



CHALMERS



Infringements on inventors' and small enterprises' patents

Causes, effects and a possible cure

Master of Science Thesis

in the Management and Economics of Innovation Programme

WILHELM FORSER

CARL MAGNUS ULLMAN

Department of Technology Management and Economics

Division of Innovation Engineering and Management

CHALMERS UNIVERSITY OF TECHNOLOGY

Göteborg, Sverige 2015

Report No. E 2014:107

Infringements on inventors' and small enterprises' patents

Causes, effects and a possible cure

WILHELM FORSER
CARL MAGNUS ULLMAN

Infringements on inventors' and
small enterprises' patents
Causes, effects and a possible cure

WILHELM FORSER & CARL MAGNUS ULLMAN

© WILHELM FORSER & CARL MAGNUS ULLMAN, 2015.

Master's Thesis E 2014:107

Department of Technology Management and Economics
Division of Innovation Engineering and Management
Chalmers University of Technology
SE-412 96 Göteborg, Sweden
Telephone: + 46 (0)31-772 1000

Cover:

Logotype for a Patent Protection Initiative, a cogwheel representing technology and Justitia, representing the legal aspect (See chapter 5)

Chalmers Reproservice
Göteborg, Sweden 2015

Abstract

Individual inventors and small enterprises can rarely enforce their patents from infringement by large enterprises. They are also vulnerable to aggressive takeovers, which often result in the loss of their patents and financial problems. In most of these cases, predominantly larger firms use their financial strength to avoid paying for patented technical solutions, ultimately exhausting the individual inventor or SE.

The main reason these two strategies work for large companies is that the inventor or SE does not have the financial means to sufficiently finance legal processes throughout appeals. This forces the financially weaker actor to settle or accept the infringement.

This causes problems, not only for individual inventors and small actors, but also for society as a whole. If inventors and small enterprises are unable to profit from their inventions, many of the incentives and conditions for inventing are removed. With fewer inventions and fewer start-ups, the economy may suffer on many levels.

It has been established in a study sponsored by the EU Commission that infringement on small firms' patents is a frequent phenomenon. Therefore, the issue of frequency of the phenomenon is left out of this study.

This is a qualitative study, investigating a phenomenon, its causes and effects, and suggesting a possible cure. Being a master's thesis from a technological university, the thesis has a constructive approach, aiming not only to investigate the problem, but also to suggest a possible cure.

The primary sources of information are scientific research and interviews with patent holders who have been affected by patent infringement and aggressive takeover. The case studies are primarily based on interviews with inventors. Since the study focuses on the problem that individual inventors and SEs experience, less emphasis has been given to the large corporations' side of the story.

The possible cure takes the form of a Patent Protection Initiative (PPI), where solid financial strength and organizational features makes it possible to enforce patents and deter large companies from infringing, thereby increasing the incentives for successful licensing agreements.

The PPI will select specific, valuable and enforceable patents, and assert those against predator firms. The operations will be financed through retaining a percentage of license fees from patents and damages awarded in litigation cases.

List of abbreviations

AIS – Automatic Identification System

IP – Intellectual Property

IPO – Initial Public Offering

IPR – Intellectual Property Rights

NPE – Non-Practicing Entity

PDU – Patent Defense Union

PRV – Patent & Registreringsverket (Swedish Patent Office)

PPI – Patent Protection Initiative

SE – Small Enterprise

SME – Small & Medium sized Enterprise

STDMA – Self-Organized Time Division Multiple Access

SUF – Svenska Uppfinnareföreningen (Swedish inventors association)

Table of contents

Abstract.....	1
List of abbreviations.....	2
1. Introduction	6
1.1. Purpose	7
1.2. Problem analysis.....	7
1.3. Limitations	8
1.4. Definitions.....	8
1.5. Method.....	9
1.6. Structure of thesis.....	10
2. The problem of individual inventors & small enterprises loosing the rights and profits from their inventions.....	11
2.1. The phenomenon of patent infringement, its causes and effects	11
2.1.1. Intimidation.....	12
2.1.2. Risk.....	13
2.1.3. Manufacturing capability.....	14
2.1.4. Decision structure.....	14
2.1.5. Economic consequences	15
2.2. The phenomenon of aggressive takeover, its causes and effects	16
3. Case studies - understanding causes and effects	18
3.1. Håkan Lans	18
3.1.1. The color graphics	18
3.1.2. SAAB and the AIS.....	19
3.2. Kenneth Palmestål – IQ-therm	20
3.3. John Mitchell vs. Dragon Systems and Nuance Communications	20
3.4. Johan Ullman vs. Gylling	21
3.5. Implications for design of a cure	22
4. Past and present attempts to solve the problem of patent infringement - exploring historical cures	25
4.1. The SUF insurance 1985	25
4.2. The SUF insurance 2007.....	25
4.3. Statens Patentpartner Sweden AB	26
4.4. The CJA study.....	28
4.5. Patent Defense Union	29
4.6. Patent insurances	30
4.7. The Judge - litigation funding and insurance	31
4.8. Patent monetization firms and non-practicing entities (NPE)	31
France Brevets	32
4.9. A Swedish patent ombudsman	33
4.10. Implications for design of a cure	33
5. A suggested cure - Patent Protection Initiative	36
5.1. Overview	36
5.2. The offer	41
5.2.1. Offer to patent holders by PPI	41
5.2.2. Offer to investors by PPI	41
5.2.3. Offer to licensees by PPI.....	42
5.3. Rights and obligations.....	42
5.4. Revenue model	42

5.4.1.	Revenue from licensing.....	43
5.4.2.	Revenue from litigation.....	43
5.4.3.	Revenue distribution.....	43
5.5.	Customers.....	43
5.6.	Product-market fit.....	44
5.6.1.	Willingness to pay.....	44
5.6.2.	Comments and summary of product market fit	44
5.7.	Selection of patents	45
5.8.	Situations that could arise for the PPI	46
5.8.1.	Case 1 – winning infringement lawsuit.....	46
5.8.2.	Case 2 - losing infringement lawsuit.....	47
5.8.3.	Case 3 – successful licensing	47
5.8.4.	Case 4 – no infringement or license	47
5.9.	Financing the PPI	47
5.9.1.	Financial analysis.....	48
5.9.2.	Best-case scenario for the fund.....	50
5.9.3.	Worst-case scenario.....	51
5.10.	Remaining steps to realize the PPI	52
5.10.1.	Marketing and finding patents	52
5.10.2.	Patent selection process.....	52
5.10.3.	Investment	52
	Discussion	53
5.1.	Benefits with PPI model.....	53
5.2.	Risks with the PPI model.....	53
5.3.	Partnerships	54
5.4.	Profit.....	54
5.5.	Moral aspects.....	54
6.	Bibliography.....	56
7.	Appendix I.....	60
7.1.	Legal aspects.....	60
7.1.1.	Swedish law and praxis	60
7.1.2.	Counter suits	60
7.1.2.1.	Suit for nullifying the patent.....	60
7.1.2.2.	Suit for better right to the patent.....	61
7.1.3.	Payment of legal fees	61
7.1.4.	Corporate veil	61
7.1.5.	Dispute resolution	62
7.1.5.1.	Mediation	62
7.1.5.2.	Settlement.....	62
7.1.5.3.	Arbitration.....	62
8.	Appendix II.....	64
9.	Appendix III	67

Table of figures

Figure 1- The PPI acquiring funds and patents and transferring rights to subsidiary, negotiating a license agreement with an external company.....	38
Figure 2 - Illustration of the PPI receiving income from licenses and distributing it to the respective parties.	39
Figure 3 - Illustration of the PPI engaged in a legal process.....	40

Table of tables

Table 1 - Distribution of patent engagements	48
Table 2 - Legal costs.....	48
Table 3 - Financial Analysis	49
Table 4 - Financial Analysis best-case scenario	50
Table 5 - Financial Analysis worst-case scenario	51
Table 6 - Base case	67
Table 7 - Best case	67
Table 8 - Worst case	67

1. Introduction

A study funded by the European Union shows that 67% of respondent SMEs (Small and Medium Enterprises) have patents that had been infringed on (Kingston, Enforcing Small Firms' Patent Rights, 2000). It also shows that inventors have small chances of protecting their patent rights against large companies that infringe on the patent or refuses to pay license fees (Kingston, Enforcing Small Firms' Patent Rights, 2000).

The first paragraph of the Swedish Patents Act (1967:837) states that *"Anyone who has made an invention which is susceptible of industrial application, ...is entitled pursuant to Chapters 1 to 10 of this Act to obtain, upon application, a patent for the invention in this country and thereby acquire an exclusive right to exploit the invention commercially...."* (Patentlagen (SFS 1967:837)). This means that an inventor shall, during a limited time, be granted a monopoly to the patented invention. One purpose of the patent system is to give incentives to inventors and entrepreneurs to create inventions and commercialize them into innovations in order to create jobs and prosperity in society (Webster & Weatherall, 2013).

Without the incentives provided by the patent system, it is likely that fewer innovations would appear on the market, and significant potential economic values would go unrealized because of inventions being kept secret instead of patented and published (Webster & Weatherall, 2013). Patent protection is an important part of IPR (Immaterial Property Rights) because it protects the essential technical idea. The temporary monopoly gives the inventors a chance to gain financial compensation for the personal time and capital invested to create the invention.

A well functioning patent system where the inventor gets a temporary monopoly in exchange for sharing the technology with the public community is a key incentive for inventors to invent (Lanjouw & Shankerman, Protecting Intellectual Property Rights: Are Small Firms Handicapped?, 2004). Today, patents have become the domain of large corporations, often used as strategic weapons in corporate wars. In this context, small actors can hardly exert themselves, and the patent system is losing its intended function.

In Sweden, there has been a decline in patent applications over the last 10 years. One reason behind this is the difficulty in enforcing patents against infringement (Jansson, 2009). In the United States, the rate of filing patent lawsuits is growing faster than that of patent grants (Kingston, Enforcing Small Firms' Patent Rights, 2000). This is a troublesome development.

The majority of patent infringement cases never go to trial. However, large costs are still incurred even in cases where a settlement is reached (Lanjouw & Shankerman, Protecting Intellectual Property Rights: Are Small Firms Handicapped?, 2004). Many SMEs are intimidated by incurring such costs, thereby refraining from taking action against infringers, indirectly tolerating infringement of their patents (Kingston, Enforcing Small Firms' Patent Rights, 2000).

It is also a recognized problem that many inventions never get realized. An unrealized invention can be a great waste of potential wealth. By fear of losing their inventions to predator firms or infringement, inventors become cautious to disclose their inventions.

In Sweden, there is a need to improve SMEs' capabilities to assert themselves during legal proceedings (Ax, o.a., 2011). Being able to handle IPRs is essential in order to turn an invention into an asset that later can lead to a competitive advantage and growth for the company (Ax, o.a., 2011).

In the report "Public support system for dealing with corporate IPR", Ax, et al. (2011) conclude that the enforcement of patent rights should be included in the current financial support to innovation.

In order for Sweden to remain innovative, more inventions need to become producible, marketable, industrially applicable innovations. Increasing the number of invention-start-ups that grows strong and profitable, should contribute to economic growth on a national level.

1.1. Purpose

The purpose of this thesis is to investigate and analyze the qualitative aspects of the phenomenon of financially strong actors infringing on patents held by individual inventors and small enterprises (SE), its causes and effects, as well as suggesting a possible cure.

1.2. Problem analysis

The dynamics of inventors losing the rights to their inventions is multi faceted, with aspects ranging from the very patent system itself, to modern economics and markets. The enforcement of patent related disputes is not equal for all parties. The demands for quick return on investment and quarterly results can encourage profits over ethics.

The modern patent system, dating back to 1450 Italy, was initially designed to give inventors exclusive rights to their inventions in exchange for an exact description of how to replicate it (Kealey, 1996). The value for the state being that technological advances would eventually become public property and not perish with its inventors. The exclusivity provided an economic incentive for innovating, and the publication inhibited indefinite monopolies.

In order for the patent system to work as intended, inventors need to be able to enforce their patents against infringers. If a patent cannot be enforced, it loses its purpose, and ultimately the entire patent system becomes pointless.

One problem with the patent system is that it relies on the national legal system for trial and judgment. The legal proceedings around patent infringement are effective only if both parties have sufficient means to litigate, i.e. similar financial strength.

In the case of inventors or SEs enforcing their patents against large corporations, the capability to process is skewed. Large corporations have better means to finance legal proceedings, rendering the patent holder inferior.

The impact of losing a patent related legal process is more disastrous to the small actor than it is advantageous to the larger actor; thereby the risk / reward equation is skewed in favor of the financially stronger actor. In the case of infringement, the small actor often has to risk private assets to finance legal proceedings. A loss could render the small actor bankrupt. The infringer, on the other hand, only risks paying reasonable license fees. Being sentenced to pay the legal fees of the counterpart is also unbalanced as the stronger party normally incurs significantly larger fees than the small actor, making the consequences of losing far greater for the inventor.

It is an established fact that inventions are a strong force in national economy and global competitiveness. In order for a nation to thrive, new small companies need to survive and grow large. Such companies have historically been built around inventions. Therefore it is of great importance to keep the incentives to innovate intact and allow inventors and SEs to protect their inventions from infringers.

1.3. Limitations

It has been established in a study sponsored by the EU Commission that infringement on small firms' patents is a frequent phenomenon. Therefore, the issue of frequency of the phenomenon is left out of this study, which focuses on its causes, effects and a possible cure.

The suggested cure is not validated in the scope of this thesis. The aim of this thesis is to suggest a design of a cure and define its key features. Execution or realization is not included in the scope of the thesis.

The limitations of this thesis are derived from careful consideration of available time and the resources to gather relevant information. These limitations are as follows:

1. The IPRs are limited to granted patents and filed patent applications.
2. The patent holders are limited to individual inventors and small enterprises.
3. The suggested initiative is limited to current Swedish legal frameworks.
4. The geographical scope for developing the initiative is limited to Sweden

1.4. Definitions

Below is a glossary of phrases used, with definitions relevant for this thesis.

- **Arbitration** – Non-governmental court mainly used as a means to settle disputes between companies. Arbitration can only be invoked by agreement. In arbitration, in Sweden, the losing party has to cover the cost of the court, which is a for-profit organization.
- **Civil law** – Legal system using documented core principles, serving as the law. In civil law countries loser pays the winner's legal fees as opposed to common law countries where each party in a legal process carry their own cost.
- **Individual inventor** – A person who is not working for a company and invents a particular process or device, or a person who invents things as an occupation.
- **Infringement** – Someone making use of a patent they are not entitled to without paying for it.
- **Innovation** – An innovation is an invention that has commercial success.
- **IPR** – Intellectual property rights typically include all patents, trademark, copyrights and know-how and the right to claim it as your own.
- **Large companies** – In the scope of this report, companies that are financially significantly larger than the counterpart are considered large companies. The absolute size of what is considered a "Large company" is not emphasized in this report. Rather, the relative size of the companies, where one part is financially stronger, and thereby has better means to finance legal proceedings, and where a potential loss or payment of legal fees and damages, has a small impact on the survival of the company.

- **Medium enterprises** - as defined in EU law: Companies with less than 250 employees and a turnover of less than € 50M (The Commission of the European Communities, 2003).
- **Non Practicing Entity (NPE)** – An organization with the main purpose to litigate infringing companies on behalf of patent holders in an attempt to collect license fees or damages. Also called “Patent Trolls”.
- **Ombudsman** - The institution of the ombudsman, first created in Sweden more than 200 years ago, is designed to provide protection for the individual where there is a substantial imbalance of power (Ombudsman Association, 2014).
- **Patent** - A government authority conferring a right or title for a set period, especially the sole right to exclude others from making, using, or selling an invention.
- **Prior Art** – In relation to a new invention, *prior art* describes existing technology, such as existing patents and published technical solutions. Patent protection cannot be granted if *prior art* is found.
- **Small enterprises** - as defined in EU law: Companies with less than 50 employees and/or a turnover of less than € 10M (The Commission of the European Communities, 2003).

1.5. Method

The phenomena and problems of patent infringements and aggressive takeovers have been investigated along with their causes and effects. This has been done by qualitative research; open-ended interviews, supported by interview guides, with inventors and individuals who have tried to solve these problems previously. A thorough analysis of academic reports on the subject has been conducted in order to understand the scope and the critical issues already identified.

The reports that have been used in this thesis are deemed relevant despite their varying age, due to the slow evolution of the patenting system. The same problems that were referred to several years ago are still referred to today. Case studies of inventors and SE's who have been affected by patent infringement have been conducted. The chapter concerning these cases is based on open-ended interviews with inventors along with background research conducted by 3rd parties. Few interviews have been conducted with representatives of large companies. This is mainly due to the difficulty in securing interviews with decision makers that are initiated in this field, and willing to disclose relevant information on the cases. This leads to more attention to individual inventors and how they experience the problem. The purpose of this report is not compromised by the slightly unilateral selection of interviewees in the case studies, as it investigates a problem affecting inventors and SEs.

Studies of previous and current attempts to solve this problem have been performed in order to understand what went wrong and what worked in each respective attempt, giving guidance to mistakes that can be avoided and strengths that can be utilized. This has been done through open-ended interviews with the people behind the attempts, as well as studies of the reports published on the different attempts. The information gathered has been analyzed to provide insight in what have been the main weaknesses with these attempts.

Potential investors have been interviewed to identify what information and features they would require if they were to invest in such a venture. These interviews have been open-ended and supported by interview guides. To ensure the feasibility of the PPI, legislations and restrictions have been studied and open-ended interviews with legal experts have been performed. The interviews range from open to semi-structured in order not to limit the interviewees or put boundaries on their answers. To provide sufficient structure, interview guides were used during all interviews. The results from the interviews have been used to deepen and augment the data collected in the literature study. The interviewees were selected based on their expertise and experience in their respective fields.

Being a master's thesis from a university of technology, the standpoint is constructive, focusing on an important problem, and based on analyses suggesting a possible cure.

1.6. Structure of thesis

The thesis is structured to give the reader information about the phenomenon, the causes and the effects of patent infringement. Derived from this information, a Patent Protection Initiative is presented with the aim to cope with these problems.

Abstract

List of abbreviations

- 1. Introduction**
- 2. The problem of individual inventors & small enterprises losing the rights and profits from their inventions**
- 3. Case studies - understanding causes and effects**
- 4. Past and present attempts to solve the problem of patent infringement - exploring historical cures**
- 5. A suggested cure - Patent Protection Initiative**

Discussion

- 6. Bibliography**
- 7. Appendix I**
- 8. Appendix II**
- 9. Appendix III**

2. The problem of individual inventors & small enterprises loosing the rights and profits from their inventions

This chapter covers the phenomenon, causes and effects of patent infringement and aggressive takeover. The information provided is gathered from relevant literature on the subject.

