

RESEARCH ARTICLE

The construction of patent claims

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Abstract

This paper highlights two recurring facets of the way UK courts approach the construction of patent claims: the adoption of methods typically applied to the interpretation of contracts and the recognition that immaterial variations not expressly claimed nevertheless fall within the scope of protection. Drawing on the normative implications arising out of Ronald Coase's paper on the problem of social cost, this paper argues that the patent system operates as a substitute for an explicit bargain between economically active entities operating in the market under which a duty is accepted by one party in return for acceptance of a burden of risk by the other. This perspective incorporates both the static costs and the dynamic benefits of the system and accords with the monopoly-profit-incentive theory most commonly advanced in support of the patent system. It is shown how the contemporary approach to claims construction is supported by the object of giving effect to the presumed intentions of the parties to this hypothetical bargain and that this underpins both the implication of terms which go beyond those expressly agreed to by parties to a contract and the construction of patent claims so as to embrace immaterial variations not expressly within their scope.

Keywords: intellectual property law; patents; claims construction; Coase theorem

Introduction

It has long been a feature of UK patent law that claims define the scope of patent protection. For over 35 years UK courts have adopted the guidance given by Lord Diplock in *Catnic Components v Hill & Smith*¹ and have approached the construction of claims 'purposively'. Although there have been refinements and adjustments over this period, these have been relatively minor and the principle of purposive construction has operated as the universally applicable bedrock of patent construction.² The robustness of this approach has been significantly tested by the obligations arising by way of the UK's membership of the European Patent Convention (EPC). The UK is a founder member of this Convention and the Patents Act 1977 was enacted specifically to implement the obligations arising under it. The EPC's express object is to strengthen co-operation between the states of Europe in respect of the protection of inventions. It provides a means by which patent protection can be obtained in the EPC Member States by a single procedure for grant. It also establishes certain standard rules governing patents.³ One such relates to the construction of claims in the context of resolving infringement

¹[1982] RPC 183.

²Adopting the language used by Lord Hoffmann in *Kirin-Amgen Inc v Hoechst Marion Roussel Ltd* [2004] UKHL 46 at [52].

³These objects are expressly laid out in the Preamble to the Convention. It is in light of these objects that Patents Act 1977, s 130(7) provides that various sections of the Act are, 'so framed as to have, as nearly as practicable, the same effects in the United Kingdom as the corresponding provisions of the [EPC]'. Lord Hoffmann, in *Merrell Dow Pharmaceuticals v Norton* [1996] RPC 76 at 82, declared it the duty of UK courts to construe these various sections, as far as possible, so as to give them the same effect as the corresponding articles of the EPC.

disputes.⁴ Article 69 EPC provides that the extent of protection conferred by a patent is to be determined by the claims. There is a Protocol on the interpretation of this article which is intended to guide national courts. The Protocol directs that courts should not give a strict, literal meaning to the words used in the claims but adds that Article 69 EPC does not admit claims being seen as a mere guideline to the extent of protection. Instead the Protocol directs courts to interpret Article 69 EPC in way that steers a path between these extremes: one which ‘combines a fair protection for the patent proprietor with a reasonable degree of legal certainty for third parties’.

The Protocol to Article 69 EPC has undoubtedly influenced judicial decision-making insofar as national courts, including those of the UK, have recognised that any approach to claims construction must be supported by its terms. But its directions are vague⁵ and despite its regular invocation it has admitted a range of approaches across the Community, each claiming to be consistent with the Protocol’s terms.⁶ As originally formulated, Article 69 EPC and its Protocol did not prompt significant substantive change in the domestic law of the UK. Amongst the UK judiciary there was little appetite to displace the purposive approach to claims construction operating under the common law before the coming into force of the 1977 Act.⁷ In contrast to the profound changes effected in other Convention countries, UK judges displayed apparent indifference to the goal of unification of the laws of Convention countries.⁸

A number of amendments were made to the EPC at a Diplomatic Conference in 2000, including one motivated by concerns that Article 69 EPC and its Protocol had failed to achieve harmonisation of the approach to claims construction. Of particular concern were the inconsistencies as between the Member States in the treatment of ‘equivalents’.⁹ The Protocol was revised and a second article added which provides that, for the purpose of determining the extent of protection conferred by a European patent, ‘due account shall be taken of any element that is equivalent to an element specified in the claims’.¹⁰

⁴In this legal context the construction of claims is rarely straightforward, not least because outright duplication is a rare type of infringement; an observation made by the US Supreme Court in an argument directed to justifying recognition of a doctrine of equivalents in the USA: *Graver Tank & Manufacturing v Linde Air Products*, 339 US 605 (1950) at 607.

