

# Zurich IP Retreat 2017 - Patents and Hindsight

This international retreat on the shores of lake Zurich, organized by INGRES (**Michael Ritscher** and **Tobias Bremi**) and ETH Zurich (**Stefan Bechtold**), was held in honour of Dr. Dieter Brändle, the first President of the Swiss Federal Patent Court who will retire at the end of 2017. It brought together opinion leaders in the law of innovation and technology from all over the world, including judges, litigators, patent attorneys, in-house lawyers and academics, to discuss one of the fundamental problems in patent law: the need to assess the prior art, and most notably inventive step (non-obviousness), without hindsight and knowledge of the invention. Is this even possible from a psychological perspective? Likely how successful are the approaches to avoid hindsight bias developed in different jurisdictions? Presentations and panel discussions over the course of two short days shed some lights on these questions.

**Michael Ritscher** (Attorney, Meyerlustenberger Lachenal, Zurich) opened the conference by admonishing the attendees not to think of blue elephants - an exhortation that is impossible to follow. Just as trying not to think of blue elephants is not a successful strategy to avoid thinking of blue elephants, neither is being aware of the hindsight bias a successful strategy not to be influenced by knowledge of past events. Hopefully, legal doctrine had developed more promising approaches to attenuate hindsight bias.

## Psychological Dimensions

The opening presentation and the first panel looked at hindsight bias from a psychological perspective.

**Aileen Oeberst** (Professor, University of Mainz, Germany) gave an overview of the psychological research on hindsight bias. "Hindsight bias" has two components: on the one hand, after the event is known, it appears more inevitable than before the event ("It had to happen"). On the other hand, it appears more foreseeable than it actually was ("I knew it all along").<sup>1</sup> A third aspect is that the event distorts the memory – after the event, one even remembers (falsely) that the one predicted the event. Since this latter aspect seems not to play a role in the context of patent law, it is not further addressed. Which aspect of hindsight bias is more important in the context of obviousness assessments in patent law is an unresearched question. It is potentially important because the underlying process informs which debiasing strategies, if any, could be successful. Prof. Oeberst also raised the question whether knowledge of an invention is more alike an "event" or almanac knowledge, which are the categories commonly studied in hindsight experiments, and hinted that it might not fit into either of these categories.

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<sup>1</sup> Blank, Nestler, von Collani & Fischer, How many hindsight biases are there?, Cognition 2008, 1408-1440.

Hindsight bias is a very robust phenomenon with small to moderate effect sizes.<sup>2</sup> Small effect sizes may still have an important effect on binary choice if the decider is on the threshold; i.e., in close cases. Whether domain expertise can safeguard against hindsight bias is not entirely clear, experts – specifically judges – are certainly not immune to hindsight bias.<sup>3</sup> Deliberation in groups does not seem to reliably reduce hindsight bias, but the research is limited and restricted to small groups (three people).

Debiasing hindsight bias is generally considered very difficult.<sup>4</sup> Instructions to “ignore the ex post knowledge” are useless.<sup>5</sup> The best strategy is to withhold the knowledge of the outcome from the decision maker, but this may not be feasible for obviousness assessments. Short of shielding the decision maker from information, “consider the opposite” strategies show promise.<sup>6</sup> It is, however, important that the decision maker comes up with his or her own reasons why the opposite may have happened. It is therefore unclear whether advocating demonstrating reasons for other outcomes is a successful strategy for debiasing.

**Greg Mandel** (Professor, Temple University Law School, USA) summarized his original research on hindsight bias in patent law.<sup>7</sup> Mandel found, in an experimental study with mock jurors, a strong effect of hindsight bias. While only between 23% and 49% of participants (depending on scenario) found that a solution to the technical problem presented – with a selection of pertinent prior art – was obvious when they did not know the patented solution, 59% to 85% found the solution obvious when they were aware of it. In other words, about a third more decision makers found the invention obvious when they were aware of it versus those who were only told of the problem, despite having been informed of the same prior art references. Standard jury instructions for patent cases and explanation of the “teaching suggestion motivation” test did not reduce hindsight bias.

**Marco Kleine** (Senior Research Fellow, MPI for Innovation and Competition, Munich, Germany) added some thoughts from an experimental economist’s perspective, but had to admit that the economic research in this area largely relied on the psychological studies introduced by Prof. Oeberst. Several studies indicate that hindsight bias increases over time,<sup>8</sup> which might be important when obviousness is judged years after the invention was made. The type of ex post information matters – almanac questions exhibit greater hindsight bias than real world events or case scenarios.

**Mark Schweizer** (President elect, Federal Patent Court, Switzerland) added that people tend to incorrectly believe that others are more susceptible to cognitive biases than they are themselves

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<sup>2</sup> Guilbault, Bryant, Brockway & Posavac, A Meta-Analysis of Research on Hindsight Bias, *Basic and Applied Social Psychology* 2004, 103-117.

<sup>3</sup> Oeberst & Goeckenjan, When being wise after the event results in injustice: Evidence for hindsight bias in judges’ negligence assessments, *Psychology, Public Policy, and Law* 2016, 271-279.

<sup>4</sup> Giroux, Coburn, Harley, Connolly & Bernstein, Hindsight Bias and Law, *Zeitschrift für Psychologie* 2016, 190-203.

