Bird & Bird

Actavis v Eli Lilly - Are we clear now?

Patrick Kelleher

Much has been written about the implications of the July 2017 Supreme Court decision in *Actavis v Eli Lilly* in which Lord Neuberger delivered the judgment of the Court. Commentators have noted Lord Neuberger's development/overturning of the long-standing law of purposive construction which was set out by Lord Hoffmann in the 2004 case of *Kirin-Amgen v TKT* in the House of Lords. The keystone of Lord Neuberger's ruling centres on the scope of patent claims and the role of the express claim wording. Lord Hoffmann famously decided that claim scope was purely a matter of construction in context - a claim should be construed, he said, by asking what a skilled person would have understood the patentee to be using the language of the claim to mean.

Lord Neuberger fundamentally disagreed and set aside Lord Hoffmann's ruling that claim scope was to be decided purely as a matter of construction. In a far-reaching decision, described by some commentators as his "parting gift" to patent law before his retirement from the bench, Lord Neuberger held that patent claim scope was not solely a construction issue but was rather a two-part test, only the first of which was claim construction. Lord Neuberger disagreed that the purposive construction approach was fully in accordance with the Article 69 EPC and the Protocol on Interpretation and found instead that Lord Hoffmann had given insufficient consideration to equivalents in deciding claim scope which means the UK has never been acting in accordance with EPC 73 or 2000.

Lord Neuberger assessed the so-called Protocol Questions which had been devised as an aid to deciding claim scope, by Mr Justice Hoffmann (as he then was) in the 1985 case of *Improver v Remington*.

Rather than focusing solely on the language of the claim, Lord Neuberger stated:

"The [first Protocol] question as framed by Hoffmann J, with its emphasis on how 'the invention' works, should correctly involve the court focusing on 'the problem underlying the invention', 'the inventive core', or 'the inventive concept' as it has been variously termed in other jurisdictions." (at ¶60).

The UK Patents Act s125 (1) is clear that the "invention" shall be taken as that which is set out in the claims. Therefore Lord Neuberger's formulation of "inventive core" or "inventive concept" must necessarily be broader than what is merely set out in the claim. At first glance, Lord Neuberger's formulation might appear fair and sensible in a world where colourable imitators exist, who wish to take advantage of patentees' endeavours.

But what is the inventive core or inventive concept of a patent? How broad is such a claim scope? What would a patent infringement case look like when the scope of claim was assessed on the basis of the inventive core/concept set out in the patent specification? What problems could this approach produce?

For a key example of such a case, one needs do no more than look at the *Kirin-Amgen* case at first instance[1], coincidentally decided by Mr Justice Neuberger, as he then was. Indeed, it might be said that *Actavis v Eli Lilly* is less a case in which Lord Neuberger overturned Lord Hoffmann, and more one in which Lord Neuberger corrected a long-held but misconceived approach and re-instated his own earlier judgment. The parallels are instructive. The manner in which the scope of claim issue was addressed by Neuberger J in *Kirin-Amgen* and the

[1] [2001] EWHC 518

manner in which he considered the parallel issue of breadth of claim insufficiency (something not at stake in the *Actavis* case) bears further examination.

Kirin-Amgen v TKT - infringement

The case concerned the Kirin-Amgen 1983 patent relating to recombinant erythropoietin, or Epo for short. Epo in its natural state is a hormone produced in tiny quantities in kidney cells of healthy individuals. The hormone stimulates the bone marrow to produce red blood cells, for example in low oxygen conditions such as where the individual is at altitude. The natural product can be isolated from urine. Recombinant Epo is useful for treating various kinds of anaemia.

The Kirin-Amgen patent described their work in collecting vast quantities of human urine, isolating and purifying the natural Epo protein, obtaining its amino acid sequence, fishing out the Epo gene from a human genomic library and finally cloning the gene into cells for commercial production of Epo. The key battleground of the case centred on Table VI of the patent which set out the full DNA sequence of the Epo gene.

The TKT technology, known as "gene-activation" and which was developed in the mid to late 1990s was not foreshadowed in the Kirin Amgen patent – simply because it was a more advanced technology in a rapidly developing field. TKT recognised that practically every cell in the human body contains the full complement of genes even though not all of those genes may be active in any particular cell. For example, the Epo gene exists in all human cells but it is switched off in all of those cells except for some cells in the kidney where Epo is produced. TKT identified the precise location of the native Epo gene in a human cell which did not make Epo and by means of a process known as homologous recombination, inserted far upstream of the gene a promoter, essentially a genetic on-switch. When the cells were cultivated, they were found to produce Epo.