⁵Lord Neuberger has noted that the drafting of the Protocol bears all the hallmarks of the product of a compromise agreement: *Actavis v Eli Lilly* [2017] UKSC 48 at [32]. See also the commentary in N Pumfrey et al ‘The doctrine of equivalents in various patent regimes – does anybody have it right?’ (2008) 11 *Yale Journal of Law & Technology* 261 at 307.

⁶Aldous J, in *AssiDoman v The Mead Corporation* noted that, ‘[t]he middle ground referred to in the protocol is not clearly defined and every court within the Community had adopted a method of interpretation which it believes to be consistent with the protocol’: [1995] FSR 225 at 236. In *BASF v Smithkline Beecham* Sedley LJ observed that, ‘[t]here is nothing... in Article 69(1) as expounded by the Protocol which would not have been endorsed by the Victorian judges of our jurisdiction...’ [2003] EWCA Civ 872 at [104]. See also M van Empel *The Granting of European Patents* (Leyden: Sijthoff, 1975) p 307 (‘... it does not seem likely that many courts will admit that their decisions do not comply with this standard’); and T Blanco White *Patents for Inventions* (London: Stevens & Sons, 4th edn, 1974) pp 35–36 (‘[Art 69 EPC] is a provision that will certainly allow both English and German courts to treat their respective national laws of infringement – which are very different – as conforming with the Convention’) and the more general commentary in M Fisher ‘New protocol, same old story? Patent claim construction in 2007; looking back with a view to the future’ (2008) *Intellectual Property Quarterly* 133.

⁷The first opportunity for a full consideration of claims construction under the 1977 Act fell to Hoffmann J, in *Improver Corp v Remington Consumer Products Ltd*, who held that Lord Diplock’s speech in *Catnic* indicated the same approach to construction as that laid down by the Protocol. This was later doubted by the Court of Appeal in *PLG Research v Ardon International*, Neill LJ expressing the hope that in future, ‘attention will be concentrated on the requirements of the protocol and the developing European jurisprudence and not on those of the common law before 1977’: [1995] FSR 116 at 133. Neill LJ’s hopes were not realised however and in *AssiDoman Multipack Ltd v The Mead Corporation*, Aldous J held that purposive construction was the correct approach to construction under the Patents Act 1977 declaring himself loathe to discard 14 years of case law unless it was certain that this was not the correct approach: [1995] FSR 225 at 236. Adoption of the purposive approach was subsequently cemented by the Court of Appeal’s holding in *Kastner v Rizla* that the *Catnic* test was to be applied when considering the ambit of a patent claim under the 1977 Act: [1995] RPC 585 at 594.

⁸See Fisher, above n 6, at 150.

⁹Ibid, at 141–142.

¹⁰The amended version of the EPC came into force in December 2007.

The UK Supreme Court responded with an approach to claims construction markedly different from any adopted since *Catnic*.¹¹ In *Actavis UK Ltd v Eli Lilly & Co*¹² Lord Neuberger directed that deciding infringement actions required asking two questions, each to be answered from the perspective of a person skilled in the relevant art. If the answer to either was ‘yes’, then, he said, there was an infringement.¹³ First, he said, one must ask whether the alleged infringer’s variant falls within the scope of any of the claims as a matter of ‘normal interpretation’. The first question, Lord Neuberger observed, involved a familiar process that was subject to the same general principles applied in the interpretation of commercial contracts.¹⁴ If not, then the second question was whether the variant nonetheless infringed because it varied from the claimed invention in an immaterial way. This second question he said, squarely raised the principle of equivalents.¹⁵

The adoption of methods typically applied to the interpretation of contracts to the construction of patent claims is not a new feature of UK law.¹⁶ Nor is the recognition that immaterial variations fall within the scope of protection.¹⁷ The central object of this paper is to highlight the particular significance of these recurring facets of UK law and in particular to show how they accord with the dominant economic theory supporting the patent system and the consequences of that accord. In this respect the argument draws on the normative implications arising out of Ronald Coase’s paper on the problem of social cost¹⁸ and offers a new way of thinking about patents as bargains.