<sup>5</sup> Kelman, Fallas & Folger, Decomposing Hindsight Bias, *Journal of Risk and Uncertainty* 1998, 251-269.

<sup>6</sup> Roese & Vohs, Hindsight Bias, *Perspectives on Psychological Science* 2012, 411-426.

<sup>7</sup> Mandel, Patently Non-Obvious: Empirical Demonstration that the Hindsight Bias Renders Patent Decisions Irrational, *Ohio State Law Journal* 2006, 1391-1453.

<sup>8</sup> Bryant & Guilbault, “I Knew It All Along” Eventually: The Development of Hindsight Bias in Reaction to the Clinton Impeachment Verdict, *Basic and Applied Social Psychology* 2002, 27-41.

“bias blind spot”). Cognitive sophistication, as measured by SAT (Scholastic Aptitude Test) and the Cognitive Reflection Test (CRT) does not reduce the bias blind spot.<sup>9</sup> In other words, smart people also believe they are less susceptible to biases than others, but are in fact equally biased.

## Avoiding Hindsight Bias In Patentability Assessment Around The World

The second panel sought to show which approaches to reduce hindsight bias different jurisdictions had developed.

**Graham Ashley** (Chair, EPO Board of Appeal) briefly summarized the EPO’s problem-solution approach (PSA).<sup>10</sup> Selection of the closest prior art is done with knowledge of the invention, potentially introducing hindsight bias. The attempt to avoid this is the requirement that the prior art must address the same or a similar problem than the invention. A critique of having a “closest” prior art, i.e., conducting inventive step assessment only starting from one prior art document, is that the invention must be inventive over the entire state of the art (Article 56 EPC), so it should be irrelevant what the starting point is.

When defining the objective problem to be solved, care must be taken that the problem is defined as achieving the *effect* of the distinguishing features, not the distinguishing features. If the distinguishing feature is X, the problem is not to find X, but how to achieve the effect that X has.

Another safeguard against hindsight bias is a strong emphasis on whether the skilled person “would” have found the solution. The “would” question has three aspects: (i) would the skilled person having started from D1 (= closest prior art) have actually considered D2; (ii) would he or she actually found the solution in D2; and (iii) would the skilled person have applied the suggested solution to the teaching of D1? Graham explained that “his” Board of Appeal often sketched the argument for inventive step as well as against inventive step, assuming first that the invention is based on inventive step, then assuming that it is not based on inventive step. Whichever argument reads more convincingly prevails.

**Peter Meier-Beck** (Presiding Judge, 10<sup>th</sup> [Patent] Senate, Federal Court of Justice, Germany) emphasized that a retrospective view cannot be avoided, but one should strive to avoid being biased. There is a risk to read into the text what one has only learned subsequently. It is essential that any piece of prior art is read in its own context. Reducing the reading to elements or paragraphs which are or seem to be similar or close to the invention is highly dangerous and seduces to interpreting the text in accordance with an understanding which is predetermined by the patent in suit, i.e. by hindsight.

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<sup>9</sup> West, Meserve & Stanovich, Cognitive sophistication does not attenuate the bias blind spot, *Journal of Personality and Social Psychology* 2012, 506-519.

<sup>10</sup> EPO, Guidelines for Examination in the European Patent Office, November 2016, Part G, Chapter VII, Section 5.

Starting the analysis by determining the closest piece of prior art is also highly dangerous. We need to know the invention to determine what is the closest piece of prior art. But *ante inventionem* the skilled person does not necessarily know the most promising springboard. Taking this springboard for granted is pure hindsight. Defining the problem by determining the difference between the invention and the closest piece of prior art is also hindsight. Sometimes it is plausible that the skilled person would have tried to solve that problem, sometimes the problem construed that way may be artificial.

Of course, we need some reduction of the complexity of prior art to find a reasonable starting point. But it makes sense to ask the question whether the starting point was realistic *ante inventionem* and whether it was plausible that a skilled person would have tried to solve a problem which is the result of our hindsight-led “problem construction” and not mentioned in a prior art document. It is not enough that the skilled person could have started from the closest prior art, it is required that he or she would have – a similar question like the one posed in the third step of the PSA, but now posed in a different context, namely the choice of the starting point for the development that led to the invention.

**Kathleen M. O’Malley** (Judge, Court of Appeals for the Federal Circuit, USA) explained that currently, there were three avenues to challenge patents in the United States – through the District Courts up to the CAFC, through the International Trade Commission, and through the USPTO Patent and Trademark Appeal Boards (PTAB) to the CAFC. The approaches in the different venues were not necessarily congruent, which leads to problems. The PTAB has been instructed to “get rid of bad patents” – it has been told to be (hindsight) biased. PTAB combine a lot of references in finding obviousness, unlike District Courts. They also do not consider secondary, objective criteria, that traditionally play an important role in obviousness determinations in US law.

Hindsight bias is particularly difficult to deal with in patent cases. In other cases, the court can limit the information the jury receives, e.g., changes to product design after an injury occurred. This is not possible in patent cases; the jury must know the invention. O’Malley believes that (constitutionally mandated) twelve-member juries lead to better decisions, as the discussion becomes more nuanced and violation of jury instructions less likely.

Additional “biases” may be introduced by attorneys. Counsel for patentee tries to paint the inventor as heroic and sympathetic. Copying, which is considered a secondary indication of inventiveness, often helps the patentee.

