him. Secondly, if the invention is new but obvious to a person skilled in the art, then the applicant does not possess anything the public is eager to learn, and there is no reason to exchange exclusivity for the publication of the invention.

Applicants benefit from the patent system because they are granted the exclusive right to exclude others from commercially exploiting the invention. These rights are transferable. Owners can license their patents to third parties for use subject to certain conditions.



As we have already seen, patents are sometimes considered as a kind of contract between the applicant and society.

Applicants and patent owners are interested in benefiting from their inventions.

Owning a patent gives them the right to prevent others from making, using, offering for sale, selling or importing a product that infringes the patent, for a limited amount of time and the country for which the patent has been granted.

The exceptions to this are use of the patent for non-commercial purposes, including private use and academic research.

Society is interested in:

- Encouraging innovation so that better products can be made and better production methods can be used for the benefit of all;
- Protecting new and innovative companies so that they can compete with larger established companies, in order to maintain a competitive economy;
- Finding out the details of new inventions so that other engineers and scientists can further improve them; and
- Promoting technology transfer, that is from universities to industry.

In return for this protection, applicants must reveal their inventions to the public, so others can build on them. This takes the form of publication of the application by the relevant patent office.

This social contract is institutionalised in the form of patent law.

Slide 7

Rights conferred by patents

Patent owners have the right to prevent others from making, using, offering for sale, selling or importing products that infringe their patents, for a limited amount of time in the country in which the patent was granted. If you own a patent, you can exclude everybody from commercially using the invention, even inventors who subsequently independently make the same invention.

However, some exceptions exist. For example, if another company independently makes the same invention and starts using it before you apply for a patent, in many jurisdictions the first company will be allowed to continue using the invention. The legal rights conferred by patents also do NOT extend to acts done privately and for non-commercial purposes or acts done for experimental purposes relating to the subject-matter of the patented invention.

Patent rights can be transferred, for example by selling, licensing or donating the patent.

If using your invention means using other people's intellectual property, then you need to have their permission! For example, if your biotech invention involves copying DNA, then you need to have the permission of the company that owns the intellectual property.

Rights conferred by patents

- Right to prevent others from making, using, offering for sale, selling or importing infringing products in the country where the patent was granted

Exception: non-commercial purposes (private use, academic research)

- Right to assign, sell or license these rights

These rights belong to the patent holder.



Intellectual Property Teaching Kit

Patent owners have the right to prevent others from making, using, offering for sale, selling or importing a product that infringes their patent, for a limited amount of time.

Exceptions include use for non-commercial purposes, such as private use or academic research.

Further options include licensing inventions to others, or allowing everybody to use the invention for free.

Many important technologies such as CDs, DVDs, mobile phone technology and digital TV are covered by numerous individual patents that companies license to each other in a process known as cross-licensing.

If commercialising your invention means using the intellectual property of others, then you need to have their permission!

Slide 8

What is a patent? (animated slide)

This slide is animated. The first click displays the bullet points, the second the kettles. These examples are designed to demonstrate how inventions can "nest" within one another.

According to some dictionary definitions, patents give their owners "the right to exploit the invention". These dictionaries are wrong!

Patents do not grant the right to use the invention. For example, before a new drug can be sold on the market, it needs the formal approval of government agencies. Rather, a patent is a negative right. It is the right to exclude others from doing certain things with your invention, whilst not conferring any positive or enabling right on the owner. Patentees can exclude others from making, using, selling or importing their invention.

Patents are strictly territorial. You cannot take action against infringing products or processes in countries where you do not have patent rights. You must wait for such infringing articles to cross the border into a country where you have rights before you can take action. (You might not be planning to sell any products in, for example, East Asia, but if you think it will be a source of infringing copies which would flood your European market, then you would be wise to consider patent protection in East Asian countries, so that you can stop the problem at the source.)

At this point you could ask students to suggest reasons why a patent holder might not be allowed to work their invention.

It may be that your invention falls within the scope of an earlier patent. You might have invented the first-ever electric kettle which uses a ceramic heating element as its base-plate. This has advantages over kettles which have a metal heating element upon which limescale (calcium deposits) forms. Such a kettle might be novel and inventive, and get you a patent (patent B). But it still falls within the scope of an earlier patent for all electric kettles (patent A). In order for you to make, use and sell your invention you need a licence from the patent owner of the earlier, broader patent, but they in turn would need a licence from you to make kettles with ceramic heating elements. This is where you could enter into a cross-licence agreement. Indeed, this is where the vast majority of industrial collaborations start.

Note: Patents owned by others may overlap or encompass your own patent. If this happens, you need to obtain the right to use other people's inventions – for example by obtaining a licence – before you can start commercialising your own patented invention, and vice versa.

To establish whether or not you are free to use your invention, you have to perform a patent search. It is best to do this before starting development, so as not to waste time and effort by duplicating what others have already done. If in doubt, ask a patent attorney or other patent professional.

Given the enormous number of patents that exist today, it is quite difficult for many companies to ensure that their products do not unknowingly infringe a patent. But despite the difficulties, companies have no option but to carefully search and analyse existing patents first.

What is a patent?

- Does a patent give you the right to exploit an invention?

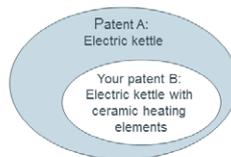
- NO!



- A patent is a negative right. It gives you the right to prevent others from exploiting the invention. It is not an enabling right.

- Patents owned by others may overlap or encompass your own patent. -> Seek a licence before commercialising

For example:



Intellectual Property Teaching Kit

The key concept of this slide is to show that a patent is a negative right, not a positive one.

For example, let us imagine that you have invented the first-ever electric kettle to have a ceramic heating element as its base-plate. This kettle has advantages over kettles which have a metal heating element upon which limescale forms. Such a kettle might be novel and inventive, and could get you a patent, which we will call patent B.

However, your patent does not grant you the right to use your invention, because it falls within the scope of an earlier patent for all electric kettles, which we will call patent A.

For you to make, use and sell your invention you need a licence from the owner of the earlier, broader patent, patent A.

But they in turn would need a licence from you to make kettles with ceramic heating elements.

This is where you could enter into a cross-licence agreement. Indeed, this is where the vast majority of industrial collaborations start.

Patents owned by others may overlap or encompass your own patent. In this case, you need to obtain the right to use other people's inventions – for example by way of a licence – before you can start commercialising your own patented invention, and vice versa.

Slide 9

What do patent documents look like?

Bibliographic information

A patent application must name the inventors and the person or entity that applied for the patent. If a transfer of rights occurs during the examination proceedings, the patent will show the proprietor of the patent at the point in time when it was granted.

If a patent is granted, the bibliographic data in the patent specification will also include the date of filing, the date the patent was granted, the patent number and the technology class. The date of filing is very important because this determines the date the patent will lapse (20 years after the date of filing; some exceptions exist) and it is also important for determining the prior art (= everything communicated to the public before the date of filing).

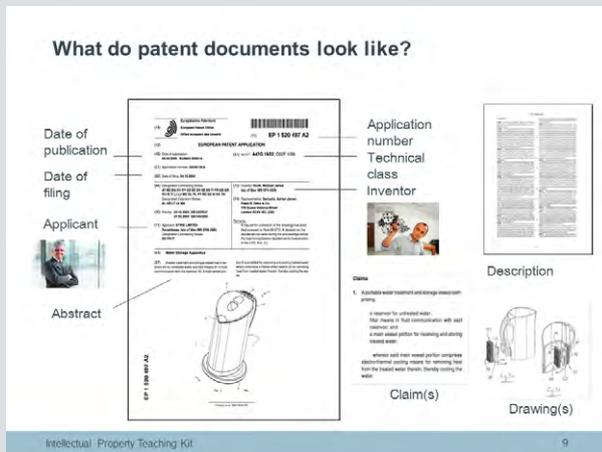
The technology class is important because it allows you to search easily for all patents that pertain to a specific technology domain. The rest of the bibliographic information is also useful for finding relevant patents. For example, to find the patents applied for by certain companies or inventors in a field, you can perform a search for their names. However, it is important to be aware that the applicant named on the application may no longer be the owner of the patent. When a patent is sold or transferred, for example when a company is bought, the new owner is not obliged to inform the patent office and the patent office will not issue a new patent publication, even if it learns about the transfer of ownership (patent reassignments known to patent offices are available in special databases only).

Claims

From a legal perspective, the most important part of a patent document is the claims, as they define the extent of the patented technology. If a company's product or process falls within the scope of the claims then there may be an infringement and the patent owner can stop the company's activity through an action brought in the courts. Damages and other remedies may be awarded if an infringement is found to have occurred.

The claims will often change during the application process. Frequently they will be narrowed down because part of the invention claimed in the application is found not to be new (i.e. prior art exists) or because the patent office considers that what is being claimed by the applicant is much broader than he has disclosed in his explanation of how to repeat the inventive process. This second issue is called insufficiency of disclosure.

Patent claims are often difficult to read. Legal interpretation of the claims of a patent is a task best performed by patent attorneys or other patent professionals.



Patent applications can be filed by the inventor or the inventor's employer.

Inventions are usually the property of the company that employs the inventor. This is also the case for university researchers in many countries.

A European patent application contains a full and detailed description of the invention so that others can understand and replicate it, one or more claims which define the technical features of the invention for which protection is sought - this is called the "scope of protection" - and optional drawings which help with understanding and interpreting the claims and description.

The cover sheet contains bibliographic information about the applicant and the inventor.

It also contains an abstract, one of the drawings, and details of the technical class.

The abstract and the technical class are useful when it comes to searching for patents.

Slide 10

What does the description contain? (optional)

The items shown on the slide will be found in most patent documents as part of the description.

Rule 42 EPC, which lays down the legal requirements for descriptions of European patents, reads as follows:

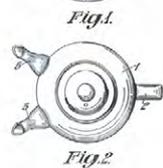
"1. The description shall:

- (a) specify the technical field to which the invention relates;
- (b) indicate the background art which, as far as is known to the applicant, can be regarded as useful to understand the invention, draw up the European search report and examine the European patent application, and, preferably, cite the documents reflecting such art;
- (c) disclose the invention, as claimed, in such terms that the technical problem, even if not expressly stated as such, and its solution can be understood, and state any advantageous effects of the invention with reference to the background art;
- (d) briefly describe the figures in the drawings, if any;
- (e) describe in detail at least one way of carrying out the invention claimed, using examples where appropriate and referring to the drawings, if any;
- (f) indicate explicitly, when it is not obvious from the description or nature of the invention, the way in which the invention is industrially applicable.

2. The description shall be presented in the manner and order specified in paragraph 1, unless, owing to the nature of the invention, a different presentation would afford a better understanding or be more concise."

What does the description contain?

- Prior art
 - *teapot with one spout*
- Drawback of prior art
 - *time-consuming*
- Problem to be solved
 - *reduce filling time for multiple cups*
- Solution
 - *provide a second spout*
- Advantage of the invention
 - *filling time is reduced*



This slide shows the what a typical description contains. The description also refers to the drawings.

Slide 11

What can and can't be patented (animated slide)

Patentability requirements vary from country to country. In most countries, patents cannot be granted in respect of ideas, concepts, discoveries, computer programs as such, business methods, teaching methods, diagnostic methods, medical therapies, and so on.

However, if a computer algorithm is used to achieve a technical result, e.g. in an electronic control device, it can be patented. The technical effect of the computer algorithm must go beyond the normal physical effects involved in the execution of the program (e.g. of electric currents flowing in computers when calculating). For more information on this topic see the EPO brochure "Patents for software?" at www.epo.org/news-issues/issues/software.html

Each jurisdiction has its own exclusions from patentability. For example, in the USA patents on software as such and on business methods were regarded as patentable for some time. However, in recent court decisions this practice has been limited.

Other conditions are that the invention must have an industrial application and does not interfere with morality or *ordre public*. For example, the requirement of industrial applicability may be a hurdle in biotechnology.

The European Patent Convention (EPC) provides a comprehensive list of matter excluded from patentability in Europe. Article 52 covers what is considered not to be an invention and Article 53 covers what is excluded from patentability even if it is an invention.

In addition to the list of subject-matter or activities "as such" that are not considered to be inventions for the purposes of granting European patents (under Article 52 EPC), inventions falling into any of the following categories are excluded from patentability (see Article 53, Rule 28 EPC):

- inventions whose commercial exploitation would be contrary to *ordre public* or morality (including, for example, processes for cloning human beings or the use of human embryos for commercial or industrial purposes).
- plant or animal varieties or essentially biological processes for producing plants or animals (although "microbiological processes and products thereof" are patentable).
- methods for treatment of the human or animal body by surgery or therapy and diagnostic methods practiced on the human or animal body (although products, in particular substances or compositions for use in such methods, e.g. medicaments or surgical instruments, are not excluded).

For more information see the EPO's "Patents for life?" brochure at www.epo.org/news-issues/issues/biotechnology.html

The text of the European Patent Convention is available at www.epo.org/law-practice/legal-texts/epc.html

What can and can't be patented

Patents protect technical inventions which solve technical problems:

- Chemical substances, pharmaceuticals
- Processes, methods, uses
- Products, devices, systems

For an invention to be patentable, it must usually be

- ✓ new to the world (i.e. not available to the public anywhere in the world)
- ✓ inventive (i.e. not an "obvious" solution), and
- ✓ susceptible of industrial application

In most countries, patents are not granted for mere business methods or rules of games, or for methods of treatment, diagnostics and surgery of the human or animal body, or for inventions that are contrary to *ordre public* or morality, or for plant and animal varieties.

The slide includes several visual elements: a pill bottle and pills, a person in a lab coat, a technical drawing of a mechanical part, a water tap with a drop of water, a person working at a computer, and a red 'X' over a person at a computer. The text is arranged in a structured layout with bullet points and a central list of criteria.

Intellectual Property Teaching Kit 11

Under the European Patent Convention or EPC, "European patents shall be granted for any inventions, in all fields of technology, provided that they are new, involve an inventive step and are susceptible of industrial application."

"New" means that there should have been no previous public disclosure of the invention before the date of filing. If an invention has already been revealed to the public there is nothing to "trade" for exclusivity, and therefore no social contract.

The concept of inventive step is quite difficult to assess. The EPO must compare the invention with what would have been obvious to an imaginary skilled person at the time of filing.

The EPC does not provide a definition of what is meant by the term "invention".

It does, however, provide a non-exhaustive list of subject-matter that are **not** considered inventions. The items listed at the bottom of this slide are expressly excluded from patentability.

Slide 12

When is an invention "new"?

An invention can only be patented if it is new. An invention is considered to be new if it does not form part of the state of the art. The purpose of this requirement is to prevent the state of the art being patented again. By "state of the art" we mean everything that was available to the public before the date of filing of the application. This means that at least one member of the public had access to the information and that this person was not bound to secrecy or confidentiality. This includes internet citations, as long as it can be proven that the information was on the web at a certain date.

There are a few exceptions to the requirement that an invention cannot have been disclosed prior to the date the patent is filed. One is if the publication was due to an evident abuse in relation to the applicant, or the applicant had displayed the invention at an officially recognised international exhibition. See Article 55 EPC for details: www.epo.org/law-practice/legal-texts/epc.html

When is an invention "new"?

- When it is not part of the state of the art
- State of the art = everything made available to the public before the date of filing

Keep your invention confidential until you have filed your application!

State of the art

Date of filing

Patent application

Year

2008 2009 2010 2011 2012 2013 2014

Intellectual Property Teaching Kit 12

For a European patent to be granted by the EPO, the invention must be new at the date of filing of the patent application.

"New" means that the invention does not form part of the state of the art.

The state of the art comprises everything made available to the public by means of a written or oral description, by use, or in any other way, before the date of filing of the European patent application.

It is vital that you keep your invention confidential until you have filed your application.

Slide 13

Do's and don'ts for safeguarding novelty

For an invention to be new or novel, it must not be publicly disclosed prior to the filing of the patent application. Only the aspects of the invention that are new can be protected by a patent.

Any public disclosure prior to filing the application will destroy the novelty of your invention. Public disclosure can include talking about the invention in a lecture, a seminar or an exhibition, publishing an article, or mentioning it in a blog entry. Selling a product that incorporates the invention may also be considered a public disclosure.

You must therefore not tell anyone about your invention before you apply for a patent. However, you can tell qualified (registered) lawyers, solicitors and patent attorneys, because anything you say to or show them is legally privileged. This means it is in confidence and they will not tell anyone else.

If you need to discuss your invention with someone other than a lawyer or patent attorney before you apply for a patent, a non-disclosure agreement (NDA) can help. If you are thinking about disclosing your invention to someone else, you should consult a patent attorney or lawyer first.

If there are any students in the audience who have already published or disclosed an invention, point out that in some countries it is still possible to apply for a national patent after first publication, provided you do so within a certain time limit ("grace period"). Under the EPC, no such grace period exists and any publication or disclosure prior to filing the first application will destroy novelty.

See the EPO website for the "How to apply for a European patent" guide: www.epo.org/applying/european/Guide-for-applicants.html

Do's and don'ts for safeguarding novelty



Don'ts

- Do not publish any articles, press releases, conference presentations/ posters/ proceedings, lectures or blog posts, etc. before you file
- Do not sell any products incorporating the invention before you file




Do's

- Sign a non-disclosure agreement (NDA)
- Seek professional advice at an early stage
- File before anyone else does!





Intellectual Property Teaching Kit 13

If you disclose your invention before the filing date you risk invalidating your patent application.

Remember the social contract? If you have already revealed your invention to the public, you will have nothing to "trade", so you won't get a patent, even if it was you who made the invention public!

Under the EPC, the first to file the patent application will be entitled to the grant of a patent on a particular invention.

If you disclose your invention before filing, it will no longer be considered "new", regardless of the form the disclosure took, including written form (even in a publication that no-one

might have read), oral disclosure (such as in a presentation or lecture), actual use or sale, and regardless of the place. In other words, all material made available to the public anywhere in the world forms part of the state of the art.

