Economic Incongruities Induced by a Fragmented Patent System in Europe

Bruno van Pottelsberghe de la Potterie Malwina Mejer
ECARES, Université Libre de Bruxelles, ULB CP139, 50 av. F.D. Roosevelt, 1050, IXELLES, Belgium
(Email: bruno.vanpottelsberghe@ulb.ac.be, mmejer@ulb.ac.be)

Abstract The European patent system is known to be highly fragmented: once a patent is centrally granted by the European Patent Office (EPO) it must be enforced in the desired EPC (European Patent Convention) Member States. The traditional criticism of this system is that it is prohibitively costly, due to cumulated post-grant costs: translation costs, national validation fees and national annual renewal fees. This paper argues that the consequences of this 'fragmentation' are actually much more dramatic than the mere cost of prosecuting a patent before national patent offices would suggest. Cost simulations and case studies provide evidence suggesting that heterogeneous national litigation expenses and practices induce i) a high level of uncertainty and a higher degree of managerial complexity; ii) high costs of litigations in case of multiple national litigations; iii) economic and legal incongruities due to easier 'parallel imports', possible 'time paradoxes' and a defacto paradox of having a EU level competition policy and granting authority facing national jurisdiction supremacies on patent issues. These three issues could be solved through the implementation of a community patent.
Keywords European patent system, patent cost, litigation process, enforcement

1 Concluding Remarks a Fragmented Patent System

The European patent system has been put in place in 1978, when height European countries ratified the European Patent Convention (EPC). Under the EPC, the process of granting a patent has been centrally performed by the EPO (European Patent Office). Nowadays the number of Member States is of 34, witnessing the success of the system and a wide recognition of the usefulness of the EPO. The EPC does not, however, provide a uniform system to enforce European patents once they are granted. A European patent takes effect as a national patent in each state where it is validated and enforced after its grant by the EPO. In other words, once granted a patent is subject to the national rules and practices of the member states.

Such a fragmented system has two main implications for applicants. The first one, the classic one, is the prohibitive cost of patent protection in Europe. In contrast to other large regional or national patent offices in the world, payment of national validation and renewal fees, the frequent translations requirements and the enforcement costs must be multiplied by the number of countries where the applicant aims at an effective protection.

The second implication concerns patent litigations and is less frequently heard of. It is related to the cost, complexity and uncertainty induced by highly heterogeneous national patent systems: a patent has to be enforced on a country by country basis, with different legal practices and outcomes. National courts have so far an exclusive jurisdiction over patent litigations, with effect on their own territory. Infringement cases are dealt with using national law. In case of multiple litigations there is a risk of different courts reaching opposite conclusions.

The objective of this paper is to provide empirical evidence on the economic implications of the currently highly fragmented patent system in Europe. Two methodological approaches are used. The first one summarizes the results of recent simulations of patenting costs in Europe. Despite the London Agreement that aims to ease translation requirements, the cost of patenting in Europe is still prohibitive. The second approach investigates the implications of the fragmented system for managing and enforcing patents in Europe. The description of litigation systems in four European countries and three case studies clearly underline the systemic incongruities that are induced by the European patent system in its current form, not to mention the high degree of complexity, cost and uncertainty induced by variegated approaches to tackle patent-based litigations.

The paper is structured as follows: the next section presents litigation costs and describes the heterogeneity of judicial systems across four EPC Member States and the USA.. In section 3, three economic incongruities induced by a fragmented European patent system are described and then illustrated through several case studies.. Section 4 concludes.

2 Litigation Costs

Van Pottelsberghe and Mejer (2008) provide the detailed analysis of the impact of the London Agreement on the cost of patenting in Europe. Their results are illustrated in Table 1. Without accounting for external expenses, relative medium term cost savings due to the ratification of the London Agreement is 29% when validating the European patent in six countries (EPO-6; i.e. Germany, France, Italy, the Netherlands, Switzerland and the United Kingdom) and 24% when validating the patent in thirteen countries (i.e. EPO-13 which includes EPO-6 counties and Austria, Belgium, Denmark, Finland, Ireland, Spain and Sweden). The saving rates are smaller when looking at a ten years period for patent protection and correspond to 21% and 19% for EPO-6 and EPO-13 respectively. This is undoubtedly a substantial cost decrease, but one must keep in mind that a European patent still remains the most expensive region in the world.

Table 1 Procedural and Translation Cost relative to the US, Fees as of May 2008

	Per patent	Cost per claim	Cost per claim per capita
EPO-13 (LA)	6.9	8.7	7.0
EPO-6 (LA)	4.0	5.1	5.4
JPO	0.8	2.0	4.7

Source: Adapted from van Pottelsberghe and Mejer (2008, Appendix Table XX). These costs correspond to the examination process fees, the translation costs and the renewal fees for ten years of protection in 6 and 13 EPC member states once the London Agreement (LA) is in force.

Even after the ratification of the London Agreement by 15 EPC contracting states a European patent is four to seven times more expensive than a US patent when procedural and translation costs are considered (c.f. Figure 1). Even in relative terms the difference remains large. Table 2 shows that the cost per claim is five to nine times more expensive in Europe than in the US. In Japan, where patents include much less claims, the cost per claim is twice as high as in the US. The last column of Table 3 also takes into account the market size (measured as the number of inhabitants in the geographical area covered by the patent offices). It shows that even after the London Agreement the cost per claim per capita is five to seven times more expensive than in the US, and it gets closer to the cost of patenting in Japan thanks to the economies of scale induced by the size of the European market.

