

IPR, innovation, patents – What is it? What for?

In which respect does it concern science?



Cornelia Rhomberg
Innovation Management
University of Innsbruck
project.service.office



What is IPR? What is an invention?

What is the difference between invention and innovation?

What do people do with innovations/IPR? What for?

What is a patent? What is patentable? How to apply?

How much does it cost to protect IPR?

Why IPR-protection at universities?

How does IPR affect me as researcher?

What is Technology transfer? How does it work?



Do you remember the fundamental terminology?...

What is IPR?



Intellectual property: Original creative works that have economic value and are protected or protectable by law

Intellectual property rights:

- owners of IP are granted certain exclusive rights to a variety of intangible assets (literary, ideas, inventions, designs)
- types of intellectual property that are protected by law, like copyrights, trademarks, patents, industrial design rights and trade secrets in some jurisdictions
- number of distinct types of legal monopolies over creations of the mind

psb
project.service.büro

Universität Innsbruck

What is an invention?

What is the difference between invention and innovation?

- An invention is a new configuration, device, or process
- Invention is an evolutionary, creative act which leads to an outcome that is outside of the norm
- Do not mix up discovery with invention!!
- Invention is the conversion of cash into ideas.
- Innovation is the conversion of ideas into cash.

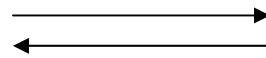


psb
project.service.büro

Universität Innsbruck

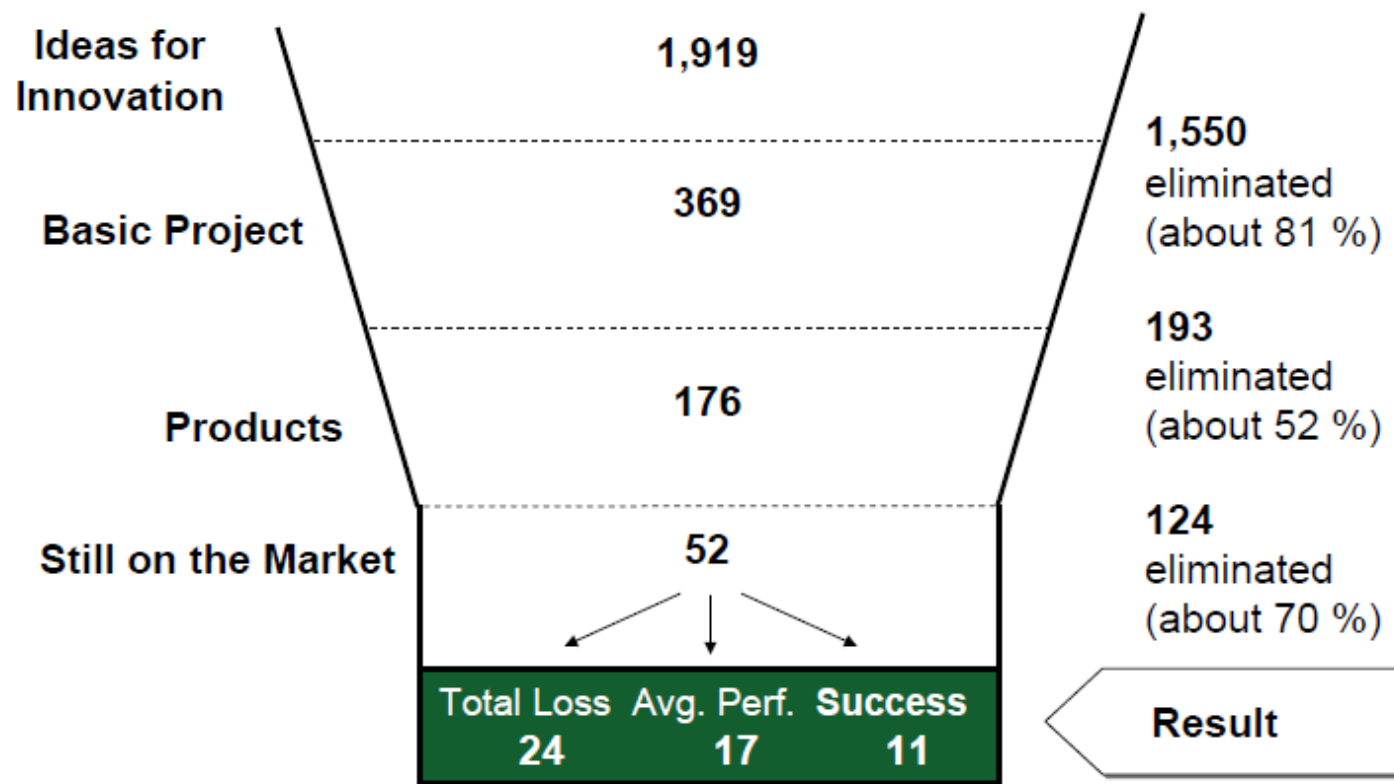
What do people do with innovations/IPR?