The key claims of the patent were claims 1 & 26 which can be paraphrased thus:

Claim 1: *A DNA sequence for use in securing expression in a eukaryotic host cell of Epo…where the DNA sequence is that of Table VI or related thereto*

Claim 26: *A product of the expression in a host cell of a DNA sequence according to claim 1*

Kirin-Amgen's case was that the Epo gene in the TKT cells was a DNA sequence of claim 1 and accordingly the TKT Epo product, (so called Gene activated Epo or GA-EPO) was therefore a product within claim 26. TKT's case was that the wording of the claims, particularly the words "host cell" required that the Epo gene actually be introduced into that cell – i.e. that it be exogenous to that cell. The Kirin-Amgen cloned Epo gene was indeed exogenous to the production host cells. Conversely, the TKT Epo gene was endogenous – the gene had always been in that cell albeit in an inactive form. By merely introducing the promoter 'on-switch', TKT had not made that cell into a host to the Epo gene and therefore the gene could not fall within the claim.

Kirin-Amgen placed great stock in the argument that as TKT had begun their research programme to locate the native Epo gene by relying on the sequence information first published in the Kirin-Amgen patent, they had hijacked the patent's "contribution", its inventive concept. Consequently, even though TKT might not have fallen within the precise wording of the claims, it would, said Kirin-Amgen, be unfair to the patentee for TKT to be held not to infringe.

This argument found favour at trial before Neuberger J:

"In my judgment, the variant involved in TKT's technology does not have a "material effect on the way the invention works". In each case, one has what was referred to in the evidence as an "identical string of DNA", namely the encoding regions of the EPO gene, expressing EPO in the conventional and natural (albeit artificially massaged) way." (at ¶620)

Despite his finding that the relevant claims ought to be construed so that "host cell" implied use of the exogenous gene (as was TKT's argued case), Neuberger J nevertheless held that TKT had appropriated Kirin-Amgen's "contribution to the art". But for its utilisation of the Table VI information, the judge said, TKT could not have developed its own process.

"The essence of the invention embodied in 605, its contribution to the art or what one might call its inventive concept, is the disclosure encapsulated in

Table VI, which contains the whole of the encoding sequences, the whole of the intervening introns, and a large proportion of the upstream and downstream sequences. It enabled that to be done which was previously impossible, namely the production of EPO in accordance with biotechnological methods, as they existed at the relevant date as they would have been expected to develop and improve over the ensuing years. It seems to me that, in a fast developing technology such as that involved here, it would have been inconceivable to the notional reader of the 605 patent at the relevant date that there would not be significant developments and changes in the technology of genetic engineering over the life of the 605 patent. What TKT have done is to use a new technique, homologous recombination, to achieve EPO expression by the natural EPO-encoding sequences." (at ¶622)

The Judge also applied the three "Protocol questions" and found TKT to have used an obviously immaterial variant of the patented technique. This was on the basis that the patent "*was getting at the production of Epo*" and both processes resulted in production of Epo. The high level of generality given to the patent claim by Neuberger J was striking:

"The way in which the invention works in this case (whether one looks at the patent in suit or at TKT's technology) is the use of the natural EPO-encoding DNA sequence resulting in the expression of EPO in a cell where the genome has been artificially manipulated. It is the nature of the artificial manipulation which is the difference between the two systems: in the teaching of the patent, the traditional method of inserting the encoding sequence (possibly plus introns and an artificial promoter) is used, whereas TKT's newer technology involves switching on the endogenous encoding sequence by means of an inserted artificial exogenous sequence including an artificial promoter. If this latter technology were explained to the notional reader at the relevant date, and he was also told that it worked, I consider that he would have concluded that it was obvious that it worked in the same way as the more traditional technique described in the patent. The essential point, as I see it, is that EPO is expressed in a eukaryotic cell through the medium of a DNA sequence which is in each case identical, being the naturally occurring EPO-encoding DNA sequence." (at ¶631)

Just as he would later do in the *Actavis* Supreme Court decision, Neuberger J found that the skilled person should be told that the variant "worked" when answering Protocol question 2.