2.1. The phenomenon of patent infringement, its causes and effects

There are strong mechanisms that inhibit the chances for individual inventors and SEs to protect their patents. This problem and its effects have been identified in several independent reports on the subject (Kingston, Enforcing Small Firms' Patent Rights, 2000; Mitchell, 2011) (Ronspies, 2004) (Lanjouw & Shankerman, Protecting Intellectual Property Rights: Are Small Firms Handicapped?, 2004). The underlying mechanisms behind the 67% of SMEs who have patents that have been infringed on (Kingston, Enforcing Small Firms' Patent Rights, 2000) are dependent on economic strength (Ronspies, 2004). In order to defend the rights to a patent infringed on, one must enter into legal processes. In most cases these processes incur costs in excess of 750 000 £ (UK) (Mitchell, 2011). The statement that "no patent is stronger than the financial capability to enforce it" is a recognized fact (Kingston, Enforcing Small Firms' Patent Rights, 2000). Private inventors and small enterprises can rarely afford even their own costs for legal processes (Kingston, Limited Incontestability for Small-firm Patents , 2006). The financial consequences of losing a potential process, being sentenced to also pay the legal fees of the counterpart, can be devastating for a small firm.

If a patent is of great value, a significant amount of money can be spent on processing aimed at getting the rights to the patent (Ronspies, 2004). This problem becomes apparent when the economic strength of the parties is unequal (Lanjouw & Shankerman, Protecting Intellectual Property Rights: Are Small Firms Handicapped?, 2004).

Inventors run a great risk of losing their patents, or at least the temporary monopoly that they by law are entitled to. If an individual inventor or SE does sue a larger company for patent infringement it is very likely that they will provoke a counter suit for better right or to nullify the patent (Kingston, Limited Incontestability for Small-firm Patents , 2006). This is often devastating for an individual inventor or SE with limited resources. If the court finds the patent to be invalid, and infringement cannot exist, the originator loses both the patent and the legal process. The main issue with countersuits for better right or nullification is that individual inventors or SEs rarely have the capacity to defend themselves (Kingston, Limited Incontestability for Small-firm Patents , 2006). Well-established companies in patent-intense industries maintain significant legal departments and use external legal experts to a large extent. A patent lawsuit is in theory a judicial review where arguments are tested in court, but in reality it is a proceeding where the financially stronger part almost always has the upper hand (Janicke & Ren, 2006). Patentees who manage to win legal disputes often have the same financial strength as their accused-infringer adversaries (Janicke & Ren, 2006).

The effect of litigation costs is a mechanism for raising the costs of the opposing party, which further increases the advantage held by financially strong firms

(Lanjouw & Lerner, Tilting the Table? The Use of Preliminary Injunctions , 2001). In fact the high cost of litigation for individual inventors and SEs can remove the potential profitability of a patent, thereby stifling innovation to the detriment of the economy and society (Ronspies, 2004)

According to an article regarding who is the most frequent winner in patent litigation cases in the US it was found that 87% (169 out of 194) of accused infringer companies with revenues over \$1 billion won their cases between 2002-2004 (Janicke & Ren, 2006). In Kingston's (2000) study of EU SMEs, only 2% of the respondents reported making a successful claim against infringers. A rational would-be infringer may decide to infringe after taking into account the financial weakness of a small business or individual patentee, knowing that the risk of enforcement is relatively low (Beron & Kinsella, 2011). If the patentees decide to litigate, their relative lack of financial strength strongly correlates with the outcome of the case (Beron & Kinsella, 2011).

If the infringing party loses the legal process, the compensation they are sentenced to pay is normally a portion of the loss of trade profit for the inventor, a fee that in many cases correspond only to the royalty that they might have paid for a lawful license of the patent (Hellberg, 2014).

For the inventor, the potential consequences of losing a lawsuit are disproportionately large compared to the potential gain of winning. In addition to this, legal proceedings and appeals can take several years, during which the patent loses value and becomes unattractive to any 3rd party due to the ongoing process.

There are several causes to the phenomena described above. One of these is the fact that financial strength affects the outcome of a patent infringement case (Janicke & Ren, 2006). Another issue, particularly in Sweden, is that the damages awarded in patent infringement cases are very low (Hellberg, 2014). A calculation of the average damages awarded to Swedish patentees, since 1976, in the few cases they have won, amounts to just over 6MSEK (Hellberg, 2014). These damages are primarily awarded as compensation for a loss of revenue, meaning that individual inventors who are not producing or selling a product will not receive any damages. In the best case, the non-producing patent holders can be rewarded an amount corresponding to a reasonable license fee. In Sweden, these "reasonable license fees" are on average 6,4% (Hellberg, 2014). These figures can be compared with damages awarded in the US where the average was over \$60M in 2008 (Hillel, Mazzeo, & Zyontz, 2013).

An individual inventor or SE who has sued for infringement must allocate funds to continuously finance legal proceedings. This puts great significance on financial strength in order to achieve legal justice.

2.1.1. Intimidation

Research by Kingston (2000) show that nearly half of the respondent SMEs are intimidated by larger firms, who threaten to force crippling litigation costs on them if they try to enforce their patents. The threat of incurring significant costs from legal processes is systematically used by larger firms to intimidate SMEs (Kingston, Enforcing Small Firms' Patent Rights, 2000). Thus allowing them to infringe on patents with impunity (Kingston, Enforcing Small Firms' Patent Rights, 2000).

The intimidation does not necessarily involve explicit threats (Kingston, Enforcing Small Firms' Patent Rights, 2000). The awareness of the financial discrepancy between an SME and a stronger counterpart will generally be enough for the weaker part to refrain from litigation (Kingston, Enforcing Small Firms' Patent Rights, 2000). There are however cases where the threats have been explicit, knowing the weakness of a smaller firm, the large firm simply says "okay, sue us then" in the virtually certain knowledge that the smaller firm cannot afford it (Kingston, Enforcing Small Firms' Patent Rights, 2000). Finding the cheapest way to use an invention that someone else has patented is a significant competitive advantage in many industries.

2.1.2. Risk

Apart from the bare financial logic illustrated above, the risk aspect also needs to be taken into consideration. Making a risk assessment of the outlook of a potential infringement lawsuit, the potential gain of winning must be weighed against the potential effects of losing. For financially strong companies, the risk of being sued, and the potential consequences of losing a lawsuit, are normally minor, compared to the potential gain of infringing (Ronspies, 2004). Large companies normally make thorough investigations of the financial capacity of their counterpart in order to determine how long they can maintain legal processes (Ronspies, 2004). This makes it very difficult for individual inventors and SEs to enforce their patent rights.

In Sweden there are currently no effective means available that allows financially weak actors to protect or enforce their patents. In other countries, e.g. the United States, lawyers are allowed to take on cases with contingency fee, giving them a portion of potential rewards, which mitigates parts of the financial aspect of legal processing (Kingston, Limited Incontestability for Small-firm Patents, 2006). In Sweden, however, it is not allowed to take on cases with a contingency fee if you are a member of the Swedish Bar Association (Advokatsamfundet, 2012). In civil law countries where losers have to bear a winner's legal costs, a large firm may even be able to prevent litigation from getting under way at all (Kingston, Limited Incontestability for Small-firm Patents, 2006). This can be done by asking the court to require their opponent to provide security for any costs which may be awarded against it, which an individual inventor or SE is likely to find it impossible to do (Kingston, Limited Incontestability for Small-firm Patents, 2006).

Due to the importance of strong financial backing, the chance that an individual inventor or SE would file a lawsuit for infringement is small (Beron & Kinsella, 2011). In case of a lawsuit, there are limited chances that the inventor or SE can finance the process until a verdict is reached (Beron & Kinsella, 2011). Large companies can finance legal proceedings for a long time and it is unlikely that the individual inventor or SE will be able to complete the process throughout verdicts and appeals.

Since there are statistically low financial risks associated with infringing on patents, there are no significant economic reasons for companies not to infringe. Thus it is, in most cases, far more profitable for large companies to ignore the patent, and risk litigation, than honoring a license agreement and paying license fee. Apart from economic reasons, there are other factors such as public relations and reputation.

Before infringing on a patent, most corporations will make risk assessments and economic calculations of each possible outcome and its consequences (Beron & Kinsella, 2011). These often show that it is not economically advantageous to enter into a license agreement, since this would mean paying the highest possible fees, rather than taking the odds of being sued and then the odds of losing. From an industrial perspective, disregarding ethical aspects, paying license fees for a patent means lower margins and competitive disadvantage.

2.1.3. Manufacturing capability

Another reason for this behavior by financially strong infringers is that they generally have the resources to manufacture and market the component or product immediately (Kingston, Enforcing Small Firms' Patent Rights, 2000). The infringer can make money from day one and for every day they can postpone a court judgment in favor of the small firm, it means more sales profit for the infringer (Kingston, Enforcing Small Firms' Patent Rights, 2000). The invention is of a potentially much greater value to a large organization than to the inventor, which in turn means that the organization can motivate much greater spending to acquire the patent, than the inventor can, fighting to keep it.

The inventor or SE rarely has the financial capability to start up production of a new invention while at the same time running a legal process against the infringer. It is also very hard to find financing (Kingston, Limited Incontestability for Small-firm Patents, 2006) or licensees for a patent that is being infringed on. Patents that are disputable are often less attractive and perceived to be associated with greater risk than non-infringed patents (Kingston, Limited Incontestability for Small-firm Patents, 2006). For a potential licensee, it can also be tempting to infringe, if they see that others already infringe on the patent. For SMEs it is vital to quickly move forward with their inventions, finalizing design, and setting up production (Hermansson, 2010). Getting stuck in legal proceeding and missing valuable time to further develop and market the invention can be devastating (Hermansson, 2010). Even if the small firm eventually wins the dispute, the delay can mean that the large firm has earned more money from the infringement by that time than any costs associated with the dispute.

2.1.4. Decision structure

Decisions about whether or not to infringe on patents are primarily made by middle managers who are concerned with their own career (Kingston, Enforcing Small Firms' Patent Rights, 2000). Most large corporations are measured by their quarterly profits. Combined, these two factors put a short-term perspective on business decisions, encouraging quick profits and diminishing the incentives to reach long-term cooperation with inventors. Since infringement lawsuits are likely to go on for several years, middle managers are rarely concerned with the potential consequences of losing a lawsuit because they have produced a good quarterly result (Kingston, Enforcing Small Firms' Patent Rights, 2000) and moved on to the next job assignment. When middle managers are faced with a decision to infringe on a patent of a small firm or not, the advantages far outweigh the risk (Palmgren, Affärsplan Statens Patentpartner Sweden AB, 2011).

With such insignificant consequences, managers who recommend taking a license from a small firm or inventor could be considered throwing away the valuable asset the firm possesses in its power to intimidate (Kingston, Enforcing Small Firms' Patent Rights, 2000). Kingston (2000) further states that, throwing away assets and adding additional cost of royalties or license fees will not be seen as the best way to for the middle manager to get a promotion. It is thus likely that infringement can be dealt with if the risk of loosing is higher, making the consequences for the decision makers graver.

It is difficult to chart the full network of effects caused by these phenomena. The main concern that has been voiced in previous research, however, is that individual inventors and SEs will refrain from protecting their inventions (Ronspies, 2004) (Kingston, Why patents need reform, and some suggestions for it in, 2009) (Kingston, Limited Incontestability for Small-firm Patents , 2006) (Webster & Weatherall, 2013) (Lanjouw & Shankerman, Protecting Intellectual Property Rights: Are Small Firms Handicapped?, 2004).

2.1.5. Economic consequences

Without the confidence that patent rights can be enforced quickly and efficiently when needed, the patent system will not stimulate innovation (Webster & Weatherall, 2013), in Sweden or internationally. To enter a legal process to protect and defend intellectual property rights in the event of a conflict can have serious consequences for a small business (Kingston, Limited Incontestability for Small-firm Patents , 2006). This often leads to individual inventors and SEs choosing not to seek formal protection for their intellectual property, as they see no chance in winning a patent litigation case (Kingston, Limited Incontestability for Small-firm Patents , 2006).

The significant economic disparity between patentees and large, corporate actors may create an impression among individual inventors and SEs that the costs necessary to protect a patent by far exceed the profits expected from the commercialized invention (Ronspies, 2004). The conclusion of such a cost-benefit analysis ultimately leads to a reduction in the number of innovations disclosed by small inventors (Ronspies, 2004). Instead SEs and individual inventors may turn to other forms of protection of their IP such as trade secrets, which cost little to maintain but provide negligible benefits to society (Ronspies, 2004).

Kingston (2000) reports that nearly half of the respondents in his study say that the fear of legal costs associated with their patents was either a large or significant negative factor affecting their investment in innovation. Kingston (2000) further claims that these companies probably are the most innovative firms there are. Legal processes related to patents often last several years. This may have the effect that, rather than continuing to build on that invention and thinking about how to improve it and other ideas that they have, the inventors lose the incentives to undertake R&D (Lanjouw & Shankerman, Protecting Intellectual Property Rights: Are Small Firms Handicapped?, 2004).

In a national economic scope, a Danish report states that 100-340M€ are lost in Denmark due to inventions being infringed or never pursued (Larsson T. , Patentintrång; En fråga för svenska staten?, 2003). There is nothing that indicates that the situation would be significantly different in other countries. Mitchell (2011) claims that the cost of losing nationally developed technology to

infringement or patent nullification challenges, adds up to vast amounts. Although statistics are not available for reasons including confidentiality, some individual UK SME cases currently in dispute are known to be worth tens of millions of GBP each and there are thousands of cases that never ever reach a court because of the barriers (Mitchell, 2011).

The issue of distraction of inventors and business owners from innovatory activity is also brought up by Kingston (2000). All the time and energy that is spent on legal disputes to enforce patent rights is taken away from the inventive capacity and ingenuity, which are the most important characteristics of such firms (Kingston, Enforcing Small Firms' Patent Rights, 2000). Large firms usually have their own legal departments and do not suffer from this distraction (Kingston, Enforcing Small Firms' Patent Rights, 2000).

The effects of the lacking support to innovative SMEs and inventors are clearly a problem even though it can be hard to quantify. Both Larsson (2003) and Kingston (2000) does however point out the importance of enabling innovative SMEs and inventors to do what they do best so that they can contribute in a positive way to the economy.

Companies and innovators must be able to profit from the work they devote to developing ideas into products. If there are deficiencies in the ability to protect patent rights, there will be fewer commercialized innovations (Ronspies, 2004). The fact that individual inventors and SEs are less capable of protecting their patents compared to large established firms is a problem that needs to be dealt with.

Individual inventors and SEs do not deserve special patent protection simply because of their economic disadvantages according to Ronspies (2004). Rather, society should take the steps necessary to level the legal playing field for individual inventors and SEs because they have consistently made innovative contributions to society in ways that large corporations likely never will (Ronspies, 2004). Unless small entities can afford to enforce their patent rights, such contributions may simply cease to exist (Ronspies, 2004).

In summary, the patent system is not functioning in the way it was intended unless the inventors or SEs have the means to finance legal processes until a verdict is reached. This creates a situation where actors can use financial strength to profit from the work of others without paying for it, and with low risk of repercussions.

2.2. The phenomenon of aggressive takeover, its causes and effects

Another problem for individual inventors and SEs is aggressive takeover on which very little research has been found. The phrase "aggressive takeover" refers to events where an inventor unwillingly loses his company to a third party, investor or large firm.

A situation where there is a fall-out between equal partners that co-founded the company is not included in this aggressive takeover.

The typical case is that a financially strong investor, e.g. large companies, investment firms, business angels etc., identifies small companies with promising inventions, and a need for financing.

In the general case, the investor then buys a minority of shares. By different methods, the investor then forces the original owner away from the company, and acquires all, or a majority of the shares. One such method is centered on

spending all the available funds, and demanding more shares in order to invest the funds required.

There are several different cases of how this takeover can be conducted. One method, known as “kill the inventor” describes how investors invest the capital necessary to commercialize the invention (Palmgren, Kill the Inventor – An impact assessment of white collar crime, 2012). This capital is then spent or shifted to other companies, rendering the innovation company in need of additional capital. The investors refuse any other external investors, but offer to invest a part of the capital needed, if the other owners, in these cases the inventor or founder, invests a proportional amount. Unable to do so, the investor offers to trade their investment for more shares, now at a significantly reduced price, compared to the initial investment. The company being in dire need of capital, forces the founder to give up the majority of shares, and hence the control of the company to the investor. Once the majority is acquired, the investor moves to strip the inventor of any influence in the mutually owned company (Palmgren, Kill the Inventor – An impact assessment of white collar crime, 2012).

It has surfaced during the interviews with Swedish inventors that there often is discrepancy between the inventor and the investor in the vision for the invention. This can create similar problem as those described above, though the initial intention is that both the inventor and the investor should profit from the invention. There is, in this case, a perception that investors will be better able to take the invention to where they want, and have better possibilities to profit from it by not involving the inventor.

The term “kill the inventor” takes the intimidation process one step further. It is a term used to describe how companies and/or investors abuse the inventors’ rights (Palmgren, Kill the Inventor – An impact assessment of white collar crime, 2012). Companies use their dominant monetary position to extort inventors with lesser means to defend themselves to not only steal their patents, but also to further make sure that the inventor will not be able to obtain redress (Palmgren, Kill the Inventor – An impact assessment of white collar crime, 2012). The term “kill the inventor” is used not only because of its figurative meaning but also its literal meaning, it is not uncommon that inventors take their own lives when their lifework have been stolen and they have no chance of redemption (Palmgren, Kill the Inventor – An impact assessment of white collar crime, 2012).

One example of this is the inventor of the FM radio, Edwin Armstrong. Armstrong tried to sell his invention to Radio Corporation of America who did not want to buy it. Instead they stole it. Edwin Armstrong then went to court and spent three years trying to win the case, which ruined him and led him to take his own life (Lessing, 2013).

Stealing or infringing on patents is one issue, but, perhaps, a far greater one is the fact that inventors even go so far as taking their own lives (Palmgren, Kill the Inventor – An impact assessment of white collar crime, 2012). The fact that this has happened means without question that no more inventions, nor job opportunities or economic prosperity will see the light of day from that inventor.

3. Case studies - understanding causes and effects

This chapter aims to provide background knowledge through accounts of cases where inventors and SEs have lost their inventions and or savings to large companies. This illustrates some of the methods used by large organizations to acquire patents from small actors.

3.1. Håkan Lans

The stories of Håkan Lans have been depicted in novels and TV-documentaries in Sweden and internationally. The cases referenced below relate to Lans' patents for color graphics and the AIS (Automatic Identification System). The information provided is based on the documentary "The 986 Patent", an interview with Håkan Lans, news articles about Lans as well as information gathered through literature and interviews (Collaros & Etzler, 2012) (Lans, 2014) (Kleja, 2011) (Brändström, Niklasson, & Westholm, 2011) (Cauthorn, 2014) (IMO, International Maritime Organisation, 2014).

3.1.1. The color graphics

Håkan Lans invented color graphics for computers in the 70's and received a patent for that technology. It was harder than Lans expected to sell the patent or a license to it, mainly because there was no real demand for this new technology. Instead Lans waited for someone to start using the patent. In the mid 1980's the demand appeared, and Lans saw a computer made by Hitachi that used his technology without paying a license fee. Lans then sued Hitachi who made a countersuit, claiming that Lans was not the inventor of the color graphics at all. It is common practice in patent infringement cases that the infringing party files a counter suit for better right to the patent, or to void the patent.