So the key message is keep it confidential!

Do not disclose your invention to anyone, not even orally, until you have filed your patent application.

If you need to talk to potential customers or investors before you file, make sure you sign a non-disclosure agreement with them first.

Once you have filed your application, you are free to present, publish or sell your invention as you wish.

Slide 14

When is an invention "inventive"?

An invention is held to involve an inventive step - i.e. to be inventive - if it is not obvious to the skilled person in the light of the state of the art. The inventive step requirement is intended to prevent exclusive rights forming barriers to normal and routine development.

Inventive step is usually evaluated on the basis of the problem-solution approach. This approach assesses whether the solution presented to the problem in the patent application is obvious or not to the person skilled in the art.

The skilled person is a legal fiction. The concept of the skilled person means a practitioner with general technical knowledge in the relevant technical field. He or she is assumed to have access to the entire state of the art and to be capable of performing routine work and experimentation, but to be devoid of inventive skills.

When is an invention "inventive"? This always depends on the specific circumstances of the case. Various factors may be taken into account, such as the unexpected technical effect of a new combination of known elements, the choice of specific process parameters within a known range, the difficulty the skilled person has in combining known documents, secondary indicators such as the fact that the invention solves a long-standing technical problem which there have been many attempts to solve, or the overcoming of a technical prejudice.

When is an invention "inventive"?

- When it is not obvious to the person skilled in the art in view of the state of the art
- The person skilled in the art
 - is a skilled practitioner in the relevant technical field
 - has access to the entire state of the art
 - is aware of general technical knowledge
 - is capable of routine work

 **He knows EVERYTHING, but has ZERO imagination!**



Intellectual Property Teaching Kit 14

At the EPO, inventive step is assessed using the problem-solution approach.

This approach assesses in an objective manner whether the solution proposed to the problem presented in the patent application is obvious or not to the person skilled in the art.

The person skilled in the art is a legal fiction. He or she is considered to be a practitioner with a general technical knowledge in the relevant field, with access to the entire state of the art and capable of performing routine work and experimentation.

He does not, however, have any inventive skills.

Slide 15

Assessing novelty (animated slide)

This slide is animated. The first click goes to the prior art search stage. Each subsequent click reveals a prior art document.

The claim describes the technical features of the invention.

The first step in deciding whether an invention is new is to define the prior art, the relevant part of that art, and the content of that relevant art. For this, a search into the prior art is done. The patent examiner concerned usually consults a number of databases containing patent documents as well as scientific journals. He may also search on the internet or in other media.

In our example, the search revealed four documents. The patent examiner now has to compare the claim with each document in turn and see whether the invention differs from it. Here none of the documents discloses all the features of the claim. Hence, the invention (as expressed in the claim) is new.

Assessing novelty

Claim: A pouring vessel comprising
 (a) a compartment for liquids (1),
 (b) a handle (2),
 (c) a lid, and
 (d) two spouts (5) extending from the compartment (1),
 (e) whereby the tops of the two spouts are arranged at the same height.

Fig. 1



Stage 1: Prior art

The prior art search revealed the following documents:

Document D1: A teapot with one spout.



Document D2: High efficiency distributor for fertilizer. Each rod has several nozzles for spraying liquid.



Document D3: A filter handle with two spouts to be used with a coffee-maker.



Document D4: An oil and vinegar bottle which reveals a second bottle inside. The two spouts are cleverly arranged to ensure the second bottle never drips while the first one is in use.



Intellectual Property Teaching Kit 15

The claim describes the technical features of the invention.

In order to be able to decide whether an invention is new, the patent examiner responsible for examining the application first has to define the prior art. To do this, he has to perform a search into the prior art, which will usually involve consulting databases containing patent documents and scientific journals, as well as searching the internet and other media.

In the example shown here, the search revealed four documents. The patent examiner compared the claim with each document in turn and checked whether the invention differs from it. None of the documents discloses all the features of the claim, so the invention as expressed in the claim is new.

Slide 16

Assessing inventive step (I) (animated slide)

This slide is animated. Each click reveals a stage in the assessment of inventive step.

It is important to remember that an invention which at first sight appears obvious might in fact involve an inventive step. Once a new idea has been formulated, it can often be shown theoretically how it might be arrived at, starting from something known, by a series of apparently easy steps.

Patent examiners are expected to be wary of ex post facto analyses of this kind and to bear in mind that the documents produced in a search have, of necessity, been obtained with foreknowledge of the subject-matter that constitutes the alleged invention.

The EPO has developed an approach which avoids such errors and allows examiners to objectively judge the presence of inventive activity at the time the claimed invention was made. Known as the problem-solution approach, it allows for a more objective assessment of inventive step and lessens the risk of hindsight.

The various questions that must be asked during this analysis can be grouped into three stages.

Stage 1

In view of the documents produced in the search the examiner considers the differences between the claim and each document. Next, he selects the document which comes closest to the invention. Normally, this is the document which has the most features in common with the invention. In this example, document D1 has been taken as the starting point, and the features that the claim has in common with this document have been determined.

Stage 2

The examiner notes the differences between the claim and this document. He thinks of the advantages these differences may have over the claimed invention. Clearly, the time taken to fill several cups is reduced by having a second spout.

The next question to ask is whether the skilled person would have overcome the drawback of document D1 in the same manner as the inventor did. In order to answer this question, the examiner formulates a so-called objective problem. The problem usually is to achieve the same effect as the invention. In this case the question would be "How can we modify the teapot of D1 in order to reduce the time needed to fill multiple cups?"

This question is answered on the next slide.

Assessing inventive step (I)

Stage 1

- Determine the closest prior art and common features:
 - a compartment for liquids
 - a handle
 - a lid
 - one spout



Stage 2: Problem

- Differences over D1:
 - two spouts instead of one
 - particular arrangement of the spouts
- Drawback of prior art:
 - time-consuming
- Advantage/effect of the invention:
 - the time needed to fill multiple cups is reduced
- Objective problem to solve:
 - how to modify the teapot of D1 to reduce the time needed to fill multiple cups




Intellectual Property Teaching Kit 16

To ensure an objective assessment of inventive step, the EPO, for example, uses a structured problem-solution approach which lessens the risk of hindsight.

The questions asked during this analysis can be grouped into three stages.

In stage 1, the examiner considers the differences between the claim and each document. He then chooses the document which comes closest to the invention. This is normally the document which has the most features in common with the invention. In our example, this is document D1 and we have identified the features that the claim has in common with it.

In stage 2, the examiner notes down differences between the claim and this document. He thinks of advantages based these differences. In this case it is the reduction in the time needed to fill several cups thanks to the second spout.

The next question is whether the skilled person would have overcome the drawback of document D1 in the same manner as the inventor did. To answer this question, the examiner formulates a so-called objective problem, which is usually how to achieve the same effect as the invention. In this case the question would be "How can we modify the teapot of D1 in order to reduce the time needed to fill multiple cups?" We will look at the answer to this question on the next slide.

Slide 17

Assessing inventive step (II) (animated slide)

This slide is animated. The first click shows the problem facing the skilled person. The second click shows the other prior art documents the skilled person would consider in order to find a solution. The third click asks the question whether the combination of the teachings of D1 with the teachings of one of the other documents results in the invention.

Stage 3

We have to bear in mind that, realistically, the skilled person only has access to the prior art in his technical field, which is the technical field of the invention, in this case the field of kitchen utensils for food processing, in particular beverages. In order to come to a fair judgement in the above question, the skilled person is meant to look only at documents from this technical field. Clearly, document D2, the fertiliser distributor, does not belong to this field and is therefore not considered any further.

Next, the examiner checks whether the other documents (D3 and D4) relate to filling several cups simultaneously and whether they offer the advantage of the invention.

- D4 does not disclose the same effect, since the fundamental principle of the bottle in D4 is different. D4 uses one spout at a time, but never the two spouts together, to pour liquid. D4 therefore teaches away from the invention and is discarded in the further assessment.
- D3 discloses an espresso maker with a filter handle that allows two cups to be filled concurrently. This document looks promising as it addresses the problem of filling several cups at the same time.

The final step in this assessment is to make a careful judgement as to whether the invention is obvious when looking at these two documents.

In order to do so, the examiner must ask the following hypothetical questions:

If the skilled person were to look at D1 in combination with D3, would he find a solution for the problem of reducing the filling time?

Would he grasp the technical teaching from D3 that he had to add a further spout to the teapot of D1?

And what technical teaching would he take from D3?

Bear in mind that this is only a very simple example for the purpose of demonstrating the considerations which have to be made when assessing inventive step. For the sake of this example, the examiner may make the following considerations with regard to D3.

Firstly, the outlet in D3 does not reduce the time for filling two cups since the flow rate of the espresso maker remains the same. In fact, the opposite is true: it takes twice the time to fill two cups, or, looking at it another way, in the same amount of time, the two cups would only get half full.

Secondly, even if the skilled person applied the principle of the outlet with the two pipes (D3) to the known teapot (D1), he would not arrive at the claimed invention. In D3, the outlet is Y-shaped and consists of one pipe extending into two pipes, whereas the invention makes use of two separate spouts.

Therefore, the examiner may finally arrive at the conclusion that the claim is inventive, since the two documents in combination would not arrive at the claimed invention. A patent could thus be granted on the basis of this claim.

Assessing inventive step (II)

Is the claimed solution obvious in view of the prior art?

Stage 3: Solution

Objective problem for the skilled person: How to modify the teapot of D1 in order to reduce the time needed to fill multiple cups

Intellectual Property Teaching Kit 17

In stage 3, the examiner is looking for an answer to the question: How would the skilled person modify the teapot of D1 in order to reduce the filling time for multiple cups?

[Click 1]

The skilled person realistically only has access to the prior art in the technical field of the invention, which in this case is the field of kitchen utensils for food processing, in particular beverages. To come to a fair judgement, the skilled person should look at documents from this field only. The fertiliser distributor in D2 does not belong to this field, so should not be considered any further

Next, the examiner checks if the other documents - D3 and D4 - are concerned with filling several cups simultaneously and whether they offer the same advantage as the invention. D4 does not disclose the same effect, as it only uses one spout at a time, and not two together. Thus, D4 teaches away from the invention and must be discarded.

D3 discloses an espresso maker with a filter handle that allows two cups to be filled concurrently. This looks promising.

[Click 2]

The examiner then comes to the final step in his assessment, which is to make a careful judgement as to whether the invention is obvious when looking at the two documents.

[Click 3]

To do this he must ask the following hypothetical questions:

- If the skilled person looked at D1 in combination with D3, would he find a solution for the problem of reducing the filling time?
- What teaching would he take from D3?

For the sake of this example, the examiner may make the following considerations with regard to D3.

Firstly, the outlet in D3 does not reduce the time needed to fill two cups since the flow rate of the espresso maker remains the same. In fact, the opposite is true: it takes twice as long to fill two cups. Looked at another way, in the same amount of time, the two cups would only get half full.

Secondly, even if the skilled person applied the principle of the outlet with the two pipes in D3 to the known teapot in D1, he would not arrive at the claimed invention. In D3, the outlet is Y-shaped and consists of one pipe extending into two pipes, whereas the invention makes use of two separate spouts.

The examiner may therefore arrive at the conclusion that the claim is inventive, since the two documents in combination would not arrive at the claimed invention. A patent could thus be granted on the basis of this claim.

Slide 18

How to obtain patent protection in Europe (options 1 and 2) (animated slide)

There are currently three different ways of obtaining patent protection in Europe. The first is to file a national patent application in the country concerned, the second to file a patent application with the European Patent Office (EPO), and the third to file an international patent application via the Patent Cooperation Treaty (PCT). All of these options have their advantages, drawbacks and implications with regard to time frame and costs.

Filing individual national patent applications in multiple European countries means complying with the national requirements in each country. These can differ in terms of language, time limits and fees, and whether or not the applicant has to be represented by a patent attorney.

This administrative burden has been greatly reduced by the European patent system, which harmonises the patent granting procedure for the member states of the European Patent Organisation. European patents are granted by the EPO. They are mostly equivalent to national patents in those countries for which they are granted. They have a legal effect similar to a bundle of national patents in all the countries that the applicant has chosen from the Organisation's member states. There are cost implications in particular with regard to translations, renewal fees and attorney fees after the grant of the patent.

The EPO is located in Munich (headquarters), The Hague, Berlin, Vienna and Brussels, and currently has 38 member states (European Union: 28). The latest countries to join the Organisation were Albania and Serbia in 2010. Two further countries recognise European patents upon request: Montenegro and Bosnia and Herzegovina. Since 2015 European patents can also be validated in Morocco and the Republic of Moldova.

For a guide to applying for a European patent go to www.epo.org/applying/european/Guide-for-applicants.html

For frequently asked questions on applying for a patent go to www.epo.org/service-support/faq/own-file.html

Obtaining a European patent can cost around EUR 5 300 in EPO fees alone. For the latest figures, go to www.epo.org/law-practice/legal-texts/html/epc/2013/e/ma6.html

The forthcoming European patent with unitary effect ("unitary patent") will provide a further option for applicants. It will be a European patent granted by

the EPO under the provisions of the European Patent Convention (EPC) to which unitary effect for the territory of the 26 participating EU member states can be attributed after grant, at the patentee's request.

Once a European patent has been granted, any legal proceedings that arise, such as infringement or revocation actions, are currently dealt with not by the EPO but by the national courts of the country or countries where the actions arise. From the date of entry into force of the Agreement on a Unified Patent Court, the Unified Patent Court will have the exclusive competence for infringement and revocation actions relating to European and unitary patents as far as the territories of the contracting states to the UPC are concerned.

Additional information

The concept of priority

If the applicant for a patent in a given country has already filed an earlier patent application for the same invention in any other country, he can, within 12 months of the date of filing of the earlier application, claim this earlier filing date as the "priority date" for his subsequent application.

This priority date counts as the date of filing of the subsequent application for the purposes of assessing the state of the art and the right to the patent.

This can be advantageous for the applicant for two reasons. First, if someone else publishes the same invention in the period between the priority date and the actual date of filing of the subsequent application, this publication will not count as part of the state of the art when the novelty and inventive step of the subsequent application are assessed.

Second, most patent law systems, including that established by the EPC, apply the "first-to-file" principle. If two applicants file an application for the same patent, the one who files first will get the right to the patent.

So if applicant A can validly claim a priority date for his subsequent application in a given country, he will be granted the patent for this country even if applicant B has applied for the same patent in this country in the period between applicant A's priority date and the date on which applicant A actually files his later application.

How to obtain patent protection in Europe (options 1 and 2)

The national route

- Separate procedures for each state
- Procedures differ according to national law

The regional route: European Patent Convention

- One application filed at one office for up to 42 states
- One procedure
- Applicant selects the desired states
- One European patent for up to 42 states
- Results in a bundle of national patents

Intellectual Property Teaching Kit 18

There are three main ways of obtaining patent protection in Europe.

The first is by filing with a national patent office. A national patent is valid only in the country for which it has been granted. You do not have to be a resident of a particular country in order to apply for a patent there. To obtain patents in several countries, applicants must file a separate patent application for each country. Each application has to fulfil the relevant national requirements.

The second route is via the European Patent Office. The European patent system was set up to harmonise and streamline the patent granting process in Europe. With the grant of a European patent the applicant can obtain national patents in the European countries he chooses to designate. For this, he has to perform certain acts such as paying fees or translating the patent document.

Currently, patent protection can be gained in up to 42 countries....The EPO has 38 member states. The latest countries to join were Albania and Serbia in 2010. A further two states – Montenegro and Bosnia and Herzegovina – recognise European patents upon request. Agreements for the validation of European patents have entered into force with Morocco and the Republic of Moldova in 2015.

A further alternative, a European patent with unitary effect – or unitary patent – will be available from the date of entry into force of the Agreement on a Unified Patent Court.

The third option – applications under the Patent Cooperation Treaty – offers patent protection in countries worldwide. We will look at this option in a moment.

Slide 19

Key facts about the unitary patent

The EU's so-called "patent package" implements enhanced co-operation between 26 of the EU's 28 member states (all EU member states except Croatia and Spain). It consists of Regulation (EU) No. 1257/2012 of the European Parliament and of the Council of 17 December 2012 creating unitary patent protection (OJ EPO 2013, 111), Council Regulation (EU) No. 1260/2012 of 17 December 2012, which sets out the translation arrangements (see OJ EPO 2013, 132), and the Agreement on a Unified Patent Court (UPC Agreement, OJ EPO 2013, 287).

The two regulations entered into force on 20 January 2013. They will, however, only apply from the date of entry into force of the UPC Agreement.

The UPC Agreement, which constitutes the third component of the patent package, will enter into force after the deposit of the 13th instrument of ratification or accession (provided they include those of the three states with the highest numbers of European patents in force - i.e. France, Germany and the United Kingdom).

The Agreement was signed in February 2013 by all the EU member states except Poland and Spain. However, these two states, as well as Croatia, which joined the EU on 1 July 2013, could still accede to the Agreement.

The unitary patent represents a further option for users in addition to existing national patents and European patents.

It will be a European patent granted by the EPO under the provisions of the European Patent Convention to which unitary effect for the territory of the 26 participating EU member states is attributed after grant, at the patentee's request. According to Regulation No. 1257/2012, unitary effect may be requested for any European patent granted on or after the date of application of the Regulation, on condition that the European patent was granted with the same set of claims in all 26 participating member states.

The EPO will be responsible for administering requests for unitary effect. It will also be responsible for collecting and administering the renewal fees for unitary patents and for keeping a register for unitary patent protection which will include legal status information such as licences, transfers, limitations, revocations and lapses.

The unitary patent will cover the territories of the 26 participating EU member states and may only be limited, transferred, revoked, or lapse in respect of all these territories. It may, however, be licensed in respect of the whole or part of these territories.