"...it would seem somewhat inconsistent if the Claims were incapable of extending to subsequent inventive techniques, or even to inventive new versions of existing techniques, subsequent to the date of the patent, simply because the notional reader skilled in the art at the relevant date would not have known whether they would have worked or not. That seems inconsistent with "fair protection for the patentee". Obviously, there must also be "fair protection" for any subsequent inventor. However, if his invention involves a new way of doing that which could not be done without the disclosure of the patent, it is not apparent to me that the new inventor should be able to "scoop the pool", thereby obtaining the benefit of the old invention, which properly belongs to the original patentee, as well as obtaining the benefit of the new invention, which does properly belong to him, and which can be protected by way of a new patent." (at ¶629)

When it came to the 3rd Protocol question, whether "strict compliance with the primary meaning of the claim was an essential requirement of the invention", Neuberger J quoted Lord Diplock's decision in Catnic and found that "no plausible reason had been advanced why a rational patentee should want to place so narrow an interpretation on his invention" (at ¶635)

In the Court of Appeal, the Judges (led by eminent patents Judge Aldous LJ) reversed this finding of infringement. In considering the Protocol questions, they then decided that at the level of generality of the claims, TKT's process was in fact a material variant. Endogenous DNA simply could not be an immaterial variant of exogenous DNA. By generalising the claims to the mere production of Epo, the Trial Judge had actually over generalised.

Actavis v Eli Lilly

In *Actavis v Eli Lilly*, the key issue related to scope of patent claims and direct infringement.

Actavis was seeking freedom to operate for its pemetrexed dipotassium product used for treating cancer. Lilly's patent claimed pemetrexed disodium, having been narrowed during prosecution from claiming all antifolates then to pemetrexed per se.

Although Actavis had undertaken not to challenge the patent's validity, it nonetheless advanced an argument, in aid of its claim construction, that the patent would have been rejected by the EPO on the basis of added matter, if Lilly's claim construction were correct. Lilly contended that the Actavis argument placed the patent's validity in issue and so was barred by the Brussels regulation. However, Arnold J accepted Actavis' argument citing the Protocol on Article 69 EPC and holding that the Protocol's requirement for "*fair protection for the patentee*" meant that an analysis of scope of protection of a claim had to allow for a consideration of rival claim constructions which might invalidate the claim. This was because a construction which led to invalidity could not be said to be fair to a patentee. The Judge's decision was upheld by the Court of Appeal on this point.

As mentioned at the outset, Lord Neuberger set aside Lord Hoffmann's principle that claim scope equals purposive construction. Lord Neuberger's new two-part test for considering whether an alleged infringement was within the claim scope was as follows:

(i) Does the variant infringe any of the claims as a matter of normal interpretation?; if not

(ii) Does the variant nonetheless infringe because it varies from the invention in a way which is immaterial?

According to Lord Neuberger:

"[Question (ii) involved] not merely identifying what the words of a claim would mean in their context to the notional addressee, but also considering the extent if any to which the scope of protection afforded by the claim should extend beyond that meaning."

As such, the Supreme Court was fully opening the door to equivalents which fell outside the normal construction in context of the claim. To decide whether a variant fell within the scope of the claim, Lord Neuberger reformulated the long-standing "Protocol Questions":

Q1: *Notwithstanding that it is not within the literal meaning of the relevant claim of the patent, does the variant achieve substantially the same result in substantially the same way as the invention, i.e., the inventive concept revealed by the patent?*

Q2: *Would it be obvious to the person skilled in the art, reading the patent at the priority date, but knowing that the variant achieves substantially the same result as the invention, that it does so in substantially the same way as the invention?*

Q3: *Would such a reader of the patent have concluded that the patentee nonetheless intended that strict compliance with the literal meaning of the relevant claim of the patent was an essential requirement of the invention?*

In this way, Lord Neuberger's ruling appears at first sight to be a fillip for patentees, in that the proper scope of their patent claims is not limited to what would come from an interpretation of the language of the claim in context but now extends beyond this to obviously immaterial variants which would previously, under the law according to *Kirin-Amgen (*in the House of Lords*)*, have fallen outside the claim scope. On its face, this decision may appear to be extremely favourable to patentees and more akin the approach of the German patent courts.

Does a Patentee always want claims with broadest possible scope?

However, Patentees might be well-advised to eschew celebrating this decision as being entirely in their favour. The *Actavis v Lilly* action was brought purely on the basis of non-infringement; Actavis gave an undertaking not to attack the validity of the patent in order to preserve the UK court's jurisdiction. Nonetheless, at first instance and appeal Actavis was permitted to run an argument on claim construction to the effect that the construction proposed by Lilly (covering equivalents) should not be accepted because of the negative implications which this construction would have on the validity of the patent. In the Supreme Court, however, it is fair to say that the impact of this broad scope of claim upon the validity of the Lilly claim received minimal examination. The decision recognised that the claim had been drafted narrowly in accordance with the preferred embodiment described in the patent. According to the Supreme Court, however, this did not mean that the patentee did not intend other embodiments to infringe.