Lans realized that, if he lost, he would risk being ruined and as the proceedings went on for many years, it looked grim for Lans. Hitachi finally presented evidence to show that Lans did not own the patent at all, through two very credible witnesses who claimed that they invented the color graphics before Lans.

At that point Richard A. Callahan, head of security for IBM and former CIA agent showed up at the Swedish trade council with the intent to give Lans important information. Callahan showed Lans information and evidence that indicated that the witnesses had been bought by Hitachi to lie in court. The reason for IBM having an interest in Lans' case was that IBM and Hitachi had a bitter rivalry and IBM wanted to limit Hitachi's power by any means available. Lans' lawyers used this information to discredit the witnesses and the case ended in a settlement after eight years of legal processing. At the time, Lans had also received an unlimited credit from the Swedish government in order to continue the legal proceedings for as long as necessary.

The story did not end there however. Even though many companies were paying license fees to Håkan, there were still ten computer companies that did not. Lans left the legal proceedings to an American law firm, which would turn out to be a mistake. The law firm bungled the lawsuit because of a technicality; the firm sued in Lans' name instead of his company's name, where he was the only employee. The case came to be centered on whom of the two actually owned the patent. The suits and countersuits once again threatened to ruin Lans.

In the mid 2000's Lans was involved with many legal disputes, none that had a positive outlook. At one point, Lans even contemplated taking his own life. During this time, Lans also strongly suspected that he was being followed and had his phone and email bugged. He heard strange clicking sounds in his phone, emails he sent were received with weird characters and the information he only shared with his lawyers surfaced from his opponents during trials. Lans struggled with the lawsuit for 15 years and sent 127,000 pages to the American courts. It did not end until the judge died and his replacement found the process to have been too long and torturous with major flaws. The new judge offered to start all over but all the computer companies except Acer caved-in and offered a settlement. Acer and Lans are still fighting (August, 2014) and Acer wants more than 3 million dollar US to cover their court costs.

3.1.2. SAAB and the AIS

Håkan Lans created an invention that combines GPS (Global Positioning System) with data link communication to equip all vessels at sea with accurate information about their own and other vessels' positions. The system, called AIS (automatic identification system), has become a world standard, used on small boats, ships and freighters alike. All passenger ships and all international voyaging ships are required to have AIS. The system significantly increases the safety as all ships can see the position, heading, speed and identity of all other ships using the system.

SAAB was not a part of the development of the AIS, but came in at a later stage and signed a license agreement with Lans' company GP&C Systems International AB. When the sales for SAAB grew, they ceased to pay the license fees with the argument that they were being discriminated. The motivation was that other manufacturers were infringing on the patent as well. When GP&C Systems International AB initiated a lawsuit against SAAB in 2011 to get paid according to the applicable license agreement, SAAB instead demanded the license fees they had paid to be refunded.

During the legal process SAAB, through one of their subsidiaries, claimed that the AIS had lead to a financial loss and was not a success story, something that they had claimed in a previous annual report. SAAB then refused an authorized accountant to review their books with the motivation that it contained confidential information.

SAAB claimed that they had paid considerable sums to GP&C Systems International AB over the years, but no accounting report or explanation was been provided. SAAB maintained, in the Stockholm district court, that their accounting was a trade secret and would not allow an authorized auditor to examine their sales.

In the beginning of 2010, IP prosecutor Fredrik Ingblad launched an investigation of suspected infringement of the patent for the AIS. Swedish Patent Law 57§ third paragraph says that prosecutors may bring criminal charges "*if the plaintiff states the offense and the prosecution for specific reasons is warranted in the public interest*".

The result of this case, which was the first of its kind, had importance beyond the involved parties. It was a test of both the law enforcement authorities'

competence and their appreciation to the lack of equality that often exists between perpetrators and victims in IPR cases.

The case was dismissed in the later part of 2011. The reason the prosecutor did not see it fit to prosecute is that Lans allegedly did not own the patent in Sweden, but only has the right to license it in Sweden through the company GP & C, where Lans is CEO.

3.2. Kenneth Palmestål – IQ-therm

The case about Palmestål is based on the following references: (Laurén, 2010) (Palmestål, 2014)

Kenneth Palmestål founded the company IQtron on an invention for energy optimization of electric heating, called IQtherm. The invention won an acquisition competition by NUTEK (now Tillväxtverket), virtually guaranteeing orders worth 35 MSEK.

Palmestål lost the invention and the company to a venture capitalist that was formerly involved in the scandalous IT-company, Prosolvia. At the time, IQtron was worth around 8 MSEK.

Palmestål failed to prove to the court that there was an oral contract between him and the venture capitalist. The court acknowledged that there was a written offer but no written contract. The offer, written in 1998, stipulates a “Solution for financing and competence for growth”. The investor guaranteed financing of 3-10 MSEK during three years. The goal was to make an IPO at 30-100MSEK.

Palmestål agreed to sell 26% of IQTRON with an option of additionally 25%. In May 1998 both parties agreed to this in writing. Thereafter the venture capitalist initiated the process “Kill the inventor”.

At the first meeting with the bank, the new part owner refused to warrant any loans. Without the warranty from both owners, the bank could not approve any loans.

In June Palmestål received a demand to surrender his shares, giving the investor 91% of the shares. Due to the “problems with finding financing” Palmestål should give his shares to the investor without any reimbursement. Negotiations from Palmestål was met with the ultimatum that if he did not surrender the shares, the investor would immediately file for bankruptcy.

The lack of financing meant the production ceased, and no products could be delivered. No products were delivered to the retailers; Clas Ohlson and ASEA Skandia. In the spring of 1999, Palmestål sold the company without profit. Palmestål sued the venture capitalist in the district court for breach of contract and lost. He was sentenced to pay legal fees of 700.000 SEK

He appealed to the Swedish Court of Appeal, but his case was not tried.

Since Palmestål was unable to pay the 700 000SEK in legal fees, the venture capitalist demanded distraight. Palmestål was able to loan the money from a friend, and was thereby able to keep his house.

3.3. John Mitchell vs. Dragon Systems and Nuance Communications

The case about Mitchell is based on the following references: (Mitchell, 2011) (Gulliksson, 2014) (Karlberg, 2011) (Levin, 2014).

The British inventor John Mitchell invented a system for speech recognition for computers, called Allvoice. He was rewarded patents in the US and EU. When he realized that US software companies were using his invention in their products,

he sued the multinational companies Dragon Systems, IBM, Nuance and Dictaphone, and won. Making the companies pay him significant amounts in damages, as well as signing licensing agreement for continuing to use his patent. One contributing factor to Mitchell being able to run the process was the fact that his US lawyers, as is common in such cases, worked on contingency. Upon winning the case, they were rewarded almost half the damages. Despite the rulings in Mitchells favor against these companies, a case against Microsoft is still ongoing (2011).

3.4. Johan Ullman vs. Gylling

The case about Ullman is based on the following references: (Ullman, M.D, Inventor & Entrepreneur, 2014) (Ullman, 2001) (Computer Sweden, 2003) (Patton, 2001).

Johan Ullman is a medical doctor, a scientist and one of Sweden's most productive inventors. Most of his inventions are aimed at improving the work environment for people and reducing the risk of injuries. The events referenced below relate to the invention of a new type of computer mouse that proved to significantly reduce the risk of hand-, arm-, and shoulder related injuries collectively known as mouse-arm-syndrome. Johan Ullman was rewarded a worldwide patent for this invention.

In 2002, a venture capital firm that expressed interest in the product "UllmanMouse" approached Ullman. The company, Gylling Capital, now Gylling Invest, offered financing and support in marketing and selling the product and acquired a minority post in the company Ullman Technology AB.

Ullman was persuaded to sign the license- and shareholder agreements as private person, not in his role as executive of his company. This would later prove to have devastating consequences for Ullman.

Shortly after Gylling had acquired a minority post, Ullman was falsely accused of severe breach of the agreements, for not having filed a patent application in Taiwan. Ullman Technology's assets of 3 MSEK were also transferred to another company, Creator AB, owned by a previous executive in the Gylling sphere. Ullman was informed that unless he could quickly invest another 1.2 MSEK, Gylling would have to invest the means required to save the company. This would, however, come at the cost of Ullman loosing his stock-majority. At this point, Ullman demanded to see the bookkeeping of Ullman Technology, a company of which he still owned 58%. The office being in Gylling's building in Stockholm, Ullman was physically denied access.

After this, seeing no other options, Ullman terminated both the license agreement and the shareholders agreement with immediate effect.

An arbitrary process, where Gylling sued Ullman for breach of contract was initiated despite Ullmans expressed request for public court. Ullman was unable and unwilling to pay the fees, which lead to Gylling paying the up-front fees for both parties, using the money from the mutually owned company, Ullman Technology.

The arbitration court ruled in the favor of Gylling and sentenced that Gylling should be allowed to acquire Ullman's 58% of the company for half of their real value, which the arbitration court set to 200 000 SEK and to pay Gylling 3 MSEK for their legal costs. This resulted in personal bankruptcy for Ullman.

Being the major stakeholder in Ullmans bankruptcy, Gylling managed to buy the bankruptcy estate from its Trustee, through a highly unusual agreement, shifting all control of the bankruptcy estate from the Trustee to Gylling. In effect, this meant that Gylling could decide if and when the bankruptcy should be closed, and the conditions for termination.

Through this arrangement, Gylling were able to keep Ullman bankrupt for 10 years, exerting economical and psychological pressure on him and his family. Controlling the bankruptcy estate allowed Gylling to run any number of recovery processes indefinitely, accumulating millions (SEK) in legal fees.

In parallel to the bankruptcy, Gylling sued Johan Ullman's wife, children and mother-in-law in a recovery-process. After five years of processing, Ullmans family was informed that if they lost, they would have to pay several millions in legal fees, in addition to the 7 MSEK that Gylling demanded to cover Johan Ullmans debt from the arbitration process. The head judge informed Ullmans family that even if they won the case, the counterpart would appeal and the process would continue many years. This ultimately forced them to accept a settlement, rendering them 3MSEK in debt to Gylling.

Johan Ullman was hit by mental exhaustion and was not able to work, neither as a doctor nor as inventor after the processes started in 2003. He was kept in personal bankruptcy until 2011, due to Gylling forcing the continuation of the bankruptcy, prohibiting Ullman from any form of business activity. Like others in similar situations, he suffered a severe exhaustion syndrome, leading him close to suicide.

The company Ullman Technology, of which Ullman owned a majority, is now controlled by Gylling and has been renamed and moved abroad. Gylling are still running processes to acquire Ullman's patent.

3.5. Implications for design of a cure

Håkan Lans' case about the color graphics shows that there are larger companies that are willing to go great lengths and even lying in court, to avoid paying license fees and come by patents. It is common practice for infringers to file a countersuit for better right to or nullifying the patent. That makes it important for inventors and SEs to have the financial means, not only to enforce their patents, but also to defend their patents against counter suits.

The case also shows that larger firms can be malicious in the way they use the legal system to exert pressure on an individual inventor. Extensive legal processing is used by some large firms to "bleed out" the counterpart to acquire patents and avoid paying license fees (Cauthorn, 2014).

In Lans' case concerning the AIS, few were willing to pay the license fees, which resulted in SAAB's decision to end the payments to Lans. The fact that companies refuse to pay license fees shows that patents are essentially worthless unless the owner has the financial means to enforce them.

The more valuable the patent is, the more money a company is willing to spend on legal fees instead of paying license fees (Beron & Kinsella, 2011).

Consequently this indicates that the need for solid financial protection increases with the value of a patent.

A cure with a significant "war chest" to finance legal proceedings for the inventor, in return for a percentage on the licensing fees, could in Lans' cases have stopped the prosecutions. It could also have incentivized the other large

companies to pay the licence fees Lans was entitled to. The threat of solid financial backing to an inventor results in higher risk for infringer, which, in turn, leads to a more level playing field.

As it is common practice for large companies to sue for better right or nullification of a patent once they are accused of infringement, it is important that a suggested cure supplies both offensive and defensive protection. Lans' cases show the need for experienced and reliable legal partners to avoid careless performance by councils.

Palmeštål's case is an example of aggressive takeover. Once the investor had become a partner, he revealed his intentions, and almost managed to take over the company.

A suggested cure that has created a subsidiary with an exclusive license should in this case enter all the agreements with the investor. This would mean that an investor would no longer be able to pursue the inventor in such a manner. If it becomes clear that the investor has ill intentions, a suggested cure should have the option revoke the exclusive license from its subsidiary. The method of making the mutually owned company insolvent in order to force the patent owner to pay or give up shares becomes pointless, as there is no significant financial impact to the inventor in case of bankruptcy. The patent safely resides with the parent company.

It could be argued that this construction could deter potential investors, but if the investors' intentions are to license and cooperate honestly, the agreements should be just as attractive as one with the inventor. It can instead be argued that a cure will generate more investments from venture capitalist because they will know that the technology they are investing in is better protected from infringement.

Mitchell's case illustrates that it is possible for an individual inventor to win against companies with immense financial assets, as long as the inventor can see the process through, and not risk losing everything. A suggested cure should achieve the same goal through substantial financial strength.

When the cases are tried in Sweden, it is not possible for lawyers who are members of the Swedish bar association to work on contingency. This means that an individual inventor would have to finance the legal proceedings on his or her own. The suggested cure would allow individual inventors and SEs to enter into legal proceedings without having to risk all their own financial resources.

Ullmans case is another example of an aggressive takeover, where the inexperience and limited financial resources of the inventor created an unequal balance between the parties. Gylling's financial superiority and experience allowed them to manipulate the system to their advantage, and put Ullman in a poor position. Ultimately, the risk of total economic collapse in case of losing, forced Ullman's family to agree on a settlement. The relative risks for Gylling were of lesser significance, where even the worst-case scenario would only take a fraction of their financial resources, while the potential gain of winning could prove highly profitable for many years.

Cases like this could be prevented by providing legal council and prevent an inventor to sign agreements that makes them vulnerable, instead through subsidiaries with an exclusive license.

There are a few differences between the different cases, but one common denominator is that a financially stronger party can use its power and financial

strength to either take over the patent rights or to avoid paying license fees. To counteract this problem, the ability to claim and defend the rights to patents needs to be balanced and less dependent on financial power.

Some of the cases show that the dissonance between the individual inventor and the large company can create big problems. The large differences in the expectations and estimations of potential markets can be hard to bridge when two parties have opposing stakes in terms of profit.

It could be beneficial to broker between the parties, adjusting expectations and facilitating negotiations. There could also be a service provided, in a cure, to assist with negotiations and legal council when it comes to signing contracts.

This mediation service could also be attractive to large corporations that are concerned about being accused for trying to cheat inventors.

It is possible that new legislations are needed to cope with these problems. Such legislations could mean more severe punishments, or just enforcement of the laws that already exists. Another way would be to establish a cure that acts as a buffer between the parties, raising the ability of the weaker part, to match that of the stronger one.

Key elements in a suggested cure, derived from the cases above are; solid financial strength to finance both offensive and defensive legal proceedings, an organizational structure with strong corporate veil between mother and subsidiaries, universal agreements and services brokering the negotiations and agreements between the parties. The cure can also help in manage expectations, helping the inventor or SE as well as the company interested in licensing.

The next chapter brings up previous and present attempts to help inventors and SMEs, better defend themselves and their patents against infringers. The aim is to learn from their mistakes and further give input to a suggested cure.

4. Past and present attempts to solve the problem of patent infringement - exploring historical cures

There have been some attempts to help SMEs and inventors to better protect their IPR. A few of these attempts are presented below and also the insurance solutions that are available today.

4.1. The SUF insurance 1985

The Swedish Inventor Association (SUF) offered an insurance solution to cover costs associated with legal disputes already in 1985 (Larsson T. , 2014). The annual insurance premium was between 2 000 to 3 000 SEK per patent (Larsson T. , 2014).

There was no initial screening that the patents had to pass in order to be accepted. All SUF members were able to obtain an insurance policy for any of their patents. There was, however a pre-qualification prior to initiating a legal process.

The insurance failed 10 years after its launch. Two legal processes had drained all the financial resources of the insurance (Larsson T. , 2014). SUF had about 250 patents enrolled in the insurance.

It became apparent that many of the disputes were due to disagreements between previous partners who had fallen out and not due to infringement by larger companies (Larsson T. , 2014). These cases were not qualified for initiating legal processes.

According to Larsson (2014) one of the main issues with this insurance was that too few inventors obtained the insurance. This, in turn, meant that not enough funds were available to cover the cost associated with the disputes that arose. The conclusions from this solution are that a low premium is not a guarantee for a large insurant base, and sufficient funds for processing are instrumental. Initial screening prior to accepting patents would reduce the risk of fruitless processing and internal disputes.

4.2. The SUF insurance 2007

SUF again tried to launch the insurance in 2007, then with a higher insurance premium of 8 000 to 16 500 SEK depending on the geographical coverage of the patent, whether it covered just the Nordic countries or also the EU and ESS-area (Svenska Uppfinnarföreningen, 2007). This insurance would cover costs up to 2 MSEK. The insurance would cover inventors that had their patents infringed on, as well as inventors being accused of infringing on others' patents (Svenska Uppfinnarföreningen, 2007).

None of the insurance solutions had any support from the Swedish government (Larsson T. , Former chairman of Svenska Uppfinnarföreningen, 2014) (Svenska Uppfinnarföreningen, 2007). Governmental support might have proven beneficial in critical situations, as it has been recognized as a success factor in previous cases (Hentzell, 2014) (Palmgren, Affärsplan Statens Patentpartner Sweden AB, 2011).

The issue of too few members, enrolled in the insurance, occurred again with this second attempt, which led to insufficient funds, and the consequential

termination of the insurance solution in 2012 (Larsson T., Former chairman of Svenska Uppfinnareföreningen, 2014).

The fact that the insurance policy would only cover up to 2 million SEK and that this limitation was official, was one of the reasons for failure (Palmgren, Affärsplan Statens Patentpartner Sweden AB, 2011). If the infringing company is aware of the financial recourses available to an inventor, they can keep the process alive with appeals until they know that the inventor has depleted his financial recourses for processing. It can easily be calculated how much legal processing the insurance will cover. Assuming a 50/50% distribution of processing costs between the parties, the infringing company can make a calculated decision on whether or not to infringe.

As in the case of SUF's first offer, not enough funds were available to finance the legal processes. The conclusion that can be drawn from this is that a significant "war chest" needs to be available for a suggested cure to be effective. Another conclusion is that the funds need to be incalculable for infringers.

4.3. Statens Patentpartner Sweden AB

The main idea with an IPR organization run by the Swedish government was to stimulate the Swedish economy by allowing more innovations to reach growth and remain taxable in Sweden (Palmgren, Affärsplan Statens Patentpartner Sweden AB, 2011). It is now an established fact that innovations with significant value will eventually be drawn into legal processes (Palmgren, Affärsplan Statens Patentpartner Sweden AB, 2011). Since the financially stronger party in many previous cases determines the outcome of the proceeding, the inventor would need a so-called "patent partner" to balance the inequality of the parties (Palmgren, Affärsplan Statens Patentpartner Sweden AB, 2011).