With regard to the translation arrangements, it was decided to use the EPO's tried and tested language regime based on three official languages, namely English, French and German. After grant of the European patent, if the patent holder opts for a unitary patent, no further translations will be required (except in cases of dispute). Machine translation will be available for the purpose of getting information about the content of patents. However, during a transitional period – before a sufficiently high quality of machine translation into all official EU languages is available – where the language of the proceedings before the EPO is French or German, a full translation of the European patent specification into English must be provided or, if the language of the proceedings is English, into any other official language of the EU. This translation must be filed by the patentee together with the request for unitary effect. It has no legal effect and is for information purposes only.

Key facts about the unitary patent

- A European patent with unitary effect
- Further option in addition to European patents and national patents
- Protection in a single step for 26 participating EU member states
- Unitary effect can be registered by the patentee after the grant of the European patent
- Unitary character for said 26 states: limitation, transfer, revocation, lapse (only in respect of all states)
- No translation after grant, machine translation sufficient
- One-stop shop with centralised post-grant administration by the EPO (single renewal fee, register entries)



Europäisches
Patentamt
European
Patent Office
Office européen
des brevets

First, though, let us have a look at some key facts about the unitary patent, which is a European patent with unitary effect.

The unitary patent is a European patent granted by the EPO. After grant and at the patentee's request, unitary effect is attributed for all EU member states except Croatia and Spain. It is expected that the unitary patent scheme enters into force in 2017.

Unitary effect means that the patent may only be limited, transferred or revoked, or lapse in respect of all these 26 states.

For a transitional period – before a sufficiently high-quality of machine translations into all official EU languages is available – applicants must provide a full translation into English if the patent was granted in French or German. In case the patent was granted in English, then a translation into any other official language of the EU must be provided.

Slide 20

Key facts about the Unified Patent Court

Currently, the national courts and authorities of the contracting states to the European Patent Convention are competent to decide on the infringement and validity of European patents. In practice, this gives rise to a number of difficulties when a patent proprietor wishes to enforce a European patent – or when a third party seeks the revocation of a European patent – in a number of countries. These include high costs, the risk of diverging decisions and a lack of legal certainty.

The Agreement on the Unified Patent Court addresses these problems by creating a specialised patent court (Unified Patent Court, or UPC) common to the contracting EU member states with exclusive jurisdiction for litigation relating to both European patents and European patents with unitary effect (unitary patents). This includes infringement actions, revocation actions and counterclaims for revocation, actions for damages, actions for provisional and protective measures and injunctions, and actions concerning decisions of the EPO in carrying out the new tasks entrusted to it in relation to unitary patents.

The UPC will consist of a Court of First Instance, a Court of Appeal and a Registry. The Court of First Instance will comprise local and regional divisions as well as a central division. The Court of Appeal will be located in Luxembourg, while the seat of the central division of the Court of First Instance will be in Paris. Specialised sections of the central division dealing with disputes relating to patents in particular classifications will be set up in London and Munich. All panels of the new jurisdiction will be multinational and can be composed of legally and technically qualified judges depending on the division and on the action to be heard. All judges will have proven experience in the field of patent litigation.

Furthermore, the UPC Agreement establishes a patent mediation and arbitration centre, as well as a training centre for judges.

The Unified Patent Court is a court common to the contracting EU member states and will thus have to ensure the correct application and uniform interpretation of EU law, as any national court, in particular in accordance with Article 267 TFEU (Treaty on the Functioning of the European Union).

This means that the UPC will, where necessary, be required to refer questions to the CJEU on the interpretation of, for example, the two Regulations creating unitary patent protection and the Directive on the legal protection of biotechnological inventions.

During a transitional period of seven years, actions for infringement or for revocation concerning "classic" European patents can still be brought before the national courts. A proprietor of or an applicant for a European patent granted or applied for prior to the end of the transitional period will also have the possibility to opt out from the scope of the UPC Agreement (unless an action has already been brought before the UPC). They will have to notify their opt-out to the Registry by the latest one month before expiry of the transitional period. This opt-out can be withdrawn at any moment via notification to the Registry, unless an action concerning the relevant patent has already been brought before a national court. The transitional period may be extended by a further seven years by the Administrative Committee (decision-making body within the court system composed of one representative per contracting member state).

The UPC agreement is expected to enter into force together with the unitary patent scheme in 2017.

Key facts about the Unified Patent Court

- A specialised patent court with exclusive jurisdiction for litigation relating to European patents with “classic” unitary effect (“unitary patents”) and European patents



UPC includes two European instances:

Court of First Instance
with local and regional divisions located in the member states, and central divisions

Court of Appeal

- Multinational panels composed of legally and technically qualified judges



In the current situation, the national courts and authorities of the contracting states of the European Patent Convention are competent to decide on the infringement and validity of European patents in their respective countries.

The creation of the Unified Patent Court or UPC will provide a specialised patent court common to the contracting EU member states which will have exclusive jurisdiction for infringement and revocation actions for both European patents and unitary patents.

The UPC will consist of two European instances, a Court of First Instance and a Court of Appeal. The Court of First Instance will comprise local and regional divisions in the contracting EU member states. Furthermore, there will be a central division with its seat in Paris and specialised sections of the central division in Munich and London.

Slide 21

How to obtain patent protection in Europe (option 3)

The Patent Cooperation Treaty (PCT) allows applicants to apply for patents in multiple member states by means of a single patent application. PCT applications do not lead to "international" patents. Instead they branch into individual national patent applications at a later stage.

Thus, after the initial PCT phase, the cost of a PCT patent corresponds to the sum of the cost of all the individual patent applications in all the countries for which the application has been filed. The total cost for worldwide protection can amount to as much as EUR 100 000.

The PCT also issues a search report, offers an examination and allows for amending the application, which can also be a huge cost saving. The search report is usually communicated to the applicant around four to five months after the filing of the international application.

The major advantage of a PCT application is that the actual filing of the application in each of the countries in which protection is sought can be delayed until the PCT process is completed. PCT applications give the applicant up to 30 months to decide, firstly, if the invention is worth the effort of international patenting, and, secondly, in which countries he wants to seek protection (for PCT applications entering the regional phase before the EPO (Euro-PCT applications), the time limit is 31 months).

Given the high cost of applying for patents in many countries, this gain of 18 months (or 19 months for Euro-PCT applications) can be very important, as at the same time the payment of national patent office fees is delayed (as compared to first filing a national patent application and further national patent applications within 12 months claiming priority from the earlier application).

In particular for SMEs, start-up companies or spin-outs, a PCT application with the prospect of IP protection may be a decisive factor when it comes to obtaining external funding. Moreover, after 30 months the applicant is usually in a better position to evaluate whether it is worth pursuing national applications on the basis of the PCT application (cost implication).

The cost of filing an international PCT application with the EPO as receiving office amounts to around EUR 3 100 (plus attorney fees where applicable). However, the cost varies a lot depending on, for example, the number of pages or the designated countries in which protection is being sought.

Details of the current fees can be found at www.epo.org/applying/forms-fees/international-fees.html

PCT applications can be filed with certain national patent offices, the European Patent Office or with WIPO (World Intellectual Property Organization) direct.

For an introduction to the PCT procedure before the EPO ("Euro-PCT"), see the Euro-PCT Guide, How to get a European patent, Guide for Applicants, Part 2 at www.epo.org/applying/international/guide-for-applicants.html

How to obtain patent protection in Europe (option 3)

The International route: Patent Cooperation Treaty (PCT)

- One single application for up to 148 countries*
- Harmonisation of formal standards (language, patent agent, fees)
- Search report and opinion on patentability
- After 30-31 months, decision by applicant on which countries to proceed in.



*December 2013

Intellectual Property Teaching Kit

21

Returning now to our options for patent protection in Europe, the third route is the Patent Cooperation Treaty or PCT. The PCT allows applicants to apply for patents in multiple member states by means of a single application, not just in Europe but worldwide too.

PCT applications do not lead to "international" patents. Instead, they branch into individual national patent applications.

There are a number of advantages for the applicant. In addition to the single application procedure at the beginning, the formal standards for the application are harmonised, including language, patent attorney and fees.

The applicant gets a search report and an opinion on the patentability of his invention, and has up to 30 months to decide in which countries he wants to proceed with his patent application.

Slide 22

The grant procedure before the EPO (animated slide)

This slide is animated. Each click reveals a further stage in the procedure.

After a patent application has been filed, the first step in the European patent grant procedure is the examination on filing, or formalities examination. This involves checking whether all the necessary information and documentation has been provided, so that the application can be accorded a date of filing.

While the formalities examination is being carried out, a European search report is drawn up, listing all the documents available to the EPO that may be relevant to assessing the novelty and inventive step of the invention. In the search report the patent examiner reports any prior art that is related to the invention and provides an indication of whether or not this prior art conflicts with the claims of the application. The search report is usually (but not always – there is no legal requirement) created and sent to the patent applicant before the patent application is published.

Patent applications can be withdrawn at any time. A common reason for withdrawing an application is if the EPO search report finds substantial conflicting prior art. By withdrawing the patent application early enough the applicant can avoid its publication.

Patent applications are normally published 18 months after the date of first filing of the application. The applicant can request publication of the application before the usual 18 months.

After the request for examination has been made, the EPO examines whether the application and the invention meet the requirements of the European Patent Convention and whether a patent can be granted. It is unlikely that a patent will be granted within three years. Most patents are granted within five years of the application being first filed.

After the EPO has granted a patent, any person can file an opposition during the first nine months of its life and provide evidence that the patent should not have been granted (e.g. because the invention had already been disclosed, etc.). At the end of the opposition proceedings, which only take place if an opposition is filed, the patent can be maintained in full or in amended form or it can be revoked. Generally speaking, the number of patents opposed is quite small.

Once the mention of the grant is published, the patent has to be validated in each of the designated states within a specific time limit to retain its protective effect and be enforceable against infringers.

As a rough guide, it currently costs about EUR 5 300 to take a European patent application through to the grant stage. Fees are charged for filing, search, designation of states, claims (if more than fifteen), examination, grant and printing. Renewal fees are also payable for the third year and each subsequent year after the date of filing.

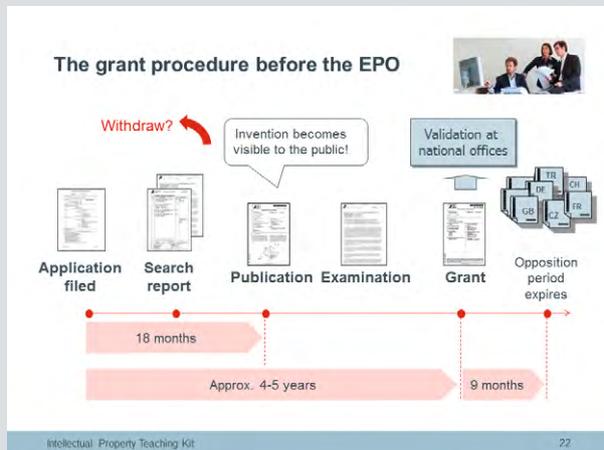
The filing and search fees due at the beginning of the procedure currently amount to about EUR 1 365. The remaining fees are payable later. That means that applicants can decide at each stage of the procedure whether or not to continue with their application.

At the post-grant stage, competence is transferred to the contracting states designated in the European patent. In some contracting states, costs may be incurred for validating the European patent. In order to maintain the patent, renewal fees must be paid each year in each designated state.

The overall cost of obtaining a European patent may also include fees for the services of a patent attorney and translation. Further details of these costs can be obtained from any patent attorney authorised to act as a professional representative before the EPO. A searchable database of professional representatives can be found on the EPO website.

For frequently asked questions on applying for a patent go to www.epo.org/service-support/faq/own-file.html

For the latest fee amounts see the Rules relating to Fees at www.epo.org/law-practice/legal-texts/html/epc/2013/e/ma6.html



The patent grant procedure before the EPO consists of the stages shown here on the slide.

When an application is filed, a search report is drawn up listing all the documents available to the EPO that may be relevant to assessing the novelty and inventive step of the invention. This is usually done before the patent application is published. Applicants can withdraw their application at any time, for example if conflicting prior art is found. If applications are withdrawn early enough, then the application is not published.

The application is published – normally together with the search report – 18 months after the date of first filing of the application. The published patent application provides some provisional protection even before it is granted.

After the request for examination has been made, the EPO examines whether a patent can be granted. If it decides that a patent can be granted, it issues a decision to that effect.

Once the mention of the grant of the patent is published, the patent has to be validated in each of the designated states within a specific time limit to retain its protective effect and to be enforceable against infringers. Different national requirements with regard to translation, representation, fees and time limits apply.

Third parties can oppose the patent on the grounds that it should not have been granted.

Slide 23

What can happen after a European patent has been granted?

Under Articles 99 and 100 EPC, within nine months from the publication of the mention of the grant of a European patent in the European Patent Bulletin, any person may give notice to the EPO of **opposition to the European patent** granted, invoking lack of patentability, e.g. lack of novelty or inventive step (Articles 52-57 EPC), or lack of a sufficiently clear and complete disclosure of the invention (Article 83 EPC), or that the granted patent extends beyond the application as filed (Article 123(2) EPC).

Oppositions are dealt with by opposition divisions, which are normally made up of three examiners. Opponents are advised to use the official EPO opposition form, which is available free of charge from the EPO and the IP offices of the contracting states. Notice of opposition is not deemed to have been filed until the opposition fee of EUR 785 (2016 figure) has been paid. In practice, opposition proceedings at the EPO are relatively rare.

For more information about oppositions, go to www.epo.org/applying/european/oppositions.html

The decision to **limit or revoke a European patent** takes effect on the date on which it is published in the European Patent Bulletin and applies ab initio to all contracting states in respect of which the patent was granted (Article 105b EPC).

Renewal fees will be due for a granted European patent in those states where the European patent takes effect as a national patent. These fees can be expensive, but amounts differ in different contracting states:
<http://www.epo.org/law-practice/legal-texts/html/natlaw/en/vi/index.htm>

If the annual renewal fees are not duly paid or if the patentee revokes his patent or the patent is revoked, the patent might lapse earlier.

Bringing **invalidity proceedings** in each country where a European patent has taken effect can be extremely expensive. The fact that a patent has been examined and granted by a patent office is no guarantee that it will remain valid. Courts may find that a patent is invalid even though the patent office had earlier been satisfied of its validity when it examined the same aspects of the application and granted the patent.

Infringement proceedings can be lengthy and expensive, and the outcome uncertain. In fact, a common defence for competitors accused of infringing a patent is to argue that the patent is invalid and should never have been granted in the first place. As with invalidity proceedings, infringement proceedings must be brought before the national courts in each country where the European patent has effect (status as at 2013).

From the date of entry into force of the UPC Agreement the exclusive jurisdiction for infringement and revocation actions relating to European patents and unitary patents will as far as the territories of the contracting states of the UPC Agreement are concerned, lie with the UPC (subject to transitional provisions).

What can happen after a European patent has been granted?

- Opposition
- Limitation/revocation
- Renewal fees
- Invalidation proceedings (before a court)
- Infringement proceedings (before a court)



After a European patent has been granted, third parties – usually the applicant's commercial competitors – may oppose the patent before the EPO if they believe that it should not have been granted. They must do so within nine months of the grant.

The patent proprietor may request the revocation or limitation of his patent at any time following grant of the patent.

To prevent the patent lapsing, renewal fees must be paid every year to the individual national patent offices.

After the nine-month period for opposition has lapsed, anyone who wants to challenge a patent, for example on the grounds that it does not meet the criteria for the grant of a patent, must initiate court proceedings.

The rights conferred by a patent mean that its owner has exclusive rights to prevent others who do not have the owner's consent from doing certain things, including making, using, offering for sale, selling, or importing the protected product. Infringement proceedings can be initiated to stop a third party from performing any of these acts.

Invalidation proceedings and infringement proceedings must be brought before the national courts in each country where the European patent has effect*.

Once the UPC Agreement enters into force, the exclusive jurisdiction for infringement and revocation actions relating to European patents and unitary patents will as far as the territories of the contracting states of the UPC Agreement are concerned lie with the UPC.

* Valid 2013.

Slide 24

What is infringement?

What constitutes infringement of a patent is determined by the courts in the jurisdiction in which the patent is valid, with reference to the applicable national law. The general principle is that a person not having the patent proprietor's consent is prohibited from certain acts, and that breach of those prohibitions constitutes infringement.

Although the rights conferred by a patent are not harmonised in different jurisdictions, international minimum standards that must be applied in each jurisdiction are set out in Article 28(1) of the TRIPS Agreement, which states that:

"A patent shall confer on its owner the following exclusive rights:

- (a) where the subject matter of a patent is a product, to prevent third parties not having the owner's consent from the acts of: making, using, offering for sale, selling, or importing for these purposes that product;
- (b) where the subject matter of a patent is a process, to prevent third parties not having the owner's consent from the act of using the process, and from the acts of: using, offering for sale, selling, or importing for these purposes at least the product obtained directly by that process."

Source: www.wto.org/english/docs_e/legal_e/27-trips.pdf

In addition to the international minimum standards set out in TRIPS, many European countries have adopted definitions of "direct" and "contributory" infringement based on the Community Patent Convention (CPC), which, although signed in December 1975, never entered into force since it was not ratified by a sufficient number of member states, and which contains in its 1989 version the provisions on the prohibition of direct or indirect use of the patented invention (Articles 25 and 26 CPC). Fourteen years later, the Agreement relating to Community patents, done at Luxembourg on 15 December 1989, was an attempt to revive the project. This agreement consisted of an amended version of the original Community Patent Convention (CPC), but the attempt failed. Nevertheless, many of the member states of the EEC at that time introduced some harmonisation into their national patent laws in anticipation of the entry in force of the CPC.