It could be argued that the Supreme Court fell into error in this regard and proceeded on the basis of a fallacy; that a patentee always wants the broadest scope of protection possible. In the process of claim formulation and refinement, during the dialogue with the patent office, the patentee/applicant actually has a number of competing considerations in mind. These include:

- Formulating the claim so that it is new and inventive, i.e., avoids the prior art;
- Formulating the claim so that it is sufficient, i.e., properly enabled;
- Formulating the claim so that it gives practical protection against likely infringements. The patentee may have in mind actual competing products or possible infringements, or both;
- Formulating the claim so that it is formally acceptable to the examining authority.

Here, practical considerations come into play: a patentee may know that a certain form of claim would be immediately acceptable to the office and so granted quickly, while another, broader form might be granted but only more slowly and after some resistance. If there is a practical need to begin infringement proceedings, patentees often opt for the narrower claim in such circumstances. It is not the case that at the time of drafting the claims the patentee necessarily wants them to have the broadest possible scope. A broad scope may embrace the prior art, or be insufficiently supported by the disclosure, and so invalidate the patent.

The upshot is that when a court comes to construe a patent's claims, the general kinds of considerations which are likely to have been in the patentee's mind are apparent, but (usually) not the details. As a result, it is perfectly possible that the reasons for including a limitation to the claims are not apparent from the specification. But that does not mean that there was no reason, or that the limitation is not important. In the case of STEP v Emson[2], Hoffmann LJ, as he then was, explained this situation:

"The well-known principle that patent claims are to be given a purposive construction does not mean that an integer can be treated as struck out if it does not appear to make any difference to the inventive concept. It may have some other purpose buried in the prior art and even if this is not discernible, the patentee may have had some reason of his own for introducing it."

Similarly, Lord Neuberger at para 82 of *Actavis* cited with approval a passage from *Kirin-Amgen* in the House of Lords which Lord Hoffmann mentions the role of the file wrapper in claim construction.

"The courts of the United Kingdom, the Netherlands and Germany certainly discourage, if they do not actually prohibit, use of the patent office file in aid of construction. There are good reasons: the meaning of the patent should not change according to whether or not the person skilled in the art has access to the file and in any case life is too short for the limited assistance which it can provide. It is however frequently impossible to know without access, not merely to the file but to the private thoughts of the patentee and his advisors as well, what the reason was for some apparently inexplicable limitation in the extent of the monopoly claimed."[3]

Lord Neuberger continues at para 83 of Actavis: "In the absence of good reason to the contrary, it would be wrong to depart from what was said by the House of Lords".

Ironically, the above passage from para 35 of Kirin-Amgen which is cited with approval by the Supreme Court, is actually taken from a wider discussion by Lord Hoffmann as to why it will be a rare thing that a patentee should be permitted to expand the scope of claim beyond that which can be gleaned from properly construing the language of the claim. As to this, it is noteworthy that paragraph 35 of *Kirin Amgen* was not cited in full by Lord Neuberger. The remainder of paragraph 35 actually states:

"*One of the reasons why it will be unusual for the notional skilled man to conclude, after construing the claim purposively in the context of the specification and drawings, that the patentee must nevertheless have meant something different from what he appears to have meant, is that there are necessarily gaps in our knowledge of the background which led him to express himself in that particular way...*"

"*One possible explanation [for drafting a narrow claim] is that it does not represent what the patentee really meant to say. But another is that he did mean it, for reasons of his own; such as wanting to avoid arguments with the examiners*

[2] [1993] RPC 8

[3] [2004] UKHL 46 @ ¶35

over enablement or prior art and have his patent granted as soon as possible. This feature of the practical life of a patent agent reduces the scope for a conclusion that the patentee could not have meant what the words appear to be saying."

Unfortunately, these aspects of construction were only lightly touched upon by the Supreme Court. As such, it is clear that the Supreme Court has held that a patent claim should be given the broadest possible scope for infringement purposes, encompassing all variants which are obviously immaterial but which would work, whether the patentee wishes to have such a scope or not. This will however not inevitably be to the patentee's advantage.

What about claim validity?

