

The Validity of European Nanotechnology Patents in Germany

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ABSTRACT

Even though European Patents are granted by an international authority, the European Patent Office, it is the national courts which have the final say as to the validity of such patents in their respective country. These courts have developed their own case law, which sometimes contradicts the practice of the European Patent Office. In this article, the German and European Patent Attorney Stefan Rolf Huebner discusses the conflicting views of the German Federal Supreme Court and the European Patent Office as to the patentability of so-called numerical selections which are often used for claiming fundamental nanotechnology inventions. The Supreme Court's opinion in this matter can put nanotechnology patentees in the unfortunate situation of being granted a European Patent which may be un-enforceable in Europe's largest national market. Practical advice is presented in this article for applicants of nanotechnology patents to avoid this pitfall.

I. NUMERICAL SELECTION INVENTIONS IN NANOTECHNOLOGY

Patent offices in Europe are dealing with an increasing number of patent applications concerned with nanotechnology inventions.¹ Nanotechnology exploits the baffling new properties that materials can take on when they are structured on the nanometer scale, where quantum mechanics and classical physics meet. Gold as a bulk material, for example, is an excellent conductor, but can turn into a semiconductor when broken up into nanoparticles. Conversely, common carbon, which in bulk is a poor conductor, suddenly becomes a remarkably good conductor when turned into nanotubes.² Crystals of conventional

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¹ According to a study by the OECD published in May 2007, the annual number of European patent registrations involving nanotechnology inventions almost doubled between 1998 and 2002. Thirty-five percent of nanotechnology registrations came from the U.S.A., 29% from Japan, 11% from Germany, 6% from France, and 5% from Great Britain. See Masatsura Igami & Teruo Okazaki, *Capturing Nanotechnology's Current State of Development Via Analysis of Patents*, STI Working Paper (2007), available at <http://www.oecd.org/dataoecd/6/9/38780655.pdf>.

² John C. Miller & Drew L. Harris, *The Carbon Nanotube Patent Landscape*, 3 NANOTECHNOLOGY L. & BUS. 427, 428 (2006).

semiconductor material that are between 2 and 10 nanometers in diameter can emit light in a colour which is determined by the exact size of the crystal.³

With these types of nanotechnology inventions, it is the structure's size and not the chemical composition that distinguishes a nanotechnology invention from the prior art. Indeed, the European Patent Office defines nanotechnology as follows:

The term nanotechnology covers entities with a controlled geometrical size of at least one functional component below 100 nanometers in one or more dimensions susceptible of making physical, chemical or biological effects available which are intrinsic to that size.⁴

Consequently, many basic nanotechnology inventions can be defined in the form of so-called numerical selection inventions. A numerical selection invention is when an inventor selects a sub-range (e.g., the area of "2 to 10 nanometres" necessary for semiconductor nanocrystals) from a larger range known from the prior art (e.g., semiconductor crystals with a diameter "smaller than 1 millimetre," i.e., between 0 and 1 millimetres). Moreover, to be patentable, the selection must be novel and not obvious. The non-obviousness hurdle can be overcome without difficulty by most fundamental nanotechnology inventions because, after all, effects which are contradictory to intuition are a trademark feature of nanotechnology inventions. In the case of the semiconductor crystals, for example, it may have been obvious for reasons of miniaturisation to contemplate diameters smaller than 1 millimetre, but there was no motivation at all to choose diameters in the specific range of 2 to 10 nanometres before researchers discovered the unique optical properties of such crystals.

But what about novelty? Can materials or devices, which are in themselves well-known, attain novelty solely through a certain selection of their measurements? The answer depends on who you ask.

II. THE EUROPEAN PATENT OFFICE CAN GRANT PATENTS, BUT NATIONAL COURTS DECIDE WHETHER THESE PATENTS ARE VALID

In Europe, patentees can either apply for patents with the national patent offices of each state in which they seek protection or apply for a European Patent with the European Patent Office in Munich. If patentees trust their inventions to the European Patent Office—which is what the majority of nanotechnology applicants do—this office acts in place of the national offices in examining and granting a patent in one, centralized, proceeding.⁵

However, once the European Patent Office grants a European patent, there is no "European Patent Court" for handling litigation of European Patents in the same centralized fashion in which the prosecution is handled by the European Patent Office. Rather, all jurisdiction regarding the infringement or the validity of the European patent lies with the courts of the individual member states.⁶ Although the

³ Ken Barovski, *Standing On The Moon: The story of Quantum Dot Corporation*, 1 NANOTECH. L. & BUS. 199, 203 (2006).

⁴ MANFRE SCHEU ET AL., MAPPING NANOTECHNOLOGY PATENTS: THE EPO APPROACH, WORLD PATENT INFORMATION, 204 (2006) (defining nanotechnology).