In a nutshell, the high fragmentation of the European patent system induces a high and prohibitive relative cost of patenting in Europe, which is about five to eight times higher than in the US. Due to their prohibitive costs European patents are effectively validated in only six countries on average (out of 34 Member States).[34] For the business sector at large these results suggest that European firms pay much more than their Japanese or American counterparts to get a patent granted. Since these higher costs seem to influence the patenting behavior of applicants, we may conclude that European innovators face more stringent conditions for the appropriability of their intellectual capital.[35]

In Europe the situation is very complex as there are institutions at national and European level that can judge in parallel on patent validity. Within nine months following the decision to grant, third parties can file an opposition to grant before the EPO in order to revoke or amend the patent. What makes this procedure attractive for the opponent is that the EPO decision on European patent validity is effective in all designated states where a European patent has been effectively enforced. Moreover, it is relatively not expensive as total cost of the opposition varies between EUR 6,000 and 50,000 including patent attorney's intermediation. Nowadays, about 6% of European patents are challenged at the EPO (EPO, CA/PL 29/99).[36] A decision of the EPO to revoke a European patent is supposedly final and a decision to uphold a European patent (the decision to maintain the patent as granted or in an amended form) leaves the way open for further validity challenges before national courts.[37]

[34] Cf. e.g., van Pottelsberghe and van Zeebroeck (2008) and Harhoff et al. (2007).

[35] For evidence on the fee elasticity of patents, see de Rassenfosse and van Pottelsberghe (2007, 2008)

[36] Of those, about one third is revoked, one third is maintained in an amended form, which generally means "reduced in scope", and one third is maintained as granted (i.e., the opposition is rejected).

[37] The EPC gives national courts jurisdiction over invalidating a European patent with an effect on their own territory (art 138 of the EPC).

As a European patent takes actually effect as a national patent, national jurisdictions have the right to judge on patent infringement and validity cases.38 The same European patent has to be enforced on a country by country basis. Such a system is very costly for both the applicant and the defendant, as the cost of potential enforcement and litigation must frequently be cumulated over the number of countries where the applicant has its patent effectively enforced.

National litigation costs vary significantly across jurisdictions according to the type of proceedings, the complexity of the case, the technological field and the market value that is at stake. The EPO (WPL/4/03) has estimated the cost of patent litigation in four EPC contracting states, Germany, France, the Netherlands and United Kingdom, where 90% of current European patent litigations take place. The broad costs of litigation in these countries are presented in Table 2.

Table 2 Patent Litigation Cost in Four EPC Contracting States and US (in EUR 1,000)

	Germany[2]	France	The Netherlands	United Kingdom	Cumulative 4 EPC	United States
1st Instance	50 to 250	50 to 200	60 to 200	150 to 1,500	310 to 2,150	n.a.
2nd Instance	90 to 190	40 to 150	40 to 150	150 to 1,000	320 to 1,490	n.a.
Total	140 to 440	90 to 350	100 to 350	300 to 2,500	630 to 3,640	380

Source: Adopted from EPO Doc. WPL/11/05 Rev. 1, 16.02.2006; Bessen and Meurer (2008)
Notes: [1] Includes court costs and patent attorneys' fees.
Cost for both validity and infringement. The cost of dispute depends on the value in dispute. The lower bound is estimated for the value in dispute EUR 250 thousands and the upper for EUR 1 million.

The United Kingdom is by far the most expensive jurisdiction among EPC signatories countries. The cost is much higher than in the three other jurisdictions, and is nearly as high as the cumulated costs in the three other jurisdictions. The litigation costs in Germany, France and the Netherlands are similar. However, in case of multiple litigations, costs have to be added across jurisdictions. The cumulated cost of litigation vary from EUR 310 thousands before the four tribunals of First Instance up to EUR 3,6 millions when accounting for the cost of appeal at the Second Instance. Costs of multiple litigations are extremely prohibitive especially for individuals and small and medium firms. When comparing with the United States the cost of multiple litigations in Europe is much higher, at least twice as high. However, one should be cautious when comparing the litigation costs in the European Union and in the United States due to the different estimation methods and marked differences between judicial institutional settings. Moreover, the value of external expenses, which is not accounted for here depends on the volume and the complexity of the case.

In Europe, jurisdictions differ not only in terms of cost of proceedings but also with respect to the institutional settings and probably as well with respect to the quality of adjunctions (qualification and number of judges deciding on the case) as illustrated in Table 3.

Germany is an example of a country with a dual judicial system where courts hearing infringement cases are separated from the court that decides on patent validity (revocation), albeit in France, the Netherlands and United Kingdom the same court hears and judges in both cases. Table 4 shows that the degree of institutional specialization differs substantially across countries. Some countries have specialized IP chambers (France and the Netherlands), while others specialized patent courts (Germany and United Kingdom). With regard to the quality of proceedings, Germany has the highest number of legally and technically qualifies judges. There are apparently no technically qualified judges in France and the Netherlands.39

Table 3 Characteristics of Juridical Systems in Selected EPC Contracting States

	Germany	France	The Netherlands	United Kingdom	United States
Judicial system	Dual system	Single system	Single system	Single system	Single System
The Court of First Instance					

38 Art 2(2) EPC: The European patent shall, in each of the Contracting States for which it is granted, have the effect of and be subject to the same conditions as a national patent granted by that State, unless this Convention provides otherwise.