One of the key tenets of UK patent law is described at para 9-13 et seq of Terrell on Patents:

"It is, of course, a fundamental principle that the construction of a claim is the same whether validity or infringement is to be considered; no patentee is entitled to the luxury of an "elastic" claim which has a narrow meaning in the former case but a wide meaning in the latter. Under English procedure, infringement and validity are normally litigated at the same time and therefore the court is astute to avoid such a result. Thus in European Central Bank v Document Security Systems, Kitchin J at first instance noted that:

> *"This case therefore seems to me to be a very powerful illustration of why it is desirable to try infringement and validity issues together, where at all possible. If they are tried separately it is all too easy for the patentee to argue for a narrow interpretation of his claim when defending it but an expansive interpretation when asserting infringement."*

In the same case in the Court of Appeal, Jacob J made the same point more graphically:

> *"Professor Mario Franzosi likens a patentee to an Angora cat. When validity is challenged, the patentee says his patent is very small: the cat with its fur smoothed down, cuddly and sleepy. But when the patentee goes on the attack, the fur bristles, the cat is twice the size with teeth bared and eyes ablaze."*

This fundamental proposition of patent law must still apply in the post-*Actavis* world, the Supreme Court not having overturned it. Such a broad scope of claim for infringement purposes could have grave implications for the validity of the same patents. For example, a prior art disclosure which differs from the patent claim in suit only immaterially, and which was previously available to opponents for inventive step attack purposes only, will no longer be so limited; following *Actavis v Lilly*, such a prior art disclosure will be potentially novelty-destroying.

Kirin-Amgen v TKT - Insufficiency

As mentioned above, the decision in *Actavis v Lilly* could be viewed as a decision by Lord Neuberger re-instating his own previous decision in *Kirin Amgen v TKT*. We have discussed above the analysis conducted by Neuberger J to find infringement by TKT's gene-activation process of Kirin-Amgen's cloning patent. Unlike in *Actavis v Lilly*, the Kirin Amgen case did involve a plea of breadth of claim insufficiency; Neuberger J characterised the plea as follows:

"Claim 1 (again like many of the other Claims) extends not merely to EPO but to analogues of EPO (that is any polypeptide with possibly significant variations in the amino acid residues of EPO, which retains EPO-like characteristics) with virtually no teaching (other than one or two specific instances) as to what those analogues may be." (at ¶488)

Neuberger J considered the breadth of such a claim encompassing Epo analogues:

"As to analogues, [the] unchallenged evidence was that the specific structures and activities of the proteins coded for are not predictable. EPO has 165 amino acids, and a change of one amino acid to another specific amino acid could be deleterious, beneficial, or make no difference; the number of different permutations involved in changing any two of the 165 amino acids runs into millions. Once one contemplates the possibility of changing, say, up to ten of the amino acids (and the evidence I heard suggested, albeit not specifically, that over ten changes in a protein with 165 residues may well not affect functionality, particularly if the changes were to residues not in the active sites of the protein), the permutations are, almost literally, approaching the infinite. Over and above this, the patent purports to cover deletions and additions. It seems to me that investigation as to which analogues (and therefore which encoding

sequences) fall within Claim 1 would involve work of a routine nature, but it could not possibly be said that it would take a reasonable time." (at ¶490)

For its part, the Kirin-Amgen patent gave little, if any, significant help on this aspect. There was nothing to indicate which amino acids might be changed and/or which amino acids could probably not be changed in the EPO sequence contained in Table VI. If the patent had revealed the three dimensional structure of EPO, and, perhaps even more, if it had revealed which of the internal sequences constituted the active sites, that would have given some assistance, possibly substantial assistance, to the reader. The evidence indicated that Amgen had started an analogue programme, but it was not given high priority, compared, for instance, with expanding the effort on the development of mammalian cell lines producing higher levels of EPO. Amgen knew very little about the three dimensional structure of EPO or its active sites. The evidence was that the investigations necessary to give any real guidance as to which amino acid residues in EPO could be varied without the resultant polypeptide losing its EPO-like characteristics would have involved "a research programme", the very thing which has been said to give rise to classic insufficiency.