The section that follows sets out to illustrate in more detail how UK courts have approached the exercise of claims construction by adopting principles common to the interpretation of contracts and, within this framework, what then has been understood as a material variation. The object of the third section is to provide theoretical support for UK courts’ adoption of the contractual paradigm in construing patent claims. In essence, the argument advanced is that the patent system should be seen as a substitute for an explicit bargain, not as commonly asserted between the state and the patentee, but between economically active entities operating in the market under which a duty is accepted by one party in return for acceptance of a burden of risk by the other. Under this hypothetical agreement both parties seek to manage the risks associated with innovation: one by sharing the idiosyncratic costs of innovation and the other by outsourcing research capabilities. This provides an *ex ante* perspective of the patent bargain that readily incorporates both the static costs and the dynamic benefits of the patent system and accords with the monopoly-profit-incentive theory most commonly advanced in its support. The final section sets out to show how the contemporary approach to claims construction can be seen as giving effect to the presumed intentions of the parties to this hypothetical bargain. The argument develops by demonstrating that giving effect to presumed intention underpins both the implication of terms which go beyond those expressly agreed to by parties to a contract and the embracing of immaterial variations not expressly within the scope of patent claims. This section concludes with the observation that in both cases the operating presumptions can be rationalised as minimising the transaction costs of bargaining. An examination of these transaction costs points to an important difference between the presumed intention behind narrowly drawn and specific patent claims and similarly framed contractual terms. The analysis and economic evaluation provides theoretical support for the Supreme Court’s decision in *Actavis* and its suggested mode of incorporating a doctrine of equivalents into UK patent law.

¹¹An observation made by Lord Kitchin in *Icescape v Ice-World* [2018] EWCA Civ 2219 at [59].

¹²[2017] UKSC 48.

¹³[2017] UKSC 48 at [54]. Of course the great challenge is in deciding what makes a variation ‘immaterial’ since this requires consideration of the extent to which the scope of protection should extend beyond that dictated by the normal interpretation given to the words used in the claims: *ibid* at [56].

¹⁴In particular the principles affirmed in *Wood v Capita* [2017] UKSC 24: *ibid* at [58].

¹⁵[2017] UKSC 48 at [54].

¹⁶This relationship is explored more fully in the following section.

¹⁷Again a feature explored in the following section.

¹⁸R Coase ‘The problem of social cost’ (1960) 3 *Journal of Law & Economics* 1.

1. The judicial approach to claims construction

As noted above, in *Actavis*, Lord Neuberger directed that the interpretation of a patent claim should be subject to the same general principles applied in the interpretation of commercial contracts. This is not a novel approach. Acknowledgement of the relationship certainly extends back as far as the late nineteenth century. Thus in *Nobel's Explosives Co v Anderson*, Lord Esher MR, in construing a patent, expressly adopted the same canons of construction as those applied to 'every agreement between parties' and 'to almost every instrument that the Court has to construe as between litigants'.¹⁹ This understanding informed the construction of claims well into the twentieth century.²⁰ Lord Esher's positioning of the exercise in the context of litigation is important because it explains why courts see parallels between the exercises of claims construction and construction of other legal instruments. This ex post perspective of courts significantly shapes how they approach the construction of patent claims in infringement proceedings:

[a]lthough it has often been said that the question of construction does not depend on the alleged infringement... questions of construction seldom arise in the abstract. That is why in most sensible discussions of the meaning of language run on the general lines 'does it mean this, or that, or the other?' rather than the open-ended 'what does it mean?'²¹

Thus interests, and in particular the scope of protection enjoyed by the patentee, are typically defined by way of a process that pitches an individual right against an individual correlative duty.²² In light of this it is unsurprising that UK courts recognise and apply common general principles in construing patent claims, legal agreements and other instruments that courts have to construe as between litigants.