Typically, courts in European countries have adopted provisions on infringement based on acts that undermine the right of the patent proprietor to prevent third parties' direct use of the invention, in particular:

- making, offering, putting on the market or using a product which is the subject-matter of the patent, or importing or stocking the product for these purposes
- using a process which is the subject-matter of the patent or, when the third party knows, or it is obvious in the circumstances, that the use of the process is prohibited without the consent of the proprietor of the patent, offering the process for use
- offering, putting on the market, using, or importing or stocking for these purposes the product obtained directly by a process which is the subject-matter of the patent.

In addition, courts in European countries have adopted definitions of contributory infringement based on acts that undermine the right of the patent proprietor to prevent third parties' indirect use of the invention, in particular:

- supplying or offering to supply a person, other than a party entitled to exploit the patented invention, with means, relating to an essential element of that invention, for putting it into effect therein, when the third party knows, or it is obvious in the circumstances, that these means are suitable and intended for putting that invention into effect.

Once the UPC Agreement enters into force, infringement proceedings relating to European and unitary patents will in general be brought before the UPC (subject to transitional provisions).

What is infringement?

- Making use of a patented product or process without the consent of the patent owner
- Making, offering, putting on the market, importing or stocking the product
- Making, offering, putting on the market, importing or stocking a product directly obtained from a protected process
- Using a process or offering the process for use



- Infringement is determined by the national courts or by the Unified Patent Court (once it enters into force)
- What constitutes infringement in one country may differ from other countries
- Patent proprietors can claim damages and other remedies from alleged infringers

As a general principle, any person not having the patent proprietor's consent is prohibited from certain acts, and breach of those prohibitions will constitute patent infringement.

Patent proprietors can take legal action, including filing for injunctive relief and/or claiming damages from persons considered to be infringing their patent.

Precisely what constitutes infringement of a patent may differ in each jurisdiction, and is determined by the national courts with reference to the applicable national law.

The competence for infringement and revocation actions concerning European and unitary patents will generally lie with the Unified Patent Court, once it comes into force.

The courts in European countries have adopted provisions on infringement. Typically, the acts considered to undermine the right of the patent owner to prevent third parties' direct use of the invention include

- making, offering, putting on the market or using a protected product or importing or stocking the product for these purposes,
- using a process or offering the protected process for use, and
- offering, putting on the market, using, or importing or stocking for these purposes the product obtained directly by a protected process.

Slide 25

How is infringement determined? (I) (optional, animated slide)

The animated slide is optional OR the example may be replaced by an example of your own.

Firstly, it has to be determined whether an act which has been carried out without the consent of the patent proprietor is prohibited by the applicable patent law. Secondly, whether or not infringement has occurred depends on an analysis of whether the features of the alleged infringing item are covered by the claims of the patent.

Furthermore, even if an act has been carried out without the consent of the patent proprietor and the infringing item is covered by the claims of the patent, there are limitations to the patent proprietor's rights, i.e. exceptional cases in which this act is not prohibited by the applicable patent law. Such exceptions include for example acts done privately for non-commercial purposes, acts done for experimental purposes, the use of biological material for the purpose of breeding, and discovering and developing other plant varieties.

The EPC is not primarily concerned with matters of infringement, as this is left to the national courts. However, it does establish the principle by which the scope of protection conferred by patents in the EPC states is to be determined by the claims, with the description and drawings used to interpret the claims (Article 69 EPC).

The Protocol on the Interpretation of Article 69 EPC provides further guidance and is an integral part of the Convention.

In practice this means that the extent of protection basically encompasses everything that is literally covered by the claims. However, it may in some cases also encompass so-called equivalents to the invention covered by the claims. The question of equivalence is, however, a rather vague concept and of even greater complexity than the issue of infringement as such.

For more information see www.epo.org/patents/law/legal-texts/epc.html

Example

The example illustrates the territorial effect of patents as well as what is meant by the extent of protection. It is about two companies that are commercially active in the market for cutting tools.

One of the companies – PAPER-FIX – produce in Italy scissors with eye rings that are covered by plastic. The plastic has good insulation properties, and the user's fingers do not get as cold when cutting paper as they do when using scissors made purely of metal. PAPER-FIX sell these insulated scissors in the UK.

Recently, PAPER-FIX were approached by a company called HAIRY-CUT, accusing them of infringing their patent. HAIRY-CUT's patent was granted for the UK and claims cutting means with two eye rings.

Question:

Are PAPER-FIX infringing HAIRY-CUT's patent?

The answer is shown on the next slide.

Optional

How is infringement determined? (I)

Claims

- Define the features of the invention = matter for which protection is sought
- Description and drawings are used to interpret the claims

Extent of protection

- Everything that is literally covered by the claims
- May also encompass equivalents

Infringement occurs when the infringing product possesses all the features of the claimed invention

Example:



PAPER-FIX produce scissors with eye rings covered by plastic in Italy and sell them in the UK

Are PAPER-FIX infringing HAIRY-CUT's patent?



HAIRY-CUT have a UK patent claiming cutting means with two eye rings

Intellectual Property Teaching Kit 25

The question of infringement is rather complex. In the European patent system, decisions on infringement are taken by the national courts. The EPC does, however, establish the principle that the scope of protection conferred by a European patent in the EPC contracting states is to be determined by the claims, with the description and drawings being used to interpret the claims.

In practice, this means that the extent of protection basically encompasses everything that is literally covered by the claims. However, it may in some cases also encompass so-called equivalents to the invention covered by the claims.

The example shown here is about two companies that are commercially active in the market for cutting tools. It illustrates both the territorial effect of patents, as well as what is meant by the "extent of protection".

PAPER-FIX is a company that produces scissors with eye rings that are covered by plastic. The plastic has good insulation properties. PAPER-FIX produce the scissors in Italy and sell them in the UK.

PAPER-FIX have been approached by a company called HAIRY-CUT, who have accused them of infringing their patent. HAIRY-CUT's patent was granted for the UK and claims "cutting means with two eye rings".

The question is, are PAPER-FIX infringing HAIRY-CUT's patent?

Slide 26

How is infringement determined? (II) (optional, animated slide)

This slide is animated. The first step is to assess whether the acts done by PAPER-FIX constitute acts of infringement. PAPER-FIX produce and sell allegedly infringing products. Production and sale qualify as acts of infringement when they are done without the permission of the patent owner.

The second step is to check the territories in which HAIRY-CUT have patents. They have a patent in the UK. So, if PAPER-FIX infringe HAIRY-CUT's patent, then this can only be the case for their sales activities in the UK.

The third step is to assess the scope of HAIRY-CUT's patent. HAIRY-CUT have patent protection for any cutting means with two eye rings. PAPER-FIX produce special scissors where the eye rings are covered with plastic. As the graphic on the slide shows, the scissors produced by PAPER-FIX fall within the extent of protection of HAIRY-CUT's patent, even if they comprise supplementary features (in this case plastic insulation). PAPER-FIX are therefore infringing HAIRY-CUT's patent. In order to be able to sell their scissors in the UK, PAPER-FIX must get a licence from HAIRY-CUT. Otherwise they may need to stop their sales activities in the UK market.

The situation in Italy is different. As HAIRY-CUT have no patent protection for Italy, the production of the insulated scissors by PAPER-FIX in Italy cannot constitute infringement. PAPER-FIX can therefore continue producing their products in Italy.

PAPER-FIX should check if anyone else has patents covering scissors with plastic eye rings in Italy or the UK – or any other country in which they want to sell them.

Next question

A third company, SHEAR-MAN, import garden shears into the UK.

Are they infringing HAIRY CUT's patent?

Firstly, importing counts as an infringing act.

Secondly, SHEAR-MAN's commercial activities are in a country for which HAIRY-CUT has patent protection, i.e. the UK.

Thirdly, the garden shears imported by SHEAR-MAN do not have eye rings, so they do not fall within the extent of protection of HAIRY-CUT's patent. SHEAR-MAN can therefore continue to import their garden shears into the UK market.

However, SHEAR-MAN should also check if anyone else has patents in the UK that cover this kind of garden shears.

Optional

How is infringement determined? (II)

Are PAPER-FIX infringing HAIRY-CUT's patent?

Cutting means with two eye rings

HAIRY-CUT's UK patent

PAPER-FIX sell in UK

Scissors with plastic eye rings

1. Generally speaking, production and sale are acts of infringement.
2. **UK:** Yes. The scissors are within the extent of protection.
3. **Italy:** No. HAIRY-CUT do not have a patent in Italy. PAPER-FIX and others can freely produce insulated scissors (provided no one else has a patent there → perform patent search!)

What about the garden shears imported into the UK by SHEAR-MAN?

UK: No. The shears do not have eye rings. They are outside the extent of protection.

Intellectual Property Teaching Kit 26

So, are PAPER-FIX infringing HAIRY-CUT's patent?

Firstly, we have to ask ourselves whether the acts done by PAPER-FIX constitute acts of infringement. PAPER-FIX produce products and sell them. Production and sale qualify as acts of infringement when done without permission.

Then we have to check in which territories HAIRY-CUT have a patent. They have a patent in the UK. So, if PAPER-FIX are infringing HAIRY-CUT's patent, then only in the UK. What about the scope of HAIRY-CUT's patent?. HAIRY-CUT have patent protection for any cutting means with two eye rings. PAPER-FIX produce special scissors where the eye rings are covered with plastic. As the graphic shows, these insulated scissors fall within the extent of protection of HAIRY-CUT's patent. Therefore, PAPER-FIX are infringing HAIRY-CUT's patent. PAPER-FIX must get a licence from HAIRY-CUT in the UK, otherwise HAIRY-CUT can stop them selling the scissors on the UK market.

What about in Italy? As HAIRY-CUT do not have patent protection for Italy, the production of insulated scissors by PAPER-FIX in Italy does not constitute infringement. Therefore, PAPER-FIX can continue producing their scissors in Italy.

By the way, PAPER-FIX should also check if anyone else has patents in the UK or Italy which cover scissors with plastic eye rings.

Continuing with our example, let's imagine that there is a third company called SHEAR-MAN.

They import garden shears into the UK.

Are SHEAR-MAN infringing HAIRY CUT's patent?

Importing counts as an infringing act. Moreover, SHEAR-MAN's commercial activities are in the UK, a country for which HAIRY-CUT have patent protection. But the garden shears they import do not have eye rings, so they do not fall within the extent of protection of HAIRY-CUT's patent. SHEAR-MAN can therefore continue to import them.

Once again, SHEAR-MAN should check if anyone else has patents in the UK that cover this kind of garden shears.

Slide 27

Advantages and disadvantages of getting a patent

Patent owners can exclude others from using their inventions. If the invention relates to a product or process feature, this may mean competitors cannot make products with the same features without obtaining a licence from the owner. This gives the owner a competitive advantage that can be turned into profit.

As European patents are examined by the European Patent Office rather than simply registered, the rights they afford are more certain than many other forms of legal protection available for inventions. Patent holders enjoy strong legal protection. For example, if a patent is infringed, the holder can sue for infringement or order customs to intercept imports of the products. However, as we have seen, patent enforcement costs can be substantial.

Patents can be annulled after they have been granted, either by a competitor successfully challenging the patent immediately after grant in an opposition procedure, or as a result of invalidation or revocation proceedings.

Another huge benefit of patents is that the invention becomes tradable. Because of the protection offered by the patent, the seller can tell prospective buyers the details of the invention without running the risk of the invention being stolen.

But patenting also has some drawbacks. First of all, patent applications are published after 18 months. This means that everybody (including competitors) can get a blueprint of your invention 18 months after the filing date or, if priority has been claimed, from the priority date. Furthermore, as we saw earlier, patents can be very expensive if broad international protection is sought.

Sometimes the time lag of several years from application to grant could mean that, by the time the patent is granted, the invention has already become obsolete. However, the published patent application does offer some limited protection, both factual (competitors are faced with the prospect that a patent grant will render their investments worthless) and legal. For details of the latter see Article 67 EPC (www.epo.org/law-practice/legal-texts/epc.html).

Advantages and disadvantages of getting a patent

Advantages

- Exclusivity enables investment and higher returns on investment
- Strong, enforceable legal right
- Makes invention tradable (licence, sale)

Disadvantages

- Reveals invention to competitors (after 18 months)
- Can be expensive
- Grant may take 3-5 years
- Patent enforceable only after grant; proceedings can be costly

The advantages of getting a patent include the fact that patent owners can exclude others from using their inventions. In other words, competitors cannot make products with the same features without obtaining a licence. This gives patent owners a competitive advantage.

European patents offer strong legal protection, as they are examined rather than simply registered. Patent rights are therefore more certain than many other forms of legal protection.

In case of infringement, patent holders can sue the infringer or order customs to intercept imports of patented products.

Last but not least, a patent makes an invention tradable. Sellers can tell prospective buyers the details of the invention without running the risk of the invention being stolen.

The disadvantages of patenting include the fact that patent applications are published after 18 months, so everybody, including competitors, can find out about the invention. The information is available free of charge from online databases such as Espacenet. However, the published application does offer some limited protection, both legal and factual. Factual means that the prospect of a patent being granted might discourage competitors from investing in the commercialisation of a potentially infringing product.

Finally, patents can be very expensive if broad international protection is sought. And because of the time lag of several years from application to grant, by the time the patent is granted, the invention may already have become obsolete. Also, enforcing patent rights may mean going to court, and this can be expensive.

Slide 28

Alternatives to patenting

Instead of patenting their inventions, some inventors opt to keep them secret or simply to publish them, while others do not care about intellectual property rights and do not do any of these.

The most frequent reason for (intentionally) publishing an invention without patenting it is that publishing costs very little compared with patenting. The benefit of publishing the invention is that others cannot apply for a patent on it any more. Inventions must be new in order to be patentable, and if the invention has been published before, then the "second" inventor cannot get a patent. In this way, the "first" inventor makes sure he will not be prevented from using the invention by a third party. The drawback of publishing the invention is that it can no longer be patented by the original inventor. Furthermore, publication will disclose the invention to competitors. Improvements might be patented by a third party and this might block the further development of the initial invention.

Keeping the invention secret is another option to avoid the cost of patenting and at the same time to avoid the invention being revealed to competitors. This is especially useful for manufacturing processes that are difficult to observe or reverse-engineer from the end product. In such cases it is very difficult to find out and prove that a competitor is infringing the patent. Trade secrets therefore offer the benefit of avoiding information disclosure while not sacrificing much of the protection that could be offered by a patent. Keeping an invention secret will often also incur costs, at least the cost of signing non-disclosure agreements with employees and partners. Even though trade secret law offers some protection, it is difficult to enforce. You need to prove that competitors have used unlawful means to find out about your trade secret.

Keeping an invention secret can be risky because competitors can reverse-engineer the invention or independently develop the same invention. They could even file a patent on the invention and might then be able to stop you developing your invention further (although the original inventor cannot normally be stopped from using the invention in exactly the same way as before). Another drawback of keeping the invention secret is that it is often difficult to actually keep secrets. Back in 1985, even before computer security problems could be exploited for industrial espionage on a large scale, a survey found that information on new products and processes became available to competitors on average within a year (Mansfield, 1985: How rapidly does new industrial knowledge leak out?, *Journal of Industrial Economics*, December 1985).

The final option – **to do nothing** – is obviously the cheapest way of handling an invention. However, it has no other benefits, and in fact has a number of substantial drawbacks. Other people might patent your invention, preventing you from using it unless you can prove that you used it before. You will not enjoy exclusivity, and everybody will be allowed to copy the invention. And according to the above-mentioned study, it is very likely that it will not be long before others find out about your invention.

Other non-patenting options include lead-time advantages (being the first to introduce the product to the market), learning curve effects (starting to learn about the technology earlier and thus maintaining a technical advantage), network effects (creating a user base or a technical standard first) and customer relations. In surveys, these means have been found to be at least as important as patent protection and other legal instruments. However, they are not only employed as alternatives to patent protection, but are instead often used in conjunction with them.

Alternatives to patenting	
Disclose (publish) the information	
<ul style="list-style-type: none"> Cheap Prevents others from patenting the same invention 	<ul style="list-style-type: none"> Does not offer exclusivity Reveals the invention to competitors
Keep it a secret	
<ul style="list-style-type: none"> Cheap (but there is the cost of maintaining secrecy) Does not reveal the invention 	<ul style="list-style-type: none"> No protection against reverse-engineering/duplication of invention Difficult to enforce Secrets often leak quite fast
Do nothing	
<ul style="list-style-type: none"> No effort required 	<ul style="list-style-type: none"> Does not offer exclusivity Competitors will often learn details

Intellectual Property Teaching Kit 28

What are the alternatives to patenting?

One option is to publish the invention in any newspaper, magazine, journal, book or public prior art database. Publication prevents others from applying for a patent on the same invention – although other prior patents might effectively block its use. At the same time, it discloses the invention to competitors, so improvements might be patented by a third party and this might block the further development of the initial invention.

Another option is to keep the invention secret. This is frequently used, especially for inventions that do not qualify for patent protection, and for production processes that cannot be reverse-engineered by analysing the end product. In the latter case, patent infringement would be very difficult to prove, so a patent might not be very effective. This option is inexpensive, although there is some

cost involved in the signing of non-disclosure agreements with employees and/or partners. Trade secrets are, however, difficult to enforce, and proof is needed that competitors have used unlawful means to find out the secret. On average, detailed technological information will leak out within a year.

The third option is to do nothing at all.

Other options have been found to be at least as important as patent protection and other legal instruments. These include lead-time advantages, in other words being the first to introduce the product to the market, learning curve effects, which involves starting to learn about the technology earlier and thus maintaining a technical advantage, network effects – creating a user base or a technical standard first – and customer relations. All of these options are often used in conjunction with patents, rather than to replace them.

Slide 29

What to consider before filing an application (animated slide)

This slide is animated. Each click reveals a further stage in the procedure.