39 However, the judge or the parties can designate a consultant (engineer or research) who is actively involved in the proceedings but does not participate in the judges' deliberations (Council of the EU, 11622/07).

Specialized court	Federal Patent Court (validity); 12 District Courts (infringement); specialized courts in Düsseldorf and Mannheim	10 Tribunal de Grande Instance; specialized patent judges in Paris and Lyon	specialized IP chamber at District Court in The Hague s	Patents Country Courts and the Patents Court of the High Court	Federal Courts; Court of Appeals for the Federal Circuit
Legally qualified judges	62	40	6	6	-
Technically qualified judges	46	0	0	5	-
Composition of the court	3 or 5	3	3	1	-
Litigation activity (2004)					
# of patents in force	410,000	380,000	141,000	360,000	1,650,000
# of EP nationalized	307,488	252,798	121,337	257,600	n.a
# of patents litigated	200 (nullity) 500 (infringement)	300	70	85	3075

Source: Allgayer (2005), Council of the European Union Document No 11622/07 and EPO WPL/4/03, Total number of patents in force adopted from WIPO Patent Report (2007 Edition) pp. 43; Number of patents litigated adopted from EPO WPL/4/03; Number of European patents nationalized adopted from CJA Consultants Ltd (2006) study for the European Commission on 'The feasibility of possible insurance schemes against (European) patent litigation risks';

Table 3 also presents the broad number of litigations in the four jurisdictions and in the United States. The countries with the largest number of patents enforced logically have a large number of litigations. However, the share of litigations in the total number of patents varies substantially across countries. Germany is the country with the cheapest and most renown judicial system for patent-related litigations within Europe. One may therefore wonder whether the relatively small litigation costs in Germany induces a higher proportion of litigations. An insight is provided by figure 1, which displays the position of the five countries along two dimensions: the average cost of litigation and the share of litigations in the total number of patents enforced in the country. A traditional non linear demand curve seems to drive the relationship, with on one extreme Germany and on the other the United Kingdom, with few, but expensive, litigations.

In the US, the relatively large market, and hence the value at stake, reduces to some extent the prohibitive costs associated with litigations, hence the relatively high litigation rate. At the opposite is the United Kingdom, with the highest litigation costs per capita and the smallest number of litigations. It could be argued that figure 1 does not provide a comprehensive picture of how patent systems actually work. Indeed, the quality of the examination process, and other institutional differences are not presented (i.e., there is no pre-grant opposition at te USPTO). However, the fact that the relationship holds with the four European countries, supports the view that litigation costs do influence the propensity to litigate.

The previous section illustrates the high patenting costs (filing, validation, translation and renewal) induced by a fragmented system. The results presented in this section show high and heterogeneous relative litigation costs across countries, especially within Europe. The multiplicity of small markets (as compared to the US) actually exacerbates the prohibitive costs of managing and enforcing patents in Europe, especially in case of multiple parallel litigations within Europe. But the actual architecture of the European patent system induces even more complexity and uncertainty on the shoulders of assignees, as depicted in the next section.