One manifestation is that changes in the approach to claims construction and the approach taken to the interpretation of other legal documents have moved in parallel. Lord Hoffmann observed in *Kirin-Amgen Inc v Hoechst Marion Roussel Ltd*, that the purposive approach to claims construction advocated by Lord Diplock in *Catnic* was part of a general trend under which courts began to read documents including contracts and patent specifications with same understanding.²³ Noting that the approach to the interpretation of claims adopted by Lord Diplock in *Catnic* was, 'all of a piece' with the approach he adopted a few years later to the construction of a charterparty in *The Antaios*,²⁴ he effectively equated Lord Diplock's approach to patents in *Catnic* with the 'purposive' construction of commercial contracts.²⁵

Before the decision in *Actavis*, Lord Neuberger too recognised that there were common general principles applicable to the construction of a range of legal instruments. In *Marley v Rawlins*²⁶ he said that the same approach should be taken to interpretation of unilateral notices as taken to the interpretation of contracts.²⁷ Whether the document in question was a commercial contract, a will or a patent specification, he said that its interpretation was to be approached purposively with the

¹⁹(1894) 11 RPC 519 at 523.

²⁰See for instance *Lyle & Scott Ltd v Wolsey Ltd* 1955 SLT 322 at 327; and *Daily v Etablissements Fernand Berchet* [1993] RPC 357 at 361.

²¹*Rockwater Ltd v Technip France SA (formerly Coflexip SA)* [2004] EWCA Civ 381 at [42].

²²A relationship famously explored in W Hohfeld 'Fundamental legal conceptions as applied in judicial reasoning' (1913) 23 Yale Law Journal 16.

²³[2004] UKHL 46 at [30]. Note also in this respect the dicta of Balcombe LJ in *Daily v Etablissements Fernand Berchet* [1993] RPC 357 at 361 ('... the canons of construction of a patent are the same canons of construction that are to be applied to every written instrument that has to be construed by the court... It must, however, be a purposive rather than a purely literal construction...').

²⁴[2004] UKHL 46 at [31].

²⁵See the comments of Lord Neuberger in *Actavis* [2017] UKSC 48 at [41].

²⁶[2014] UKSC 2.

²⁷[2014] UKSC 2 at [21].

aim of identifying the intention of the party or parties to the document by interpreting the words used in their documentary, factual and commercial context.²⁸

However, by the time of judgment in *Actavis* Lord Neuberger had partially altered his position: a shift that reflected changes in the way courts approached the interpretation of contracts. Whilst reiterating that the principles applicable to the interpretation of contracts were shared in the interpretation of patents, this did not lead him to the conclusion that both were to be read purposively. He was of the view that purposive construction, as that term had been understood and applied, risked confusing the law relating to the interpretation of legal documents.²⁹ The explanation for this change in position is to be found in what Lord Hodge said in *Wood v Capita Insurance Services Ltd* regarding contracts:

Textualism and contextualism are not conflicting paradigms in a battle for exclusive occupation of the field of contractual interpretation. Rather, the lawyer and the judge, when interpreting any contract, can use them as tools to ascertain the objective meaning of the language which the parties have chosen to express their agreement. The extent to which each tool will assist the court in its task will vary according to the circumstances of the particular agreement or agreements. 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.³⁰

Modern patent specifications are undoubtedly sophisticated and complex documents and will almost invariably have been prepared by a skilled professional.³¹ If their interpretation is to be approached in the same way as contracts, then within Lord Hodge's scheme, one would expect textual analysis then to be the principal tool used in their interpretation.³² The factual matrix, on the other hand, one would expect to be of less significance. Whether a variant infringes because it varies from the claimed invention in an immaterial way, and in particular whether it is an equivalent, is a question that goes to building the factual matrix: it a question answered by reference to facts and expert evidence.³³ However because of the express demands of Article 2 of the Protocol, this particular aspect of the factual matrix cannot be disregarded in the construction of patent claims.³⁴ Lord Neuberger's solution is to make of it a discrete question independent of the question of interpretation.³⁵

It is unsurprising then that Lord Neuberger avoids employing the term 'purposive construction' to describe any of the elements within the approach he advocates in *Actavis*. However, called upon to interpret what he said, later courts have pointed to an inconsistency arising because Lord Neuberger makes clear that that the interpretive exercise that is the first step, requires adopting the perspective of the notional addressee of the patent in suit³⁶ and that the object of the exercise is to

²⁸Ibid, at [20].

²⁹[2017] UKSC 48 at [53].

³⁰[2017] UKSC 24 at [13].