If an invention is patentable it does not always follow that it will result in a commercially viable technology or product. Therefore, a careful weighing of the pros and cons is essential before filing a patent application. As patenting an invention can be very costly, you should also look into alternatives such as secrecy or utility models.

Think ahead and give some thought to the commercialisation of the invention as early as possible. A cost/benefit analysis should take into account the following questions. Is there a market for the invention? What kind of investment will it take to bring the invention to the market? Will you need technical and/or financial assistance from other companies to commercialise the invention? Having a patent is a distinct advantage if you are likely to seek financial support from venture capitalists or other investors. The potential markets and production sites will influence your decision in which countries to apply for a patent.

In order to get a first impression if an invention is new it is worth spending time on a prior art search. A prior art search can prevent you from wasting money on a patent application, in case the search reveals prior art documents that are likely to render the patenting of your invention impossible. Many online databases such as Espacenet give free access to patent documents. Ideally, the search should also cover the relevant technical and scientific journals, conference proceedings and websites of companies in the field. Professional search services are also available.

In order to get a clear picture of the patentability issues it is highly advisable to seek the advice of a patent professional at an early stage.

In many countries, national law or employment contracts require employees to transfer their rights to an invention to their employer (see also Article 60 EPC). It is important to find out about the specific legislation to avoid future disputes.

Employees or business partners who have contributed financially or technically to the development of an invention may also have acquired rights, so you should clarify all outstanding issues over the rights to the invention before filing any application.



What sort of things should you consider before deciding to file an application for a patent?

An invention may not always result in a commercially viable technology or product, so it is important to consider the advantages and disadvantages of patent protection. You should look into alternatives such as secrecy or utility models. You should also make a cost/benefit analysis. Is there a market for the invention? What kind of investment will it take to bring the invention to the market? Will you need technical and/or financial assistance from other companies to commercialise it?

You should get legal advice on whether the invention is patentable. You can of course

perform a patent search yourself using free online databases such as Espacenet, or have the search done by a professional service. You can also search relevant technical and scientific journals, conference proceedings and websites of companies in the field. But professional legal advice is a must.

Last but not least, you should clarify ownership of the invention. National law in your country, or your employment contract, may require you to transfer your rights to the invention to your employer. Employees or business partners who have contributed financially or technically to the development of the invention may also have acquired rights, so it is important to clarify all outstanding issues before filing the application.

Slide 30

What might happen if I decide not to patent my invention? (animated slide)

Patenting may not always be the right solution for your business. It is therefore important to understand what might happen if your company decides not to patent a patentable invention.

Somebody else might patent it

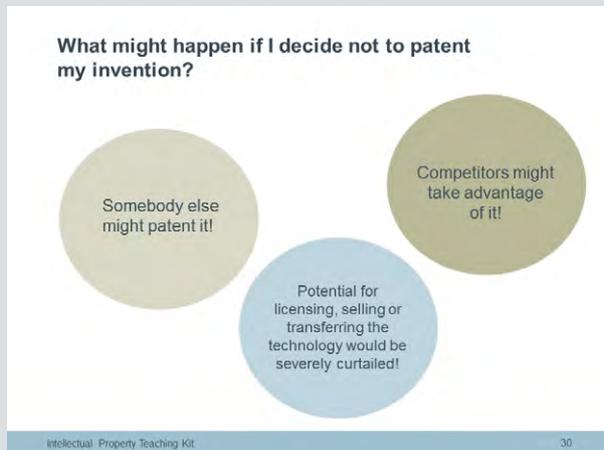
In most countries, where more than one person has filed a patent application for the same invention, the first person to apply will have the right to the patent. This means that if you do not patent your invention or if you file your application too late, somebody else might get a patent. As a consequence, the patent-holder will then be able to hinder you from entering the market. You will need to obtain a licence for using the (your own) invention.

Competitors will take advantage of your invention

If the product is successful, competitors will be tempted to make the same product by using your invention but without having to pay for such use. As they do not need to make up for the R&D costs you have invested they are likely to be able to produce a commercial product more cheaply and to compete at a lower market price. This can reduce your market share considerably.

The potential for licensing, selling or transferring the technology will be severely curtailed

Nobody is willing to pay for the right to use something that does not belong to anybody. Therefore, opportunities for licensing are severely hampered.



Patenting may not always be the right solution for your business. It is therefore important to understand what might happen if you decide not to patent a patentable invention.

First of all, somebody else might patent it. The first person to apply has the right to the patent. If you do not patent your invention, somebody else might get a patent on it instead. The patent-holder would then be able to exclude you from the market and you would need a licence for the product.

Secondly, competitors may take advantage of your invention. They may well be tempted to make the same product by using your invention but without having to pay for the use. And as they would incur virtually no R&D costs, they would be able to compete at a lower market price.

And finally, the potential for licensing, selling or transferring the technology would be severely curtailed. Nobody is willing to pay for the right to use something that does not belong to anybody.

Slide 31

How patents are used

Patents can be used for a variety of purposes. The most frequent one is to protect a company's products or processes from imitation. This is of obvious importance for the company's profits.

In the world of high-tech start-ups in particular, a company's expected economic success often critically depends on its IP rights, because larger competitors already exist who could otherwise simply copy the invention and sell it more cheaply. Investors will often refuse to invest in a new high-tech company if it does not have strong patents protecting its technology. Thus, patents also play an important role in attracting funding for new ventures.

Patents can serve other purposes beyond protecting a company's products. For example, owners can license their patents to other companies or use them to block the research efforts of their competitors (efforts that might endanger their own technological lead). And certainly there are patents that are simply not used.

A large-scale empirical study financed by the European Commission collected information from the inventors of more than 7 000 European patents in a range of industries. The results give an insight into how patents are actually used.

"Internal use" means that the patent is used to protect aspects of products the company manufactures or aspects of their manufacturing process. "Licensing" means the patent owner allows another company to use the invention for royalty fees. "Cross-licensing" means that two or more companies exchange licences to their patents. "Blocking competitors" means that the patents are not used to protect their own products or processes, but 'just' to hinder competitors from using the invention. "Sleeping patents" are those currently not used for any purpose.

There are large differences in the use of patents depending on country, industry and size of the company. For example, the percentage of patents used for licensing is much higher in biotechnology.

Licensing can be a means of benefiting from the invention without having to actually produce the products and/or set up a company. However, according to recent empirical research, collecting royalties is not the only focus of licensing activities (see below). In particular, giving licenses is often a means of gaining access to the patents and knowledge of other companies. Getting access to third-party patents can be crucial. In industries where inventions build upon each other and many patents are needed to be able to make a product (such as in semiconductors and telecommunications) cross-licensing agreements are the norm.

Patent use

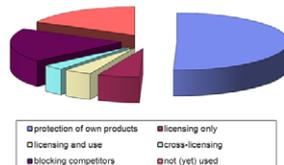
	Internal use (%)	Licensing (%)	Cross-licensing (%)	Licensing and use (%)	Blocking competitors (unused) (%)	Sleeping patents (unused) (%)	Total (%)
Electrical engineering	49.2	3.9	6.1	3.6	18.3	18.9	100.0
Instruments	47.5	9.1	4.9	4.3	14.4	19.8	100.0
Chemicals and pharmaceuticals	37.9	6.5	2.6	2.5	28.2	22.3	100.0
Process engineering	54.6	7.4	2.0	4.9	15.4	15.7	100.0
Mechanical engineering	56.5	5.8	1.8	4.2	17.4	14.3	100.0
Total	50.5	6.4	3.0	4.0	18.7	17.4	100.0

Distribution by technological class. Number of observations = 7 711.

Source: Giuri et. al. (2007): *Inventors and invention processes in Europe: Results from the PatVal-EU survey*, Research Policy, No. 36, pp. 1107-1127.

How patents are used

- Protecting products and processes
 - increasing turnover and profits
 - attracting investors
- Licensing
- Cross-licensing
- Blocking competitors
- Building reputation
- Not (yet) used



Survey of approx. 7 000 European patents in 2005

A survey of more than 7 000 patents showed that 50% were used to protect companies' own products and processes. 6% were used for licensing only, 4% for licensing and use, 3% for cross-licensing, and 19% for blocking competitors, and 17% had not yet been used.

It also established that there were substantial differences depending on country, industry sector and company size.

Cross-licensing is very important for certain industries. For example, ordinary mobile phones have to use technology protected by so many different patents that most mobile phone companies have made cross-licensing agreements to allow each other to use their respective patents.

Slide 32

The value of European patents (optional)

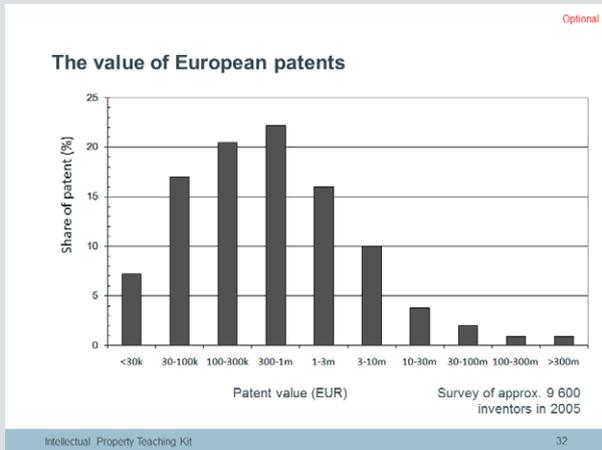
This chart illustrates the results of a large-scale empirical study carried out in 2005. It shows the distribution of the value of patents granted by the European Patent Office. According to these estimates, about 45% of all patents are worth up to EUR 300 000, about 20% are worth between EUR 300 000 and EUR 1 million, and 10% are worth between EUR 3 and EUR 10 million.

Background

A questionnaire was sent to the inventors of a random sample of patents applied for at the European Patent Office between 1993 and 1997. The questionnaire was returned by 9 600 inventors out of the 27 000 polled. In one of the questions, the inventors were asked, given all the information they had learned so far, to estimate the amount of money the patent owner could have sold the patent for to his strongest competitor on the day the patent was granted. Inventors responded by choosing one of the ten value categories shown here.

For more information see

http://ec.europa.eu/internal_market/indprop/docs/patent/studies/patentstudy-report_en.pdf



A survey of 9 600 inventors of applications filed with the EPO between 1993 and 1997 was carried out in 2005, some time after the patents had been applied for. The inventors were asked to estimate the amount of money the patent owner could have sold the patent for to his strongest competitor on the day the patent was granted. The chart shows the distribution of the value of patents issued by the EPO.

As we can see from the results, about 45% are worth up to 300 000 euros. About one in ten is worth between 3 and 100 million euros.

The distribution is skewed. Many patents have a low value and very few patents have a high value.

Slide 33

Re-inventing the wheel – literally

Researchers, scientists and engineers do not always review what has already been invented before starting a new project. As a result, many of their research projects yield results that others have not only already published, but perhaps also even patented. In many cases, inventors only find out that "their" invention has already been patented when informed to this effect by the patent office examining their application.

The precise extent of this duplication of R&D efforts is not known, as statistics are not available. But because patent offices search for prior inventions for each and every patent application they receive, they have some idea of the extent of the phenomenon. The Austrian Patent Office estimates that, in Europe, EUR 60 000 million are wasted each year on inventing what has already been invented (Annual Report 2006).

In 2005, the president of the Association of Austrian Inventors noted that the extent of duplication in R&D means that "up to 10 000 of the 30 000 inventors active in Austria work to no avail" (Mario Wally (2005): "Doppelt gemoppelt", profil extra, February 2005, 24-25). ProVendis, the technology transfer agency of a number of German universities, estimates investments in duplicate R&D in Germany to be EUR 12 000 million per year, or 25% of total R&D spending.

Lessons to be learned

- Search the literature, patents and other information sources before starting any project.
- Search again at project milestones; your project goal might have changed and other inventors might have been active too.

Reinventing aircraft wheels

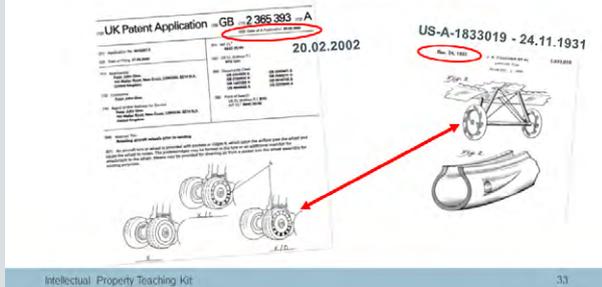
This slide gives estimates for the extent of the duplication of R&D efforts and presents a real-life example in which someone literally reinvented the wheel. In 2000, a patent application was filed for an invention that solves the problem of excessive wear (or even explosion) of aircraft wheels due to high acceleration when touching the ground. It uses small pockets on the side of the tyres that make the wheels spin in the wind without the need for an additional electrical motor. What the inventor did not know was that this invention had already been made in the early days of airplane technology. A US patent application that described the same invention had been filed (and almost forgotten) way back in 1929.

This case highlights two important points:

- Searching the patent literature is worth the effort.
- The problem you are looking to solve might already have been solved, and the solution might even be free to use (the 1929 patent expired some time ago).

Re-inventing the wheel - literally

- 15-25% of all R&D efforts are wasted each year on inventions that have already been invented.
- Don't start your R&D until you have done a search!



According to the figures provided by the Austrian Patent Office in its annual report 2006, the replication of R&D results costs anything up to EUR 60 000 million a year in Europe alone. The President of the Association of Austrian Inventors estimated that up to 10 000 of the 30 000 inventors who are active in Austria work "to no avail". The technology transfer agency ProVendis estimates that 25% of all German R&D investment is wasted by duplicating R&D that has already been done.

In the example shown on the side, the application relates to the technical problem of the excessive wear or even explosion of aircraft

wheels due to high acceleration when touching the ground. The proposed solution provides for small pockets on the side of the tyres that make the wheels spin in the wind without the need for an additional electrical motor. This invention had already been made in 1929, when a US application was filed which described it.

The key message here is, always perform a prior art search! You should check the literature, including articles and patents, before you start your project. You should also search again at various project milestones. Your project might have changed and other inventors might have been active, too.

Slide 34

Solutions found in patent documents (animated slide)

This slide is animated. Patents are a unique source of information. Studies have shown that in some technical fields around 80% of the information contained in patent documents cannot be found anywhere else. The exact percentage depends on the technical domain and the value of the knowledge. The more valuable a piece of scientific or technical knowledge, the more likely it is that it will be published in a patent.

In a recent large-scale study in the field of chemistry, a total of 34 000 new chemical compounds in various domains such as polymers, alloys, etc. were traced in scientific journals and in the patent literature. It was found that, depending on the field, up to 77% of new compounds were published in patents only, and not in journals. In total, 10 300 compounds (30%) could only be found in patents. Only 1 200 compounds documented in patents (11% of what was found in patent documents) had also been published in journals.

In addition to the absence of many R&D results from journals, there is another important difference between the two information sources: research papers focus on the findings of the research (their contribution to science), while patents focus on how to actually make the invention work.

Reviewing the journal literature only would mean missing out on a large amount of valuable knowledge. Furthermore, companies often do not want to disclose their new product development activities and do not publicly report such information. But very few companies intentionally forgo patent protection for the sake of surprising competitors with new products. As all patent applications are published just 18 months after the priority date, patent data contains new information on a company's new product development activities which cannot be found elsewhere.

The time factor

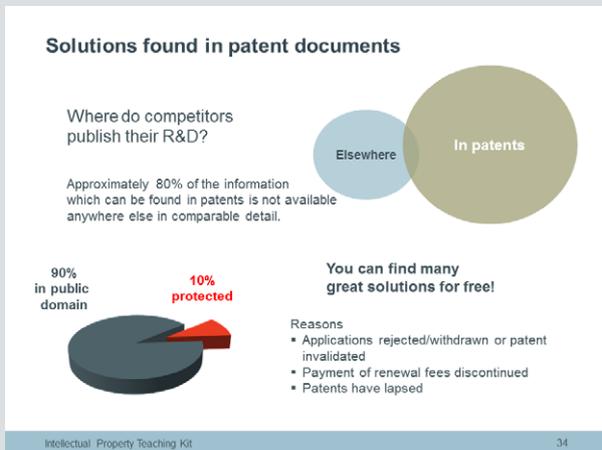
Patent applications take 18 months to be published. This may seem like a long time. But publication in peer-review journals takes time too. In many cases, the patent application will be published before the corresponding academic paper.

Additional benefits of patent information

- Patents have a uniform structure throughout the world.
- Almost all patents can be viewed free of charge. So access to them does not depend on your library's financial budget.

Most documents in patent databases concern inventions that are free to use by everyone. Depending on the patent office, the figure can be as high as 90%. This is due to several reasons:

- A substantial number of all published patent applications are withdrawn by the applicant or rejected by the patent office. This means that these patent applications never became patents. Although an application might have been withdrawn, the published application document can still be retrieved (except if the application was withdrawn before the publication was made). Furthermore, some patents are found to be invalid in opposition proceedings or in the courts.
- To maintain a patent, the applicant or owner must pay renewal fees. If the patent does not appear economically attractive any more, the owner will discontinue payment of the renewal fees and the patent will lapse. From that point in time onwards, anybody can use the patent for free. This does not only apply to worthless inventions; patent holders may not have realised the full potential of a patent or they may have simply abandoned it because it did not relate to their core business.
- Even if renewal payments are made, a patent will last a maximum of 20 years from the date of filing (with some exceptions). Thus, almost all patents filed more than 20 years ago are free to use. There are many examples of "old" inventions that are not necessarily outdated, including pharmaceuticals, superconductors and the internet (invented in 1973!).



In some technical fields approximately 80% of the information that can be found in patents is not available anywhere else in comparable detail. Patents focus on how to make things work, while scientific articles focus on the scientific contribution.

Also, your competitors will "announce" their new products in patents if they want to have patent protection!