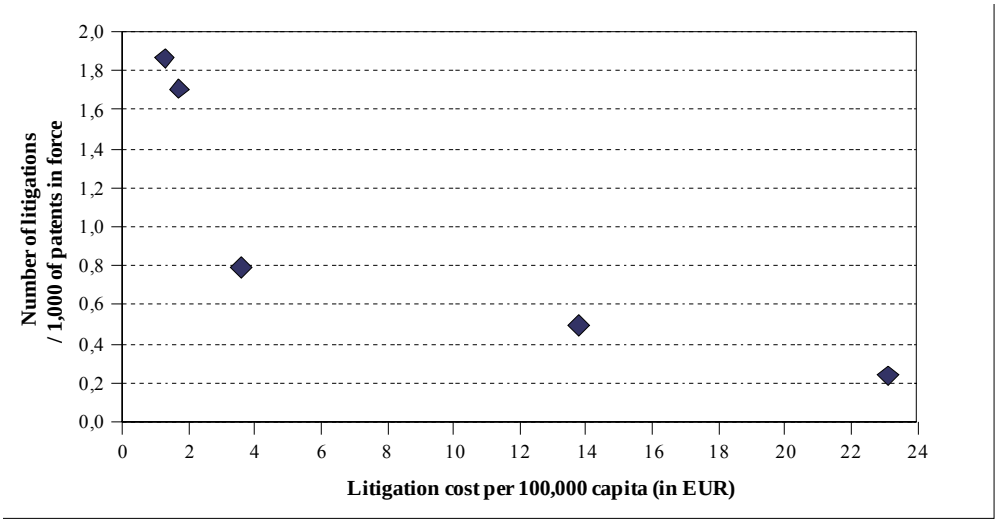

Figure 1 A Litigation Demand Curve, 2004

1.1.1.1.1	1.1.1.1.2 E	1.1.1.1.3 R	1.1.1.1.4 L	1.1.1.1.5 K	1.1.1.1.6 S	1.1.1.1.7 PO*
1.1.1.1.8 Number of patents in force	1.1.1.1.9 10,000	1.1.1.1.10 80,000	1.1.1.1.11 41,000	1.1.1.1.12 60,000	1.1.1.1.13 ,650,000	1.1.1.1.14 8,730
1.1.1.1.15 Litigation cost in 1000 EUR MIN	1.1.1.1.16 40	1.1.1.1.17 0	1.1.1.1.18 00	1.1.1.1.19 00	1.1.1.1.20	1.1.1.1.21 3
1.1.1.1.22 Litigation cost in 1000 EUR MAX	1.1.1.1.23 40	1.1.1.1.24 50	1.1.1.1.25 50	1.1.1.1.26 500	1.1.1.1.27	1.1.1.1.28 00
1.1.1.1.29 Average total cost, in EUR 1,000	1.1.1.1.30 90	1.1.1.1.31 20	1.1.1.1.32 25	1.1.1.1.33 400	1.1.1.1.34 80	1.1.1.1.35 6,5
1.1.1.1.36 Population in millions	1.1.1.1.37 2,3	1.1.1.1.38 1,4	1.1.1.1.39 6,4	1.1.1.1.40 0,5	1.1.1.1.41 99,1	1.1.1.1.42 88,0
1.1.1.1.43 Cost per 1,000 capita	**1.1.1.1.44 ,52**	**1.1.1.1.45 ,59**	**1.1.1.1.46 3,76**	**1.1.1.1.47 3,13**	**1.1.1.1.48 ,27**	**1.1.1.1.49 ,20**
1.1.1.1.50 Litigation/1000 patent in force	**1.1.1.1.51 ,7**	**1.1.1.1.52 ,8**	**1.1.1.1.53 ,5**	**1.1.1.1.54 ,2**	**1.1.1.1.55 ,9**	1.1.1.1.56 **0,0**

- For the EPO: instead of the total number of patents in force we take the total number of patents granted in 2004. We assume that on average 6% of European patents granted are in opposition. Average total cost per opposition at the EPO is assumed to be between EUR 6,000 and EUR 50,000 and is estimated for a case involving a round or two of correspondence between the parties during the opposition procedure and preparing for and taking oral proceedings. Similar cost are likely on appeal (those estimates are provided by the attorney's company Mewburn Ellis (www.mewburn.com). European patents are on average effectively validated in 6 countries therefore, population size for the EPO is assumed to be the sum of the population is those countries.

3 Institutional Settings: 3 Case Studies

The current institutional setting of the European patent system actually divides the internal market into geographical areas where the patent is enforced and those where it is not. Further, national jurisdictions have the final 'say' for any enforcement issue, from patent validity to infringement. Such a situation paves the way to three related economic incongruities: EU-wide competition policy but national patent rights, intra-EU 'parallel' trade and patent protection, and time paradox:

a) **EU-wide competition policy and national patents**: The patent system is justified by the *dynamic efficiency* it is supposed to generate: the monopolistic power associated with a patent aims at stimulating firms to innovate. It is generally opposed to the *static efficiency* ensured by antitrust or competition policy. The latter is controlled centrally in Europe, by Directorate General Competition, for the whole European Union. There is therefore a flagrant inconsistency within the European Union: its competition policy authority has a reach on the whole European market and the counter-effect policy

leverage, the intellectual property policy, is ultimately run at the national level in each of the 34 EPC contracting states. We are therefore evolving in a seemingly centralized system, where national authorities may invalidate a patent centrally granted by the EPO, and where a national application might be granted independently from the EPO.

b) **Unfair intra-EU 'parallel' trade:** is the principle of free movement of goods in the EU makes it relatively easy for imitators, infringers, or parallel importers to enter the European Union through a country where the patent has not been enforced, and then distribute it widely within Europe. This of course does not preclude enforcing the patent in the countries where it has been effectively validated, but makes it much more difficult to identify imitated goods and counterfeited products. The company has to deploy financial and managerial resources to secure protected markets against potential infringers (this was partly performed by border controls in the past). Once the alleged infringer is identified in one of the national markets the patent holder must rely on the legal procedures of this particular state to enforce its rights: injunctions, seizure orders, and other judicial remedies which will be granted in accordance with provisions of national law.[40] The counter argument would be that, if the probability of infringement is high, and if the patented invention is 'worth it', one would logically expect the applicant to validate and enforce its patent in the 34 EPC Member States. This latter argument is rather fragile however, as it fails to take hold of the real option mechanism associated with all innovation processes. Time is needed between the invention is made and its potential market success. At the beginning of the innovation process the entrepreneur does not have the resources, not to mention the time, to uphold prohibitive patenting costs in numerous (small) member states.