⁵ In 2005 more than 90% of all first registrations in Europe for nanotechnology inventions were submitted to the European Patent Office.

⁶ In the European Patent Convention (EPC) it is stipulated that invalidation proceedings are not the task of the European Patent Office but that of the member states of the European Patent Conventions and their national courts, with the exception of a 9 months period following the grant of the patent, during which invalidation can be requested before the European Patent Office in so-called opposition proceedings. See European Patent Office, EPC Art. 99 (1973), available at <http://www.epo.org/patents/law/legal-texts/html/epc/1973/e/ar99.html>. Opposition proceedings, however, are not court proceedings and there are a number of important differences between the two (e.g., regarding the admissible reasons for invalidation). Thus far, member states have not agreed on whether to establish a European Patent Court system even though there have been several initiatives, such as the proposal of a

national courts use the same substantive law as the European Patent Office⁷ when considering European Patents, the courts often interpret the law differently. Such differences in interpretation can lead to a national court invalidating a patent granted by the European Patent Office.

For European nanotechnology patentees this situation can arise due to the diverging opinions of the European Patent Office and the German Federal Supreme Court on the issue of the so-called numerical selection inventions. While the European Patent Office relying on its interpretation of the European Patent Convention's novelty requirement may grant a patent for this kind of invention, a German court is likely to invalidate the patent, based the German Federal Supreme Court's diverging interpretation of the same provision.⁸ The problem is serious, especially seeing that about two-thirds of all patent litigation in the European Union occurs in German courts.⁹ Moreover, this problem is exacerbated because these rulings often serve as precedents for out-of-court settlements in other states.

III. CAN A NUMERICAL SELECTION BE NEW?

1. The standpoint of the European Patent Office

There is a general consensus that a concept can be disclosed by being explicitly mentioned in the prior art as well as by being implicitly disclosed through a more general teaching. In the case of a selected sub-range, a concept can only be new if it was not implicitly disclosed through the general teaching of the known larger range.

From these considerations, the European Patent Office developed three criteria which must be fulfilled for a sub-range which is selected from a larger parameter range, to be regarded as novel:¹⁰

- The selected sub-range must be narrow in comparison to the known range;
- It must be sufficiently far removed from examples that illustrate the known range in the prior art; and
- It must not provide an arbitrary specimen from the prior art (*i.e.*, not a mere embodiment of the prior description but another invention).¹¹

It is almost as if these criteria were custom-made for nanotechnology inventions because, by definition, such inventions touch on new effects which only occur within a narrow range on the nanometer scale. The nanotechnology range is generally far removed from its counterparts in conventional technology. Hence, in the filings with the European Patent Office, it is often an obvious choice to claim a new nanomaterial or a new nanodevice in terms of a selection invention, delimiting it against the prior art by means of a size range or a related parameter range.

European Patent Litigation Agreement (EPLA). See European Patent Office, European Patent Litigation Agreement Legislative Initiative History, available at <http://www.epo.org/patents/law/legislative-initiatives/epl.html>.

⁷ The substantive law which is valid for European patents is stated in the European Patent Convention (EPC). See The European Patent Convention, available at <http://www.epo.org/patents/law/legal-texts/epc.html>. When national courts rule on European patents, they must use the EPC rather than national patent law. However, national courts are not bound by the European Patent Office's case law and may apply their own interpretation of the EPC.

⁸ See Stefan Rolf Huebner, *Zur Neuheit von Erfindungen in der Nanotechnologie*, GRUR, 839 (2007).

⁹ See e.g., Katrin Cremers, *An Empirical Investigation of the Litigation Strategies in Intellectual Property Right Suits in Germany*, Zentrum für europäische Wirtschaftsforschung [ZEW] Mannheim (2003); See also Sabine Rojahn, *Internationale Patentstreitigkeiten*, (2003) (presented at Munich). German courts do have the reputation among attorneys of ruling quickly, competently and at reasonable costs.

¹⁰ Christian Kallinger et al., *Patenting Nanotechnology: A European Patent Office Perspective*, 5 NANOTECH. L. & BUS. 95 (2008).

¹¹ An indication of a new invention is, for example, a new effect that was discovered to occur only within the selected sub-range.

2. The standpoint of the German Federal Supreme Court

A patentee who indeed chooses to patent his nanotechnology invention by claiming a sub-range may come to regret this choice if the patent claim is contested in a German court. In a series of rulings, the German Federal Supreme Court (“BGH”) established the doctrine that any parameter range which lies within an already known parameter range lacks novelty and therefore patentability.¹² Specifically, the BGH reasoned that, “[i]n accordance with the rules of arithmetic, the naming of a numerical interval represents a simplified notation of the numerous possible values which lie between the minimum and maximum values.” Thus, with the disclosure of a particular range, all values lying between the minimum and maximum values and all sub-ranges are considered to be disclosed as well.