There are a number of reasons why most patent documents describe inventions that

are free to use. Firstly, the application may have been rejected or withdrawn or the patent invalidated. Secondly, payment of the renewal fees may have been discontinued if the owner saw no further value in the patent. And finally, the patent may have lapsed.

"Old" solutions are not necessarily "outdated". Just think, for example, of antibiotics, superconductors or the internet, which was invented back in 1973.

Slide 35

Searching for patents is easy

Everyone involved in research and development activities should be aware of patents. Even if you have not yet reached the stage of filing a patent application, the technology described in the EPO's free databases can be very valuable.

The EPO and many other patent offices offer free patent databases. What is special about the EPO's Espacenet database is that it contains most worldwide patents in one database. The amount of technical information in this patent documentation collection is phenomenal, with data from 1836 up to the present day. The EPO's databases are probably the largest single source of information on technology in the world today.

At www.espacenet.com you will find not only the search interfaces, but also online help and many tools that make finding patents easier.

Espacenet offers both a simple quick search and more advanced search options. To start with you could try using the quick search function to search for the name of a well-known researcher.

When viewing a patent in Espacenet, you get links to other patents cited in the prior art search report and to the patents that cite the patent that you are viewing. You will also find information about the countries in which protection is sought and links to the legal status information.



Anyone involved in research and development activities needs to be aware of patents. Even if you have not yet reached the stage of filing a patent application, the technology described in the EPO's free databases can be very valuable.

You can use Espacenet to watch new technologies emerge, find solutions to your technical problems, discover what your competitors are developing, and identify potential business partners.

Espacenet is easy to use and contains more than 90 million documents from 80-plus countries, covering data from 1836 to today. It is probably the largest single source of information on technology in the world today. Free to use, it has forward and backward citations and an online translation tool providing machine translations between English and 31 other languages.

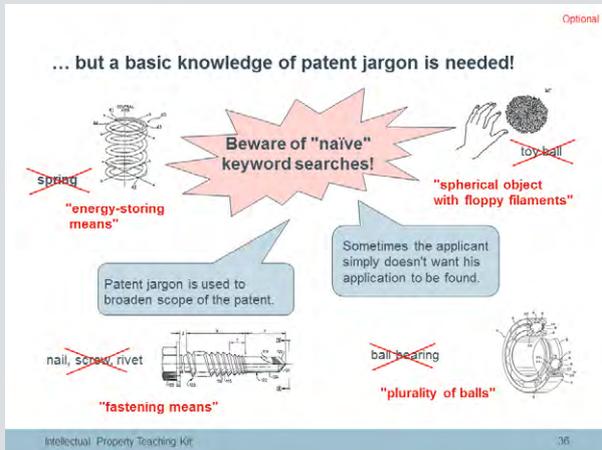
Slide 36

... but a basic knowledge of patent jargon is needed (optional, animated slide)

This is an animated slide. Click through the four examples.

Simple or "naïve" keyword searches have very limited effectiveness. When describing their inventions, applicants frequently use broad concepts instead of intuitive keywords, either to broaden the scope of the patent or to deliberately make it harder to find.

The examples of patent jargon shown here are meant to provide an amusing conclusion to the lecture. You may like to introduce them with a humorous comment, along the lines of: "We engineers like to call a spring a spring. But that's not how patent attorneys see it. Let's have a look at the language they use."



Engineers like to call a spring a spring. But that's not how patent attorneys necessarily see it. Let's have a look at the kind of language they use.

Simple, "naïve" keyword searches have very limited effectiveness, because applicants and attorneys will often use the kind of jargon shown on the slide to broaden the scope of the patent or to deliberately make it harder to find.

Slide 37

Quiz (optional, animated slide)

This slide is animated.

1. Can anyone apply for a patent?

Patent applications can be filed by the inventor or the inventor's employer. Inventions are usually the property of the company that employs the inventor. The inventor has the right to be named on the application/patent.

2. Who is the inventor?

The inventor is the person who conceived the invention. He has the right to be named on the patent document.

3. What is the difference between patent holders and inventors?

The person or company who files the patent application is the applicant, holder or owner of the patent. The applicant is often the company or research institution that employs the inventor. The inventor may also be the applicant.

4. What can you get a patent for?

Patents can be obtained for inventions in a technical field, for instance a product, a process or an apparatus.

5. What are the requirements for obtaining a patent?

An invention is defined in the patent claims. It must be new, inventive and susceptible of industrial application.

6. What is the term of a patent?

The term of a patent is the length of time for which it is valid. Patents can be valid for up to 20 years, or longer in certain technical fields (such as pharmaceuticals).

7. What routes are there for obtaining a patent in Europe?

1. Filing an application with a national office: one application per country.
2. Filing with the European Patent Office: via one application applicants can obtain protection in up to 42 European countries.
3. Filing an international patent application (PCT) with certain patent offices worldwide: one application at the initial stage. Applicants can proceed with national applications in the countries they choose at a later stage.

8. What is the difference between a patent application and a patent?

A patent application is the set of documents the applicant needs to file in order to request the grant of a patent. If the application fulfills the necessary requirements, the patent office grants a patent on the basis of these documents.

9. Even if an invention is patentable, is it always wise to apply for a patent?

Filing a patent application is a business decision. A cost/benefit analysis is necessary to decide this. Other means of protection may be an option.

Quiz

Optional

1. Can anyone apply for a patent?
2. Who is the inventor?
3. What is the difference between patent holders and inventors?
4. What can you get a patent for?
5. What are the requirements for obtaining a patent?
6. What is the term of a patent?
7. What routes are there for obtaining a patent in Europe?
8. What is the difference between a patent application and a patent?
9. Even if an invention is patentable, is it always wise to apply for a patent?



2 Patent case study

Patent case study

List of slides

Slide 38	Patent case study
Slide 39	Two companies with two very different IP strategies
Slide 40	Question
Slide 41	Answer
Slide 42	What did Xerox PARC do wrong?
Slide 43	What do all these companies have in common?
Slide 44	What happens if you don't protect your IP?
Slide 45	How did Xerox learn from this experience?
Slide 46	A different approach: The case of Célula 3PP
Slide 47	What did Célula 3PP do?
Slide 48	Célula 3PP's IP
Slide 49	A success story thanks to IP
Slide 50	Online resources

Slide 38
Patent case study



Slide 39

Two companies with two very different IP strategies

This case study is based on the example of two companies with two very different patent and IP strategies. One is a big, internationally known company that made some IP mistakes early on in its life which allowed others to benefit from its R&D efforts. The other is an SME that sought help from a patent information centre and was advised to patent its inventions and register its trade marks and designs.

The case study will illustrate how patent protection prevents others from using your technology and the results of your work for free. Patents can act as 'flags' to let others know we own that technology and that we are experts in that field, attracting investors, top collaborators and companies to partner with. The strategic use of patent information can help you keep track of competitors' R&D, and patent monitoring can help prevent and avoid infringement suits.

Two companies with two very different IP strategies

1. Large internationally known company
2. SME



Two very different IP strategies

This case study is based on the example of two companies with two very different patent and IP strategies. One is a big, internationally known company that made some IP mistakes early on in its life which allowed others to benefit from its R&D efforts. The other is an SME that sought help from a patent information centre and was advised to patent its inventions and register its trade marks and designs.

Slide 40

Question

According to Wikipedia, a disruptive innovation is an innovation that helps create a new market and value network, and eventually disrupts an existing market and value network (over a few years or decades), displacing an earlier technology. The term is used in business and technology literature to describe innovations that improve a product or service in ways that the market does not expect, typically first by designing for a different set of consumers in a new market and later by lowering prices in the existing market.

Question

Who invented

- the personal computer (PC)?
- the point-and-click graphical user interface (GUI)?
- the laser printer?
- the Ethernet?

Do you know which company invented all these disruptive technologies in the 1970s? The answer may surprise you.

Slide 41

Answer

All these technologies were invented by Xerox PARC. PARC stands for Palo Alto Research Center. Founded in 1970 as a division of Xerox Corporation, Xerox PARC is a research and development company in Palo Alto, California with a distinguished reputation for its contributions to information technology and hardware systems.

It pioneered the personal computer, the point-and-click graphical user interface (GUI), the laser printer and the Ethernet (Xerox private LAN), but it never earned a big profit from them, because it failed to patent the technologies involved. Great ideas were lost in the copier giant's bureaucracy, as it did not invest in patenting anything outside the company's core business of copy machines.

Answer

- They were all invented by Xerox PARC

The answer is Xerox PARC. The company invented the personal computer, the point-and-click graphical user interface or GUI, the laser printer and the Ethernet.

Slide 42

What did Xerox PARC do wrong?

If it's not patented, it's not protected!

Anyone can take advantage of your invention if you don't protect it.

That's why you should always apply for a patent or keep your work secret until you do.

If you do not apply for a patent, anyone could buy one of your products and reverse engineer it to find out how it is made and replicate it with a different brand.

You should at least keep them secret, in case you decide to patent when the conditions are right. You should not disclose them or the competition may copy or improve upon them.

If you don't protect your IP, other companies or individuals can freely use the results of your work.

What did Xerox PARC do wrong?

- They didn't patent the technologies they invented, and these technologies were later used by others with great success.
- They did not keep them secret.

If you don't protect your innovations, other companies or individuals are free to use the results of your work.

This is what happened to Xerox PARC.

And if the time is not right, at least keep them secret so they don't lose novelty or get copied by the competition.

Slide 43

What do all these companies have in common?

All these companies benefitted from inventions that were originally made by Xerox PARC.

Apple's Macintosh computer GUI was inspired by a tour of PARC that Steve Jobs took in 1979. Jobs did the same with UNIX as the basis for the MAC OS and with PortalPlayer as the platform for the iPod, making him and Apple the precursors of Open Innovation.

Later, Xerox's GUI also inspired Microsoft Windows.

Xerox developed one of the first PCs (ALTO), but IBM became famous for inventing the PC. The laser printer is in HP's hall of fame, but it was first invented by Xerox.

According to "Rembrandts in the Attic: Unlocking the Hidden Value of Patents", by Rivette and Klein (2000), "The failure to patent the results of innovative research can also lead to huge financial and strategic losses, as illustrated by Xerox's decision in 1979 not to patent its invention of the graphical user interface (GUI) that later formed the basis of Apple's Macintosh and Microsoft's Windows personal computer operating systems."

According to a 2011 article by Lucy Kellaway in the Financial Times Online, "Even Apple, which is always held up as an example of a company that does things its own way, built some of its most important technology after Steve Jobs first saw it at Xerox."

What do all these companies have in common?

- Apple
- 3Com
- Adobe Systems
- Microsoft
- IBM
- Hewlett Packard

Intellectual Property Teaching Kit

43

What do these companies have in common?

They all benefitted from inventions originally made by Xerox PARC.

Apple's Macintosh computer GUI was inspired by a tour of PARC that Steve Jobs took in 1979. Later, Xerox's GUI also inspired Microsoft Windows.

Xerox developed one of the first PCs – the ALTO – but IBM became famous for inventing the PC.

The laser printer is in HP's hall of fame, but it was first invented by Xerox.

Slide 44

What happens if you don't protect your IP?

What happens if you don't protect your IP?

- You're not protected!
- Others will be happy to capitalise on your ideas ... for free!

Intellectual Property Teaching Kit

44

If you don't protect your intellectual property and your R&D results, anyone can use this knowledge and information for their own benefit.

In the vast majority of countries, disclosing your invention before filing a patent application means that it will no longer be new, which in turn means that you cannot protect it, and others may profit from it.

Also, if you patent your invention in one country, others can copy and replicate it in a country where you didn't file for protection.

Besides protecting your intangible assets, patents act as 'flags' or 'lighthouses' that attract talent, investors, customers and partners.

Slide 45

How did Xerox learn from this experience?

To make sure that this did not happen again, Xerox set up XNE (Xerox New Enterprises) to exploit the new inventions generated by PARC. They now license technologies to other companies for a fee or royalty.

Some of these technologies are spun off, earning huge returns when the companies go public on the stock market.

Xerox also set up XIG (Xerox Innovation Group) to manage R&D, intellectual property, business development for licensing and new business opportunities.

More information can be found at www.xerox.com/en-us/innovation and www.xerox.com/downloads/usa/en/innovation/innovation_xig_brochure.pdf

How did Xerox learn from this experience?

- XNE (Xerox New Enterprises)
 - Licenses technologies for a fee or royalty
 - Some are spun off, earning huge returns when the companies go public on the stock market
- XIG (Xerox Innovation Group)
 - R&D
 - IP
 - Business development for licensing
 - New business opportunities

Intellectual Property Teaching Kit

45

What did Xerox learn from this experience?

What new strategies did they adopt?

They created a company called XNE - or Xerox New Enterprises – to exploit new inventions generated in PARC, and they license these technologies for a fee or royalty.

Some of these technologies are spun off, earning huge returns when the companies go public on the stock market.

They also set up XIG – the Xerox Innovation Group – to manage R&D, intellectual property, business development for licensing and new business opportunities.

Slide 46

A different approach: the case of Célula 3PP

A different approach: the case of Célula 3PP

- Micro-company set up in 2007
- Spin-off from TOPO, a plastics injection company from the Marinha Grande region of Portugal
- Challenged by customer to make a cheaper and more efficient valve
- How did they go about tackling this challenge?

Intellectual Property Teaching Kit

46

Célula 3PP is a Portuguese micro-company which was set up as a spin-off from TOPO, a well-established mould company in Portugal's Marinha Grande region. The Marinha Grande region is known around the world for its mould industry, which produces precision moulds for the plastics, glass and crystal industries, with companies such as Samsonite, Mercedes-Benz, Porsche and Nokia relying on the area's engineering and expertise.

This industry is very innovative and technologically advanced, competing worldwide and maintaining a strong presence in the market. In general, the mould companies are small and medium-sized (15 employees on average). They work by the principle of production on demand and are very customer-driven.

Célula 3PP was set up in response to a challenge from one of TOPO's customers to make a cheaper and more efficient valve than those currently on the market.

But how could they find out the features of all the other valves in the market? How could they be sure that they would not be copying somebody else's valve and infringing their rights?

Slide 47

What did Célula 3PP do?

To find out about the valves already on the market, Célula made use of the patent information resources available online.

The EPO's Espacenet database (www.espacenet.com) is an excellent resource because it also allows users to access the examiners' search reports via a link to the European Patent Register.

Although several of the patents Célula 3PP found were in the public domain, making them free to use, they went on to develop a new air and liquid valve made of polypropylene (PP) which did not infringe any patents already in force.

The information they found in the patent literature allowed them to avoid mistakes and leveraged their knowledge about materials suitable for the valve they wanted to develop.

They also obtained advice from their regional IP support office.

The company then obtained a development grant of EUR 1 million at an innovation fair. In 2014 it was reported that a number of companies were interested in the product, and that Célula planned to launch the product on the market in two to three years' time

Other sources of patent information:

- Intellectual Property Digital Library (<http://www.wipo.int/ipdl/en/overview.html>)
- United States Patent and Trademark Office (www.uspto.gov)
- PatentScope (www.wipo.int/pctdb/en)



To find the answers to these questions, Célula 3PP searched in a number of sources, including the EPO's Espacenet database, WIPO's Intellectual Property Digital Library, the website of the United States Patent and Trademark Office and WIPO's PatentScope database.

Espacenet is an excellent resource because it also allows access to examiners' search reports via a link to the European Patent Register.

Although several of the patents found were in the public domain, making them free to use, Célula developed a new air and liquid valve made of polypropylene (PP) which not infringe any existing patents. The result was the valve shown here on the slide.

What IP rights do you think the company could and should apply for?

Slide 48
Célula 3PP's IP

Célula 3PP's IP

- Patent
- Industrial design
- Trade mark (Tethys)

(11) EP 2 250 412 B1

EUROPEAN PATENT SPECIFICATION

(43) Date of publication and mention of the grant of the patent: 20.06.2012 - Bulletin 2012/255

(51) Int. Cl.: F16K 21/06 (2006.01) B29C 45/00 (2006.01) B29C 40/16 (2006.01)

(21) Application number: 08724035.4

(86) International application number: PCT/PT2008/000011

(22) Date of filing: 07.03.2008

(87) International publication number: WO 2009/110813 (11.09.2009 Gazette 2009/37)

(54) MONOBLOCK BALL VALVE AND MANUFACTURE METHOD THEREOF
MONOBLOCKKUGELVENTIL UND HERSTELLUNGSVERFAHREN DAFÜR
CLAPET A BILLE MONOBLOC ET SON PROCÉDE DE FABRICATION

(84) Designated Contracting States: AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR

(72) Inventor: DOMINGUES MATOS, Arnaldo P-2420-012 Marinha Grande (PT)

(43) Date of publication of application: 17.11.2010 - Bulletin 2010/48

(74) Representative: Ferreira, Maria Sílvia Clark, Modet & Co Rua Castilho, 85-9 1200-153 Lisboa (PT)

(73) Proprietor: Célula 3pp, S.A. 2421-908 Marinha Grande (PT)

(56) Reference cited: EP-A- 0 242 927 DE-A1- 4 454 716 DE-A1- 4 440 978 GB-A- 1 202 559 GB-A- 1 580 278 US-A1- 2004 112 562

- <http://patentscope.wipo.int/search/en/WO2009110813>

Intellectual Property Teaching Kit 48

Célula 3PP filed an international patent application under the Patent Cooperation Treaty to cover all major markets and protect their intellectual work. A European patent based on this application has been already granted.

They also filed an industrial design application and considered registering the name Tethys as a trade mark.

What other IP rights could they have applied for?

They could have applied for

- a trade mark for "Célula 3PP"
- a domain name such as *www.celula3pp.pt* or *www.tethys.pt*
- utility models, for subsequent improvements to the valve.

They could also have considered designations of origin or geographical indications such as "Made in Portugal" or "Made in Marinha Grande".