³¹In the words of Lord Hoffmann, '... the words will usually have been chosen upon skilled advice. The specification is not a document inter rusticos for which broad allowances must be made': *Kirin-Amgen* [2004] UKHL 46 at [34].

³²This can be seen as a contemporary manifestation of the assumption long adopted by courts that a patentee will have exercised care in setting out the limits of his claim and so will defer to the judgments made by the patentee. See for example Buckley LJ's judgment in *Catnic* in which he distinguishes between explicit directions given by the patentee and assumptions that a skilled reader might make: [1982] RPC 183 at 226–227.

³³See Lord Neuberger's observations in *Actavis* [2017] UKSC 48 at [54].

³⁴In the final section of this paper I develop the argument that equivalents should be taken into account in the construction of patent claims not only to give effect to the express demands of Article 2 of the Protocol but also because doing so acknowledges the costs and benefits of claims explicitly addressing a particular contingency.

³⁵A broadly similar argument is advanced in C Jamieson 'In defence of a UK doctrine of equivalents' (2019) 41 European Intellectual Property Review 147 at 150–151.

³⁶[2017] UKSC 48 at [54].

identify what the words of the claim would mean in their context to the addressee.³⁷ Thus, despite some of his dicta suggesting otherwise, the conclusion reached by later courts is that this first step involves a conception of purposive interpretation.³⁸ The current understanding is as set out by Arnold J in *Eli Lilly v Genentech*:

The claim must be given a ‘normal’ interpretation: *Actavis UK Ltd v Eli Lilly & Co...* This means a ‘purposive’ interpretation, that is to say, an interpretation which takes into account the purpose of the Patent, which is to describe and claim an invention to a person skilled in the art: *Icescape Ltd v Ice-World International BV...* As HHJ Hacon sitting as a High Court Judge pointed out in *Regen Lab SA v Estar Medical Ltd ...*, it is no longer necessary to take equivalents into account in such an interpretation, because it is now possible for a patentee to contend that a patent has been infringed by virtue of the doctrine of equivalents even if it is not infringed when the claims are given a normal interpretation.³⁹

It is notable that HHJ Hacon (and Arnold J) understood that the effect of *Actavis* then was to remove a consideration of equivalents from the scope of purposive interpretation as that method had been previously understood. *Actavis* thus can be understood as re-positioning that consideration rather than introducing it. Indeed Lord Neuberger himself acknowledged that the particular conception of purposive construction operating before *Actavis* did give effect to a doctrine of equivalents, but only by way of ‘an extended version of the ordinary concept of “construction” or “interpretation”’,⁴⁰ adding that domestic law has long recognised that a product or process will infringe despite incorporating an immaterial variation from the invention as claimed.⁴¹

The decision in *Actavis* prompts an enquiry into the proper scope of the process of interpretation and that issue is tackled in the final section of this paper. It also invites consideration of how UK courts previously applied the doctrine of equivalents (whether under the umbrella of ‘purposive interpretation’ or otherwise) and on what basis. The remainder of this section sets out to show that UK courts’ understanding of what is material, and within this the account they have taken of equivalent variations, are further artefacts of the ex post perspective adopted by UK courts and a further manifestation of an approach that defines interests by pitching an individual right against an individual correlative duty.

The comprehensive, detailed and influential historical review undertaken by Hugh Laddie leads him to the conclusion that, during the nineteenth century, domestic courts developed the principles of equivalents and ‘pith and marrow’.⁴² As to the relationship between these, he observes that:

... the concept of equivalents is really a sub-group within the wider class of infringement by colourable evasion or by taking the pith and marrow. As far as the former is concerned, there is infringement if in the accused product or process one or more of the claimed features is replaced by an alternative. The latter cover any form of colourable imitation, whether that takes the form of omission, substitution or addition of a feature.⁴³

³⁷In contrast then to the second step of construction, which goes beyond this and considers the extent – if any – to which the scope of protection afforded by the claim should extend beyond that meaning: *ibid* at [56].