Time paradox: The current institutional setting within the EU allows for time inconsistencies in the treatment and enforcement of patents. Within nine months of the decision to grant, third parties can file an opposition against the patent filing (either for revocation or for amendments, cf. Harhoff's paper) at the EPO. The decision on opposition is supposed to have an effect in all the countries where the patent is effectively enforced. However, the EPC allows third parties to challenge the validity of a patent before national courts. Such an action for nullity can be made directly from the date of validation in a national patent office (no later than three months from grant by the EPO), even if there is still an opposition pending at the EPO. Likewise, the patentee can sue potential infringers from the date of grant. As it takes on average 4 years for the EPO to tackle an opposition case (Harhoff, 2004) it is, therefore, possible to be accused of infringement and pay for damages or even endure permanent injunction at national level while having the patent later declared invalid by the EPO.

Three case studies are used to illustrate the economic incongruities induced by the European patent systems and the implied managerial complexity for firms. The case studies are briefly described in Table 4.

Table 4 Case Studies - Stylized Facts

	EPILADY		**SARA LEE**		**DSS**	
Patent Litigation key data						
No of EP	EP0101656 B1		EP0904717		EP0455750 B1	
Patent holder	Epilady		Sara Lee/DE and Philips Electronics		Document Security System Inc. since 2005	
Date of filing (EPO)	29/07/1983		30/09/1998		13/11/1991*	
Date of grand (EPO)	1986		22/08/2001		01/01/2002	
Alleged infringer	Remington		Group of Dutch and Belgian companies[2]		European Central Bank	
Year of litigation	1989		2001		2005	
Decisions of the Courts						
	Validation	Infringement	Validation	Infringement	Validation	Infringement
CFI of the EC[1]	n.r	-	n.r	-	n.r	*pending*

[40] There is an obvious conflict between intellectual property rights policies, which scope is limited to national markets, and the principle of free movement of goods. The Treaty of Rome prohibits quantitative restriction on imports and all measures having an equivalent effect between member states (art. 28 Treaty of the European Union). IPR may, however, constitute such a measure. The compatibility of the IPR a trade restrictive measure has to be justified under art 30 if the TUE: shall not constitute a means of arbitrary discrimination or a disguised restriction on trade between Member States.

EPO	upheld	n.r	revoked	n.r	-	n.r
AT	-	NO	-	-	*pending*	-
BE	-	YES	upheld	YES	*pending*	-
DE	-	YES	-	-	upheld	-
ES	-	-	-	-	*pending*	-
IT	-	YES	-	-	*pending*	-
FR	-	NO	-	-	revoked	-
NL	-	YES	decision postponed	NO	upheld	-
UK	-	NO	-	-	revoked	-
Incongruities						
EU competition vs national patents	X		X		X	
Intra-EU 'parallel' trade	X		X		X	
Time paradox			X		X	

Source: Council of the European Union, Document No 11622/07, Bird and Bird (2004), CMS (2007) and Boyes Turner (2007).
Notes: [1] Court of the First Instance of the European Commission
[2] Retail chains: Coöperatieve Inkoopvereniging Intergro BA, Vomar and Drie Mollen in The Netherlands as well as Fort Koffiebranderij, Cafes Liégois and Beyers Koffie in Belgium

3.1 The Property Hedge: Epilady vs Remington

In the early 1980s Epilady invented its famous device: a "*hair remover for use on ladies legs*". Once having been granted a European Patent for its invention in 1986, Epilady sold its device in 11 EPC contracting states. During the first two years of marketing and selling, Epilady suited about 28 competitors who infringed its patented invention by producing one-to-one products and won in all cases. In 1988, Remington entered the European market with *Smooth and Silky*, a device that performed exactly the same function as *Epilady* but with a slightly different mechanism (the former used a rotating helical spring system whereas *Smooth and Silky* a rotating rubber bar with slits in it) and within the same year it had filled an opposition at the EPO.[41] In order to uphold its monopolistic position within Europe Epilady brought a patent infringement action against Remington in Austria, Belgium, Germany, France, Italy, the Netherlands and the United Kingdom. Meanwhile, in 1991 the EPO upheld the Epilady patent.

Despite the harmonized juridical law put in place by the EPC, the subsequent rulings of the national courts on infringement differed across jurisdictions.[42] Courts in Austria, France and the United Kingdom judged that there was no infringement of the Epilady patent, whereas courts in Belgium, Germany, Italy and the Netherlands ruled that infringement took place. This case study illustrate the 'non-European' dimension of the European patent system, a clear lack of consistency.

3.2 Coffee Wars: Senseo

The Dutch-American company Sara Lee/DE and Philips Electronics developed the *Senseo* coffee machine, which makes an individual cup of coffee supplied in circular pads that are inserted into the machine by the user. For this technology they were granted a European patent "*assembly for the use in a coffee machine for preparing a coffee, container and pouch (pad) of said assembly*". The coffee machine proved to be a great success and competitors started entering the market for coffee pads delivering copycats in shops. In order to secure its monopolistic position in the market for pads, Sara Lee initiated a number of infringement proceedings against competitors (including those in Belgium and the Netherlands) towards the end of 2001. She argued that as the pads constituted an essential part of the innovation, producing those pads constitutes an indirect infringement of her patent. Shortly after grant,

[41] The first opposition against the Epilady patent was filed at the EPO in 1987 by Beasille Marketing Limited.