Relevant prior art may also be from related fields, not necessarily from the same field as the invention. There was not necessarily a “closest” prior art except in chemical/pharmaceutical cases, where the assessment must start from a lead compound. Expert evidence is used to understand what the prior art actually taught back at the priority date.

It is important to show that there was motivation to combine references. Such motivation can come from outside the field of the invention. Another important consideration is whether there was a reasonable expectation of success. Teaching away, often difficult to prove, may safeguard against hindsight bias.

Secondary evidence such as a surprising effect of the new feature, a long felt need, scepticism in the field and failed attempts by others to solve the same problem (ideally by the defendant), industry praise, commercial success and copying are important elements of hindsight analysis and help avoiding hindsight bias.

Inventions in technological fields that are familiar to the general public may be found obvious more readily, while complex technology makes a combination of references seem less obvious to a jury of lay people.

**Rian Kalden** (Judge, The Court of Appeal of The Hague, Netherlands) notes that hindsight affects inventive step by definition, because the judge is supposed to go back in time before the contribution by the invention was known. This assessment requires knowledge of the contribution.

Simple solutions to difficult problems are often underappreciated. Dutch courts generally employ the the PSA, but it is not required. Cases are often framed in PSA terms by the lawyers. One criticism is that the PSA is not suitable for “problem inventions”, where the creative act lies in defining the problem. Well – if it is not suitable, do not use the PSA, it is not required by law. While the PSA may not be immune to hindsight bias, neither are other approaches.

One safeguard against hindsight bias is that under the PSA, the closest prior art must be a document that skilled person would actually have looked at – in the same field, trying to solve the same problem. The closest prior art may only be from a different field of technology if there is a good reason choose it. One should not simply count the number of identical features – this may be decisive only when there are several realistic starting points.

Formulating the objective problem determines the outcome of the case. The great risk of the PSA is formulating the wrong problem – such as including a feature of the invention in the problem to be solved rather than an effect of that feature. The objective problem must not contain any pointers to the solution. There is almost always disagreement on the formulation of the problem to be solved between the parties. Judges need to be very careful. If the closest prior art is the same as in the application, the problem should be the same as the one formulated in the application, too. However, if the closest prior art is different, the objective problem will be different, too.

Would the skilled person have arrived at the solution at the priority date? Only a combination of two documents, possibly with common general knowledge (CGK), is allowed. A combination of more than two documents is an indication of inventiveness. No combination with just any other document that happens to share the missing feature is sufficient. There must be a pointer to the document to be combined and an incentive to find it, read it and use it. Not everything that can be found will be found. If the title and abstract of a reference point to another direction, the skilled person will probably not read it. Is there a reasonable expectation of success that the disclosed solution will work? Generally yes, unless there is teaching away and there are other options without teaching away.

Hindsight may also favour patentees, when further positive effects of the invention are found only after the filing date. It is difficult to ignore such effects, but they should be ignored. The

plausibility test requires that the effect must be made plausible in the application for subsequent evidence to be considered and seeks to safeguard against this form of hindsight bias.

**Richard Arnold** (Judge, Patents Court, UK) explained that English law is clear – hindsight bias must be avoided when assessing obviousness. Moulton LJ, in *British Westinghouse Co v Braulik* (1910) 27 RPC 209, 230, states “I confess that I view with suspicion arguments to the effect that a new combination, bringing with it new and important consequences in the shape of practical machines, is not an invention, because, when it has once been established, it is easy to show how it might be arrived at by starting from something known, and taking a series of apparently easy steps. This ex post facto analysis of invention is unfair to the inventors and, in my opinion, it is not countenanced by English Patent Law.”

In *Mölnlycke AB v Procter & Gamble Ltd* [1994] RPC 49, 113 Sir Donald Nicholls VC emphasized the importance of considering secondary (contemporary) evidence to avoid hindsight bias: “What with hindsight seems plain and obvious often was not so seen at the time. It is for this reason that contemporary events can be of evidential assistance when testing the experts’ primary evidence. ... Secondary evidence of this type has its place and the importance, or weight, to be attached to it will vary from case to case.”

*Technip France SA’s Patent* [2004] RPC 46 at [15] reminds everybody that the reasons an expert gives for obviousness, not his or her conclusions, are most important. Similarly, *SmithKline Beecham plc v Apotex Europe Ltd* [2005] FSR 23 at [53] teaches that not sympathy towards the expert, but the fundamental reasons for their opinions should determine the credibility of experts.

*MedImmune Ltd v Novartis Pharmaceuticals UK Ltd* [2011] EWHC 1669 (Pat) at [118] teaches that “sequential unmasking” should be used in the instruction of experts. First, the expert should only consider the prior art, then the priority documents and only finally the patent(s). *HTC Corp v Gemalto SA* [2014] RPC 9 at [274] cautions that this is not always possible and not required by law.

In *Schlumberger Holdings Ltd v Electromagnetic Geoservices AS* [2010] RPC 33 at [77], [79] Jacob LJ exhorts the benefits of secondary evidence: “It generally only comes into play when one is considering the question ‘if it was obvious, why was it not done before?’ That question itself can have many answers showing it was nothing to do with the invention, ... . But once all other reasons have been discounted and the problem is shown to have been long-standing and solved by the invention, secondary evidence can and often does, play an important role. If a useful development was, in hindsight, seemingly obvious for years and the apparently straightforward technical step from the prior art simply was not taken, then there is likely to have been an invention. ... “

The attacker may rely on any prior art, even completely obscure references. This is hindsight, but not bias. The law allows this kind of hindsight for sound policy reasons.