Kirin-Amgen's defence to the plea of breadth of claim (aka Biogen) insufficiency, hinged upon the House of Lords decision in Biogen itself - *Biogen v Medeva*. Neuberger J explained Kirin-Amgen's case:

"Adopting the language of Lord Hoffmann in Biogen [1997] RPC 1 at 48, when explaining the Board's decision in Genentech I/Polypeptide Expression Amgen's argument effectively amounts to contending that its "invention discloses a principle of general application" rather than "a number of discreet methods or products". As Lord Hoffmann also explained at [1997] RPC 48, if the invention is of the former quality "the claims may be in correspondingly general terms", whereas if of the latter quality, "the patentee must enable the invention to be performed in respect of each [discreet product or process]" (at ¶494)

Neuberger J then decided that the first step in considering whether Kirin-Amgen's invention amounted to a principle of general application was to identify the technical contribution to the art made by the disclosure in the Kirin-Amgen patent. He summarised Amgen's case as follows:

"Amgen's case, in a nutshell, is that the contribution of the 605 patent is encapsulated in the disclosure contained in Table VI of the 605 patent. This Table identifies the precise amino acid sequence of EPO, and the great majority of the EPO gene (including much of the upstream sequence including the two start sites, the whole of the encoding exons, the whole of the intervening introns, the splice donor sites and the whole of the downstream sequence) coupled with enabling teaching as to how enough of that DNA sequence could be isolated and used in a cell to express EPO in far greater quantities than would be achieved naturally. The disclosure enabled something which could not have been achieved before, something which was plainly desirable and beneficial in commercial and humanitarian terms, and something for which eminent groups of scientists had been searching without success, despite substantial financial backing, over the previous five years or so." (at ¶496)

and held that:

"*In my judgment, in agreement with the Australian and the Netherlands Courts, Amgen's contention is well-founded. Dr Lin delivered the goods, in the sense of providing all the necessary teaching which thereafter enabled biotechnologists to express EPO in cells using exogenous EPO-encoding DNA in accordance with routine methods, as they existed at the relevant date and developed from time to time over the life of the 605 patent. To that extent, he is entitled to commensurate "fair protection" under the Protocol. Suppose a third party invented and patented a new method of transfecting a human cell with exogenous encoding DNA, for example... In such a case, although the new technique would "owe nothing to the teaching of the [605] patent or any principle it disclosed", the ability to express EPO by the new technique would do so. Identifying the extent of the monopoly to the expression of EPO, but not to any particular technique, appears to me to accord to Dr Lin a monopoly which "correspond[s] to [his] technical contribution to the art" as embodied in the 605 patent.*" (at ¶504)

Given this assessment of Kirin-Amgen's technical contribution, Neuberger J had no difficulty in finding that the Kirin-Amgen patent embodied a principle of general application. In close parallels to the *Actavis v Lilly* factual matrix, (with numerous unidentified salts and analogues of

Pemetrexed potentially falling within the claim), Neuberger J considered whether Kirin-Amgen's claim, encompassing billions of Epo analogues, was sufficient:

"514. Amgen rely on the comparatively worthless nature of a patent relating to a protein and its encoding gene if it could not extend to analogues of the protein. A few amino acids or even just one amino acid could be substituted with no significant change (or possibly even an improvement) to its activity; concomitant alterations could be made to the codons in the gene. As Mr Waugh says, it would be only too easy for someone to benefit from the teaching of the patent by proceeding, on a trial and error basis, to substitute one amino acid residue for another somewhere along the polypeptide chain of EPO, and then to construct a strand of DNA with an appropriately adjusted sequence of codons. If, as seems virtually certain, it would be possible to change, say, ten of the 168 amino acid residues in human EPO for any one of say ten other amino acids, without the EPO losing its biological properties, that would mean that there were over ten billion different variants. As indicated above, I suspect that that is a substantial under estimate, because it appears likely that more than ten amino residues could be changed (provided that they were not within the active sites) without the resultant polypeptide losing its biological properties, and each such one amino acid could well be substituted by most or even all of the other nineteen amino acids. It also appears that some of the amino acid residues can be lost without the resultant protein losing is biological properties. Mr Waugh…argues with justification that it would be impossible in these circumstances, however great the resources available to a patentee, to test for each of these variants, and then to ensure that there is sufficient teaching in respect of them.

515. I accept that Amgen could have carried out, and could have disclosed the results of, further work which would have given more information and guidance about the possible analogues. However, the result of such information would not have been exhaustive, and it would certainly still have been the case that the reader would have been in a state of uncertainty as to whether any particular change would have resulted in a loss or reduction in the EPO-effectiveness of the resultant polypeptide. He would know that there was a better chance of a particular change having no effect or having an effect, but that is all. Further, at least on the facts of the present case, it is unrealistic not to have regard to the fact that the pressure on Amgen, and indeed on the other researchers in this field, was to obtain the sequences of EPO and the EPO gene, and to use this to effect expression of EPO in a transfected host cell. It would have put the first person to win this particular race in an unreasonably hard position if he had to elect between revealing his disclosure but not being able to claim analogues, which would probably render his patent almost worthless, or to hold off applying for his patent while he investigated analogues, in which case he may lose out to a later competitor who applied for a patent earlier. At least on the present facts, I do not think "fair protection to the patentee" can fairly require that unpalatable choice of the inventor. Certainty or even fairness to third parties or the public does not appear to me to point the other way."