[42] Art 69(1) of the EPC reads as follows: *The extent of the protection conferred by a European patent or a European patent application shall be determined by the terms of the claims. Nevertheless, the description and drawings shall be used to interpret the claims*. During the discussions at the diplomatic conference on the final version of the EPC this simple rule was interpreted in completely different way by the British and German courts. Instead of rewording the article protocol on the interpretation of this article was agreed upon and incorporated into the drat of the EPC (Straus, 2000).

in September 2001, the firm Albert Heijn B.V filed an opposition before the EPO.[43] In mid 2002 the Court of Appeal in The Hague held in its preliminary proceedings that there was no indirect infringement action. Further rulings were ceased waiting for the EPO decision concerning European patent validity.

At the end of 2003 Sara Lee's competitors seeking the declaration of non-infringement in Belgium filled an action before the Court of First Instance in Antwerp and won. However, Sara Lee appealed this decision and in 2004, without waiting for the outcome of the opposition before the EPO, the Antwerp Court of Appeal held that the competitors infringed Sara Lee's patent: *they had delivered means that allowed third parties to make use of the patent which constituted an indirect infringement of the patent*. Sara Lee won in Belgium and kept its monopolistic situation until August 2006, when the EPO revoked her patent in full for lack of inventive step. The *Senseo* case shows that the current system not only allows for discrepancies in interpreting the claims but also induces time inconsistencies, especially when the EPO and national courts decide in parallel on the validity of a patent. In this case, the infringer had to pay for damages despite the fact that the patent would be revoked two years later by the EPO.

3.3 A local currency?: DSS v. ECB

An American company, Document Security System Inc. (DSS), which is specialized in developing, licensing and selling anti-counterfeiting technology and products, holds a European patent for '*non-replicable document and method of making same'*.[44] This technology makes special images (i.e. stripes) on the banknotes, which cannot be replicated when copying or scanning. In August 2005 DSS started an infringement action against the European Central Bank (ECB) claiming that the ECB uses their technology.[45] According to the EC Treaty, a person claiming compensation from one of the European Institutions can bring his action before the Court of the First Instance (CFI) of the European Commission. DSS referred to this rule and launched infringement case before the CFI. Shortly after the proceedings before the CFI started, the ECB filed claims to invalidate the DSS Patent in Austria, Belgium, Germany, France, Italy, Luxembourg, the Netherlands and the United Kingdom.

Few national courts have already issued decisions concerning the validity of the DSS patent. The English and French courts revoked it whereas the Dutch and German decided the opposite, upholding it. The case before the other courts is still pending, so is the infringement case before the CFI. Additionally, to the inconsistent interpretations of a single patent application, this example shows that the current system allows for a situation in which the validity of the same European patent is judged separately from the infringement at different courts: one central European and one national. Different courts hearing different aspects of the case is not a new issue in countries that have a dual system i.e. Austria and Germany but not for countries with a single system, i.e., where there is only one court that judges on both infringement and validation. If the CFI rules out that the ECB actually infringes the DSS patent, one may wonder what the market will be: the place of coordination (ECB) or the place of main use of bank notes (i.e., the market where the patent is valid and enforced). In the former case the market will be gigantic, whereas in the latter the market will 'only' be proportional to the countries in which the patent is still in force.

The bottom rows of table 5 designate which 'incongruity' is illustrated by each case study. The two incongruities related to the antagonism between EU competition authorities and national jurisdictions and to the easier intra-EU parallel trade are nearly as frequent as the number of patent families in force in Europe. They affect the managerial complexity and litigation costs 'only' when infringements occur and are identified. 'Time paradox' is a less frequent event than the two others because it takes place only when a centralized process (i.e., with a litigation at the CFI or an opposition at the EPO) takes place simultaneously to one or several national litigations. This type of incongruity is however more frequent

[43] The opposition procedure before the EPO allows a a patent to be opposed if it is considered to be wrongly granted bya third party. An opposition can be filed by any person or institution. The notice of the opposition should be filed within nine months from the publication of the mention of a grant of the European Patent. On average, it takes 3 years for the Board of Appeal at the EPO to issue the final decision (Graham et al., 2003).

[44] Before 2001 DSS was called New Sky Communications, Inc. and specialized in the developement and production of theatrical motion pictures and home video cassettes. In 2002 it acquired four companies: Lester Levin, Inc. d/b/a Patrick Printing; Document Security Consultants, Inc. and Imperial Encryption, Inc., Thomas M. Wicker Enterprises, Inc., and changed its name to DSS. With those acquisitions the Company came to the possession of intangible assets, including the European Patent EP0455750 B1.

[45] The official name of the patent holder was changed from Wicker Ralph into Document Security System, Inc. in June 2005.

than appears at first sight, and the decision of national courts actually exacerbate this effect. For instance, in May 2007 the UK Court of Appeal ruled that damages for patent infringement awarded by a UK court must not be paid back even if the patent is later declared invalid by the EPO.[46]

What Lord Justice Jacob said in his ruling that his decision was based on the need for certainty in business is quite symptomatic: *"First and foremost, the defendant has had a full and fair opportunity of attacking the validity of the patent in his own proceedings. Next there is a very strong public interest in the finality of litigation. ...It is much better that he knows that the first litigation about validity is the time and place for him to get his best case together – that he knows he will have no second chance"*. What motivated Lord Jacob in this case was not the simple question of which court was superior, but of how to best operate an imperfect European patents system.[47]

4 Concluding Remarks

This chapter analysed the consequences of the highly fragmented European patent system (EPS). The system is fragmented because national jurisdictions still prevail for the validation and enforcement of patents. The methodologies used for the analysis are based on cost simulations and case studies.