- Make it public for free use by public
(like publishing in a journal)
- Work with the invention OPENLY without PATENTING it
(directly put it in the market, open source software – benefit for all)
- Work with the invention in SECRECY without PATENTING it
(like coco-cola composition, recipe, formula)
- EXPLOIT the invention on the basis of a PATENT or Utility Patent (technical process, device, product)



Contradiction?

Just 0,6 % of all Ideas for Innovation Turn Out to Be Successful on the Market



What is a patent? What is patentable?

A patent is a Monopoly Right granted

for an invention
by the state (presented by patent office)
to the inventor or his assignee
for a limited time (20 years)
it is valid within the country of grant

An invention is patentable if it is

new (never has been made public before

US: grace period),

non-obvious (inventive step)

capable of **industrial application** (technicity)



History of patents – who invented patents?

-In 500 BC, in the Greek city of Sybaris (located in what is now southern Italy), "encouragement was held out to all who should discover any new refinement in luxury, the profits arising from which were secured to the inventor for the space of a year."

- In England grants in the form of "letters patent" were issued by the sovereign to inventors who petitioned and were approved: a grant of 1331 to John Kempe and his Company is the earliest authenticated instance of a royal grant made with the avowed purpose of instructing the English in a new industry.

- The patent law started in Italy with a Venetian Statute of 1474 which was issued by the Republic of Venice. They issued a decree by which new and inventive devices, once they had been put into practice, had to be communicated to the Republic in order to obtain legal protection against potential infringers. The period of protection was 10 years.



Who needs patents? – why should I pay for it?

- The function of patents is to develop industry. This is achieved by granting the inventor a temporary monopoly in exchange for a full description of how to perform the invention.
- Essentially, a patent is a contract between the inventor and the public. The principle of a patent being a contract relates to the fundamentals of simple contract law where a right is given in exchange for some consideration.
- In patent law, that right is to exclude others from making, using or selling an invention in exchange for educating society of new technological advances.
- These advances enhance the knowledge base of the public which drives whole economies and provides the public with jobs.



You have the monopoly – what does the state want back?

- In exchange for the privilege of the temporary monopoly, the owner of the invention agrees to **disclose** the complete details of the invention
- To keep the patent in force, the owner needs to **pay** certain fees to the appropriate patenting authority. Failure to do so will cause the patent rights to lapse
- Some countries also require that the patent is “worked”. This means that the protected invention is **put to commercial use**. – not common, as there are so called blocking patents

Where do I apply for a patent? – who is granting a patent?

- A patent application has to be submitted to a state (country). The state is represented by the national patent office or a regional office that does the work for a number of countries, such as the European Patent Office (EPC 31 members). Under such regional systems, an applicant requests protection for the invention in one or more countries
- The WIPO-administered Patent Cooperation Treaty (PCT) provides for the filing of a single international patent application which has the same effect as national applications filed in the designated countries. An applicant seeking protection may file one application and request protection in as many signatory states as needed. (169 states)
- A patent is granted by a national patent office or by a regional office. Each country decides as to whether to offer patent protection within its borders or not. (no european patent!!)



What has to be checked before filing an application?

- successful development of a new process = invention
- initial stages: online searches using both patent and non-patent information sources on the subject of the invention.

= **prior art search**

-finding out everything that was previously known and invented which pertains to the technology or “art”. This information is needed for two reasons:

- to determine the **novelty** (originality) of the invention
- to be certain that the invention does not **infringe** (trespass) upon the patent rights of another inventor.

= **patentability search**



Do I need a patent attorney?

-During the same period, TTO will work with a patent agent or attorney to be sure that, in their expert opinion, your invention meets the criteria for patentability.

-It is also critical that the agent fully understands the invention and its purpose so that an accurate application can be **drafted** (written).

-From a legal standpoint, the most important section of the application is the **claims**, which outlines the boundaries of the property to be protected. Their purpose is to define the subject matter that the invention regards as proprietary, but not to explain the invention in great detail.

- However, if the claim(s) are too broad, they may be **disallowed** [not granted] or **opposed**[challenged] leading to **revocation** [annulment] of the application.



How does a patent look like? What does it have to contain?