As a result, Neuberger J held that the invention embodied in the Kirin-Amgen patent disclosed a principle of general application and the extent of the patent monopoly could correspond to the technical contribution. This meant that the claims were permitted to be correspondingly broad without being insufficient.

What is the Inventive Concept?

The fundamental issue for Lord/Mr Justice Neuberger in both the *Actavis v Eli Lilly* and the *Kirin-Amgen v TKT* cases was identifying the inventive core or inventive concept embodied in the respective patents in suit.

For infringement purposes, Lord Neuberger found that the inventive concept of the Eli Lilly patent was "*a medicament containing the pemetrexed anion and vitamin B12*". The inventive concept of the Kirin-Amgen patent was "*the disclosure encapsulated in Table VI [the Epo gene sequence]*".

It will not escape notice that compared with the strict wording of the respective claims, these are extremely broad formulations of the inventive concept. Even in *Kirin-Amgen v TKT*, the Court of Appeal had serious difficulties with a formulation of such breadth. Lord Justice Aldous, who gave the judgment of the court[4] said as follows:

"There can be no doubt that at the heart of the invention was the discovery and sequencing of the gene that produced EPO. That work of Dr Lin enabled recombinant EPO to be produced and was

[4] [2002] EWCA Civ 1096

also part of the essential knowledge that was required before the TKT process could be carried out. However that gene sequence was not claimed as the invention we expect because a claim to the sequence per se would not be patentable. Thus the claim is to a DNA sequence which has been made suitable for use in a host cell to produce EPO. In effect the claim is to an exogenous DNA sequence suitable for expressing EPO when introduced to a host cell. The variant is very different. The DNA sequence is endogenous. It is not suitable for expressing EPO until after introduction of the construct. When so viewed there can be only one answer to the first Protocol question which is "Yes". There are real differences between an isolated DNA sequence which is suitable for use in a host cell and a DNA sequence in a cell which needs activation." (at ¶52)

One sees immediately that the Court of Appeal was unwilling to attribute an overly broad inventive concept/scope of claim to Kirin-Amgen, because of the concomitant effect on patentability. In *Actavis v Eli Lilly*, the Supreme Court gave no consideration to whether a patent claim encompasses within its scope a medicament containing any effective pemetrexed or other antifolate salt together with vitamin B12, could still be valid. Indeed, it was Actavis' case in the Supreme Court that such a claim had been available to Lilly in the patent office before the claim was narrowed to overcome an examiner objection. However, on the basis of the Supreme Court decision, the Eli Lilly claim now includes within its scope all forms of pemetrexed that work, including all salts and even derivatives with a different chemical structure. But the patent provides no guidance at all as to how to do this, and nor did it even disclose the idea of doing so. Even the first instance judge in Actavis (Arnold J) concluded[5] that the claim would clearly be invalid if it had such a scope.

It is the formulation of the inventive concept which underlies the problems in these two cases. Kirin-Amgen wanted as broad a formulation as possible, in order that it could be attributed with inventing a principle of general application. This would permit it to capture the TKT process as an infringement and yet avoid a finding of breadth of claim insufficiency. Unfortunately, Neuberger J's finding that Kirin-Amgen's inventive concept was the Epo gene sequence carried the side-effect of lack of patentability and therefore it could not stand. The problem for Actavis is that Lord Neuberger's formulation of Eli Lilly's inventive concept must stand, at least until such time as there is a validity challenge to the Eli Lilly patent, and likely only if that challenge itself reaches the Supreme Court.

It will be a key question whether the scope of Eli Lilly's claim for validity purposes must necessarily be the same as that found by Lord Neuberger for infringement purposes or whether it can be different, and if so, how.

Discussion

One key lesson for UK patent litigators and advisers to take from *Actavis v Eli Lilly* is that formulation of the inventive concept of the patent in suit will be of critical importance. Indeed, it is likely to be a Pandora's box. One only has to examine *Kirin-Amgen v TKT* at first instance and in the Court of Appeal to see the problems and difficulties inherent in this task.