The business idea of Statens Patentpartner Sweden AB was to defend patents with substantial and proven value, on commercial grounds (Hentzell, 2014). The term *proven value* herein requires that the patent should: 1. Have generated an income 2. Have a party interested in purchasing a license, or 3. Have an ongoing infringement (Palmgren, Affärsplan Statens Patentpartner Sweden AB, 2011).

According to the business plan of Statens Patentpartner Sweden AB, the organization would offer three services under a "Patent Partner License"; 1. Transfer of IPR – protection from external exposure, 2. IPR Parking – a public "parking lot" for IPR, 3. Legal Trust Exchange – a European cooperation for IPR. The universal Patent Partner License would stipulate the relationship between the organization and the holder of the IPR. It includes a formal obligation for Statens Patentpartner Sweden AB to assist and enforce their commitment in the event of a dispute. The organization can claim a portion of the outcome of the process, related to their level of financial engagement (Palmgren, Affärsplan Statens Patentpartner Sweden AB, 2011).

In the "Transfer of IPR" product, Statens Patentpartner Sweden AB signs an agreement with the inventor or IPR-holder on commercial grounds. To protect the holder of the IPR, the organization buys the patent for a fixed sum of 30 KSEK. The original IPR-holder's right to the invention is regulated through the agreement (Palmgren, Affärsplan Statens Patentpartner Sweden AB, 2011). This construction was intended to prevent potential patent lawsuits by deterring potential infringers. Infringing on such a patent would mean risking entering into a legal dispute with the Swedish government, facing a counterpart with

unlimited processing-budget. The risk analysis made by potential infringers would in this case indicate too great a risk, which would have a preventive effect (Palmgren, Affärsplan Statens Patentpartner Sweden AB, 2011).

The term “IPR Parking Lot” is used to describe the function that a patent can be parked in the custody and protection of the organization, and taken out at any time.

The organization would be a part in negotiations with potential licensees or exploiters that approaches the IPR-holder amiably (Palmgren, Affärsplan Statens Patentpartner Sweden AB, 2011).

The third product proposes a European organization under the name Legal Trust Exchange, which is to deal with cases concerning inventions with *significant value*, or where the case have strong governmental stakeholders. It was proposed that the Legal Trust Exchange would enjoy the same support from the Swedish Government as Statens Patentpartner Sweden AB (Palmgren, Affärsplan Statens Patentpartner Sweden AB, 2011). These two organizations were intended to work in parallel.

Statens Patentpartner Sweden AB would need 45 MSEK to finance operational costs during the first 3 years, and 5 MSEK in equity (Flodström, 2014). The “war-chest” for processing costs would be the public treasury (Flodström, 2014).

Statens Patentpartner Sweden AB would finance its operations through a percentage of the income from licensing fees from the patents they defended (Hentzell, 2014). It was estimated that 10-15 patents were required to make the organization self-sustaining (Hentzell, 2014).

Sveriges Patentpartner Sweden AB was dependent on the condition that the Swedish government would act as benefactor. This would provide undisclosed and virtually undeletable resources to finance legal processes. Unable to predict the extent, cost and outcome of a potential lawsuit, infringers would be discouraged from infringing on patents (Palmgren, Affärsplan Statens Patentpartner Sweden AB, 2011). If the patent has strong financial backing it is unlikely that companies would infringe, and Palmgren (2011) uses Håkan Lans’ case against Hitachi as proof of concept. The Swedish government gave Lans an unlimited credit to continue the proceedings against Hitachi. When Hitachi realized this, they decided to settle the case. This cause of events is also recognized in the case of Hans Hentzell, who also received a credit from the Swedish government and subsequently won legal proceedings against patent infringers (Hentzell, 2014).

The governmental involvement would also entail some limitations to the model. It would, for example, not be possible to be selective in the acceptance of patents due to the risk of discrimination (Flodström, 2014).

Statens Patentpartner Sweden AB was never launched. One reason for this was that the Swedish Government was not willing to become a benefactor (Flodström, 2014). The Government was hesitant to “choose sides” and risk acting against important industrial actors. It was also expressed that such a venture would be too costly for the state, and that the necessary funds could not be allocated (Flodström, 2014).

Flodström (2014) believes that this initiative might have had a better chance of success if it had come through one of the universities, or Vinnova, instead of an independent working group.

This initiative had the potential to work as intended. The conclusions were, however, that the involvement of the government posed so many obstacles that it was impossible to see it through. To be able to achieve the benefits, it would need to be run in private regime.

Governmental involvement has proven beneficial in various cases. It can be argued that it is not the function of being a government per se, but the immense monetary resources that has a desirable deterrent effect. Hence, with solid private financing, preferable of undisclosed size, the benefits of governmental support could be enjoyed without the excessive bureaucracy that comes with it.

4.4. The CJA study

In 2002, the European Commission gave CJA Consult Limited (UK) the mission to carry out a study to examine how an insurance solution could be constructed in an economically viable way. The study was not limited to the European Union but also took into account situations occurring in the United States. They conducted a survey, which showed an extensive interest for an insurance that would allow patent owners to defend their patents in case of a legal dispute (Larsson T. , 2003).

The insurance companies stated that an insurance solution with a premium of 300€ - 600€ would be viable (CJA Consultants Ltd, 2003). This insurance would give protection for a pre-study to a cost up to 35 000€. In the case of a dispute, a deductible of 5000€ would be paid by the insurant (CJA Consultants Ltd, 2003). In the case of the dispute escalating to legal proceedings, the insurance would cover up to 1 500 000€ as well as liability up to the same amount. This model was based on the assumption of one dispute per one thousand patents and a 50% chance of winning (CJA Consultants Ltd, 2003).

According to CJA it was very important that the insurance solution covered the risk for the one accused of committing patent infringement, at least as important as to cover the cost of enforcing patents from infringement (CJA Consultants Ltd, 2006).

CJA further concludes that the EU Commission cannot take sides and support only one part. If public funding is possible, the financing should cover both parties in a legal proceeding (Larsson T. , 2003).

The CJA study did not materialize into any concrete solution. The final conclusion of the study was that such a patent insurance would need to be mandatory in order to enroll a sufficient insurant base (CJA Consultants Ltd, 2006). A voluntary scheme was not viable as the premiums would be too high, or the protection would be insufficient (CJA Consultants Ltd, 2006).

The conclusion that can be drawn from the CJA study is that, even though a suggested cure's primary objective is to inhibit infringement, it is also very important to protect the patent holders from law suits directed to diminish their financial strength. This means that any patent protected by the cure should enjoy the financing of both offensive and defensive protection.

As an insurance policy typically is intended to cover incidental risk and not business risk and an insurance covering infringement defense is very hard to estimate (Ewing, 2014) it is understandable that CJA recommended a mandatory solution. A mandatory solution is however only possible if the cure is intended to protect every patent without screening. A rigorous screening process aimed to avoid litigation between members and rooting out weaker patents is needed to

avoid unnecessary litigations. A cure with such screening process will have its strength in the few strong patents and not in numbers.

4.5. Patent Defense Union

The report “Enforcing Small Firms’ Patent Rights”, commissioned by the EU Commission, proposes the concept of a “Patent Defense Union”. The purpose of this report is an attempt to cope with the similar problems as those outlined in the report at hand.

This Patent Defense Union (PDU) would be a collaboration between inventors and SMEs who owns patents (Kingston, Enforcing Small Firms’ Patent Rights, 2000). Rules would be established to handle disputes between members in order to avoid conflicts of interest within the PDU. It would have a firm unison front against outside infringers (Kingston, Enforcing Small Firms’ Patent Rights, 2000). The PDU would not be a typical insurance solution as there is no guarantee that it would engage in every case. Once it becomes clear that an infringer does not intend to settle with a PDU member, or to agree to arbitration under the PDU conditions, the PDU would decide if the case qualifies for litigation actions (Kingston, Enforcing Small Firms’ Patent Rights, 2000). It would then be up to the patent holder to provide the PDU with all the necessary information, including expert assessments of the patent’s validity and claims (Kingston, Enforcing Small Firms’ Patent Rights, 2000).

The research conducted indicates that PDU could be run with operational costs of 1M€ per year. It would also need an initial one-off subsidy, tentatively taken from one percent of the 170M€ that the national patent offices receive from annual patent renewal fees (Kingston, Enforcing Small Firms’ Patent Rights, 2000).

The target market for the PDU would be 10% of the 18,000 patents filed or renewed each year (Kingston, Enforcing Small Firms’ Patent Rights, 2000). With a subscription level of 500€ per patent, this would give a revenue of 900,000€ (Kingston, Enforcing Small Firms’ Patent Rights, 2000). According to Kingston (2010) half of the revenue would be absorbed by administration cost and obtaining injunctive relief, leaving funds available to pursue one or two fairly high profile cases a year.

Kingston (2000) argues that the most valuable result of the PDU is that it would radically change the conditions under which decisions about infringing would be taken in larger companies. Just like other have argued before (Larsson T. , 2003), (Palmgren, 2011), Kingston (2000) claims that if the SME or inventor has financial backing, it is less likely that anyone will infringe on their patents. In the case of the PDU, the SME or inventor would also have access to all the knowledge and experience gathered within the PDU.

The principals of this report and the EU have yet to adopt or implement any of the suggestions presented in the report.

The issue of too few members is one of the reasons the PDU would not work (Kingston, Enforcing Small Firms’ Patent Rights, 2000). The PDU would require 10% of filed patents to join in order for the union to work. The aim to handle only “one or two high profile cases” per year, means that not every member is guaranteed protection. One critical element in this cure is that it is open for any patent holder to join, but selective in what cases are granted protection. This is built on the assumption that patent holder are willing to join and pay the

premium, based on the hope of being granted protection despite the odds. If that assumption were correct, the PDU method would be economically beneficial since a large insurant base would be secured without the obligation to protect them. However, it is not likely that the concept is sufficiently attractive for the customer i.e. patent holders to join.

In order for a cure to be attractive, it is therefore crucial to provide protection for all of its members. If one member does not receive financial aid to finance legal proceedings, the attractiveness of the cure would decrease.

4.6. Patent insurances

There are a few insurance products available to SMEs and individual inventors. One is provided by UK based Samian in cooperation with Lloyds (Samian, 2014). The insurance includes infringement, enforcement, invalidity, title or ownership, liability and defense of IPR (Samian, 2014). The insurance has a minimum premium of 2,250 USD for the lowest coverage and a deductible of 5,000 USD (SafeOnline, 2014). The coverage ranges from 500,000 USD to 10 million USD and higher coverage limits are available (SafeOnline, 2014).

The leading US patent protection insurance company, IP ISC provides the service of “protecting innovations from the predatory business practices of some companies” (Intellectual Property Insurance Service Corporation, 2014) (Cauthorn, 2014). Their product InventPro® Abatement is aimed at individual inventors and small companies. This insurance covers actors that possess 1 to 3 patent applications or issued patents. The insurance covers up to 100K, 250K or 500K USD per claim depending on coverage type (Intellectual Property Insurance Service Corporation, 2014). The insurance terms are 1, 2 or 3 years. This policy only accepts non-infringed patents. When discovering an infringement, the policyholder shall notify IP ISC, and provide relevant facts about the infringement (Intellectual Property Insurance Service Corporation, 2014). IP ISC requires the insured to provide an expert opinion on the infringement and the validity of the patent from an independent council. The council is chosen from a list, provided by IP ISC (Intellectual Property Insurance Service Corporation, 2014). IP ISC then decides whether or not to authorize the suit, and begin to reimburse the policyholder for the litigation expenses. They also provide “Early Intervention (EI) Services”, which include sending non-threatening letters, advising a suspected infringer of the existence of the patents and the fact that the patents are insured (Intellectual Property Insurance Service Corporation, 2014). The Swedish insurance company Assurance Selector AB also provides an insurance to cover costs associated with infringement (Assurance Selector, 2014). The insurance covers both defensive and offensive protection, meaning that it will cover costs for patent holders who wants to sue a company for infringement and also gets sued for infringement (Assurance Selector, 2014). It is however rather expensive to get coverage, a small company might have a yearly premium of 400,000 SEK (Alpman, 2006).

These different insurances are an attempt to fill a market need, but as an insurance company there are obstacles because infringement is a business risk and not an incidental risk (Cauthorn, 2014). The risk is also harder to calculate and there are limits to the insurance in terms of coverage (Cauthorn, 2014). Some insurance companies have rules that you cannot submit a claim before a certain time and you have to maintain the insurance after a claim has been

submitted, because of the adverse selection, meaning that only customers expecting infringement will seek the insurance (Cauthorn, 2014). Another problem with an insurance solution is that the claims also last a very long time and large corporations are trying to bleed out the SE or inventor (Cauthorn, 2014).

There are certain elements in these insurance solutions that are interesting to a cure To reduce operational costs, an initiative can let the patent originator survey the market for potential infringers as in the case of IP ISC. A cure should, in order to eliminate frivolous litigation, have a process in place like IP ISC to authorize the initiation of legal proceedings, pending the judgment of an independent council.

4.7. The Judge - litigation funding and insurance

The UK Patent litigation broker, The Judge, acts as brokers and advisors for actors seeking support in enforcing their patents. They offer both funding and insurance for patent litigation to patent holders.

In patent litigation financing, an investor funds a litigation project, in exchange for a percentage of license income, damages or future royalties. If the case is lost, or no value is generated from the patent, the investor loses the investment. The company works with a large international network of funders (The Judge). The patent litigation funding differs from the services of NPEs in that, in funding, the patent ownership remains with the originator (The Judge). This also means that the patent originator drives the process and the enforcement strategy, and only receives funding from a third party. The originator also decides whether or not to settle and at what level (The Judge).

Unlike traditional IP insurances, the patent litigation insurance offered through The Judge is only offered to patent holders that are either already engaged in litigation, or considering initiating one (The Judge).

This insurance can be used to enforce a patent against infringement and defense against counterclaims, or even for defending against an infringement claim (The Judge).

The insurance covers legal fees of the insured, where applicable, the fees of the counterpart. The insurance premium can be paid either up front, at a lower rate or in some cases on contingency, where a higher premium is paid only after a positive outcome. The Judge uses external specialist insurance companies to provide these services (The Judge).

4.8. Patent monetization firms and non-practicing entities (NPE)

The US based patent monetization firm, IPNav, founded by Eric Spangenberg is one of the most well known NPEs.

They have developed a platform for patent monetization that includes detailed patent and product analysis, collecting data on patent claims and commercial products globally (Spangenberg, 2014). The model also includes analysis of patent claims in terms of strength and business opportunity. They use experts in each respective field to analyze relevant industries and markets, and set motivated royalty rates (Spangenberg, 2014).

They consult with inventors, lawyers, vendors and other stakeholders in the network around a patent. Since 2003, IPNav has earned 0.5 Billion USD for their clients (Spangenberg, 2014).

When IPNav started they earned 100% of their revenue from litigation. Today 40% of their revenue comes from licenses, while their goal is 80% (Spangenberg, 2014).

IPNav is unconventional as they are turning focus away from litigation because of its inefficiency and high transaction costs. A cure should also focus on licensing rather than litigating, and aim for 100% of the revenue coming from licensing patents on behalf of the clients.

France Brevets

As an initiative by the French government and the financial institute CDC ("Caisse des Dépôts et Consignations"), the organization France Brevets ("French patents") was founded to support and invest in patents from French SEs. The purpose of the organization is to further French research and development (Arfwedson, 2013).

France Brevets intend to make as many companies as possible enter into a license agreement and the licensing fees are then shared with the holder of the patent (France Brevets, 2014). The primary goal is a license agreement and an infringement lawsuit is only considered as a last resort (France Brevets, 2014). France Brevets are however engaged in lawsuits. They intend to enforce patents that are of French interest, not limited to only French patents, French business owners or inventors (Ewing, 2014).

France Brevets express in their press releases that *"France Brevets is the first investment fund fully dedicated to patent promotion and monetization in Europe. Funded with €100 million, France Brevets deploys resources to execute patent and licensing strategies that best serve the interests of the patent holders and partners of France Brevets partners."* (France Brevets, 2014).

On August 18 2014, three years after their start, France Brevets signed its first royalty license to LG Electronics for NFC (Near Field Communications) technology for use in smartphones (France Brevets, 2014).

It is noteworthy that they clearly state their financial strength of 100M€ (Arfwedson, 2013). Even though this sum is official, it is a substantial amount and arguably large enough to scare off potential infringers.

One of the reasons France Brevets started was that a patent related lawsuit in France, on average, takes three years and costs one million euro (Arfwedson, 2013). SEs and individual inventors, thus have little interest in investing in patents unless they have very solid financial backing (Arfwedson, 2013). The problem is similar in Sweden.

Unlike patent trolls, France Brevets primary goal is to enter into license agreements with other companies and will only sue if companies continue to infringe after negotiations. A suggested cure in Sweden will have the same purpose, but without government involvement. Another noteworthy strategy that France Brevets applies is, securing their interest in related patents (France Brevets, 2014). This is a strategy that can be applied to a suggested cure, as it reduces the risk of infringement and entire patent portfolios increases the attractiveness of investments (Karlsson, 2014). Securing neighboring patents is becoming increasingly important in the field of IPR and patents. An individual patent is rarely as valuable as the added sum of each patent in a strong patent-family, especially in electronics and IT (Karlsson, 2014).

4.9. A Swedish patent ombudsman

The concept of an EU Patent Ombudsman (CJA Consultants Ltd, 2006) or a Swedish Patent Ombudsman (Brändström, Niklasson, & Westholm, 2011) has been suggested as a solution to the issues identified.

A governmental function dedicated to assist with the defense of the Swedish patent rights, an Ombudsman, could significantly increase the number of successful inventors and SMEs (Brändström, Niklasson, & Westholm, 2011). The EU Ombudsman mentioned by CA Consultants Ltd (2006) was meant to provide a resort for European patent holders' complaints. Aimed to aid the patent holder's protection and the treatment of claims in case there was to be an EU patent insurance. The Ombudsman would also investigate complaints regarding the procedures in each Member State to ensure that all European patent holders were insured in accordance with a scheme (CJA Consultants Ltd, 2006).

Brändström, Niklasson & Westholm (2011) wanted an Ombudsman that helps inventors and SMEs to protect their IPR. A Patent Ombudsman could get infringers to refrain from threatening with lengthy litigations. With solid financial resources, it can be tempting to threaten financially weak actors and individuals with litigation. The notion of taking on a government agency can be intimidating even for large actors.

No Governmental function resembling that of a Patent Ombudsman, as described above, has been introduced in Sweden or the EU.

4.10. Implications for design of a cure

In this chapter, key elements from the past and present attempts above are extracted and analyzed. This analysis provides guidance for the following chapter, where a suggested cure is presented.