Slide 49

A success story thanks to IP

The valve can be used in industry (agriculture, washing machines, industrial cleaning, etc.) or for domestic purposes (gardening, cleaning, etc.). Célula obtained a grant of EUR 1 million for developing it, and several companies have already been interested in it.

A success story thanks to IP

- Industrial property
- Patent information
- GAPI (IP support centre)
 - 22 offices in Portugal
 - www.marcasepatentes.pt/index.php?section=228

Intellectual Property Teaching Kit 49

To conclude, the success of the Célula story is based on their use of patent information to find out about existing valves, so that they could create an air and liquid valve unlike any other on the market, and the creative insights they obtained from their analysis of more than 30 patent documents relating to existing valves.

The result was a new product made of polypropylene. An international PCT application was filed in 2008 and published in 2009, a trade mark was registered and a US design patent acquired. A European patent based on the PCT application has already been granted.

Without the patent analysis procedure, and without the help of the regional IP support office, the product may never have got off the ground, or might have been very different.

Slide 50

Online resources

More about patents and other forms of IP

- www.epo.org
- www.espacenet.com
- www.wipo.int
- <http://patentscope.wipo.int/search/en/search.jsf>
- www.wipo.int/reference/en/

More about Xerox and PARC inventions

- <http://en.wikipedia.org/wiki/Xerox>
- http://en.wikipedia.org/wiki/Xerox_PARC

More about Célula 3 PP

- <http://Ingroup.swork.biz/celula3pp/index.php?id=1229>
- <http://patentscope.wipo.int/search/en/WO2009110813>

Online resources

- **Patents and other IP tools**

- www.epo.org
- www.espacenet.com
- <http://wipo.int>
- <http://patentscope.wipo.int/search/en/search.jsf>
- www.wipo.int/reference/en/

- **Xerox and PARC inventions**

- <http://en.wikipedia.org/wiki/Xerox>
- http://en.wikipedia.org/wiki/Xerox_PARC

- **Célula 3PP**

- <http://ingroup.swork.biz/celula3pp/index.php?id=1229>
- <http://patentscope.wipo.int/search/en/WO2009110813>

Here are some links to sources of further information.

3 Patent exercises

Patent exercises

List of slides

Slide 51	Patent exercises
Slide 52	About this module
Slide 53	Cover page of a typical patent document
Slide 54	The parts of a patent document (I)
Slide 55	The parts of a patent document (II)
Slide 56	More about the claims
Slide 57	Requirements for patentability
Slide 58	The test for novelty
Slide 59	Two examples
Slide 60	Sugru (I)
Slide 61	Sugru (II)
Slide 62	What does sugru look like?
Slide 63	History of the sugru patent
Slide 64	Exercise 1
Slide 65	Claims at the PCT stage
Slide 66	Claim 1 of the PCT application
Slide 67	Is it novel?
Slide 68	What did the applicants do next?
Slide 69	Comparison between original PCT claim 1 and the amended EP version
Slide 70	Patent status of sugru as of March 2013
Slide 71	Example 2: Hövding airbag cycle helmet
Slide 72	What does the airbag helmet look like?
Slide 73	Exercise 2
Slide 74	What did Hövding claim in their PCT application?
Slide 75	Claim 1 of Hövding's PCT application
Slide 76	Is it novel?
Slide 77	What did the applicants do next?
Slide 78	Comparison between original PCT claim 1 and the amended claim
Slide 79	What did the examination report say and what happened next?

Slide 51
Patent exercises

PATENT EXERCISES

Slide 52

About this module

Students should be able to look at a patent document and make sense of what all the different dates mean. The importance of dates – in determining novelty, for instance – is a core concept. Students also need to be aware that the claims determine the scope of protection conferred by the patent and the extent of the exclusive rights. It is the patent attorney's job to write claims which will give the maximum scope of protection. However, as a patent application proceeds through the examination process, the claims are likely to evolve. Certain claims may not be allowed and some may be allowed only in restricted form, depending on whether the claimed invention is novel, involves an inventive step and is industrially applicable.

This module starts with a recap of the information from the patents advanced module. What does a patent document cover page look like? What do the different dates mean? What are the different parts of a patent document? What happens during the examination procedure? And what are the requirements for patentability, including novelty and inventive step?

Two case studies are discussed – sugru (hand mouldable self-curing rubber) and the Hövding airbag helmet, both of which originated in universities in Europe – and a number of exercises are provided.

About this module

- Recap
 - What does the cover page of a patent document look like?
 - What does a patent document consist of?
 - What are the requirements for patentability?
- Patent case studies
 - The significance of dates in the patent process
 - What happens during examination
 - How claims evolve during examination

We will start this module with a recap of some of the most important information about patents. We will look at the cover page and various other parts of a typical patent document, and the requirements for patentability.

We will then look at two case studies concerning inventions originating from European universities. These case studies will be accompanied by exercises to test your knowledge and understanding of patents and patenting.

Slide 53

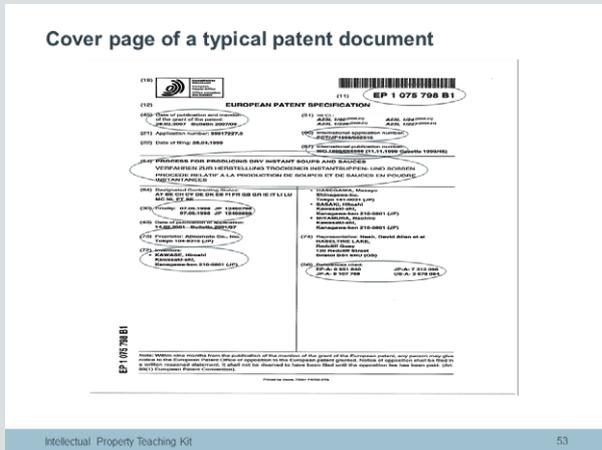
Cover page of a typical patent document

For a general explanation, see slide 9, "What do patent documents look like?" (p. 26).

German patents, for example, start with DE. CN stands for China, CA for Canada, JP for Japan, and so on, in accordance with the international two-letter country codes (http://ep.espacenet.com/help?locale=en_EP&method=handleHelpTopic&topic=countrycodes).

The Patent Cooperation Treaty (PCT) is an international treaty enabling applicants to seek protection for their inventions in 148 countries by means of a single international patent application. The PCT system is administered by the World Intellectual Property Organization (WIPO) (www.wipo.int/pct/en/). The international patent application was published as WO1999/056566 on 11 November 1999 (87).

Paragraph (73) identifies the owner/proprietor of the patent. It is important to distinguish between the patent proprietor/applicant and the inventor. Obviously, the inventor is the person who created the invention. He may also be the applicant or proprietor. However, the ownership of or right to apply for a patent is frequently passed from the inventor to, for example, his employer by virtue of an agreement or assignment. Such assignments are recorded at the patent office so that the public can understand how the ownership came about. In our example, the invention was made by four people whose names are given in paragraph (72). The proprietor of the patent is the company Ajinomoto Co., Inc. of Japan (73).



The slide shows the cover page of a typical European patent. The information on it provides a wealth of detail about the filing itself and the parties involved. Let's examine each of the sections marked on the page.

In the top right-hand corner is the number, EP1075798B1. EP indicates that the document is a European patent. 1075798 is the unique number of the patent. The B indicates that this is a granted patent. An A at the end of the number would indicate that it is a patent application.

The date of publication and mention of the grant of the patent – the date on which the grant of a patent took effect – is shown in paragraph (45).

The international application number is PCT/JP1999/002310, as shown in paragraph (86). This number indicates that the application was filed via the PCT route in Japan – "JP" – in 1999. Paragraph (22) gives the precise date of filing as 28 April 1999. The application number

is 002310. As we can see in paragraph (87), the international patent application was published as WO1999/056566 on 11 November 1999.

Paragraph (30) indicates the priority dates and the numbers of any patent applications from which priority was claimed. In this example, priority was claimed from Japanese patent applications JP12450798 and JP 12450898 filed on 7 May 1998. Thus, only the prior art available before this date was taken into account when assessing the patentability of the invention. Paragraph (56) shows the references cited in the patent document denoting what has been considered the prior art by the patent office in the course of a search or examination procedure.

Paragraph (73) identifies the owner of the patent, while paragraph (72) lists the inventors. In our example, the invention was made by the four people whose names are given in paragraph (72). The proprietor of the patent is the company Ajinomoto Co., Inc. of Japan.

As stated in paragraph (54), the invention relates to a process for producing dry instant soups and sauces. Paragraph (51) provides one or more international classification codes. These classification codes are important for searches in patent databases. The international classification A23 states that the invention is in the class which relates to "foods or foodstuffs; their treatments, not covered by other classes".

Slide 54

The parts of a patent document (I)

The parts of a patent document (I)

- Title
- Abstract
 - Short summary of the invention
- Description
 - Field of the invention (the technical area to which the invention relates)
 - Background of the invention (details of the prior art)
 - Detailed description of the invention: how does the invention provide a technical solution to the technical problem?

Patent documents consist of the title of the invention, an abstract (which is a short summary of the invention) and a description.

The description includes details of the field or technical area of the invention and the background to the invention. It outlines the technical problem that the invention seeks to solve and how others have tried to address it. It flags the technical problem to be solved by the invention, but does not reveal the invention itself.

The background of the invention sets out what existed to solve the technical problem in the field of application before the invention came along, along with the problems and drawbacks associated with the "state of the art". This state of the art is referred to as the "prior art".

This is followed by a specific or detailed description of the invention, including how it provides a technical solution for the technical problem, all possible uses and applications, and how to make or construct it. This is the part where your patent attorney will use every possible application of the invention to describe in detail how it addresses the problems cited in the background to the invention.

Slide 55

The parts of a patent document (II)

The parts of a patent document (II)

- Description (cont.)
 - Brief description of the drawings
 - Detailed description of at least one way of carrying out the invention (embodiment of the invention)
- Claims
 - What is the scope of the invention/the protection sought?
- Drawings (if any)

The description also contains a brief description of the drawings, plus a detailed description of at least one way of carrying out the invention, which is referred to as the embodiment of the invention.

The claims describe the scope of the invention.

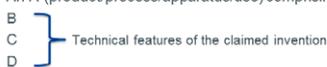
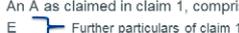
There are independent claims and dependent claims. We will see what the difference between them is on the next slide.

Finally, patent documents also usually contain a drawing or drawings illustrating the invention.

Slide 56

More about the claims

More about the claims

- Two types of claim
 - Independent claims: the invention in its broadest scope
 - Dependent claims: any claim which includes all the features of any other claim
- Independent claim
 - Claim 1 An A (product/process/apparatus/use) comprising
 - B
 - C
 - D
- Dependent claim
 - Claim 2 An A as claimed in claim 1, comprising
 - E

As we have just seen, the claims of a patent application define the matter for which protection is sought. They express the subject-matter in a technical manner which will allow people who read the patent document to understand what is being claimed by the patentee as his invention. Claims may relate to a product, an apparatus or entity, or a process, use or activity.

Independent claims are directed to the essential features of an invention. Dependent claims relate to further details of the features of the independent claim.

In the example on the slide, "A" could, for example, be a device or apparatus for mixing concrete, or a process for stabilising an emulsion, or a method for making something.

B, C and D are the features defining what the invention claimed by the applicant actually is.

So we could have the following claim, for example: A device or apparatus for mixing concrete (A) comprising a drum (B), a handle attached to it (C) and a wheel to spin the drum (D).

A dependent claim then further defines the particulars of independent claim 1, as follows: A device (A) as claimed in claim 1, comprising a handle made of iron (E).

Slide 57
Requirements for patentability

Requirements for patentability

The invention must be

- new/novel
AND
- inventive
AND
- industrially applicable

In order to be patentable, an invention must be new, inventive and industrially applicable.

Industrial application is usually easy to argue. So what are the tests for novelty and inventive step?

The **test for novelty** is objective and we will look at it in more detail on the next slide. The test for inventive step is subjective and requires "a person skilled in the art". The person skilled in the art is a technical expert in the field of the invention.

The European Patent Office uses the problem-solution approach to determine **inventiveness**. This approach comprises three main stages: determining the closest prior art; establishing the objective technical problem to be solved;

and considering whether or not the claimed invention, starting from the closest prior art and the objective technical problem, would have been obvious to the skilled person.

However, there are exceptions. For example, mere discoveries or mathematical equations are not patentable in every country. In some countries, claims for methods of treatment and business methods are not allowed. In most countries software is not patentable as such.

Slide 58
The test for novelty

The test for novelty

- The test for novelty is an objective test.
- Are all the components of the claim of the invention known?
- Are they disclosed as the state of the art in existing products or publications?
- The disclosure can be anywhere in the world and in any form.
- The disclosure is relevant if it was made before the filing/priority date of the patent application concerned.
- All it takes to destroy novelty is for a single prior art item to disclose all the features of the claimed invention.

The test for novelty is an objective test.

Are all the components of the invention known?

Are they disclosed as state of the art?

The disclosure may be a similar product that already exists. It may be a write-up, scientific article or documentation of any sort. It must be before the priority date claimed by the invention. It can be anywhere in the world, in any form and in any language. It does not have to exist as a product or be in use in practice. It doesn't matter if you are an English speaker and the invention was only ever known to a remote tribe in Indonesia whose language you don't speak.

There is an absolute novelty requirement in Europe.

For example, let's imagine that you have an invention relating to a retractable ballpoint pen.

You file a patent application on 2 May 1988. This means that all documents prior to 2 May 1988 are relevant to the test for novelty.

If all the components of your claim are present in any one document found, your invention is not novel and is therefore not patentable.

If a claim reads as "a product A having components B, C, D and E" then the test for novelty asks "Are A, B, C, D and E present in a single document and did the publication exist prior to the date of priority claimed by the present invention?"

Slide 59
Two examples

Two examples

- Sugru
- Hövding airbag cycle helmet

We will now look at two examples which were both inventions from European universities, and both start-up ventures that attracted a lot of attention.

Slide 60
Sugru (I)

Sugru (I)

- Original idea from student Jane Delehanty for her master's degree in product design from the Royal College of Art.
- Problem: So many products have a limited lifetime and physical parts seem to break all the time.
- Solution: A silicone rubber which is hand-formable, sticks to almost anything, air cures at room temperature, becomes strong and durable even in extreme weather conditions and has a soft touch, but is "grippy".
- Called sugru, from the Irish "sugradh" meaning "play".

Intellectual Property Teaching Kit

60

The original idea for sugru came from Jane Delehanty, a master's student in product design at the Royal College of Art in London.

The problem she wanted to solve with her invention arose from the fact that so many products seem to have a limited lifetime and the fact that physical parts seem to break all the time. One example might be a hammer with a plastic handle, where the plastic handle cracks but the hammer is still perfectly usable.

She addressed the problem by developing a silicone rubber which is hand-formable, air cures at room temperature, is strong and durable even in extreme weather conditions, flexible till cured, and has a soft touch, but is "grippy".

She called it sugru, from the Irish "sugradh", meaning "play".

Slide 61

Sugru (II)

Here is an excerpt from the sugru patent:

- Easier than any existing method for non-experts
- One-part: Requires no mixing by the end user – simply apply pressure as needed and allow to cure
- Requires no temperature change to form the shape
- Requires no special tools to form the shape
- Requires no temperature change to cure
- Formable and cures at room temperature
- Can easily be incorporated into products in an industrial moulding process
- Is of sufficiently high plasticity that the uncured material does not slump or sag
- Is of sufficiently high plasticity that the uncured material is not deformed in the assembly, packaging and storage phases, prior to forming by the end-user
- Is of sufficiently high plasticity that the uncured material can be formed easily and pleasurably by hand, and a smooth surface can be maintained or achieved with handling and smoothing
- Uncured formulations may be optionally self-adhesive, so that a bond can be achieved by applying them directly to substrates
- Uncured formulations may alternatively be applied to a primed substrate to achieve a strong adhesive bond – this will provide a stronger bond which will be an advantage to products manufactured industrially with material parts of the present invention
- Cures to a resilient and tough finished product, which can be waterproof and comfortable at extreme temperatures – to 250°C.

Sugru (II)

Advantages

- It is a pliable substance which quickly sets to form a firm repair, mount or grip.
- It has the mouldability of a high-temperature curing silicone but retains the adhesive properties and room-temperature curing of glues and sealants.

What makes sugru such a great product?

It is a pliable substance with quickly sets to form the required shape. No special tools are needed to form the shape.

It has the mouldability of a high-temperature curing silicone but retains the adhesive properties and room-temperature curing of glues and sealants.

We will see what it looks like on the next slide.

Slide 62

What does sugru look like?

Slide 63

History of the sugru patent

History of the sugru patent

- Priority application filed on 30 November 2006
- PCT application filed on 29 November 2007
- PCT application published on 5 June 2008
- Entered regional phase in Europe, national phases in the US, UK and China
- European patent already granted

Intellectual Property Teaching Kit

63

The story of the sugru patent started with a priority application entitled "Room temperature curable silicone elastomer composition", which was filed on 30 November 2006.

Almost a year later, on 29 November 2007, at the end of the priority period, the applicants – FormFormForm – filed an international patent application. The PCT patent application was published on 5 June 2008, 18 months from the priority date, as WO2008/065406A1. This was the first time that this patent application was available as a public document. The suffix A1 denotes that an international search report (ISR) was published at the same time.

The international application entered the regional phase in Europe and the national phase in China, the UK and the USA on 30 November 2006.

A European patent has already been granted, and validation has started in some designated states.

Slide 64

Exercise 1

What do you think is the inventive concept of sugru?

The product can be used by non-experts without the need for industrial moulding processes. It is a one-part "play dough" that does not require any additional materials or temperature processes to cure it. So the inventive concept is the self-curing, easily mouldable silicone.

What did the applicants claim in their application?

Did they claim a product or a process?