We first confirm the classical drawback of the EPS: patenting costs in the EU is prohibitive due to translation costs and national validation and renewal fee. The simple administrative burden imposed by national enforcement practices and translation requirements induce relative patenting costs that are at least four times higher in Europe than in the US. This result holds for a validation in 'only' six European countries. If more countries are targeted for protection the relative cost gets much higher. Before the London Agreement (as of May 2008), which drastically reduces translation requirements, the relative patenting cost in Europe was at least six times more expensive than in the USA. This cost disadvantage essentially concerns the patents that are applied and enforced in Europe. The fragmented market however induces more shortcomings than the mere cost of getting a patent granted: high and heterogeneous litigation costs and several economic incongruities.

Litigation costs and practices vary substantially within Europe and are associated with high relative costs. If absolute litigation costs are somewhat lower in continental Europe than in the USA or the UK, relative costs are much higher in the UK and in smaller countries like The Netherlands. The multiplicity of small markets in Europe actually exacerbates the prohibitive costs of managing and enforcing patents in Europe, especially in case of multiple parallel litigations within Europe. In the USA, the relatively large market, and hence the value at stake, reduces to some extent the prohibitive costs associated with patent litigations, hence a relatively high litigation rate. At the opposite is the United Kingdom, with the highest litigation costs per capita and the smallest number of litigations per patent enforced.

But the actual architecture of the European patent system induces even more complexity and uncertainty on the shoulders of assignees. The current institutional setting of the European patent system actually divides the internal market into geographical areas where the patent is enforced and those where it is not. National jurisdictions have the final 'say' for any enforcement issue, from patent validity to infringement. This situation paves the way to three related economic incongruities: EU-wide competition policy but national patent rights; intra-EU 'parallel' trade and patent protection; and time paradox. Three case studies illustrate these incongruities and their implication for managers. There is no Europe-wide market for technology, and even the supposedly centralized procedure, the substantive examination performed by the EPO, is actually not really 'centrallized' or 'European': it is possible for a national court to invalidate a patent granted by the EPO, or to validate a patent refused by the EPO. And these 'possiblilities' may occur in one direction or the other in up to 34 countries.

---

[46] For instance, in the case Unilin Beheer vs Berry Floor in the UK, the dispute concerned the validity and infringement of Unilin's European patent for hardwood floor coverings. In the UK the patent had been held valid and infringed, while it was still in opposition at the EPO, an opposition that would presumably last for two more years. Even if the EPO proceedings did result in the patent being revoked, this would not affect Berry's liability to pay damages, because the validity and infringement of the patent had already been subject to a final determination by the UK courts. "*The judge was not prepared to allow the conclusion of UK litigation to be dependent on the workload of the EPO*" [M. Graham Burnett-Hall (Associate, Marks & Clerk Solicitors)] cf.: http://www.marks-clerk.com/solicitors/the-epo-and-national-courts-an-odd-relationship.html for a description of the case.

[47] Cf. http://www.theregister.co.uk/2007/05/10/patent_damages_not_refunded/; OUT-LAW.COM, Published Thursday 10th May 2007 10:32 GMT.

These ‘incongruities’ and the prohibitive costs of enforcement or litigation in Europe generate both a high level of uncertainty regarding the validity of a patent (and his market reach) and a degree of complexity which indubitably reduces the effectiveness of the European patent system in its mission to stimulate more innovation and its actual attractiveness. The prohibitive costs affects probably more the smaller players like start-ups and academic spin-offs.