The research and reports referenced establishes that there is a need to help inventors and SEs protect their patents against infringement. Most of the initiatives presented above have either failed or never been realized and the need for a solution in Sweden is apparent.

Both of the insurances offered by SUF failed due to an insufficient number of insurants (Larsson T., Former chairman of Svenska Uppfinnareföreningen, 2014), which led to a lack of funds. Given the relatively affordable premium of only a few thousand SEK, this should have been a highly attractive offer for anyone holding a valuable patent. The conclusion for this might be explained, either by patent holders not being wary of infringement, or that the patent holders did not consider their patents valuable enough to afford the premium. Providing services such as brokerage, or legal council when signing contracts could bridge this problem. Another advantage of a Swedish cure compared to a traditional insurance is that the inventor or SE does not have to pay unless they, themselves, receive income. By taking a percentage of licensing fees, the inventor or SE does not have any extra expenses before a license is sold.

Another reason that few inventors signed the insurance policy was that it did not cover enough of the potential damages that could arise (Ullman, M.D, Inventor & Entrepreneur, 2014). If the policy would only cover 2 MSEK, the infringer could prolong the process until those funds were spent, and then force the inventor to settle or forfeit. If there were no financial limit, infringers would most likely

refrain from infringing as in the case of Håkan Lans against Hitachi (Hentzell, 2014) (Palmgren, Affärsplan Statens Patentpartner Sweden AB, 2011). In order to intimidate infringers, it is important to have financial resources that are sufficiently large, or ultimately incalculable (Palmgren, Affärsplan Statens Patentpartner Sweden AB, 2011). This is very important for a suggested cure. If a patent is granted protection, there should be no limit on how much a legal process can cost. This will attract new inventors and SEs and will scare off large companies contemplating infringement.

Even though there are some seasoned inventors that have been through the process, many inventors are still unaware of the risks and costs associated with enforcing a patent from infringement. Unaware of the risks and costs, inventors might refrain from paying a premium for something that they cannot see the need for (Ullman, M.D, Inventor & Entrepreneur, 2014).

If SUF had made the insurance mandatory for all patents filed, they might have been able to collect sufficient funds to increase the coverage. One apparent problem with a mandatory insurance, however is that it basically becomes an increased cost of filing and maintaining the patent. This might have negative effects on the number of patents filed. It would not be relevant for a Swedish cure.

Statens Patentpartner Sweden AB and the CJA study both involves the government, which would deter larger companies from infringing on patents enrolled in those programs (Larsson T. , Patentintrång; En fråga för svenska staten?, 2003). There are, however obstacles with governmental involvement. The Swedish government has on several occasions said that they neither want, nor can, finance one party in a legal dispute because it would mean discriminating against the other party (Flodström, 2014).

Another problem with the government's involvement is that they might have opinions about how the insurance solution should be run and who should run it (Flodström, 2014). It might be easier to find more competent people to run the insurance solution in the private sector according to Flodström (2014).

Another issue is that the government should not use taxpayers' money to finance a few patent disputes without serious consideration and the deterring effect of governmental involvement is very hard to predict (Larsson T. , Patentintrång; En fråga för svenska staten?, 2003). Instead Larsson (2003) says that the government can cooperate with other Nordic countries to pursue the issue internationally, they can initiate the emergence of a new insurance company and be a partial owner and beneficiary.

The government could assist with urging a change of rules for public funding to allow financing patent insurance coverage. Currently, to comply with EU's rules on public funding, governmental involvement would imply that both the infringer and the patent holder would need to be financed (Larsson T. , Patentintrång; En fråga för svenska staten?, 2003). It could be argued that this would defeat the purpose, but on the contrary, it would still balance the inequality of the legal system and mitigate the financial implication of processing ability.

One way to achieve this is to make patent infringement an offence prosecuted under public prosecution. This would entitle the plaintiff economic compensation for legal council.

The involvement of the government in a Swedish cure could cause complications due to the reasons mentioned above. This does not mean that there could not be cooperation with the Swedish government.

Current available insurance policies provided by insurance companies are too expensive for many small actors (Ullman, M.D, Inventor & Entrepreneur, 2014). In most cases a financial limit on the cover granted to the inventor or SME in case of a dispute. If infringers can appreciate this limit, they are likely to continue the process until this limit is exceeded (Palmgren, Affärsplan Statens Patentpartner Sweden AB, 2011). In order for a model to effectively protect SEs or inventors, it is crucial that this limit is undisclosed or inappreciably large.

If a large company finds that there is a high risk of losing a patent infringement lawsuit, they are not likely to infringe at all (Kingston, Enforcing Small Firms' Patent Rights, 2000). Kingston's (2000) reasoning behind this is that most infringement decisions today are made by middle managers that are highly concerned with their careers. When faced with a decision whether or not to infringe the patent of a small firm, any career driven large-firm middle manager would recommend infringement and intimidation rather than licensing (Kingston, Enforcing Small Firms' Patent Rights, 2000). A middle manager that decides to buy a license from a small firm instead of ignoring its patent, would discard the valuable asset that the large firm possesses in its power to intimidate. This could affect the career of the middle manager negatively (Kingston, Enforcing Small Firms' Patent Rights, 2000). With a Swedish cure that could finance legal proceedings for individual inventors and SEs, this incentive structure will be disturbed and cause middle managers to make different decisions regarding infringement.

In summary, substantial financial resources, or governmental backing should have a deterring effect on potential infringers. Governmental involvement can be beneficial, but brings with it operational limitations and possibly inefficient bureaucracy. Making an insurance solution mandatory to all patent applications would ensure a large number of insurants, but is difficult to implement and gain acceptance for. In essence, mandatory insurance would just mean increased filing- and maintenance fees and can be discarded. Large corporations are assumed to make risk analyses of the prospect of infringing or licensing prior to engaging. These risks need to be raised significantly.

5. A suggested cure - Patent Protection Initiative

The research and analysis in the previous chapters have shown many common denominators. Thereby, methods used by some large actors to infringe with impunity, have been identified. This has allowed us to distinguish features that can inhibit these methods and counteract the driving forces behind patent infringement and aggressive takeover.

These features have been used to give a basis for a suggested cure, a Patent Protection Initiative. The Patent Protection Initiative has been further developed through interviews with people with relevant experience in patent infringement, NPEs and law. It is designed with the intention to cope with the problems identified in the previous chapters and incorporates certain elements identified in the past and present attempts.

5.1. Overview

The suggested Patent Protection Initiative (PPI) presented below is in essence an organization with the purpose of protecting the patent rights of individual inventors and SEs in Sweden.

To avoid aggressive takeover and catastrophic economic loss, the PPI can use subsidiaries that receive the rights to sell licenses and assumes the responsibility to enforce the patents. Each subsidiary is started for dealing with a specific patent or patent family. The reason for creating a subsidiary for each patent or patent family is explained below.

The primary objective of the PPI is to sell licenses for the patent. This should be done in collaboration with the patent originator.

The secondary objective of the PPI is to enforce the patent against infringement. In case of infringement, the subsidiary is tasked with enforcing the patent and initiate legal processes. The legal competences to litigate will primarily come from consultants when needed. Local consultants will be hired in the respective countries where the PPI initiate patent litigation.

The key elements to make the PPI possible are:

- Substantial financial resources to impede the possibility of large actors to financially “bleed out” the patents holder.
- Sufficient expertise to determine which patents are strong and valuable with good claims. Experts will also conduct thorough investigations and due diligences in the case of infringement.
- An organizational structure that allows for patents to be licensed and enforced without the risk of involuntarily losing the rights to external actors.
- The patents should be owned by the PPI to remove the incentives for aggressive take-overs as a means to acquire a patent.

The PPI purchases a patent or the rights to a patent from an inventor or SE. In this transaction, the PPI assumes responsibility to defend the patent against infringement, if reasonable. The inventor remains as inventor on the patent, but the ownership is transferred to the PPI, primarily to reduce the likelihood of aggressive take-overs. The PPI then transfers the rights to license and enforce the patent onto a subsidiary fully owned or owned jointly with the inventor or SE.

One of the reasons the primary goal is to license instead of litigate, is that litigation is inefficient and costly for all parties. According to Spangenberg (2014) most CEOs and CFOs don't yet know how inefficient the current system is because they are entrusting the wrong group, lawyers, to manage the asset. *"The last people in the world who want to see this system change are the lawyers"* (Spangenberg, 2014).

If the PPI does not manage to negotiate a licensing deal but is forced to litigate, it is important to secure as much damages as possible. When doing so it is important to motivate and prove the damage. In cases where relatively large damages are claimed without proper motivation, the court has been found to reduce the damages to only a fraction of what is claimed (Hagman, 2014). If the damages awarded are insignificant in relation to the damages claimed, the plaintiff is deemed as losing despite the fact that they are awarded damages (Hagman, 2014). In the Swedish legal system, this incurs significant cost, since the losing party pays the legal fees of the winning party. With thoroughly motivated claims, awarded damages, corresponding to claimed damages shall result in a legal victory.

Poorly motivated damage claims, can partly explain the, in relation to other countries, low damages awarded in Swedish patent processes (Hagman, 2014). The initial cost for the PPI to acquire a patent is nominal; the actual cost/revenue is based on a percentage of future license fees or awarded damages from infringement lawsuits.

When the patent originates from an inventor, or SE with no intention of producing the invention, the main goal is to sell licenses to external actors. When the patent originates from an operating SE that wants to keep the exclusive license to their invention, but still enjoy the infringement protection, the SE also becomes the licensee. The license fee becomes the premium paid for infringement protection.

When the patent originates from an operating SE that wants to keep a non-exclusive license, and are open to also licensing the patent to others, the license fee can be reduced as it is covered by a larger number of actors. This would still require the enforcement of the patent against non-licensing companies.

Operational subsidiaries are necessary to distribute financial risk. Companies started with the sole purpose of driving lawsuits, with no other operation, can have a weak corporate veil (Lövrup, 2011). Therefore it is important that the main purpose of the subsidiaries is to establish licensing agreements.

In case of litigation, the subsidiary will receive financing from the PPI, to continually cover the costs associated with the necessary legal actions. Were they to lose, the subsidiary would go bankrupt. In case of insolvency, all rights would contractually be transferred back to the PPI. This reduces the risk of losing the patent to the infringer.

Whether or not these functions will have the desired effect or not is hard to verify with certainty. However, it can be confirmed that financial strength increases the chances of successful litigation (Janicke & Ren, 2006). An organizational structure that limits financial losses also benefits the Davids going up against the Goliaths (Ewing, 2014).

Since no identical organizations have been found, it cannot be said with certainty that this initiative will succeed. The below reported product-market fit and financial estimations do however give a promising outlook.

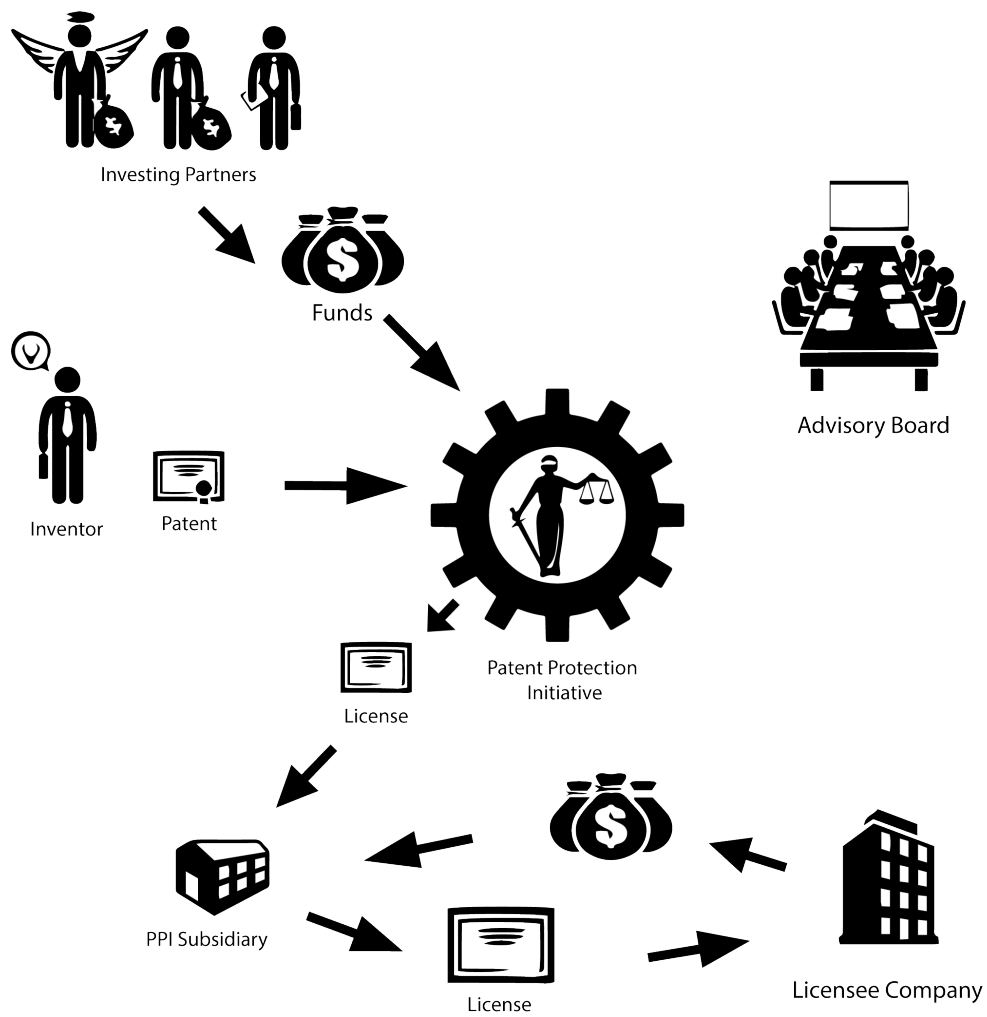


Figure 1- The PPI acquiring funds and patents and transferring rights to subsidiary, negotiating a license agreement with an external company.

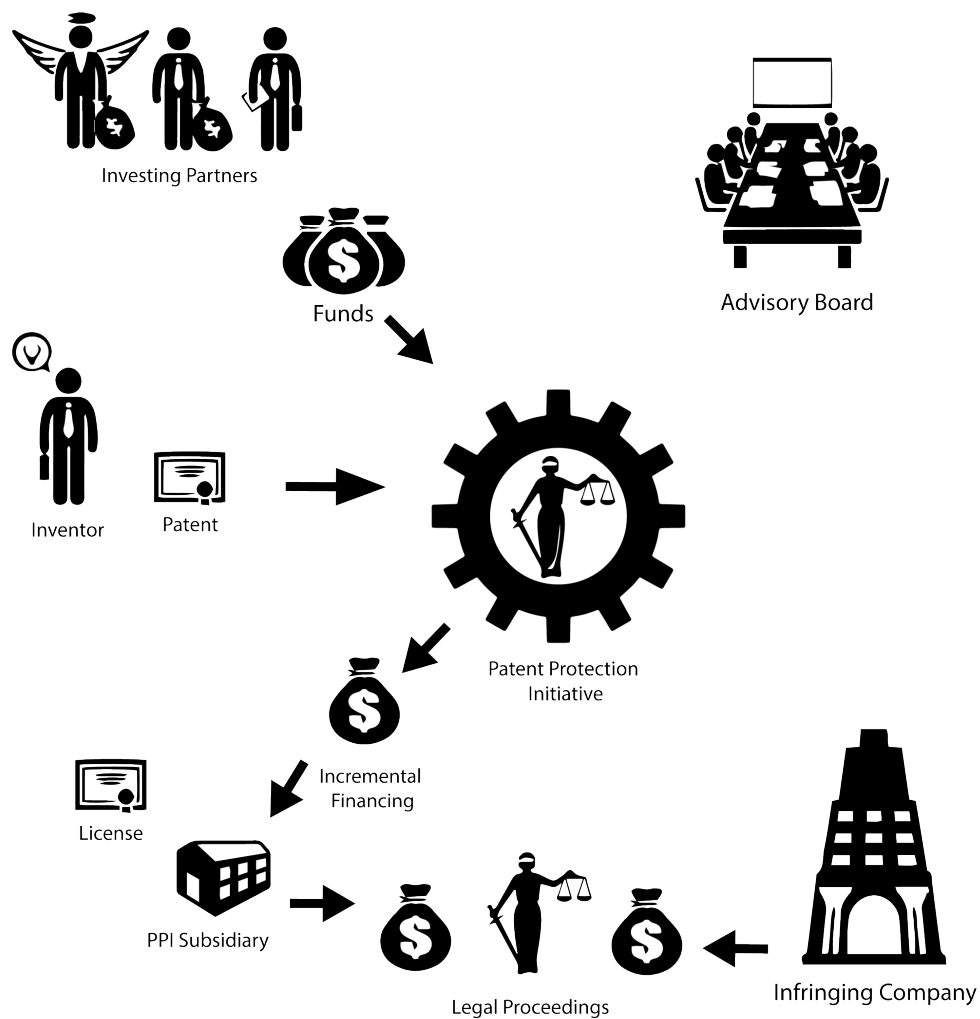


Figure 2 - Illustration of the PPI receiving income from licenses and distributing it to the respective parties.

The idea is to give offensive protection to patents that enter PPI. Offensive protection means that PPI, through its subsidiaries, will engage or sue other companies that infringe on the patents.

As previously mentioned, it is common practice for an infringer to counter sue for better right to the patent. The costs incurred in association with such a suit will also be covered by the PPI through the subsidiary.