- precise format of the patent application prescribed by the patent law of the country in which the application is made (US, EP, PCT)

The different parts of a patent are usually as follows:

- Heading/Bibliographic Data
- Prior Art
- Objects of the Invention
- Summary or “Definition” of the Invention
- Elaboration
- Utility
- Working Examples
- Claims
- Illustrations
- Search Report



US005243776A

United States Patent [19] Zelinko

[11] Patent Number: **5,243,776**
[45] Date of Patent: **Sep. 14, 1993**

[54] **GOLF SHOE CONSTRUCTION**

[76] Inventor: **Anthony P. Zelinko**, 1880 N. 5 Mile Rd., Sanford, Mich. 48657

[21] Appl. No.: **847,584**

[22] Filed: **Mar. 5, 1992**

[51] Int. Cl.⁵ **A43B 5/00; A43B 5/02**

[52] U.S. Cl. **36/134; 36/127**

[58] Field of Search 36/126, 127, 128, 134, 36/8.3, 1, 39, 131, 67 R, 59 R

[56] **References Cited**

U.S. PATENT DOCUMENTS

1,304,616	5/1919	Smith	36/127
1,362,225	12/1920	Carlslund	.
2,107,617	2/1938	Oetterer	.
2,109,712	3/1938	Schmalz	36/39
2,206,136	7/1940	Tchetchet	.
3,081,562	3/1963	Oakley	.
3,091,043	5/1963	McCorkle	.
3,204,348	9/1965	Latson	.
3,354,561	11/1967	Cameron	.
3,481,332	12/1969	Arnold	36/39

3,680,231	8/1972	Dymond	36/59 R
3,707,047	12/1972	Nedwick	36/134
3,739,497	6/1973	Cameron	36/134
4,309,832	1/1982	Hunt	36/31
4,562,651	1/1986	Frederick et al.	36/102

FOREIGN PATENT DOCUMENTS

2011134	9/1971	Fed. Rep. of Germany	36/128
581	5/1914	United Kingdom	36/7.5
239319	9/1925	United Kingdom	36/126

Primary Examiner—Steven N. Meyers

Attorney, Agent, or Firm—Learman & McCulloch

[57] **ABSTRACT**

A golfer's shoe having a spike-supporting plate pivoted to the shoe sole for rotation about an axis. The plate is biased to a neutral position by yieldable springs which enable relative rotation in each of two opposite directions between the spikes and the shoe sole and return the spikes to the neutral position following completion of the golf stroke.

14 Claims, 1 Drawing Sheet





What is IPR? What is an invention?

What is the difference between invention and innovation?

What do people do with innovations/IPR? What for?

What is a patent? What is patentable?

How much does it cost to protect IPR?

Why IPR-protection at universities?

How does IPR affect me as researcher? How can I use patent informations?

What is Technology transfer? How does it work?



Where are costs arising?

...you have to pay:

- Registration process of a patent (utility patent, trademark, design)
- patent fees to the national patent office (for national patent)
- patent fees to EPO /and or WIPO for PCT
- and maintenance fees in case the patent is granted (annual)

...you should also pay:

- the patent search (prior art search)
- preliminary marketing analysis (is it exploitable?)
- fees to your patent attorney (IPR terminology! Claims!)

...I will not mention costs for litigation (when sb infringes your right or vice versa)



How much does it cost to protect IPR?

- How much costs the national patent?

Austria: EUR 2000 – 4000 for application
EUR 3000 annual fees (20 years)

- How much costs the US patent ?

about USD 10 000

- How much costs the „EU patent“ ?

EUR 30 000 – 50 000 (more than 7 countries)

- and all this without marketing costs, which may be multiples of these sums !



Why IPR-strategy at universities – history:

State of the art:

- We live in a globalization era!
- so called „emerging markets“ – China, India, Brasil, Indonesia, Ukraine ... have much lower costs of labour than developed countries
- naturally low value added productions migrate to the developing world
- and industries of EU countries are step by step losing their competitive strength

Solution statement:

- EU solution: to make the EU economy the „innovative economy“ (or „**knowledge based economy**“)
 - apply the results of scientific research and development (R&D)
 - implement new technologies
 - and introduce new products and services to the market



What is a „Knowledge based economy“?