Indeed, many of the UK patent cases decided up to 2017 on the basis of the Protocol questions had similar difficulties identifying "*the invention*" and "*the way the invention works*" and this was with the more straightforward underlying approach of purposively construing the claim in context. Deciding upon the right level of generality to adopt in order to identify the "invention" was not a straightforward task. Post-*Actavis*, the exercise will be to identify the "*inventive core or inventive concept*" but in addition to do so with the correct level of generality; this will be doubly difficult.

Under Lord Neuberger's reformulated Protocol question 1, it is necessary to construe the claim according to the normal principles of interpreting commercial documents (at ¶58). The principles of normal interpretation are said to be set out in the Supreme Court case of *Wood v Capita Insurance*[6], which related to contracts. The reader must ascertain the objective meaning of the language which the parties have chosen. While the Supreme Court in *Actavis* eschewed a literal/textual construction and appeared to be unwilling to accept that there may be practical reasons (e.g., buried in the prior art) why a patentee would want to limit its claim to a scope narrower than the maximum possible, the Supreme Court in *Wood v Capita* took a different approach and appeared perfectly willing to consider textual as well as contextual approaches:

[5] [2014] EWHC 1511 at (at ¶148)

[6] [2017]UKSC 24

"Some agreements may be successfully interpreted principally by textual analysis, for example because of their sophistication and complexity and because they have been negotiated and prepared with the assistance of skilled professionals. The correct interpretation of other contracts may be achieved by a greater emphasis on the factual matrix, for example because of their informality, brevity or the absence of skilled professional assistance. But negotiators of complex formal contracts may often not achieve a logical and coherent text because of, for example, the conflicting aims of the parties, failures of communication, differing drafting practices, or deadlines which require the parties to compromise in order to reach agreement. There may often therefore be provisions in a detailed professionally drawn contract which lack clarity and the lawyer or judge in interpreting such provisions may be particularly helped by considering the factual matrix and the purpose of similar provisions in contracts of the same type."(at ¶13)

Squaring *Actavis v Lilly* with *Wood v Capita* and divining the proper approach to take when seeking the normal interpretation of the claim will not be a straightforward task.

Following *Actavis*, the patent claims will be held to encompass any and all immaterial variants that work, irrespective of whether the patentee wishes them included or not. Everything that is in fact an equivalent will get straight to Protocol question 3. The only possible exception is if the infringer does not know how its variant actually works, and can thereby answer Protocol question 2 in the negative. It is submitted that this is not a scenario likely to occur very often.

When answering Protocol question 3, the form of the question has changed. Question 3 now asks whether the reader of the patent would have concluded that the patentee nonetheless intended strict compliance with the literal/normal meaning of the relevant claim to be an essential requirement. Previously, under Lord/Mr Justice Hoffmann's formulation, question 3 asked whether the reader of the patent would have concluded all of this this but *from the language of the claim*. Clearly, post *Actavis*, the language of the claim is no longer part of this assessment. This appears to be opening the door to introducing the underlying factual matrix, something which as shown above is already part of normal interpretation under *Wood v Capita*. It is submitted that this is most unlikely to make answering Protocol question 3 easier and may in fact make it much harder.

At the patent drafting stage, patentees might be well advised to expressly exclude undesired variants lest they be lumbered in any subsequent patent infringement action with the full claim scope and its attendant validity problems. Add to this that the scope of the claim can vary over the life of the patent as later knowledge and inventive developments arise and the lawyer's task to advise on patent validity and scope is almost impossible.

For parties seeking to avoid patents by producing a 'work-around', there could be even greater problems. One can argue on the basis of *Actavis* that there is no longer any such thing as a 'work-around'. Any variant which achieves substantially the same result as the patented invention and in substantially the same way, will infringe, regardless of the wording of the claim.

Finally, the law as it currently stands is that the scope of patent claim must be the same for infringement assessments as for validity. The patent's validity is assessed at the priority or filing date whereas following *Actavis*, the scope of claim can change over time and must be assessed at the date of the relevant infringement with knowledge of immaterial variants and that these variants work. How to square this circle is sure to exercise patent lawyers and the patent courts in the future.

Contact

Patrick Kelleher
Partner, IP

Tel: +44 (0)20 7415 6000
Patrick.Kelleher@twobirds.com

twobirds.com

Aarhus & Abu Dhabi & Beijing & Bratislava & Brussels & Budapest & Copenhagen & Dubai & Dusseldorf & Frankfurt & The Hague & Hamburg & Helsinki & Hong Kong & London & Luxembourg & Lyon & Madrid & Milan & Munich & Paris & Prague & Rome & Shanghai & Singapore & Stockholm & Sydney & Warsaw

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