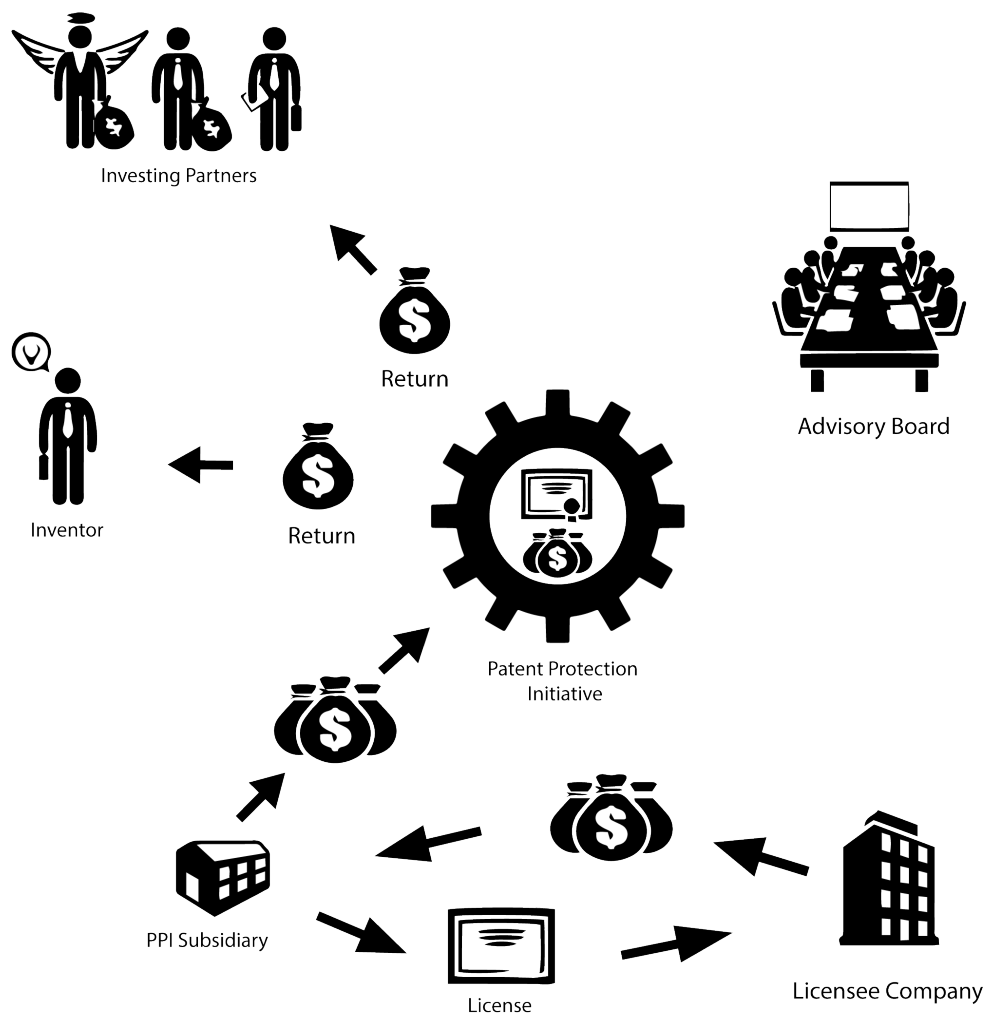


Figure 3 - Illustration of the PPI engaged in a legal process.

If the infringer wins the legal proceedings, whether it is litigation or arbitration, and the PPI is sentenced to cover the infringer's legal fees, only limited funds will be available in the subsidiary, and larger losses would be mitigated.

In the case the PPI would win the proceedings, a percentage of the damages received would be shared between PPI and the inventor or SE. In Sweden, damages are calculated on the loss of income from the patent during the infringement process and the income of the infringer, damage to the reputation of the invention and moral damage (Patentlagen (SFS 1967:837)). All cost associated with the legal proceedings would also be covered by the infringing party.

The inventor or SE would still be responsible for paying the patent fees, as he or she would have without PPI. This means that PPI will only have costs associated with the selection process, and administrative costs for owning the patent and the subsidiary that has the exclusive license. Significant cost for PPI would only be incurred if infringement is found and enforced.

5.2. The offer

As the value proposition varies between the different stakeholders. The “products” offered by the PPI vary accordingly. These offers are described below.

5.2.1. Offer to patent holders by PPI

The main value for the patent holder lies in the protection of the patent rights. This, in turn adds value in other areas. It will be less risky to exhibit the invention and more attractive for practicing companies to pay a license fee. The PPI offers to assume the responsibility to enforce a patent against infringement.

The risk of infringements occurring will be lower than if the patent was unprotected. Companies will be more hesitant to infringe when facing a strong counterpart.

The cost for the patent holder is based on license income, or settlement fees, where a percentage is retained by the PPI.

The percentage is based on the number of patents enrolled, risk factors, technology potential, strength of patent, licensing potential, litigation history and litigation potential. Each patent will be judged individually and a contract will be written with the patent holder.

This works identically if the patent holder intends to keep the license rights, in which case they pay a license fee to themselves, of which a percentage is retained by the PPI.

To minimize the risk of harm for the patent originator, all contracts should be between the subsidiary and the licensee. The inventor has final say in key decisions, but should conduct all dealings with third part companies through the PPI subsidiary.

Another part of the PPI offer is a brokering service between the patent originator and a potential licensee. This will assist with managing expectations and provide expertise in contract negotiations.

5.2.2. Offer to investors by PPI

The return on investment to the investors relies on the number of successful licensing agreements and enforcement actions.

One upside to this investment, compared to traditional funds, is that the capital does not need to be transferred to the PPI unless needed to finance enforcement. This means that the investor can still manage the committed capital and receive a return from their traditional investment. If the PPI requires funds to finance enforcement actions, the investor will provide the committed capital to the PPI. The financial risk is distributed over a number of patents in the PPI portfolio. This means that only a portion of the patents needs to be successfully licensed or enforced to ensure a return on investment.

The committed capital time frame has to be at least 5 to 10 years. This is both because of the long duration of patent processes and to ensure that infringers cannot stretch the process until the PPI becomes undercapitalized.

A commitment to the PPI is associated with goodwill, both philanthropically, helping the Davids against the Goliaths, as well as on a national-economic level, ultimately stimulating innovation by enabling inventors to pursue their ideas and retain their lawful rights. Naturally, the goodwill value is highly subjective,

and it is unlikely that an investor would invest only for goodwill, with no outlook of profit.

The idea is to return the committed capital with interest, and the option to recommit the capital for a consecutive term.

5.2.3. Offer to licensees by PPI

When a company licenses a patent through the PPI, the PPI will continue to enforce it against infringement. This allows for companies to safely license patents without the risk of competitive disadvantages.

As a licensing company, it can be difficult to motivate paying license fees for an invention that could be infringed on by a competitor. A significant value lies in ensuring that the license does provide a competitive advantage, as opposed to the *Lans vs. SAAB* case, where paying a license would mean a competitive disadvantage in cost compared to the non-paying competitors.

5.3. Rights and obligations

The PPI has the right to:

1. Refuse to finance legal proceedings if the infringement is deemed irrelevant or impossible to enforce. If there is a disagreement between the inventor and the PPI, regarding whether or not to initiate legal proceedings, a mutually chosen independent expert shall make the decision based on pre-defined checklist.
2. Return the patent to the originator if no license deal or infringement is found after an agreed upon date.

The inventor has the right to:

1. Withdraw the patent from the PPI after an agreed upon date.
2. Veto any licensing of the patent.

The PPI shall:

1. Finance legal proceedings, legal communications through the subsidiary.
2. Conduct Due diligence on infringement cases and legal cases.
3. Conduct license brokering between inventors and practicing companies.
4. File injunctions and thereby necessary documentation.
5. Compose cease-and-desist letters.
6. Assist in contract negotiations.

The inventor shall:

1. Support the PPI with expertise during eventual case research and in reviewing infringing products or patents.
2. Monitor the market, and notify the PPI of possible infringements.
3. Maintain the patent by filing necessary documentation and annual fees.

5.4. Revenue model

The PPI has two main sources of income; royalties and license income, and damages or settlements from litigation.

5.4.1. Revenue from licensing

The ideal scenario is that a license agreement is signed between the subsidiary and a practicing company. It can be an exclusive or non-exclusive license. In this case, the PPI will retain a percentage of the licensing income as a fee for the protection.

When the holder of the patent is an SE with the intention to keep the rights, and sell the product, the SE itself becomes the licensee and a percentage of an agreed license fee is retained by the PPI. If any other actor infringes in the patent, it is up to the original patent holder to decide whether to attempt to sell them a license or make them cease and desist.

The PPI will continue to protect the patent throughout the licensing deal.

5.4.2. Revenue from litigation

If another company infringes a patent, protected by the PPI, the PPI will notify the infringer and primarily attempt to negotiate a licensing agreement. If the negotiations are unsuccessful, the PPI will enforce the patent through litigation. The revenue attained by the PPI is a percentage of the damages or settlement reached in the litigation process.

5.4.3. Revenue distribution

The revenue that the PPI receives will primarily be shared between the original patent holder and the PPI. The portion that is retained by the PPI shall cover operational costs. Profits will be distributed to investors and the PPI capital fund, increasing the equity, and reducing the need for external capital.

As an indication of distribution levels, the typical case of U.S. NPEs conducting successful patent infringement litigation, the NPE retains 25% of the damages or settlements, 40% is given back to the originator of the patent and 35% goes to legal fees and experts (Ewing, 2014). This would correspond to 60% being retained by PPI to cover all operational expenses and possible profit. Since the losing part pays the legal expenses for the winning part, the operational costs will be significantly lower in a successful case. However, the damages awarded by Swedish courts are in general much lower than those in the United States.

5.5. Customers

There are two relevant customer segments for the PPI. The patent holders, being inventors or SEs, are the customers that purchase the service of protection from the PPI, paying with future revenue. This segment is still uncondensed, and there is little consensus on how to value patents, and what licensing fees and royalty rates are reasonable.

The other customer segment lies with the patent licensees, acquiring the rights to the inventions. This can be a wide range of actors, from SEs to NPEs to Multi-National Conglomerates. However, the value lies in identifying the best possible takers for each discrete patent. Identifying the actors that can capture the greatest value from the invention, should provide a good selection of licensees. The market size for the PPI's offer can be based on the number of patents in existence and the number of patents being filed, or the number of active inventors, initially in Sweden. On the buying side, the market size will depend on

the types of patents enrolled. A telecom patent will naturally have a completely different customer group than a patent for kitchen appliances.

5.6. Product-market fit

A series of interviews with successful Swedish inventors and SEs have provided valuable input regarding general interest, desirable features of a PPI and whether or not the inventors would submit their patents to such an organization (See also Appendix II).

All of the 10 interviewees had existing patents. 6 of the respondents have patent applications under processing. 8 of the respondents primarily intend to license their patents to a third party. 9 receive income from their patents today.

4 have ongoing or previous infringements on their patents. One was fighting against patent applications that intruded on his patent. Out of the 6 that had not experienced it themselves, 2 had been involved in infringement cases on behalf of companies where they were employed.

On the question whether or not the inventors would sue a large company that infringed on their patent, only 4 answered yes clearly. 3 Answered that they would enforce the patent, but only through teaming up with a strong partner, preferably a competitor to the infringing company. One would go public and use the media to create bad-will. 2 would not sue, as they see no way of financing the proceedings.

9 out of 10 respondents would join an organization that could enforce their patents in exchange for a percentage of license income, along the lines of the PPI. 5 of respondents mentioned that the terms for joining should be tailored individually. Two of the inventors had patents that they could submit immediately, if the PPI was realized. One inventor volunteered to work for the PPI.

5.6.1. Willingness to pay

The accepted percentage of royalty fees that would be retained by the PPI varies from person to person between 3-50%. The general acceptance lies between 10-20%.

While all respondents had different thoughts on how much they were willing to pay for the protection of their patents, there was a consensus in the fact that the levels has to be set on a case to case basis.

According to the inventors, the cost should vary depending on factors such as; total revenue, time, age of patent and strength of the counter part.

The retained part of the royalty fee for unrewarded patent applications could be calculated using a model that companies use for employee's inventions, this way it could be motivated more easily (Wern, 2014).

One small business owner envisioned using the PPI to finance a process against an ongoing infringement in exchange for 90% of potential damages awarded, seeing the greatest value in hindering the competitor from operating.

5.6.2. Comments and summary of product market fit

Throughout the interviews, relevant comments and requests surfaced. These comments are valuable as the interviewees are potential customers to the PPI.

Many of the comments concerned contractual matters regarding contracts between the inventor and the PPI as well as contracts between the licensee and PPI's subsidiary that licenses the patent. It is important to hinder licensees from "locking up" the patent and not realizing or producing it. Some companies do this to stop competitive technology that could threaten their current operations. Defining minimum-royalties and making non-exclusive agreements could prevent this. Media could be used as a tool to convince companies to cooperate, risking bad-will or receiving goodwill.

Comments also concerned ways to assist the inventor in finding potential licensees. It lies in both the PPI's and the inventors' interest to provide channels for commercializing the inventions through selling licenses globally. It can also be beneficial to gather business intelligence around inventors, markets, producing companies and potential licensees.

A network of large practicing companies could be attached to the PPI and investors or partners. This will give them goodwill and first-mover advantages as well as a vent for realizing non-critical inventions that are created within the companies. Academic institutions and universities could also be partners to the PPI, absorbing and providing inventions and patents.

It was expressed that prototyping is essential in the process of realizing inventions; hence a prototyping workshop would be a good feature. A method for identifying the full industrial applicability of a patent in a wide range of technological fields was also requested.

One interesting parallel identified is the resemblance with the Swedish Musicians Guild, STIM that is a private organization working on behalf of the music industry to assert the artists right for compensation.

Many of the interviewees also confirmed that they would be hesitant in suing a financially strong infringer, unless they had a strong partner. This also strengthens the opinion of the apparent need for an organization like the PPI. In summary, there is a high consensus in the need for a solution to the problem of enforcing patents against large actors. 9 out of 10 of the respondents wanted to join the PPI if it was realized and were able to effectively enforce their patents.

5.7. Selection of patents

It has been identified that the PPI has to be highly selective when choosing which patent to protect. With a high degree of selectiveness it becomes more important to identify the right patents. Identifying strong and valuable patents is a difficult task that takes a high degree of competence and experience, however it has been shown that accurate processes for selecting patents exists. According to Eric Spangenberg (2014), one of the worlds leading authorities on patent enforcement, "You can say, with a high degree of confidence, if a patent is valuable or not".

In order to achieve this, there needs to be a rigorous screening process for all applications. This process will be conducted by a board of subject experts. The competencies needed in this board of experts include technical, economical and market expertise as well as consultant experts in each niche.

The iterative patent screening process with discrete stages for various criteria should including patent claims, market, infringement situation, uniqueness, value, history of the patent, patenting history of the originator, licensing potential, number of patents that cite the patent in question, patent infringement

occurrence the industry, how far along in the granting process the patent is, number of patents granted in the same family, geographical scope of the patented technology and the patent coverage etc. The board of experts will shape the final screening process. This will allow for a more consolidated patent portfolio and only patents with high potential upside will be protected by PPI. With effective due diligence on each accepted patent, many of the problems identified with the past attempts could be eliminated. The issue of accepting rivaling patents could be avoided by choosing only one of the patents. Alternatively both could be accepted to create an even stronger patent sphere, and a stronger case against infringers.

If a patent is being infringed on and the inventor wants to enter the PPI, this should be possible on a case-to-case basis. The advisory board will determine this and the hope is that the infringing company will back away once they know that the inventor has financial backing.

The key criteria in the patents selected are; strong and enforceable claims, established value (ongoing infringement or current licensees) or potential for future value.

Both patents with ongoing infringement, and patents without ongoing infringement should be accepted. Patents that are not infringed on will have an insignificant cost to the PPI, but might still yield licensing income in the future. Patents with ongoing infringements do incur cost, but have a proven value.

5.8. Situations that could arise for the PPI

Different scenarios can occur once PPI has acquired a patent and committed to protect it against infringers. Typical scenarios and their effects on each respective stakeholder are described in the following cases.

5.8.1. Case 1 – winning infringement lawsuit

A financially strong company infringes on a patent owned by PPI, exclusively licensed to PPI's subsidiary, Company A, that sues the infringer and wins the legal proceedings.

Company A sues the infringing company and PPI provides financial means to Company A to initiate the proceedings. PPI just provides the financial means necessary to continue the proceedings in order not to have any money tied up in Company A.

Company A wins the proceedings and all the money given to Company A from PPI is covered by the infringing party and is returned to PPI. The damages awarded are shared between the inventor and PPI.

The inventor acts as a consultant during the proceedings with technical expertise. The inventor can continue to try to license or develop the invention during and after the proceedings are over. The inventor receives a percentage of the damages awarded Company A.

The investor transfers a part of the committed capital to the PPI to fund the proceedings. The committed capital along with damages and compensation for legal fees are returned to the PPI when the proceedings are concluded.

The committed capital is returned to the investor. Overshooting profit is paid on the conclusion of the investment period.

5.8.2. Case 2 - losing infringement lawsuit

A financially strong company infringes on a patent owned by PPI, exclusively licensed to PPI's subsidiary, Company A that sues the infringer and loses the legal proceedings.

Company A sues the infringing company and PPI provides financial means to Company A to initiate the proceedings. PPI continuously provides sufficient means to continue the proceedings. To mitigate the impact of losing, no excess financial resources are accumulated in Company A.

Company A loses the proceedings. Unable to cover the legal fees of the counterpart, bankruptcy proceedings might be initiated towards Company A. The infringer does not get their legal expenses covered, or the damages awarded since Company A is insolvent. The patent remains with the PPI, pending the ruling in an eventual counter suit for better right or nullification. The PPI and the inventor will decide whether or not to appeal the verdict. The inventor can continue to try to license and develop the invention after the proceedings are over. The inventor has not lost any of his or her own money during the legal proceedings and even though the infringing party won, it might still be worth pursuing the invention.

The investor transfers a part of the committed capital to the PPI to fund the proceedings. More capital might be needed from current and new investors.

5.8.3. Case 3 – successful licensing

No one infringes on the patent and the patent is successfully licensed.

The PPI gets a percentage from the license fee and it is placed in the “war chest”.

The inventor gets a percentage from the license fee.

The investor receives a percentage from the license fee at the end of the investment period.

5.8.4. Case 4 – no infringement or license

No infringements are made, and the patent is not licensed within a set time frame.

The patent stays with PPI or is given back to the inventor.

The inventor still has to pay the patent fees unless he cancels the patent.

Nothing happens to the investor or the money he/she has committed to PPI.

5.9. Financing the PPI

In order for the PPI to function as intended, financial strength is crucial. After studying previous attempts it has been established that solely relying on government funding is not an option. This means that the primary capital has to come from private investors.

One possible model for the PPI that can be relevant is the one typically used in VC (Venture Capital). The PPI would set up a fund containing a specified number of patents. Starting with acquiring capital over a vesting period of 1 – 3 years. The investors would invest in the fund over 10 +1 +1 +1 years, meaning that the investment period is 10 years with the option to liquidate, or prolong the fund one year at the time for three years. The decision to liquidate or prolong is made pro-rata by the investors.

In a model like this, a management fee of 2 percent of the invested capital is taken out each year to finance operational cost (Zider, 1998). The investors would commit the remaining investment to finance legal proceedings. After 4 years, the management fee typically falls to 1 percent.

The fund would have a first closing after a certain amount has been invested and a deadline for when the desired investment should be reached.

Three to four years after the first fund started, the PPI can start a new fund with new investors and new patents.

After the investment period is over, the investors expect to get their investment back with interest and the PPI would return the patents to the originators. The typical distribution of the profit after the investment period is 80% to the investors and 20% to the founder (Zider, 1998) in this case the PPI.

This model would make it possible for the PPI to raise sufficient funds to finance legal proceedings. As the investments consist of committed capital, the investors can receive interest on their capital elsewhere as long as it can be transferred to the PPI if needed.

Using a VC model removes some uncertainty in investment prospect, as it is an established model and already has a taxation framework. As the PPI will require financial strength it is beneficial that the investors have a significant amount of committed capital over the investment period. VC investment models often stretch over more than 10 years, which will enable the PPI to finance patent litigation cases that require both capital and time.