**Dariusz Szleper** (Lawyer, Paris, France) explains that hindsight bias is only explicitly addressed in French judgments since about 15 years ago under the influence of the PSA. He points out that the wording of Article 56 EPC in French is not precisely the same as in English (“ne découle pas d’une manière évidente” versus “is not obvious”).

It is not clear whether judges discuss the problem of hindsight bias in chambers, because French judgments are very concise, making it difficult to assess the underlying reasoning. Assessment of inventive step is considered a question of fact, outside the scope of appellate review, so appellate courts hardly ever, if at all, address the issue. Dariusz cannot find traces of the problem in the written opinions. During legal conferences, it is emphasized that PSA is applied in France and whether the skilled person “would” find the solution, not whether he or she “could”, is relevant. While the reasoning may be opaque, the final outcome of French cases is often similar to those in other jurisdictions.

Dariusz concluded by adding that motivational biases such as the French “egalitarian mood”, which considers patentees to be asking for too much, may disfavour patentees.

**Kathrin Klett** (Presiding Judge, 2<sup>nd</sup> Civil Chamber, Federal Supreme Court, Switzerland) reminded everybody that hindsight bias is a general problem, not limited to patent cases. It plays an important role in liability cases in the assessment of negligence (foreseeability of damage).

The Swiss Federal Supreme Court has not developed specific methods or approaches to avoid hindsight in patent law. It has always been aware, however, of the saying that knowledge after the event is always easy and problems solved present no difficulties. An invention involves inventive step when the solution is beyond the zone situated in between the state of the art and what a person skilled in the art on the basis of his knowledge and skills would have found with only minimal mental effort. The formula differs from the legal practice of the EPO, but is designed to mean essentially the same.<sup>11</sup>

The choice of the starting point for the assessment of inventive step should be irrelevant, as the invention must be inventive starting from any reference. Therefore, an appeal based on the argument that the lower court chose the wrong starting point will always be unsuccessful. It is the definition of the person or the team skilled in the art, their knowledge and specific technical skills at the priority date which are crucial for the decision whether the claimed technical solution was obvious or not. This seems to Kathrin Klett not so much a question of law, but of the expert knowledge guided by the appropriate questions.

**Xiang Yu** (Professor, Huazhong University of Science & Technology, Wuhan, China) explained that under Chinese law, inventive step requires that compared to the prior art, the invention has prominent substantive features and provides notable progress. The assessment of inventive step is a three-step test. First, the prior art has to be determined. It must be from the same or similar technical field, which is defined increasingly narrow. Secondly, the distinguishing features must be identified. There was a risk that the examiner failed to look at the solution as a whole and misses the gist of the invention. Thirdly, it must be assessed whether the solution as such, but the distinguishing features alone, are obvious to the skilled person.

Chinese knows a figure of speech for hindsight bias – “Zhuge Liang after the fact” (“事后诸葛亮”), Zhuge Liang being a famous prime minister of ancient China known for his great wisdom and resourcefulness. To avoid hindsight bias, market success may be considered as secondary evidence for lack of obviousness.

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<sup>11</sup> Sutter, Der bundesgerichtliche Begriff des Erfindersischen, sic! 2004, S. 469 sqq., 472.

## Closest Prior Art

**Dana Beldimann** (Professor, Bucerius Law School, Hamburg, Germany, and UC Hastings College, San Francisco, USA) briefly introduced the framework for obviousness analysis under US law. For an invention to be patentable under 35 USC § 103, it must contribute more than obvious advances to the state of the art. There is no concept of “the” closest prior art in US law. The “analogous prior art” must be considered as a whole. Prior art is analogous if it belongs to the same field of endeavor, or if not, is “reasonably pertinent” to the particular problem, so that it logically would have commended itself to the inventor's attention (*Circuit Check Inc. v. QXQ Inc.* (Fed. Cir. 2015)). The analogous prior art can comprise multiple references, except in chemical and pharmaceutical fields, where there must be a lead-compound.

References may only be combined when there is a justification to do so. The justification lies in teaching, suggestion or motivation (TSM) to combine or modify references and must be found in the prior art. The TSM standard is the main safeguard against hindsight bias. *KSR International Co. v. Teleflex* (US Sup. Ct. 2007) held that the TSM test is a helpful insight into reasons to combine, but should not be treated as a “rigid mandatory formula”. In addition to TSM, common sense can also constitute a path to proving obviousness, since a skilled person may “be able to fit the teachings of multiple patents together like pieces of a puzzle”. *KSR v. Teleflex* may lead to a larger influence of hindsight than the traditional TSM test. There is some pushback from the CAFC. In *Circuit Check v. QXQ*, the CAFC held: “An alleged infringer should not be able to transform all systems and methods within the common knowledge into analogous prior art simply by stating that anyone would have known of such a system or method. The question is not whether simple concepts such as rock carvings, engraved signage, or Prussian Blue dye are within the knowledge of lay people or even within the knowledge of a person of ordinary skill in the art. Rather, the question is whether an inventor would look to this particular art to solve the particular problem at hand.”