Reference

[1] Allgayer U., 2005, A comparison of the litigations systems in Germany, France and United Kingdom, Patenta (Patent Attorney)
[2] American Intellectual Property Law Association (2003). Report of the Economic Survey
[3] 2003. AIPLA: Washington, D.C, 4.
[4] Barton, J. H. (2000). “Reforming the Patent System.” Science 287: 1933-1934.
[5] Bessen J., ad Meurer M.J., 2008, Patent Failure, Princeton University Press, p.330
[6] CJA Consultants Ltd, European Policy Advisers, Britain and Brussels, June 2006, Patent Litigation Insurance: A Study for the European Commission on the feasibility of possible insurance schemes against patent litigation risks, Appendix to the Final Report, available at http://ec.europa.eu/internal_market/indprop/docs/patent/studies/pli_appendices_en.pdf
[7] Communication from the Commission to the European Parliament and the Council - Enhancing the patent system in Europe, COM/2007/0165 final
[8] European Patent Convention 1973, revised versions 13.12.2007
[9] European Patent Organization, Agreement dated 17 October 2000 on the application of Article 65 EPC
[10] European Patent Organization, Assessment of the impact of European Patent Litigation Agreement (EPLA) on litigation of European Patents, WPL/11/05, 16.02.2006
[11] European Patent Organization, Workload and Cost of the European Patent Judiciary, WPL/4/03, 31.10.2003
[12] European Patent Organization, Revision of the EPC: limitation procedure, CA/PL 29/99, 8.11.1999
[13] Gambardella A., Giuri P. and Mariani M., 2005, The value of patents for today's economy and society (Technical Report: Study A1.3 The value of the patents from indirect indicators: Efforts of patent enforcement in Germany), European Commission, DG Internal Market
[14] Gesamtstatistik über die Tätigkeit des Bundespatentgerichts, Jahresbericht 2004
[15] Graham S. J. and D. Harhoff, 2006, Can Post-Grant Reviews Improve Patent System Design? A Twin Study of US and European Patents, CEPR Discussion Papers, No 5680.
[16] Graham S., Hall B., Harhoff D. and Mowery D., 2003, Patent Quality Control: A Comparison of U.S. Patent Re-examinations and European Patent Oppositions, in Patents and the knowledge based economy, 2003, edited by Cohen W. and Merrill S., National Academies Press, Washington D.C.
[17] Guellec D. and van Pottelsberghe de la Potterie B., 2007, The Economics of the European Patent System, Oxford University Press, Oxford, 250 p.
[18] Harhoff D, Hoisl K., Reichl B. and van Pottelsberghe de la Potterie B., 2007, Patent Validation at the Country Level - the role of fees and transaction costs, CEPR Discussion Paper No 6565
[19] IP Campenhausen, 2004, Patent nullity proceeding and cost of patent litigation, http://ip-campenhausen.de/Nullity.pdf
[20] Roland Berger, 2005, Study on the cost of patenting in Europe, prepared on behalf of the EPO by Roland Berger Market Research, available on
[21] Stevnsborg N. and B. van Pottelsberghe de la Potterie. 2007. Patenting Procedures and Filing Strategies, Chapter 6, in Guellec, D. and B. van Pottelsberghe de la Potterie. The Economics of the European Patent System, Oxford University Press, Oxford, , p. 155-183.
[22] Straus J., 2000, Patent Litigation in Europe - A Glimmer of Hope? Present Status and Future Perspectives, Journal of Law and Policy, Vol 2
[23] van Pottelsberghe de la Potterie B. and François D., 2009, The cost factor in patent systems, The Journal of Industry, Competition and Trade, in Press.
[24] van Pottelsberghe de la Potterie B. and M. Mejer, 2008, The London Agreement and the relative cost of patenting in Europe, CEPR Discussion Paper, forthcoming
[25] van Pottelsberghe de la Potterie B. and N. van Zeebroeck, 2008, A brief history of space and time: the scope-year index as a patent value indicator based on families and renewals, Scientometrics, 75(2), 319–338.

[26] Working Party on Intellectual Property (Patents), Council of the European Union, Document No 11622/07
[27] Bird and Bird, Patent Update Newsletter, Benelux – Coffee Wars, November 2004, pp 7-9 http://www.twobirds.com/english/publications/newsletters/upload/19918_1.pdf
[28] CMS European Patent Review, January 2007, pp. 18-19 http://en.cms-dsb.com/legal_news/publications/cms_european_patents_review
[29] Boyes Turner, The Mystery of the Euro Bank Note: A Strange Case of Patent Infringement, 12 June 2007, http://www.boyesturner.com/news-article.html?id=197

Appendix

EPC contracting states as of May 2008

Member state	Code	Date of entry into the EPC	Date of LA	Member state	Code	Date of entry into the EPC	Date of LA
Belgium	BE	7-Oct-77	23-May-08*	Finland	FI	1-Mar-96	-
Switzerland	CH	7-Oct-77	6-Dec-06	Cyprus	CY	1-Apr-98	-
Germany	DE	7-Oct-77	19-Feb-04	Turkey	TR	1-Nov-00	-
France	FR	7-Oct-77	29-Jan-08	Bulgaria	BG	1-Jul-02	-
United Kingdom	GB	7-Oct-77	15-Aug-05	Czech Republic	CZ	1-Jul-02	-
Luxembourg	LU	7-Oct-77	18-Sep-07	Estonia	EE	1-Jul-02	-
Netherlands	NL	7-Oct-77	10-May-06	Slovakia	SK	1-Jul-02	-
Sweden	SE	1-May-78	29-Apr-08	Slovenia	SI	1-Dec-02	18-Sep-02
Italy	IT	1-Dec-78	-	Hungary	HU	1-Jan-03	-
Austria	AT	1-May-79	-	Romania	RO	1-Mar-03	-
Liechtenstein	LI	1-Apr-80	23-Nov-06	Poland	PL	1-Mar-04	-
Spain	ES	1-Oct-86	-	Iceland	IS	1-Nov-04	31-Aug-04
Greece	GR	1-Oct-86	-	Lithuania	LT	1-Dec-04	-
Denmark	DK	1-Jan-90	18-Jan-08	Latvia	LV	1-Jul-05	4-May-05
Monaco	MC	1-Dec-91	11-Dec-03	Malta	MT	1-Mar-07	-
Portugal	PT	1-Jan-92	-	Croatia	HR	1-Jan-08	31-Oct-07
Ireland	IE	1-Aug-92	-	Norway	NO	1-Jan-08	-

Note: *On the May 23, 2008 Council of Ministers in Belgium decided to proceed with the ratification of London Agreement.
Source: European Patent Office www.epo.org/about-us/epo/member-states.html