There are many different potential investors, such as large companies, venture capitalists, equity funds, family offices etc. (Dupui, 2011) For instance, family offices could be relevant investors as they typically are looking for long-term investments and want to park their money somewhere and feel good about it (Dupui, 2011). Large companies could, apart from pure financial return on investment, see value in goodwill of promoting innovation. Large companies are also potential stakeholders in the PPI as they can have the first opportunity to license the patents.

5.9.1. Financial analysis

Table 1 below show an estimate of what the financials could look like in the PPIs first fund. The figures concerning revenues from litigation are based on estimations and data from Swedish patent litigation cases from 1976 to 2013 where the plaintiff has won (Hellberg, 2014). Other figures are based on estimates and interviews with people with experience of licensing and patent enforcement (Spangenberg, 2014) (Hagman, 2014) (Lans, 2014) (Levin, 2014) (Ullman, M.D, Inventor & Entrepreneur, 2014).

Table 1 - Distribution of patent engagements

License	4/5	28,00
Litigation	1/5	7,00
Successful litigation	2/3	4,67
Unsuccessful litigation	1/3	2,33
Total		35,00

Table 2 - Legal costs

Hours per case	500
Hourly fee own layer	3 kSEK
Hourly fee opponents layer	3 kSEK
Legal fees per lost case	3 000 kSEK

Table 3 - Financial Analysis

Budget for PPI	10 Years
Operational costs	
CEO	11 088 kSEK
Patent attorney	7 920 kSEK
Administrator	4 752 kSEK
Office space and utilities	3 000 kSEK
Consultants	5 352 kSEK
Total	32 112 kSEK
Litigation costs	3 500 kSEK
Total cost	35 612 kSEK
Committed capital	200 000 kSEK
Engaged capital	35 612 kSEK
Revenue	
Licenses'	336 000 kSEK
Damages awarded	10 400 kSEK
Total Revenue	346 400 kSEK
Return to inventors 70%	242 480 kSEK
Profit	68 308 kSEK
To PPI	13 662 kSEK
To investors	54 646 kSEK
ROI for investors	53%
IRR for fund	16%*

*See appendix III

The fund is based on 35 patents that are infringed on or show value. Of those 35 patents, 28 are turned into license agreements and 7 result in litigation, see table 1.

The 28 patents that become successful license agreements could have had ongoing infringement, converted to licenses after negotiations between the infringer and the PPI.

2/3 of the litigation cases are successful, where one is a practicing SE that also receives damages for lost income. 1/3 of the cases are unsuccessful and the cost corresponds to legal fees from own lawyers over the investment period. As the

subsidiary becomes insolvent the opponent will not receive any funds to cover their legal fees, see table 2 and 3.

The revenues from licenses are calculated as an average over the investment period, where they are lower in the beginning and increases as the patents attract more licensees. The yearly average per patent is conservatively estimated to 1,2 MSEK, see table 3.

The ROI (Return On Investment) for investors is calculated on the engaged capital, i.e. the capital that has been used by the PPI to finance operational costs and litigation, see table 3.

The IRR (Internal Rate of Return) for the fund is calculated to 20,88%.

5.9.2. Best-case scenario for the fund

In the calculations for the best-case scenario, see table 4, the operational remain unchanged. The difference is that all patents are successfully licensed. All other assumptions such as percentages to inventors and investors also remain unchanged.

Table 4 - Financial Analysis best-case scenario

Budget for PPI	10 Years
Operational costs	
CEO	11 088 kSEK
Patent attorney	7 920 kSEK
Administrator	4 752 kSEK
Office space and utilities	3 000 kSEK
Consultants	5 352 kSEK
Total	32 112 kSEK
Litigation costs	0 kSEK
Total cost	32 112 kSEK
Committed capital	200 000 kSEK
Engaged capital	32 112 kSEK
Revenue	
Licenses'	420 000 kSEK
Damages awarded	0 kSEK
Total Revenue	420 000 kSEK
Return to inventors 70%	294 000 kSEK
Profit	93 888 kSEK
To PPI	18 778 kSEK
To investors	75 110 kSEK
ROI for investors	134%
IRR for fund	36%*

*See appendix III

In the best case scenario, the ROI for investors increases from 53% to 134% over the 10 year period, and the IRR for the fund increases from 20,88% to 25,92%. Since the primary goal for the PPI is to license the patents, this scenario is economically, ethically and strategically desirable.

5.9.3. Worst-case scenario

In the calculations for the worst-case scenario (Table 5), the operational costs remain unchanged. In this case all 35 patents in the fund are infringed on, and the PPI loses half of the patent litigation cases. If this happens, the PPI has partly failed to select patents with strong, enforceable claims, which is one of the prerequisites for the PPI to function. Hence, this scenario assumes failure in core elements of the PPI. If the PPI can foresee failure in litigation cases, there will be no appeal in order to limit losses. The assumption is that cases that are won will result in licensing deals.

The scenario of losing all 35 cases is unlikely since litigation will not be initiated for patents without a strong case.

Table 5 - Financial Analysis worst-case scenario

Budget for PPI	10 Years
Operational costs	
CEO	11 088 kSEK
Patent attorney	7 920 kSEK
Administrator	4 752 kSEK
Office space and utilities	3 000 kSEK
Consultants	5 352 kSEK
Total	32 112 kSEK
Litigation costs	27 000 kSEK
Total cost	59 112 kSEK
Committed capital	200 000 kSEK
Engaged capital	59 112 kSEK
Revenue	
Licenses'	96 000 kSEK
Damages awarded	25 200 kSEK
Total Revenue	121 200 kSEK
Return to inventors 70%	84 840 kSEK
Profit	-22 752 kSEK
To PPI	-4 550 kSEK
To investors	-18 202 kSEK
ROI for investors	-131%
IRR for fund	N/A*

See appendix III

Although the PPI loses half of the patent litigation cases, the use of subsidiaries limits the costs to the legal fees incurred by the lawyers hired by the PPI. The PPI would split the losses 80/20 with the investors in the same way as they would split the profit. This would lead to bankruptcy for the PPI, unless other funds are successful enough to cover the losses. The inventors who have entered the PPI will not incur any cost, which is one of the benefits with the PPI. They might, however risk their patents being lost or nullified. This would most likely have happened regardless of the involvement of the PPI. The main difference for the inventor is that the PPI mitigates the risk of losing personal funds.

5.10. Remaining steps to realize the PPI

In order to realize the PPI, several key functions need to be established. Below are a short description on what remains and what has not been dealt with in this theses due to the limitations.

5.10.1. Marketing and finding patents

The PPI will have to market itself to find individual inventors and SEs to enter the PPI. The first step for the PPI is to establish letters of intent saying that individual inventors and SEs agree to enter the PPI if it is realized. This should build a better case for finding investors for the first fund.

The cost for the inventor is determined individually and is left to the PPI team to decide upon, though we have calculated with a 30 percent fee on average for licensing deals.

5.10.2. Patent selection process

It has been established that there is a key value in the patent selection process. If the PPI can select valuable patents with strong and enforceable claims it is very likely that it can become successful.

How this process will be set up and how to value patents and their respective claims will be left to the PPI team to establish.

5.10.3. Investment

One of the most important features of the PPI is significant financial resources. Who should invest, and how, has been discussed, but more research needs to be conducted and more importantly the initiative needs to be executed.

Discussion

This chapter presents aspects concerning the research conducted and the suggested model. Pros and cons along with ethical and moral views on the role of the PPI and its context.

5.1. Benefits with PPI model

A key benefit of the PPI model is that inventors and SEs will have access to strong financial backing, which can have a significant effect on the outlook for exploiting a patent. This has been confirmed by several studies and interviews (Palmgren, 2011) (Kingston, Enforcing Small Firms' Patent Rights, 2000) (Ewing, 2014) (Spangenberg, 2014). With this backing, larger companies are less likely to infringe since they cannot simply exhaust the inventor financially (Kingston, Enforcing Small Firms' Patent Rights, 2000) (Ewing, 2014). This would mean that PPI would have a preventive effect and that fewer infringements would be made due to the very existence of the PPI. If a company does infringe on a patent that is protected by the PPI, the inventor will not have to use any of his or her own financial resources to enforce it.

Given that the model will work as intended, there is a likelihood of increased job opportunities due to more SEs growing large. Today, when foreign companies infringe and profit on others' patents, many of the jobs that could be created in Sweden are lost (Ullman, 2014). Patents stolen by foreign companies are creating jobs, but not in Sweden. It is important to consider the effect that inventors will lose faith and stop inventing according to Ullman (2014). This is a problem for Sweden since unemployment is a constant issue and new SEs are an important part of the solution, a problem that PPI can potentially mitigate. With more inventors spending their time and resources on creating new inventions, there is a greater chance that more jobs will be created and kept in Sweden.

As previously mentioned, a study made in Denmark estimates that the national economy loses are somewhere between 100 – 340 M€ annually due to patent infringement, and consequently undeveloped inventions (Larsson T., 2003). These figures are only for Denmark with merely 5.5 million inhabitants. Mitchell (2011) claims that this number reaches billions of euros worldwide. If the PPI could prevent only some of these infringements and help inventors believe in their patents and that they will be safe, there is a major upside to the initiative, not only for the individual inventor but also on a national economic level.

Innovations are a key element for Sweden to maintain its competitiveness and prosperity in the future. Successful inventions are needed to create new jobs and growing businesses in Sweden. This initiative should deal with these issues and begin tipping the scale back to equilibrium between large companies and inventors.

5.2. Risks with the PPI model

One of the most obvious risks with the model is that no inventors transfer their patents to PPI. This was the main reason for the failure of Swedish Inventor Association's insurance (Larsson T., 2014) and without any patents for PPI to protect there is no revenue to be made from licensing.

Another risk is that many of the patents that PPI does protect are infringed on and the cost of all the legal proceedings becomes overwhelming. This will

happen if there are fewer successfully licensed patents than there are infringement lawsuits, which would create a negative economic balance. Another risk is that the investors require quick return on their investment, which PPI is unable to accommodate, or that they withdraw without reason. Without the financial war chest to protect the patents from infringers there is potentially a higher risk of more infringements and of course fewer inventors will be willing to enter PPI with their patents.

5.3. Partnerships

To minimize the operating cost for the PPI it is beneficial to use partnerships as a source of competent personnel. Key partnerships for the PPI would include law firms, market and technical consultants. These two functions would primarily be used in the case of infringement lawsuits, but legal expertise would also be required in contract negotiations. Technical and market experts would assist in the selection process of patents.

Other partnerships that could prove valuable are NPEs with experience of successfully enforcing patents. NPEs could assist in enforcing patents in certain countries, especially in the US where they take cases on contingency. Patent enforcement financing firms can also provide the PPI with support in cases where the litigation is particularly expensive.

In the initial marketing of the PPI, both SUF and PRV are partners that will be able to promote the PPI to inventors and SE. SUF can also be a potential investor in the PPI as they previously have attempted to deal with the problem of infringement.

5.4. Profit

Any remaining profit at the conclusion of the investment period will be shared between the investor and the PPI 80/20. Eventually funds can be used to stimulate innovation through incubation and other kinds of support to inventors and SEs.

5.5. Moral aspects

The moral aspects of the organizational culture play a significant role in the current state of the field of patents and patent licensing. Not only the tolerance, but also encouragement of unethical and in some cases unlawful behavior poses a significant force that needs to be addressed and counteracted.

As referenced previously, there are low financial repercussions for large companies that infringe on patents in Sweden. Hence there are few commercial or financial reasons not to infringe. Large companies may infringe because it is cheaper than licensing a patent from an inventor or an SE. It should be mentioned that some infringements are unintentional. However, Nathan Myhrvold, former CTO at Microsoft has said that the only way to get fired from Microsoft was to do a prior art search (Spangenberg, 2014). This is, according to Spangenberg (2014) also true throughout a large sector of the corporate world. All companies that infringe, do not necessarily know that they are infringing, but they are not spending all that much time to find out (Spangenberg, 2014). It is difficult to change this behavior, however the desired effect of a balanced market

for patent can still be achieved if the large companies agree to pay the license fee when alerted about the infringement.

There is also the issue with adverse selection. Meaning that only patentees who believe their patents are likely to be infringed on, apply to the PPI. This, in turn, can increase the number of infringement lawsuits that the PPI has to conduct.

However, if this is the case it means that the PPI has valuable patents that prove their value by other companies infringing on them.

6. Bibliography

- Advokatsamfundet. (2012, 12 7). Vägledande regler om god advokatsed - Med kommentar. Stockholm, Sörmlands län, Sverige.
- Alpman, M. (2006, 03 01). Dyrt teckna försäkring mot patentintrång. Stockholm, Stockholm, Sweden.
- Arfwedson, J. (2013). *När Colbert får en idé – Fransk immaterialrätt och näringspolitik jämfört med Tyskland och USA*. Stockholm: UPPFINNARKOLLEGIET .
- Assurance Selector. (2014, 08 05). *IP försäkring-Immateriella rättigheter*. Retrieved 08 05, 2014, from [assuransselector.se: http://assuransselector.se/ip-forsakring-immateriella-rattigheter/](http://assuransselector.se/ip-forsakring-immateriella-rattigheter/)
- Ax, A., Lembke, P., Sjöberg, J., Gustafsson, L., Hjertman, M., Riis, M., et al. (2011). *Det offentliga stödsystemet för hantering av företags immateriella tillgångar - Kartläggning och analys*. Stockholm: PRV - Patent- och registreringsverket & VINNOVA - Verket för Innovationssystem .
- Beron, B. L., & Kinsella, J. E. (2011). David VS. Goliath Patent Cases: A Search for the Most Practical Mechanism of Third Party Litigation Financing for Small Plaintiffs. *Northern Kentucky Law Review* , 38:4, pp. 605-623.
- Blomstervall, E. (2014, 08 07). Jurist. (C. M. Ullman, Interviewer)
- Brändström, D., Niklasson, S., & Westholm, C.-J. (2011, 05 31). Inrätta en svensk Patentombudsman. *Ny Teknik* .
- Cauthorn, K. (2014, 10 27). Senior Director, RPX Corporation. (W. Forser, & C. M. Ullman, Interviewers)
- CJA Consultants Ltd. (2003). *Patent Litigation Insurance: A Study for the European Commission on the feasibility of possible insurance schemes against patent litigation risks*. London: European Commission.
- CJA Consultants Ltd. (2006). *Patent Litigation Insurance: A Study for the European Commission on the feasibility of possible insurance schemes against patent litigation risks*. London: European Commission.
- Collaros, M., & Etzler, F. (Directors). (2012). *Patent 986* [Motion Picture]. Sweden.
- Computer Sweden. (2003, 01 31). *Uppfinnare i yppersta världsklass*. Retrieved 08 28, 2014, from Computer Sweden: Computer Sweden
- Dupui, E. (2011, 11 03). Senior Associate Insight Venture Partners. (C. M. Ullman, Interviewer)
- Ewing, T. (2014, 09 11). JD: Law. (W. Forser, & C. M. Ullman, Interviewers)
- Flodström, A. (2014, 04 07). Former Principal of the Royal Institute of Technology, University Chancellor of Sweden, former CEO of KK-Stiftelsen and head of the Swedish National Agency for Higher Education. (W. Forser, & C. M. Ullman, Interviewers)
- France Brevets. (2014, 08 18). *France Brevets Licenses NFC Patents to LG Electronics as its First Licensee*. Retrieved 09 16, 2014, from <http://www.francebrevets.com/>:

http://www.francebrevets.com/sites/default/files/FB_signs_LGE_RELEASE_18TH%20AUGUST.pdf

Gulliksson, (2014, 08 5). *The David of Invention can beat Goliath*. Retrieved from Gulliksson: <http://www.gulliksson.se/eng/the-david-of-invention-can-beat-goliath/>

Gustavsson, C. (2014). (W. Forser, & C. M. Ullman, Interviewers)

Hagman, T. (2014, 10 31). Authorized Patent Attorney. (W. Forser, & C. M. Ullman, Interviewers)

Handelskammaren, S. I.-o. (2014, 07 01). *Handelskammaren - Skiljedom*. Retrieved 07 01, 2014, from <http://www.handelskammaren.com/tjaenster/skiljedom/>

Hellberg, J. (2014). *Skadestånd vid patentintrång*. Stockholm: Jure Förlag AB.

Hentzell, H. (2014, 03 14). Interview with Hans Hentzell. (W. Forser, & C. M. Ullman, Interviewers)

Hermansson, C. (2010). *Patents and SMEs - Managing intimidation activities from financial strong actors*. School of Business, Economics and Law. Gothenburg: University of Gothenburg.

Hillel, J., Mazzeo, M. J., & Zyontz, S. (2013, 03 2). Explaining the “unpredictable”: An empirical analysis of U.S. patent infringement awards. *International Review of Law and Economics* , 35, pp. 58-72.

IMO, International Maritime Organisation. (2014, 01 01). *AIS transponders*. Retrieved 10 29, 2014, from [imo.org](http://www.imo.org/OurWork/Safety/Navigation/Pages/AIS.aspx): <http://www.imo.org/OurWork/Safety/Navigation/Pages/AIS.aspx>

Intellectual Property Insurance Service Corporation. (2014, 01 01). *Invent Pro Abatement*. Retrieved 11 20, 2014, from IPISC: <http://www.patentinsurance.com/InventPro%20Abatement-claim.html>

Janicke, P. M., & Ren, L. (2006, 12 01). Who Wins Patent Infringement Cases? *AIPLA QUARTERLY JOURNAL* , 34, pp. 1-43.

Jansson, E.-L. (2009). *Handläggning och domstolsprövning av patent*. Stockholm: Sveriges Riksdag.

K4_Skiljedomregler ARB 2012, S. I. (2012, 01 01). Skiljedomregler eng ARB TRYCK_1_100927. Stockholm: Stockholms Handelskammarers Skiljedomsinstitut.

Karlberg, L.-A. (2011, 04 05). *Han är uppfinnaren som vann sina patentstrider*. Retrieved 08 05, 2014, from Affärsvärlden: <http://www.affarsvarlden.se/affarsjuridik/article3145218.ece>

Karlsson, K. M. (2014, 09 20). Investor, professional board member. (C. M. Ullman, Interviewer)

Kealey, T. (1996). *The Economic Laws of Scientific Research*. London: Macmillan Press.

Kingston, W. (2000). *Enforcing Small Firms' Patent Rights*. School of Business Studies, Trinity College. Dublin: ECSC-EC-EAEC Brussels-Luxembourg.

Kingston, W. (2006). Limited Incontestability for Small-firm Patents . *European Intellectual Property Review* , 9, pp. 462-467.