**Dieter Brändle** (President, Federal Patent Court, Switzerland) noted that patentees always complain about hindsight when the patent is found lacking inventive step. Since the court must rely on references introduced by the parties, the choice of prior art is not determined by the court. Only what the parties present to the court can be considered.

A patent must have inventive step irrespective of the starting point of the analysis. The law requires that the invention is inventive over the entire prior art. If a patent is found inventive starting from one prior art reference, it must be assessed whether it is also inventive starting from another starting point, if such starting point is alleged. Unless a reference can be excluded “right away” as a valid starting point, it must be accepted as starting point. The selection of the starting point is not subject to hindsight bias; the hindsight bias only comes into play in the third step of the PSA, when it is assessed whether the skilled person would have modified the starting point such as to arrive at the claimed invention.

**Willem A. Hoyng** (Attorney, Hoyng, Rokh, Monegier, Amsterdam, the Netherlands) reminded everybody that the PSA is not found in the European Patent Convention. It is a tool developed by the European Patent Office to deal with its massive case load. It may be useful, but it is artificial and may also lead to wrong results. The choice of “the” closest prior art is often



arbitrary. Courts should not be obliged to follow the PSA, which in fact there are not according to UK, German and Dutch case law.

Article 56 EPC requires consideration of the whole prior art. That whole prior art may give indications (pointers) towards the invention or away from the invention. Closest Prior Art and PSA may have a tendency towards obviousness if not applied correctly. So one should consider the art as a whole and how much incentive gives the art as a whole the skilled person to come to the invention and what is his/her expectation of success. Incentive and expectation of success should be communicative vessels when deciding the obviousness question.

Willem ended his presentation with the statement that he considered the way the EPO deals with article 54(3) EPC a big problem which leads to multiple patents for the same invention (and – via divisionals – unacceptable uncertainty of third parties). Why can EPO and Dutch courts not read “the content of European patent application” broader? The skilled person should always read (when reading for article 54(3) EPC purposes) with the common general knowledge and consider each combination with the common general knowledge as disclosed. This would avoid the grant of multiple divisionals for essentially the same invention.

**Thorsten Bausch** (Patent Attorney, Hoffman Eitle, Munich, Germany) reiterated that Germany does not have a concept of closest prior art, but the Bundesgerichtshof demands that the starting point for inventive step analysis must be justified (BGH, 16 December 2008 - X ZR 89/07 – “Olanzapine”). If, for example, a document discloses 200 compounds, it is impermissible to take one of the compounds and argue that its formulation as a sustained release formulation was obvious when there were no specific reasons *ex ante* for the skilled person to choose this compound among the many disclosed.

Thorsten’s conclusion from the unavoidability of a certain hindsight bias is that judges should be twice as careful and cautious before revoking a patent for lack of inventive step. On the other hand hindsight bias may favour the patentee when it comes to questions of claim construction and the doctrine of equivalents, as the interpretation of the claim with knowledge of the infringing embodiment may lead to a broader interpretation, and equivalents may be found obvious once they were employed.

**Fritz Blumer** (Member of the Legal Board of Appeal, EPO) stated that the case law of the Board of Appeals of the EPO emphasized continuously that hindsight should be avoided in the choice of the closest prior art. “[...] in order to avoid *ex-post facto* considerations, the closest state of the art is not generally that merely showing superficially the most similarities, but rather that conceived for solving the same primary problem or aiming at the same objective as the claimed invention and which requires the minimum of structural and functional modifications.” (T 026/04). Fritz gave an example of an invention of a multilayer panel for aircraft interiors. D1 discloses a panel for aircraft interiors, but with a different layer sequence. D2 discloses a panel for furniture with a layer sequence like the claimed one. The “same purpose” criteria should lead to the choice of D1 as closest prior art. Choosing D2 is likely based on hindsight and may lead to difficulties in formulating the objective problem (“alternative use for furniture panels” is hardly satisfactory).

The prior art should not be read with the invention in mind (T 970/004, cons. 4.1.2). Similar to the point made by Judge Meier-Beck, Fritz cautioned that one should not “pick and choose”

from a prior art reference unless there were good reasons why the skilled person would choose the specific disclosure over another.

During the ensuing discussion, Robin Jacob interjected that it should be up to the attacker of the validity of a patent to choose the starting point from which he or she wants to attack the patent. Graham Ashley prefers using the term “relevant starting point” rather than “closest prior art”. One can start from several references, but the attacker needs to justify why he wants to start from each one of them. Similarly, Rian Kalden added that there could be several starting points, but not 30. There must be a justification for a specific starting point. Katherine J. Strandburg pointed out that the PSA starting from a single closest prior art reference assumed a cumulative view of innovation, which was not necessarily correct. Innovation may also consist of thinking about a problem. Dieter Stauder made the sensible point that many granted patents were never practiced and only a small fraction ever litigated. The caseload at the EPO required a standardized approach for examination that was simple and predictable. Courts, on the other hand, are not and should not be bound by it.

## Court Experts, Party Experts and Technical Judges

**Robert van Peurseem** (Advocate-General, Supreme Court of The Netherlands) explained that Dutch law provided for the appointment of experts by the courts, but this was hardly ever done in patent proceedings. Speculating on the reasons, he mused that specialized courts with judges interested in understanding the technology, relatively narrow technical issues which are generally well briefed, the prosecution history and parallel proceedings in other European jurisdictions may have lead the judges to the impression that they do not require court appointed experts. Party experts present at the hearing may be questioned, but are not formally cross-examined.