Possible product claims

- A product such as the material itself and what it is, for instance a "self-curable silicone".
- The composition of the material, for instance a self-curable silicone of composition x, y, z.

Possible process claims

- A process for making the particular product of a particular composition (the commercially viable way of making the silicone of that specific composition).
- A process for moulding the product. They could claim the DIY process, i.e. that it is moulded by the user, and/or the process by which somebody applies a product of a particular composition to repair something, for instance.

Exercise 1

Discussion

1. What do you think the inventive concept is?
2. What do you think the applicants claimed in their application?
 - a product
 - a process
 - a composition
 - all of the above

What do you think the inventive concept of sugru is?

What do you think the applicants claimed in their application?

Slide 65

Claims at the PCT stage

Claims at the PCT stage

There are ten claims in total.

- Claim 1: Independent claim directed to a composition
- Claims 2-10: Dependent claims
- Claim 9: Product claim of the composition of claims 1 to 6
- Claim 10: Process claim for producing a product according to claims 1 to 6

There are ten claims in total. Claim 1 is an independent claim directed to a composition. Claims 2 to 10 are dependent claims. Claim 9 is a product claim – the product of the composition of claims 1 to 6. Claim 10 is a process claim relating to a process for producing a product according to claims 1 to 6.

Note that the applicants have not revealed the process for making the composition in the patent application? Why do you think that might be?

This could be for commercial reasons. If they were to license the product to a third party in order to allow them to commercialise it in new markets such as China or Australia, they might include the relevant know-how and trade secrets. The know-how could include the

commercially viable production process – in other words, how to produce the composition on a commercial scale, efficiently and safely. Trade secrets could include supplier and customer lists.

The product patent ensures that anybody who wants to make a composition of this kind cannot do so without getting a licence for the patent. This is also a clever commercial strategy for keeping one step ahead of competitors.

If, however, there was a country in which they did not patent the product and a third party wanted to make it there, they could. But that third party would have to sit and work out the details, spending time and money on figuring out how to make the composition on a commercial scale and sell it successfully.

Slide 66
Claim 1 of the PCT application

Claim 1 of the PCT application

"A one part room temperature curable silicone elastomer composition where the uncured composition has a Williams plasticity from 80 mm to 900 mm."

Claim 1 relates to the composition of sugru.

The applicants tried to get as wide a claim monopoly as possible, covering all room temperature curable silicone elastomer compositions with a Williams plasticity from 80 mm to 900 mm.

Is this what they claim their invention is? In the examination phase, the examiner will ask the following questions:

Do all such silicone compositions actually meet the specification set out in the claim?

How does this fit with the prior art identified by the examiner in his search on novelty and inventive step?

Slide 67
Is it novel?

Is it novel?

- Priority date: 30 November 2006
- Test for novelty: Did any document/publication exist before 30 November 2006 which, when taken alone, discloses the invention claimed in the sugru application?
- First published search report states claims 1 to 10 may not be novel and/or inventive. Why?
- The examiner cited seven prior art documents:
 - EP0575863A dated **29 December 1993**
 - US5171773A dated **15 December 1992**
 - US4476155A dated **9 October 1984**
 - GB2288406A dated **18 October 1995**
 - EP0905195A dated **31 March 1999**
 - US2006/142472A1 dated **29 June 2006**
 - WO03/072267A dated **4 September 2003**

The priority date of the sugru patent application is 30 November 2006, the date the UK application was filed. The PCT application was published in June 2008. The international searching authority was the EPO.

Applying the test for novelty, the examiner must ascertain if there was any document or publication that existed before 30 November 2006 that, when taken alone, discloses the invention claimed in the sugru application.

The first published search report states that claims 1 to 10 might not be novel and/or inventive. Why is that?

The reason for this is that the examiner has identified and analysed seven prior art documents – the ones shown on the slide – which call into question the novelty and/or inventive step of the corresponding claims. The first six documents are relevant for claims 1 to 10, and the last one for claims 1 to 4.

Slide 68

What did the applicants do next?

What did the applicants do next?

- Options
 - Abandon the patent application **or**
 - Request a preliminary examination (optional) **and/or**
 - Enter the national/regional phase
- Decision
 - To continue prosecution by entering the national/regional phase in Europe, the USA, the UK and China
- The claims had to be amended to ensure they were novel and inventive

Intellectual Property Teaching Kit

68

The applicants had to decide whether they should abandon the patent application or request a preliminary examination and/or proceed to enter the national or regional phase in individual countries or in Europe.

They decided to proceed by entering the regional phase in Europe and the national phase in the USA and China, and continuing to prosecute the UK filing.

They had a fixed time limit of 30/31 months – depending on the region or country – from the priority date to do this.

In light of the prior art revealed, they also had to amend the claims to ensure they were novel and inventive.

Slide 69

Comparison between original PCT claim 1 and the amended EP version

Comparison between original PCT claim 1 and the amended EP version

International patent application	Amended granted EP claim
<p>A: A one part room temperature curable silicone elastomer composition</p> <p>B: where the uncured composition has a Williams plasticity from 80 mm to 900 mm.</p>	<p>A: A one part room temperature curable silicone elastomer composition</p> <p>B: where the uncured composition has a Williams plasticity from 80 mm to 900 mm, and</p> <p>C: where the composition is a non-adhesive composition, the composition comprising:</p> <p>D: 20 to 60% by weight of a hydroxy-terminated poly(dimethylsiloxane) of viscosity greater than 350 000 mPa s (25° C);</p> <p>E: 3 to 66% by weight of a reinforcing filler;</p> <p>D: 10 to 60% by weight of a non-reinforcing filler;</p> <p>F: 2 to 6% by weight of a crosslinker and</p> <p>G: a suitable quantity of a curing catalyst.</p>

Intellectual Property Teaching Kit

69

The left-hand column shows the original PCT claim. The right-hand column shows the additions included to limit the scope and amend claim 1 for the purpose of the European application.

In light of the various prior art documents the applicants had to adjust their very broad composition claim of "any room temperature curable silicone elastomer composition where the uncured Williams plasticity is between 80 mm and 900 mm" to include more details of the actual composition. The components added in the right-hand column all limit the scope of the invention. The claim now provides a more narrow definition of what makes up a silicone composition of a Williams plasticity of between 80 and 900 mm.

The examiner is saying, "sorry, you think your invention is any room temperature curable silicone composition where the uncured plasticity is between 80 and 900 mm. But I can see that there are other people who have used this before you. You clearly have an invention that you want to protect, but I will not allow such a broad claim for your invention. In light of all the prior art I have cited, what is it you want to claim?"

The applicants then provided details within the field of room temperature curable silicone elastomer compositions of a Williams plasticity of 80 to 900 mm of the specific characteristics that define their composition.

Slide 70

Patent status of sugru as of March 2013

Patent status of sugru as of March 2013

- Granted EP patent: validation in the designated contracting states is in progress
- Examination has been requested in the other countries

The applicants have been granted a European patent. However, it will not take effect until it has been validated in each of the designated states, in accordance with the applicable national laws.

In China and the USA the examination procedure is still ongoing.

Slide 71

Example 2: Hövding airbag cycle helmet

Example 2: Hövding airbag cycle helmet

- Swedish inventors Anna Haupt and Terese Alstin from Lund University
- Problem: Regardless of safety, people do not like to wear helmets while riding their bike as it ruins their hair-do and does not look cool
- Solution: Airbag helmet
- What is it? A collar containing an airbag with helium as the inflating agent and sensors including gyroscopes and accelerometers

Intellectual Property Teaching Kit

71

In our second example, Swedish inventors Anna Haupt and Terese Alstin, originally from Lund University, sought to address the problem that, despite the need for safety, people don't like to wear cycle helmets, as they ruin their hair-do and just don't look "cool".

Haupt and Alstin invented the helmet while working on their joint master's project in industrial design. According to Swedish law at the time, children under the age of 15 had to wear helmets when riding their bikes, and a proposal had been made to extend this to all

cyclists. On their website, the inventors admit that they "would not have been seen dead in a polystyrene helmet", and that that's what prompted them to start designing an "invisible" helmet.

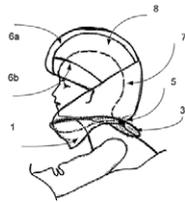
They solved the problem by inventing an airbag helmet which they named Hövding.

The helmet comprises a collar containing an airbag, with helium as the inflating agent and sensors including gyroscopes and accelerometers.

Slide 72

What does the airbag helmet look like?

What does the airbag helmet look like?



www.youtube.com/watch?v=WCd8qQv6Htw&feature=plcp

Intellectual Property Teaching Kit

72

On the left you can see a woman wearing the Hövding airbag helmet before and after a collision. The illustration on the right is from the patent application.

You can watch a YouTube video of how the helmet works in a collision at www.youtube.com/watch?v=WCd8qQv6Htw&feature=plcp

Slide 73
Exercise 2

Exercise 2

- What do you think the inventive concept is in this case?
- What do you think the applicants claimed?
- How would you have structured a suitable claim?

What do you think the inventive concept is in this case?

What do you think the applicants claimed?

How would you have structured a suitable claim?

Slide 74

What did Hövding claim in their PCT application?

What did Hövding claim in their PCT application?

- A system for protecting a portion of the body of a user in case of an abnormal movement, such as a fall or a collision (product claims 1 to 9)
- A method for protecting a head of a user in case of an abnormal movement, such as a fall or a collision (method claims 10 to 12)

The applicants claimed a system in the form of product claims 1 to 9. They also claimed a method of protecting the head of the user in case of a collision in the form of method claims 10 to 12.

To get a better understanding of the claim structures, we will focus on the independent product claim and the amendments that were made to it during the examination procedure.

Slide 75

Claim 1 of Hövding's PCT application

Claim 1 of Hövding's PCT application

(A) A system for protecting a portion of the body of a user in case of an abnormal movement, such as a fall or a collision, wherein said system comprises
(B) an apparel and
(C) an airbag arranged therein: characterised in that said airbag comprises:
(D) a first part suitable for surrounding a neck portion and back head portion of a user after inflation; AND
(E) a second part suitable for forming a hood surrounding a skull of a user after inflation,
(F) said first part and second part being folded and arranged in said apparel before inflation.

Intellectual Property Teaching Kit

75

Claim 1 is an independent claim relating to a system for protecting a portion of the body of a user.

The individual components are shown here on the slide.

Note that the claim does not include the words **bicycle** or **helmet** or **bicycle helmet** or **inflatable helmet**. Why not? It does not refer to helium as an inflating agent either. Nor does it mention sensors such as gyroscopes or accelerometers.

Why has the patent attorney said "a first part suitable for surrounding a neck portion and back head portion of a user"? Why did he not just say "a collar" or "a neck brace"?

This is because the aim is to stay as general as possible in order not to limit the claims by using specific defined expressions.

Slide 76
Is it novel?

Is it novel?

- Priority date: 26 October 2005
- Test for novelty: Did any document/publication exist before 26 October 2005 that, when taken alone, discloses the invention claimed in the patent application?
- International search report states claims 1 to 9 may not be novel and/or inventive. Why?
- The examiner cited three prior art documents:
 - DE1975451A1 dated 10 June 1999
 - DE3616890A1 dated 26 November 1987
 - WO0154523 dated 2 August 2001

The priority date of the Hövding application is 26 October 2005. The PCT application was published 18 months from the priority date. The application was virtually a secret or undisclosed document from 26 October 2005 until its publication.

Applying the test for novelty, the examiner must ascertain if there was any document or publication that existed before 26 October 2005 that, when taken alone, disclosed the invention claimed in the application.

The international search report stated that the system as described in claims 1 to 9 might not be novel and/or inventive. The examiner cited the three prior art documents shown here.

Slide 77

What did the applicants do next?

What did the applicants do next?

- Options
 - Abandon the patent application **or**
 - Request a preliminary examination **and/or**
 - Enter the national/regional phase in various countries
- Decision
 - To continue prosecution by requesting optional international preliminary examination report (IPER issued)
- The claims had to be amended to ensure they were novel and inventive

Intellectual Property Teaching Kit

77

The applicants had to decide whether they should abandon the application or request a preliminary examination, and then whether to enter the national/regional phase in various countries.

Of the three options open to them, the applicants decided to request an optional preliminary examination. An IPER or international preliminary examination report on patentability was issued. In light of the prior art revealed in the report, the applicants had to amend the claims to ensure they were novel and inventive.

Applicants may request the international preliminary examination of an international application under Chapter II of the PCT to obtain "a preliminary and non-binding opinion on the questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), and to be industrially applicable". The examination is carried out by an International Preliminary Examining Authority, for use before the "elected" offices, that is, the designated offices which are elected by the applicant for that purpose.

Slide 78

Comparison between original PCT claim 1 and the amended claim

Comparison between original PCT claim 1 and the amended claim

Original claim 1	Amended claim 1
<p>A: A system for protecting a portion of the body of a user in case of an abnormal movement, such as a fall or a collision, wherein said system comprises</p> <p>B: an apparel and</p> <p>C: an airbag arranged therein: characterized in that said airbag comprises:</p> <p>D: a first part suitable for surrounding a neck portion an back head portion of a user after inflation; AND</p> <p>E: a second part suitable for forming a hood surrounding a skull of a user after inflation.</p> <p>F: said first part and second part being folded and arranged in said apparel before inflation.</p>	<p>A: A system for protecting a portion of the body of a user in case of an abnormal movement, such as a fall or a collision, wherein said system comprises</p> <p>B: an apparel and</p> <p>C: an airbag arranged therein: characterized in that said airbag comprises:</p> <p>D: a first part suitable for surrounding a neck portion an back head portion of a user after inflation; AND</p> <p>E: a second part suitable for forming a hood surrounding a skull of a user after inflation,</p> <p>F: said first part and second part being folded and arranged in said apparel before inflation, <i>and</i></p> <p>G: <i>said first part being adapted for inflation prior to inflation of the second part.</i></p>

The left-hand column shows the original claim 1 filed at the PCT stage.

Taking account of the prior art documents cited by the examiner, the applicants amended the claim. They submitted an amended claim before the preliminary examination was carried out. The examiner issued his evaluation in an IPER, or international preliminary examination report.

The applicants added an additional component, G, which reads "said first part being adapted for inflation prior to inflation of the second part".

In doing so, they overcame the objection of lack of novelty and inventive step in light of the prior art cited by the examiner.

Slide 79

What did the examination report say and what happened next?

What did the examination report say and what happened next?

- Examination report: claims 1 to 12 are new and inventive.
- Consequences: entry into national/regional phase in various countries and regions, including China, Europe, Japan, Russia, Sweden and the United States.

Intellectual Property Teaching Kit

79

The examination report said that in light of the prior art documents cited, claims 1 to 12 were new and inventive.

So the applicants proceeded with the prosecution of the application by entering the national/regional phase. The countries they opted to file in at the same time as filing the PCT application were Australia and Canada. In Australia, a patent has already been granted on the basis of the claims as amended during the PCT examination phase.

The regions and countries in which they entered the national/regional phase after filing the PCT application were China, Europe, Japan, Russia, Sweden and the United States.

Having entered the national/regional phase in various countries on 26 April 2008, 30 months from the priority date, the applicants have already been granted a patent in China. A European patent was granted in November 2012 and a US patent in March 2013.

Anna Haupt and Terese Alstin were finalists for the 2014 European Inventor Award in the Category Small and medium-sized enterprises. <http://www.epo.org/learning-events/european-inventor/finalists/2014/alstin.html>

Terms of use

The IP Teaching Kit has been produced by the EPO in co-operation with the EUIPO.

The content provided in this IPTK is for training and information purposes only. The Information is of a general nature only and not intended to address the specific circumstances of any particular case, individual or entity.

It cannot be guaranteed by the EPO and the EUIPO that the information is always comprehensive, complete, accurate and up-to-date. Consequently, no responsibility for any loss or damage that may arise from reliance on the information is accepted by the EPO and the EUIPO.

The information in no case constitutes professional or legal advice.

Users may modify or translate the IPTK and any of its parts on condition that the EPO and EUIPO is credited as the provider of the original and that it is clearly stated that changes have been made to the original material, that the modified or translated version has not been authorised by the EPO and EUIPO, and that the EPO and EUIPO shall not be responsible for the correctness of any such modified or translated version. Any other reference to the EPO and the EUIPO, and in particular their official logo, shall be removed from any such version.

Users shall give the EPO and EUIPO free of charge an electronic copy of the modifications or translations together with the right to further distribute them, if it so wishes, as part of the IPTK, as an additional version or an alternative language version. In such cases, the EPO and EUIPO shall mention the author of the modifications or translations if requested to do so.

The IPTK and any of its parts, as well as any modification or translation thereof, may be used for non-commercial teaching and training purposes only.

For online access to the extensive IPTK collection, plus updates and further learning opportunities, go to www.epo.org/learning-events/materials/kit.html where you will also find a tutorial for teachers and lecturers.

Imprint

Produced by

European Patent Office (EPO) and
European Union Intellectual Property Office (EUIPO)

Published by

EPO Munich
2nd edition
ISBN 978-3-89605-156-1

Concept and co-ordination

European Patent Academy

Content provided by

EPO
EUIPO
Community Plant Variety Office
ip4inno project (<http://www.ip4inno.eu>)

Individual modules were produced and/or edited by

Graham Barker
Silvia Baumgart
Robert Harrison
Anu Idicula
Ingrida Karina-Berzina
John Mc Manus
Sérgio Maravilhas Lopes
Anna Yotova

Final editing

EPO Language Service

Design

EPO Graphic Design Munich

Photos

Cover: Thinkstock

IPTK can be downloaded free of charge from the EPO website
at www.epo.org/learning-events/materials/kit.html
and from the EUIPO website
at <https://euipo.europa.eu>

© EPO 2016

European Patent Office
www.epo.org

European Union Intellectual Property Office
www.euipo.eu