- Kingston, W. (2009). Why patents need reform, and some suggestions for it in. In C. Arup, & W. van Caenegem, *Intellectual Property Policy Reform - Fostering Innovation and Development* (pp. 11-28). Cheltenham, UK: Edward Elgar Publishing Limited.
- Kleja, M. (2011, 09 09). *DN Ekonomi*. Retrieved 08 06, 2014, from Dagens Nyheter-webplats: <http://www.dn.se/ekonomi/ny-motgang-for-hakan-lans/>
- Lövrup, S. (2011). *Piercing of the corporate veil -Especially regarding "litigation corporations"*. Linköpings Universitet, Institutionen för ekonomisk och industriell utveckling, Linköping.
- Lag om ändring i patentlagen (SFS 2009:111). (2009, 11 01). Stockholm, Sörmland, Sverige: Justitiedepartementet.
- Lanjouw, J. O., & Lerner, J. (2001, 10 01). Tilting the Table? The Use of Preliminary Injunctions. *Journal of Law and Economics*, 44, pp. 573-603.
- Lanjouw, J. O., & Shankerman, M. (2004, 04 01). Protecting Intellectual Property Rights: Are Small Firms Handicapped? *Journal of Law and Economics*, 47, pp. 45-74.
- Lans, H. (2014, 05 20). Inventor. (W. Forser, & C. M. Ullman, Interviewers)
- Larsson, G. (2013, 09 11). Uppfinnare tar strid. *Dagens Industri*.
- Larsson, T. (2014, 03 17). Former chairman of Svenska Uppfinnareföreningen. (W. Forser, & C. M. Ullman, Interviewers) Göteborg, Västra Götalands Län, Sverige.
- Larsson, T. (2003). *Patentintrång; En fråga för svenska staten?* Stockholm: Vinnova.
- Laurén, C. (2010, 03 21). *Ensam uppfinnare vann viktig tävling*. Retrieved 06 13, 2014, from IQTRON.se: <http://iqtron.se/Uppfinnaren9703.htm>
- Lessing, L. P. (2013, 10 17). *Encyclopedia Britannica*. Retrieved 12 04, 2014, from Britannica: <http://www.britannica.com/EBchecked/topic/35567/Edwin-H-Armstrong>
- Levin, M. (2014, 11 25). Jur.dr. (C. M. Ullman, Interviewer)
- Mitchell, J. (2011, 04 04). *Allvoice Developments Ltd response to Hargreaves review on patents*. Retrieved 02 25, 2014, from www.nyteknik.se: http://www.nyteknik.se/nyheter/it_telekom/datorer/article3139543.ece
- Ombudsman Association. (2014, 08 06). *About the role of an ombudsman*. Retrieved 08 06, 2014, from Ombudsman Association - website: <http://www.ombudsmanassociation.org/about-the-role-of-an-ombudsman.php>
- OSL_43:8. (2009, 1 1). Sveriges Offentlighets- och sekretesslag 2009:400 (OSL).
- Palmestål, K. (2014, 04 01). (C. M. Ullman, Interviewer)
- Palmgren, L.-L. (2011). *Affärsplan Statens Patentpartner Sweden AB*. Stockholm: Swedish ICT Stockholm PL Consulting på uppdrag av Swedish ICT.
- Palmgren, L.-L. (2012). *Kill the Inventor – An impact assessment of white collar crime*. Institutionen för beteendevetenskap och lärande, Avdelningen för sociologi Sociologi 3. Linköping: Linköpings universitet.
- Patent och Registreringsverket. (2014, 08 07). *Påföljder och ingripande*. Retrieved 08 07, 2014, from PRV - Patent och Registreringsverket:

<http://www.prv.se/sv/Kunskapscenter/Immaterialratt/Piratkopiering/Pafoljder-och-ingripande/>

Patentlagen (SFS 1967:837). (n.d.). Stockholm, Sweden: Justitiedepartementet.

Patton, P. (2001, 04 12). New Mouse Takes Shoulder Off the Wheel. *New York Times*.

Rättegångsbalk (SFS 1942:740). (n.d.). Justitiedepartementet.

Ronspies, J. A. (2004, 04 01). Does David Need a New Sling? Small Entities Face a Costly Barrier to Patent Protection. *The John Marshall Review of Intellectual Property Law*, 4, pp. 184-211.

SafeOnline. (2014, 08 05). *SafeOnline Safe Enterprise*. Retrieved 08 05, 2014, from SafeOnline Safe Enterprise: http://www.safeonline.com/safe_enterprise_us.php

Samian. (2014, 08 05). *Samian Underwriting Agency*. Retrieved 08 05, 2014, from Samian Underwriting Agency: <http://www.samian-underwriting.com/>

Skiljedomsinstitut, S. H. (2014, 07 01). *Vad kostar det?* Retrieved from <http://www.sccinstitute.se/skiljeforfarande/vad-kostar-det-4.aspx>

Skiljeförfarande, 1. L. (1999). Lagen om Skiljeförfarande.

Sonelius, J. (2013, 06 07). Husqvarna vill slippa rättegång. Jönköping, SE.

Spangenberg, E. (2014, 10 03). CEO IPNav. (W. Forser, & C. M. Ullman, Interviewers)

Svenska Uppfinnarföreningen. (2007, 05 10). *Uppfinnare.se*. Retrieved 07 03, 2014, from SUF: http://www.uppfinnare.se/media/dokument/om_suf/pressinfo/pressinfo_-_uppfinnarnas_rattsskyddsforsakring.pdf

The Commission of the European Communities. (2003, 05 06). Commission recommendation concerning the definition of micro, small, and medium enterprises. *Official Journal of the European Union*, pp. 1-6.

The Judge. (n.d.). *ATE Insurance*. Retrieved 11 20, 2014, from The Judge: <http://www.patentlitigationfunding.com/ate-insurance>

Ullman, J. (2014, 07 09). M.D, Inventor & Entrepreneur. (W. Forser, & C. M. Ullman, Interviewers)

Ullman, J. (2001). *Patent No. WO0101233*. World.

Webster, E., & Weatherall, K. (2013). Patent Enforcement: A Review of the Literature. *Journal of Economic Surveys*, 28, pp. 312–343.

Wern, L. (2014, 07 09). International patent attorney. (W. Forser, C. M. Ullman, Interviewers, W. Forser, & C. M. Ullman, Translators)

Zider, B. (1998, 11 01). How Venture Capital Works. *Harvard Business Review*, pp. 131-139.

7. Appendix I

7.1. Legal aspects

Laws and legislation vary between countries; the following text concerns the Swedish laws that affect the Patent Protection Initiative.

7.1.1. Swedish law and praxis

The Swedish Patent Act stipulates that infringement in someone's patent, if conducted intentionally or by negligence, is punishable by fine or prison. Punishment can also be sentenced for attempt, preparation or aiding such infringement (Patentlagen (SFS 1967:837)). Despite the Patent Act, no one has been prosecuted.

The fine shall cover reasonable compensation for the use of the invention as well as compensation for further damage that the infringement has incurred.

When calculating the size of the compensation, special consideration shall be given to the following: (Patentlagen (SFS 1967:837))

1. Loss of trade profit
2. Profit made by the infringing party
3. Damage to the reputation of the invention
4. Charitable damage
5. Patent holder's interest in patents not being infringed on.

Reasonable compensation normally corresponds to what could have been agreed amiably between the parties in a potential license agreement. (Patent och Registreringsverket, 2014)

Even if the infringement occurs unintentionally or without negligence, shall pay compensation for the use of the invention, if reasonable. (Patent och Registreringsverket, 2014)

A suit for compensation for patent infringement can only cover the five consecutive years preceding the lawsuit. If raised after that time, the right to compensation is forgone. (Lag om ändring i patentlagen (SFS 2009:111), 2009)

7.1.2. Counter suits

In the event that legal action is taken against the infringing company, it is highly likely that the infringing company will issue counter-suits.

There following are the most common cases of counter-suits:

7.1.2.1. Suit for nullifying the patent.

The infringing party might try to have the patent nullified.

The grounds for nullifying a patent vary from country to country, but are all based on that the patent lacks the necessary qualifications for patentability, and that it should never have been granted in the first place. Patent nullification trial is, in essence a re-examination, similar to the one made to the initial patent application. In Sweden patent nullification cases are handled by a specialized court; "Patentbesvärsrätten".

If nullified, the patent, and all related licenses would become useless, and worthless for the inventor or licensees.

7.1.2.2. Suit for better right to the patent

Anyone can sue the patent-owner for better right to the patent. To be successful for the plaintiff, this would, however require significant proof that he had precedence. Such a case would be initiated against the owner of the patent, regardless of licensees.

7.1.3. Payment of legal fees

The obligation related to legal expenses incurred in processes, is a substantial factor in the patent related court cases.

The main rule of the 1§ in the Swedish Code of Judicial Procedure states that the part that loses the case shall reimburse the legal fees of the counterpart (Rättegångsbalk (SFS 1942:740))

The suing part is considered losing, also when a case is dismissed by the court. The reimbursement shall fully cover the cost for preparation and legal processing as well as fees for legal counselors and assistants, provided the costs are reasonable for enforcing the rights of the party.

Swedish and EU-citizens are not obliged to prove their ability to finance a legal process. Non-EU-citizens need to provide economic surety, sufficient to fulfill processing in primary as well as appealation courts, before a legal process can be initiated (Lövrup, 2011).

7.1.4. Corporate veil

There is no Swedish law covering the issue of Corporate Veil. However, there have been several cases constituting current praxis (Lövrup, 2011).

Based on legislations, reports, doctrines and praxis examined by Lövrup (2011) four criteria for piercing of the corporate veil can be distinguished;

1. The company lacks independent commercial purpose
2. The company lacks independent management
- 3 The company is underfinanced in relation to its intended operations.
4. The use of the company constitutes an inappropriate use of the organizational form, (Aktiebolag, AB)

Using a sovereign parent, and relatively independent subsidiaries should allow a certain degree of financial and legal protection of the parent company.

Thus, if a subsidiary loses a lawsuit, the legal costs of the counter part can be mitigated.

According to relevant cases, systematic use of subsidiaries needs the following prerequisites in order to keep the corporate veil intact:

1. The main purpose of the subsidiary must not be litigation or processing
 - a. The main purpose of these subsidiaries is to manage and broker the rights to the patent.
 - b. In case there is an infringement, the responsibility to enforce the patent rights, shall be agreed to fall on the subsidiary.
2. It must be more than an extension of the parent company.
 - a. It needs to have it's own operations and board of directors.
 - b. The subsidiary shall have it's own physical address
3. It needs a balance of at least 50 KSEK at all times.
 - a. This balance can be in the form of inventory or IPR-assets.

(Blomstervall, 2014)

7.1.5. Dispute resolution

When a dispute arises between parties, it can be resolved by several methods outside of courts, such as conciliation, negotiation or mediation by third party. This chapter outlines various means of dispute resolution. Most of the cases above have ended up in public or arbitrary court.

7.1.5.1. Mediation

Mediation is normally the first attempt of resolution, where the parties explore mutually acceptable means of resolving the conflict.

7.1.5.2. Settlement

If both parties can agree on terms for solving the dispute, amiably, it can be settled outside of court, or in court just before the legal proceedings are initiated. There can be settlement discussions mediated by judges or 3rd parties. Normally, settlement negotiations take place before the case is brought up in court. Final settlement negotiations are encouraged and in some cases even mediated by the judges of the court, before the court proceedings are initiated. Settlements are also known to be reached throughout the legal proceedings all the way up to final verdict in the highest instances. Settlements are often conditioned on strong non-disclosure clauses regarding the terms and level of compensation. The main reason for this is not to affect the stock price and not encourage other inventors to sue for infringement. In the case of Håkan Lans vs. Hitachi, outlined below, the settlement that was reached was conditioned on complete non-disclosure.

7.1.5.3. Arbitration

If a dispute cannot be resolved outside of court, only two options remain; public court or arbitration. There are some differences in these two courts where, in general, arbitration is suited for disputes between corporations while public court proceedings are more apt for treating individuals.

An arbitration proceeding can normally be treaded quicker than a public court case. The actual proceedings are normally quicker.

In public court, each party carries their own legal cost until the case is settled, when the losing part pays the legal fees of the winning part. The cost of the court is carried by the state.

In arbitration court, each party carries their own cost until the case is settled, when the losing part pays the legal cost of the winning part as well as the cost of the court. Before the case is processed, each party has to make a down payment to the arbitration court. (Handelskammaren, 2014)

(K4_Skiljedomsregler ARB 2012, 2012) (Skiljeförfarande, 1999)

The cost of the arbitration court such as salaries for the judges and clerks, rent of facilities etc. often reaches significant amounts (Skiljedomsinstitut, 2014).

The cost at the Stockholm Chamber of Commerce, arbitrary institute is related to the value of the object at hand. The following examples are calculated using the online calculator tool at the Stockholm Chamber of Commerce website.

For an object valued to 1€, the up-front cost is: 11,845 €.

If the object of dispute is valued to 10M€, the up-front fees are 228,045€. Normally, this cost is shared 50/50 between the plaintiff and the defendant (K4_Skiljedomsregler ARB 2012, 2012). However, if the defendant cannot pay its part of the fees, the plaintiff can pay the defendant's part. However, if this is the case, the defendant cannot raise a counterclaim (Handelskammaren, 2014). The significant cost to the court makes a potential loss financially devastating for most individuals.

A verdict in a public court can be appealed for various reasons, such as one of the parts finds that the verdict is incorrect, or judged on incorrect material etc. An arbitration verdict, however, can only be appealed on the grounds of formal mistakes made by one of the arbitrators. Such case is appealed to public court. Public court proceedings are official documents, available to the public upon request, with the exception of certain cases of delicate nature. (OSL_43:8, 2009) In arbitration court, all proceedings and verdicts remain confidential. (K4_Skiljedomsregler ARB 2012, 2012)

In public court, the defendant is entitled to legal representation on the expense of the state. In arbitration, no such mechanism exists. The defendant is forced to appear without representation, unless he can afford the cost.

Since there is no independent supervision of the arbitrary tribunals, witnesses are not allowed to witness under oath. In public court, witnesses are legally obliged to testify truthfully.

8. Appendix II

- All of the 10 interviewees had existing patents.
- Do you have any patent applications under processing?
 - YES – great potential PCT application for propulsion, Benny Hedlund
 - YES – Hans Hällström
 - YES – Kennet Palmestål
 - YES – Patrik von Ahn
 - YES – Mats Karlsson
 - YES– Conny Gustavsson
- Is the main intention of the patents to license it?
 - Lars Wern
 - Benny Hedlund
 - NO - Dimitris Giannoccaro, own production.
 - Hans Hällström has a product, but could also sell licenses.
 - Kennet Palmestål – Have production
 - Patrik von Ahn, the patents lie in a subsidiary that licenses the rights to a producing company.
 - Anders Swedin – Small production around two patent families
 - Håkan Lans
 - Conny Gustavsson
- Do you receive income from the patents today?
 - NO - Lars Wern
 - YES – Benny Hedlund
 - YES - Dimitris Giannoccaro
 - YES – Hans Hällström
 - YES – Kennet Palmestål
 - YES - Patrik von Ahn
 - YES - Anders Swedin
 - YES – Mats Karlsson (but they have an infringer that they do not care about)
 - YES – Conny Gustavsson
 -
- Have you experienced infringement or patent theft?
 - NO - Lars Wern, but he would have liked to have them infringed on.
 - NO – Benny Hedlund
 - Dimitris Giannoccaro – Not for products, but patent applications for the related inventions.
 - NO – But one company came very close when the patent office had missed an annual fee payment.
 - NO – Kennet Palmestål
 - NO – Patrik von Ahn - It is a pressing issue, but we have yet to see any infringements
 - YES - Anders Swedin, It is possible that Sony Ericsson is infringing on the patent.
 - YES - Håkan Lans
 - YES - Mats Karlsson

- YES - Conny Gustavsson
 -
- The following had been involved in other's infringement cases
 - Lars Wern had helped companies, with patent infringement.
 - Benny Hedlund has been involved in patent infringement cases for Volvo Penta
 -
- The following would sue a large company that infringed
 - NO - Lars Wern would not sue as an individual, but team up with a competitor of the infringing company and split the profits.
 - Benny Hedlund would enforce his patents.
 - Dimitris Giannoccaro would primarily negotiate with the infringer, but if negotiations failed, he would partner up with a competing company with own interest in the case.
 - NO – Hans Hällström, would consult a lawyer, but not initiate a process, he would go public and get media attention to create bad-will for the infringer.
 - NO – Kennet Palmestål, as it is not under public prosecution, and I don't have enough resources to finance it privately.
 - Yes - Patrik von Ahn
 - NO - Anders Swedin initiated negotiations, but when accumulating 40KSEK in only a few meetings, he had to put the case on hold.
 - YES – Håkan Lans
 - No – Mats Karlsson, but would let someone else do it just to stop the competitor.
 - YES - Conny Gustavsson
 -
- If there were an organization like the PPI, the following would join.
 - Lars Wern would gladly enroll immediately if an organization like this existed, provided that the terms could be tailored individually depending on the history and status of the patent, for new patents, a standard agreement could be acceptable. He has one patent issue with Scania that he would submit immediately.
 - Benny Hedlund would be very interested in this, and claims that this is of great importance for all inventors. As a member of SUF, he sees these kinds of cases all the time. Such an initiative would be most welcome.
 - Dimitris Giannoccaro would be very interested in using such an organization if it existed.
 - Hans Hällström would be more than interested, he would like to be a part of the PPI if it is realized.
 - Kennet Palmestål would be interested.
 - Patrik von Ahn – highly interesting, but it depends on what we get, and what the cost is.
 - Anders Swedin – I would immediately join such an organization, like what STIM is for musicians.
 - Håkan Lans would be interested as long as there really is a significant war chest.

- Mats Karlsson would give up 90% of the potential damages if it meant that the competitor stopped producing, but not enroll for preventive purposes.
- Conny Gustavsson would join.

9. Appendix III

Calculations and estimates for the IRR.

$$0 = (\text{investment}) + \frac{CF_1}{(1+IRR)^1} + \frac{CF_2}{(1+IRR)^2} + \sum \frac{CF_t}{(1+IRR)^t}$$

The formula used for calculating IRR is the (IRR)-function in Microsoft Excel. This formula corresponds to the formula for NPV (Net Present Value) illustrated above, with NPV set to zero.

The values used over the 10-year period has been estimated to:

Table 6 – Base case

Year 1	-6 029 472 kr
Year 2	-4 224 304 kr
Year 3	-2 419 136 kr
Year 4	-613 968 kr
Year 5	1 191 200 kr
Year 6	2 996 368 kr
Year 7	4 801 536 kr
Year 8	6 606 704 kr
Year 9	8 411 872 kr
Year 10	10 217 040 kr

Table 7 – Best case

Year 1	-4 920 200 kr
Year 2	-2 775 760 kr
Year 3	-631 320 kr
Year 4	1 513 120 kr
Year 5	3 657 560 kr
Year 6	5 802 000 kr
Year 7	7 946 440 kr
Year 8	10 090 880 kr
Year 9	12 235 320 kr
Year 10	14 379 760 kr

Table 8 – Worst case

Year 1	-12 186 440 kr
Year 2	-11 368 240 kr
Year 3	-10 550 040 kr
Year 4	-9 731 840 kr
Year 5	-8 913 640 kr
Year 6	-8 095 440 kr
Year 7	-7 277 240 kr

Year 8	-6 459 040 kr
Year 9	-5 640 840 kr
Year 10	-4 822 640 kr

In the worst case the IRR cannot be calculated since all figures are negative.