„beloved term“ of Brussels bureaucrats (like innovation) in many EC recommendations and EP resolutions

generally they have in mind a combination of measures on two levels:

- on a macroeconomic level:

massive governmental support of R&D and of processes of implementation of their results by the industry

- on a microeconomic level:

introduction and wide implementation of good practices bringing fast, intensive and effective utilization of R&D results and implementation of innovations into industry



How to reach the goal? - The Lisbon strategy of EU

March 2000 extraordinary meeting of EU council in Lisbon declared the following:

- till 2010 EU was to become „*the most competitive and the most dynamic knowledge based economy able to keep sustainable development and generate more and better jobs while preserving strengthened social cohesion*“

- in 2005 in Brussels, implementation was reviewed:

- materialization of the knowledge based society
- completion of the common market including services and financial services
- creation of friendly milieu for enterprises and entrepreneurship
- creation of flexible labour market
- support for win-win strategies of environmental economic strategies

expressed by so called 3% target: each EU country was supposed to increase its spending on R&D to 3% of its GNP and member states were also to share the best practices of R&D and TT

= for example: EU projects !! R&D-Offensive II !!

How does IPR-protection affect me as a researcher at a university?

IPR strategy at Austrian Universities

The implementation of the new **University law in 2002** has changed the legal position concerning the exploitation of intellectual property.

Until the commencement of the new university law the federal government had the right to to exploit inventions made by employees of the university. In most cases the federal government did not take advantage of this right and returned it directly to the inventors. However, at present the employer, i.e. the **university, possesses the right to decide how to exploit inventions of their employees.**

In order to meet the new requirements and to optimize the benefit of the inventions for both, the inventors and the universities it was essential to **establish an infrastructure** that provides university researchers with professional support during the patent filing process and later on the commercial use of the patent.

To support these efforts the Federal Ministry for Education, Science and Culture and the Federal Ministry of Economics and Labour of the Republic of Austria have developed the program **uni:invent**, which is based on a recommendation of the Scientific board for research and technology in the european frame work of the **R&D-Offensive II.**





Scope of the programm uni:invent

Primarily uni:invent should support the implementation and financing of the innovation scouts, who are the **local advisers** at the universities in questions concerning intellectual property rights. In addition uni:invent provides **money for the financing of patents** and the procurement of their commercial use.

Aims

Uni:invent should result in an **optimization of the benefits of patents** and the resulting licences for the universities of Austria. Moreover, the commercial use of the Austrian patents should **strengthen the business location** Austria and thus the international competitiveness.



Work flow: Invent – report – patent

1) Report of the invention

Inventions made by employees of the university have to be reported immediately to the rectorate for research. The report has to contain all information necessary to apply for a patent and to estimate the technology and legal status of the invention.

2) Claiming of the invention by the university

The university has to decide within 3 months whether to claim the invention or not. This time limit cannot be extended.

This decision can be based on the recommendation of experts, which are in Austria represented by the Technology transfer agency **aws/tecma**. The innovation scouts of the university, where the invention has been made, have to sent the invention report to **aws/tecma** and within 6 weeks **aws/tecma** has to sent a recommendation. Only inventions which are supposed to be commercially interesting or strengthen the position of university in future collaborations are claimed by the university.

However, in some cases the university has to claim the invention, because of a contract signed at the beginning of a research project. If the university has agreed in the contract to hand on the patent rights to one of the collaborators she needs to possess all rights first.

If the university is not interested in the patent all rights go back to the inventors, which can decide themselves how to exploit their invention.



Patent application

If the university decides to claim the patent and starts the patent application she has to cover the full costs of the application. The money needed to cover those costs can be taken from the individual budget of the **uni:invent** program - as long as there is enough money available.

Exploitation of a patent

After the decision to claim the patent, the university can either start on her own (ideally together with the inventors) to find industrial partners which exploit the patent or commission **aws/tecma** to organize the utilisation. After a successful intervention of **aws/tecma** the agency takes 20% of the profit and the remaining 80% are shared between university and inventors.

Benefit for the researchers

In case that a patent is successfully commercially exploited the inventors deserve an inventor's bonus. The amount of this bonus depends on the model, which the university, where the inventor is employed, uses. In Innsbruck the inventors receive 50% of the profits, which is rather much in the international comparison.



What is Technology transfer? How does it work?

Models of interaction of academia and industry - historic excursion

- The most classical way of transfer of knowledge from academia (university) to the society are its **alumni!**
- Classical model of interaction between academia and industry = „**open science** model“
- Then came the „**linear model**“ developed predominantly in the US and later on more or less successfully in Europe and all over the world
 - patenting of outcomes of R&D and subsequent sale of the patent or a licence to a commercial user
 - In spite of all its success nowadays this model is not regarded as „effective enough“
- That is the reason why new – more efficient ways of cooperation between academia and industry have been searched for = „**innovative model**“



Models of interaction of academia and industry - basic schema



- Open science model

- alumni (teaching)
- publications, presentations (research)
- consulting (money!)
- analyses, services and contractual research (money!)