According to **Penny Gilbert** (Solicitor, Powell Gilbert, London, UK), English courts solely rely on party experts, who are cross-examined at trial. Preparation of the expert is key, otherwise he or she may not do well on the stand. To avoid hindsight bias in patent cases, a linear or sequential unmasking of information to the expert is advised (see contribution by Richard Arnold). This approach was helpful, but not always feasible, e.g. in the case of a breakthrough patent that will be known to experts in the field, or in case of standard essential patents in the telecommunication industry.

Pre-trial disclosure may reveal common general knowledge or failed attempts at solving the problem and can aid in the assessment of inventive step.

**Richard Ebbink** (Attorney, Brinkhoff, Amsterdam, the Netherlands) wondered whether inventions were the results of deterministic forces – after all, every event must have a cause, so must the invention not also be the result of causal forces? Comparing hindsight bias to the original sin, Richard said he was convinced that it is unavoidable. He emphasized that inventive step was a legal concept, as was the hypothetical person skilled in the art. There could never be relevant evidence as to what the “skilled person” actually thought back at the priority date. Care should also be taken not to confuse (court or party appointed) experts with the skilled person – the experts are almost always overqualified compared to the notional skilled person. In the end,

it came down to evaluating the credibility of stories, at which judges were pretty good. The goal should be to explain convincingly to the losing party why it lost.

According to **Miguel Montana** (Attorney, Clifford Chance, Barcelona, Spain), there are no specialized judges for patent matters in Spain so far, but new legislation introduces a limited number of specialized judges. Court appointed experts are hardly ever used. The courts cannot appoint experts unless a party requests an appointment, and parties are reluctant to request the appointment, as they have limited influence over the choice of the expert. The quality varies widely, and it is a gamble. Case law requires that the experts use a methodology that can be assessed by judges. In practice, this means the PSA is used. The expert must explain why he or she believes the skilled person would have arrived from the closest prior art at the invention without inventive step. It is insufficient to merely claim that skilled person “undoubtedly” would have combined the references. A mosaic approach is always a risk in obviousness assessments. The Spanish Supreme Court demands that the combination of references is suggested in the prior art.

From a US perspective, **Kathleen M. O'Malley** opened with the statement that experts with British accents enjoy greater credibility with US juries. On a more serious note, she said that while procedural law allowed for the appointment of experts by the court, judges hardly ever appointed experts, and those who ever did swore they will never do it again. The problem is finding a “neutral” scientist – all scientists have specific approaches to research, no one is neutral. Additionally, all discussions between judges and experts must be disclosed, which was cumbersome. While there were no technical judges in the US civil courts, many law clerks at courts with a high case load of patent cases held degrees in engineering or science, and many judges have degrees in technical fields (but are not assigned to cases based on this expertise). Of Judge O'Malley's law clerks, one has a PhD in chemistry, another a master's degree in electrical engineering. Unlike discussions with experts, discussions in chambers between judges and law clerks need not be disclosed to the parties.

With regards to party experts, the judge acts as gate keeper. Only testimony that is relevant and based on expertise, the result of reliable methods and not mere factual evidence is admissible as expert testimony. Party experts are cross-examined by opposing counsel. For claim construction, there is occasionally “hot tubbing” of experts (experts discuss among themselves), but not in front of jury. The credibility of an expert witness can only be assessed live, or possibly by video. It is a huge mistake of the USPTO not to allow live testimony. The downside of live testimony is its considerable cost, but the constitution requires trial by jury.

**Tatsuto Hirosa** (Judge, Tokyo District Court, Japan) explained that only three courts in Japan have jurisdiction in patent infringement cases. The Intellectual Property High Court has exclusive jurisdiction for invalidity (bifurcated system). There are no technical judges in Japan, but “technical research officials” provide technical assistance to judges in patent cases. Most of them are examiners from the Japanese PTO, assigned to the court for three years. All have a technical background. Their opinions are nonbinding, but very influential for the technical issues.

During the discussion, Katherine Strandburg wondered whether parties could be forced to agree on an expert. Judge O'Malley said that she had tried, but failed. In an adversary system, it was

impossible. Richard Arnold added that he liked to hear different sides to the issues. It was very illuminating.

## Objective Technical Problem

**Fritz Blumer** reminded everybody that the PSA was not cast in stone, although in practice it was ruling. Rule 42(1)(c) EPC also requires a description of “the advantageous effect of the invention with reference to the prior art” in the patent application. The PSA goes back to the very beginning of the operations of the EPO (see T 1/80 of 1981). The definition of the objective problem to be solved is a moving target. When the closest prior art changes – for example after the introduction of claim limitations – the problem to be solved also changes.

**Dirk Szynka** (Patent Attorney, König, Szynka, Tilmann, von Renesse, Munich, Germany) opined that the problem to be solved is particularly prone to hindsight bias because it does exist only with knowledge of the claimed invention, as it is derived from the effects of the differences between the subject matter of the claim and the closest prior art. The choice of the spring board document (on which the problem is based) is very important. The more sophisticated approaches (e.g., BGH, 5 October 2016, X ZR 78/14 – “Opto-Bauelement”) require looking at the technical effect of the springboard reference. However, everyday practice of the first instance and the examination proceedings tend to identify a spring board document based on a more arithmetical maximum structural identity which can lead to an objective patent problem quite independent from the patent description and the original technical approach therein and may often lead to hindsight.