It should be noted that these novelty considerations are distinct and independent from any considerations regarding the inventive step. Therefore, the nanotechnology invention can lack novelty despite being undoubtedly inventive. The BGH further emphasises that claims directed towards a sub-range are invalid in Germany, despite the differing case law of the European Patent Office, both for patents granted by the national German Patent and Trademark Office and for patents granted by the European Patent Office.¹³ Therefore, despite being granted a European Patent, nanotechnology patentees can find themselves in the unfortunate situation of being unable to enforce certain claims for their inventions in German courts.

The “arithmetic doctrine” of the BGH not only contradicts the practice of the European Patent Office, but also that of other major offices and courts around the world. In addition, the BGH’s argument is not as plausible as it first appears because it clashes with the court’s case law regarding no-numerical selection inventions.¹⁴ Nevertheless, nanotechnology inventors will have to come to terms with the views of the BGH on numerical selection inventions.

Patentees should therefore be aware of both the European and the German patentability criteria when drafting their European claims and, if necessary, introduce additional claims specifically designed for enforcement in Germany. In this way, a satisfactory scope of protection can usually be reached, as the BGH is much more patentee-friendly with other issues.

IV. SUGGESTIONS FOR FORMULATING NANOTECHNOLOGY INVENTION CLAIMS PERMISSIBLE IN GERMANY

In order for a claim to be regarded as novel in Germany, it must be delimited against the prior art by an additional feature which does not represent a numerical selection. The additional feature does not need to be inventive; it merely serves to formally render the claim novel. A particularly interesting way to achieve this is by changing the claim category, directing the claim not to the nanoproduct itself, but to the use of the nanoproduct for a certain technical purpose. A claim for the use of a product for a certain technical purpose is new if this use has not yet been made known to the person skilled in the art. Since the aim of achieving a certain effect characteristic for the nanoproduct, such as the aforementioned semi-conductivity, can constitute such a technical purpose, one can create use claims with a relatively broad scope of protection.

Use claims are a powerful tool in Germany because they can be enforced not only against the user, but also against the manufacturer and the distributor of the product to be used. According to the BGH, a

¹² See e.g., Bundesgerichtshof [BGH] [Federal Court of Justice], *Crackkatalysator I* [name of decision], 1990, 150 Deutsche Vereinigung für gewerblichen Rechtsschutz und Urheberrecht [GRUR] (F.R.G.); BGH, *Chrom-Nickel-Legierung*, 1992, 842 GRUR (F.R.G.); BGH, *Inkrustierungsinhibitoren*, 2000, 591 GRUR (F.R.G.).

¹³ See BGH, *Chrom-Nickel-Legierung*, 1992, 842 GRUR (F.R.G.).

¹⁴ See *supra* note 9, Huebner at 839.

use claim is to be regarded as already infringed when the product is “obviously prepared” for the claimed use (e.g., through an instruction manual or a labelling of the product), and not only when the actual use occurs.¹⁵

One exceptional case should be pointed out where a numerical selection invention is permissible even in Germany. According to pertinent case law, only a teaching which can in fact be practiced by a skilled artisan destroys novelty.¹⁶ That is, even if a selected sub-range is regarded as disclosed by the arithmetic doctrine of the BGH, novelty is not affected if the person skilled in the art has no way of actually obtaining the product described. This becomes relevant if the inventor, together with a nanomaterial or nanodevice, also invented a new method of nanofabrication, and can substantiate that the product, in the defined size range, can only be produced with this method. In this case, the patentee is entitled to protection for the method as well as for the product, even if the latter is claimed in terms of a numerical selection invention.

V. CONCLUSIONS

The German Federal Supreme Court does not recognise the criteria according to which the European Patent Office grants patents for numerical selection inventions. Consequently, certain claims for nanotechnology inventions are invalid in Germany, despite being granted a European Patent. To avoid this problem, patentees who register nanotechnology inventions with the European Patent Office should take into account the German case law, and if necessary, introduce claims that are specifically designed for the protection of their invention in Germany. Otherwise, a nanotechnology patentee may be left with a European patent which is unenforceable in Europe’s largest market.

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¹⁵ See e.g., BGH, *Hydropyridin*, 1983, 729 GRUR (F.R.G.); BGH, *Geschlitzte Abdeckfolie*, 1990, 505, 506 GRUR (F.R.G.).

¹⁶ See BGH, *Fluoran*, 1988, 447 GRUR (F.R.G.); Brodeßer, *Offenbarung und Beschränkung des Schutzbegehrens im Patentrecht*, Festschrift für Rudolf Nirk 85, 95 (1992).