- Linear Model

- mostly patenting and licensing (US!)

Application of R&D results
moves into the research facility

- Innovative model

- joint R &D projects
- spin-out creation



What is the Innovative model?

= joint R&D projects and spin-outs

- introduction of much more tight feedback from **users of R&D outputs**
- accepting **greater responsibility** for commercial exploitation of the R&D results by the research facility
- **Joint R&D projects** are those of research (academic) facility on one side and commercial subject on the other (not joint R&D projects between two or more academic institutions)
- **The spin-out** is an enterprise (a company) launched (and thus owned) by the research facility and/or its employees (spin-out = spin-off)
 - inevitable condition: that spin-out is a technological company focused on commercialization of IP developed at the research facility that launched it



What do I need before starting an R&D project with industry?

- joint R&D project has to be framed in a legal framework

= **Collaboration Agreement**

- The Agreement should specify (at least):

- the goals of collaboration

- roles and contributions of all parties (including payments)

- stages and time schedule of the project

- way of management of the project (project management techniques)

- assignment and dispositions of rights to created IP

- There are various „standard form“ agreements , the most well-know being the Lambert Agreements (last edition – nine versions)



Comparison of joint R&D projects, spin-out launching and patenting



	PROs	CONs
Patenting and licensing	<ul style="list-style-type: none"> Established way of KTT Relatively easy to handle Extensive technical support May bring considerable revenues 	<ul style="list-style-type: none"> Low efectivity Weak feedback from the users Pay-first, collect second Relatively slow procedures
Joint R&D projects	<ul style="list-style-type: none"> Immediate feedback from users Positive cash flow from the very start Low risk of failure 	<ul style="list-style-type: none"> Not so easy to handle Relatively low revenues (no real breakthrough) Possible problems with IP sharing
Spin-out creation	<ul style="list-style-type: none"> Strong feedback from users by definition Promising greatest revenues by far 	<ul style="list-style-type: none"> Very arduous Invest first, cash much later Long track run High risk of failure



Using patent informations in research, what for?



- **Current Awareness**

Since patents are often the first, or even the only, source of information on a technological advance, they are an invaluable source of up-to-date intelligence.

- **Avoiding duplicated effort and infringement**

An R&D concept may already be protected by a patent, or patent protection may have expired so that the invention is available for use. Searching worldwide patents literature should always be done at the start of any R&D effort, to avoid wasteful and costly duplication.

- **Licensing opportunities**

Even if an invention is still protected by a patent, it may be possible to negotiate a license for its manufacture or importation.

- **Competitive intelligence**

Monitoring the current patent literature increases awareness of who your competitors are and the technologies that they are producing. It is also increasingly useful for investment research and intellectual capital assessment.- **Technology trends**

Patent classifications can be used to monitor worldwide technological trends, by noting the numbers of applications filed in any particular subject.

- **Inspiration**

Browsing through the patents on a subject of interest can encourage the development of new ideas, particularly as it is often possible to find the same concepts being used in unrelated industries.



What do patent informations contain? Advantages:

Currency of data

The publication of a patent application is often the first time that the invention has ever been made known. In order to secure patent rights, the details of an invention have to be kept secret before a patent application is submitted.

Exclusivity of information

Studies have shown that 70-90% of the information in patents is never published anywhere else.

Citations intelligence

Many patent documents include search reports prepared by examiners from the patent office where the application was filed. These reports may cite similar patents and other related literature found in a search on the subject matter of the invention. Such supplementary information can be used to provide more background on the development of a particular technology.

Full and practical descriptions

The text of a patent specification must have sufficient detail and include illustrations so that an expert specialising in the same field can re-create the invention.

Availability of translations

An application must be made in every country in which patent protection is sought and written in the language prescribed by law. This means that the technical content of a patent may be available in a familiar language.

Ease of comparison

Although there are exceptions, patent specifications have become standardized in their layout. This feature saves time when reviewing documents, or locating specific sections of foreign language patents.



Use of patents in the technology transfer office (R&D)

Pre-research stage	To see if someone else has joined the race, someone else has taken the same approach or the concept has already been mentioned in another patent
Development stage	To exhaustively search for anything remotely similar which might be cited by a patent examiner or to repeat the research stage patent search aims
Post -filing, -examination and -grant stages	To watch for signs of [potential] imitators/infringers, the emergence of competitors attracted by the new market or new uses for patented technology through citation analysis

Innovation: Never, Ever Give Up