If one starts from a document that is not related to the problem or effect of the invention but the argument clearly leads to obviousness, it’s hard to justify disregarding it. After all, the law requires consideration of all prior art.

From Dirk’s point of view, the main practical hindsight problem is, however, the tendency to be observed in the EPO but also in German proceedings, to formulate a “concrete” technical problem by comparing a spring board document and a claim. Such argumentations explicitly seek to avoid a too “abstract”, “artificial” or “empty” problem. In Dirk’s opinion, however, the recognition of disadvantages of the prior art is a first step of the invention (if not clearly induced by the prior art or the technical knowledge of the skilled person). This opinion can also be found in the Board of Appeal Jurisdiction, e.g. T 835/00, and, more recently, BGH, 13 January 2015, X ZR 41/13 – “Quetiapin” and BGH, 11. November 2014, X ZR 128/09 – “Repaglinid”. Accordingly, a “general and neutral” technical problem must be chosen which must not contain elements of the solution and, further, no elements found in the elaboration thereof.

**Katherine Strandburg** added that US law knows no requirement to identify a problem to be solved. Identifying or framing a problem can itself be inventive. The problem solved by the invention may play a role in the definition of the analogous prior art, because it must be reasonably pertinent to the problem solved. *KSR v. Teleflex* repudiates a narrow approach to problem definition. The problem is not limited to the problem this particular patentee tried to solve. The problem can motivate the skilled person to look at other prior art that was not designed to solve that problem.

Whether hindsight leads to “wrong” decisions is ultimately not clear. Policy should decide which inventions deserve protection, and this should be informed by the outcomes – does the protection of these inventions lead to welfare gains?

Katherine wondered whether the “fundamental attribution error”<sup>12</sup>, i.e., our tendency to explain someone’s behaviour based on internal factors, such as personality or disposition, and to underestimate the influence that situational factors have, might help the patentee. In the case of obviousness assessments, this may lead to an attribution of the invention to the effort and creativity of the inventor, rather than situational factors (state of the field). It may therefore lead to a finding of non-obviousness and counteract hindsight bias.

During the discussion, **Christoph Ann** (Professor, Technical University of Munich, Germany) said we should hear more about biases other than hindsight if we want to reach unbiased judgments. **Stefan Bechtold** (Professor, ETH Zurich, Switzerland) pointed out that if hindsight bias had the same magnitude across the board, it was not a huge issue from a policy perspective. If, however, it had different effects in different cases, it was problematic. We simply do not know which one it is.

## Claim Construction And Infringement

**Dieter Brändle** emphasized that the goal of claim construction was establishing the objective content of the claim. The parties were generally not interested in an objective construction – they want to win the case, you cannot blame them.

How the claim is to be constructed is laid down, for European patents, in article 69 EPC and the Protocol on the Interpretation of article 69 EPC. The Swiss Federal Patent Court implements a three-question test similar to the BGH “Schneidmesser”, but of course with a slightly different third question (see Swiss Federal Patent Court of 25 January 2016, O2014\_0002 – “Urinalventil”).

The same construction governs infringement and validity (with reference to BGH, 2 June 2015, XZ R 103/13 – “Kreuzgestänge”). The claim is to be read through the eyes of the notional skilled person, a hypothetical person that nonetheless has an empirical content. Typically, for validity purposes, the patentee will claim the skilled person is “dumb”, while for infringement purposes, the skilled person is smart and recognizes equivalent means as obvious. To avoid inconsistent judgments, the same court should decide on invalidity and infringement. The knowledge of the skilled person can be different for invalidity and infringement purposes in the case of equivalent means discovered after the priority date. In this case, one had to “cheat” – pretend the equivalent means existed at the priority date.

While considering the prosecution history was time consuming, the parties did it anyway. If it was pleaded by a party, the court could not ignore it. The general prohibition of abuse of right, namely of venire contra factum proprium, stood in the way of granting protection for an embodiment that was surrendered during examination. While article 69 EPC did not specifically

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<sup>12</sup> Ross, The intuitive psychologist and his shortcomings: Distortions in the attribution process, in: Berkowitz (ed.), *Advances in experimental social psychology* (Vol. 10), New York 1977, 173-220.

mention the prosecution history, article 69 EPC was not exhaustive and did not forbid taking into account the file wrapper.

According to Dieter Brändle, claim construction did not leave much room for hindsight. The patentee may consider it unfair that the claim is constructed in view of the (allegedly) infringing embodiment and the patentee never contemplated the specific embodiment at the time of filing, but that was not unfair, as the claim was to be construed in view of the infringing embodiment.

**Peter Kather** (Attorney, Kather Augenstein, Düsseldorf, Germany) noted that hindsight bias was only a problem in a select few cases – those that he lost. In theory, claim construction should not be done in view of the infringing embodiment, but in practice, it was hard to avoid. In cases of literal infringement, hindsight bias was not a major bias in claim construction. This may be different, however, in cases of infringement by equivalent means. Whether an alternative means is “obvious to find” is amenable to hindsight bias, because the state of the art at the priority date should be relevant, not at the date of infringement. The equivalent means was also known at the time of judgment, which may lead to the erroneous conclusion that it was obvious to find. Peter Kather added, similar to Stefan Bechtold’s point, that hindsight bias did not lead to unfair result if it was the same for everybody.

**Robin Jacob** (Rt Hon. Professor, Former Judge Court of Appeal of England and Wales, UK) said that while claim construction in theory should be done without knowledge of the infringing embodiment – “without knowledge the infringer was even born” – this was not a realistic undertaking in practice, one had to consider the infringing embodiment to realize which points of construction were relevant. This unavoidably introduced some hindsight bias in the analysis. Sir Robin Jacob added that he did not understand why US courts considered claim construction a factual question that needed to be put in front of a jury. Under English law, it was a legal question. At the time the US Constitution was enacted, patents did not have claims.

The determination of the extent of protection conferred by a European patent is an examination in which there is only one compulsory question, namely that set by article 69 and its Protocol: what would a person skilled in the art have understood the patentee to have used the language of the claim to mean? Everything else, including the Protocol questions, is only guidance to a judge trying to answer that question.

In the recent *Actavis v Eli Lilly* ([2017] UKSC 48) case concerning Pemetrexed, the Supreme Court opened the scope of the claim widely. The proposed framework for the analysis of infringement by equivalent means lent itself to hindsight bias.

**Klaus Grabinski** (Judge, Federal Court of Justice, Germany) noted that the overlap of the “third question” under the new UK framework and the German approach was larger than the wording may suggest.

German Approach	UK Approach
<i>Element equivalent to an element specified in the claim</i>	<i>Element equivalent to an element specified in the claim</i>

<ol style="list-style-type: none"> <li>1. Does it have essentially the same effect?</li> <li>2. Was it obvious to the skilled person that it has the same effect?</li> <li>3. Would the skilled person have been able to find it as having the same effect by considerations oriented to patent claim?</li> </ol>	<ol style="list-style-type: none"> <li>1. Does it have essentially the same effect?</li> <li>2. <i>On being told what it does</i> was it obvious to the skilled person that it has the same effect?</li> <li>3. Would the skilled person have concluded that strict compliance with the literal meaning of the claim was an essential requirement?</li> </ol>
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Table 1: Comparison of German and UK approach to infringement by equivalent means

In the case of foreseeable equivalents, the relevant second question was whether it obvious to the skilled person that the alternative element had objectively the same effect as the element specified in the claim. In the case of unforeseeable equivalents, i.e., equivalents unknown at the priority date, the relevant question was whether *assuming the equivalent was known at the priority date*, was it obvious to the skilled person that it had objectively the same effect as the element specified in the claim. This was hindsight, but based on sound policy.

He introduced an example of a patent claiming the addition of soluble cerium to diesel fuel to reduce emissions. After the priority date, cerium nanoparticles were invented. The addition of (non-soluble) cerium nanoparticles to diesel fuel has the same effect as the addition of soluble cerium. **Richard Arnold** wondered whether taking into account not-yet developed equivalent means did not deter innovation. For **Klaus Grabinski**, it is correct to consider the addition of cerium nanoparticles as infringement by equivalent means. The invention was about the reduction of emissions by the addition of cerium to the fuel, not about nanoparticles. Some third party invented nanoparticles, using them as additive provided a windfall for competitors that did not invent the addition of cerium to fuel for reducing emissions.

## Broadening the Perspective (Hindsight Bias Outside of Patent Law)

**Beate Schmidt** (President, Federal Patent Court, Germany) noted that inventions were the result of a structured and methodological process. They were not comparable to the outcome of an election or a war. She wondered whether the research on hindsight bias was applicable to inventive step analysis.

**Robin Jacob** added that hindsight bias posed similar problems in design law, where the individual character of the design had to be judged with knowledge of designs that did not exist at the priority date. The perception of any form is influenced by the prior knowledge of the observer. Robin Jacob ended with the quip that Albert Einstein was fired by the Swiss Patent Office because he considered everything obvious.

**Antoon Quaedly** (Professor at the University of Nijmegen and Attorney, Klos c/s, the Netherlands) noted that hindsight bias was potentially an even bigger problem in copyright law than in patent law. The term of protection in copyright law is 70 years *post mortem auctoris*. In case of a work conceived at the age of 30 by the author, the term of protection could easily extend to 120 years. What was original back in time may not seem original now. However, Antoon is not sure whether this was a problem because the threshold of originality for protection is “extremely low” (his words) and will generally be met even in hindsight.

However, hindsight could play a key role in the assessment of the scope of protection of a work created a long time ago. It was generally accepted that there was a relationship between the level of originality and scope of protection in the sense that more original works enjoy greater protection. At which dates should the originality of the work be judged for purposes of assessing its scope of protection? At the time of its creation or at the time of infringement? Antoon Quaedly believes considering the time of creation was unrealistic. He noted that the originality and significance of a work could be perceived greater today than at the date of its creation. On the other hand, if a lot of potentially infringing works are distributed and the author of the original work tolerates this, this may lead to a diminished scope of protection. But you cannot stop the evolution of a style after the fact. Antoon conceded that this conflicted with the statutory term of protection of 70 years after the death of the author. Unless there was estoppel in a specific case, why should the author suffer from a reduced scope of protection because of his or her inaction (potentially due to lack of resources)?