³⁸See for example *Generics (t/a Mylan) v Yeda Research and Development* [2017] EWHC 2629 (Pat) at [138]; *Illumina v Premaitha Health* [2017] EWHC 2930 (Pat) at [201]–[202]; *Fisher and Paykel Healthcare v ResMed* [2017] EWHC 2748 (Ch) at [81]–[83]; and the Court of Appeal’s decision in *Icescape v Ice-World* [2018] EWCA Civ 2219 at [60] and [96]. This decision by the Court of Appeal has cemented this interpretation: *Coloplast v MacGregor Healthcare* [2018] EWHC 2797 (IPEC) at [71]; and *Eli Lilly v Genentech* [2019] EWHC 387 (Pat) at [294].

³⁹*Eli Lilly v Genentech* [2019] EWHC 387 (Pat) at [294].

⁴⁰[2017] UKSC 48 at [53].

⁴¹[2017] UKSC 48 at [57] citing in support *Walton v Potter & Horsfall* (1843) 1 WPC 585; and *Clark v Adie* (1877) 2 App Cas 315.

⁴²H Laddie ‘Kirin Amgen – the end of equivalents in England?’ (2009) 40 *International Review of Intellectual Property and Competition Law* 3 at 14–18.

⁴³*Ibid*, at 17–18.

An approach to claims construction that aims to capture ‘colourable evasion’ is one in which the focus is on the scope of the legal duties arising under the claim rather than the scope of the correlative rights and is no doubt the product of the UK Courts’ historic suspicion of monopolies.⁴⁴ A consequence is that during the nineteenth century, whilst undoubtedly embracing the essence of the invention, UK courts assessed the scope of protection by a determination of the scope of the commands and prohibitions laid out in the patent specification. So for instance, in *Dudgeon v Thomson*, the Lord Chancellor declared:

... that which is protected is that which is specified, and that which is held to be an infringement must be an infringement of that which is specified. But I agree it will not be the less an infringement because it has been coloured or disguised by additions or subtractions, which additions or subtractions may exist, and yet the thing protected by the Specification be taken notwithstanding.⁴⁵

In *Nobel’s Explosive*, Romer J observed that in order to make out infringement in all cases:

... it must be established, to the satisfaction of the Court, that the alleged infringer dealing with what he is doing as a matter of substance, is taking the invention claimed by the patent; not the invention which the Patentee might have claimed if he had been well advised or bolder, but that which he has in fact and substance claimed on a fair construction of the Specification.⁴⁶

Romer J’s approach was confirmed by the Court of Appeal. There Smith LJ specifically addressed the significance of equivalents:

The essence of the invention... is the... bringing together... two named highly explosive substances, the result being that they tame each other... It is the bringing together of these two specific compounds, and none other, which is the essence of his invention, though I include in this the use of chemical or mechanical equivalents for the matters specified: if, however, other, matters are used which are not such equivalents, such user is not within the claim, and is not covered by the patent.⁴⁷

Thus although UK courts developed a doctrine of equivalents, the basis for so doing differed from that of Continental European courts which embraced the idea that recognition of a doctrine of equivalents was necessary to accord the inventor the full extent of the reward to which they are entitled for their inventive contribution.⁴⁸ In the UK, that doctrine was developed to restrict attempts to evade the obligations arising under the patent.

⁴⁴This focus is apparent in some of the earliest reported cases: see for instance *Phillpott v Hanbury* (1885) 2 RPC 33 at 38. The focus can also be defended in principle. As pertinently observed by Jeremy Waldron, ‘legal duties are hard things for people to have – since they constrain conduct and in that sense limit freedom – we should expect the realm of duties to be the testing ground for claims of right. The realm of duties – the propositions about duty that a given claim of right entails – is where we should expect the problems with the right (if there are any) to surface. It is true that not all the problems of a legal institution are connected with the duties it imposes. But the duties are a good place to start, since they will take us to whatever hardships are most intimately involved in the immediate recognition and enforcement of the rights’: J Waldron ‘From authors to copiers: individual rights and social values in intellectual property’ (1992–3) 68 Chicago-Kent Law Review 841 at 844.

⁴⁵(1877) 3 App Cas 34 at 44–45.

⁴⁶(1894) 11 RPC 115 at 128.

⁴⁷(1894) 11 RPC 519 at 532 and see also *Automatic Weighing Machine v Knight* (1889) 6 RPC 297.

⁴⁸A Keukenschrijver ‘The German practice’ in J Pagenberg and W Cornish (eds) *Interpretation of Patents in Europe. Application of Article 69 EPC* (Cologne: Carl Heymanns Verlag, 2006) p 91 and to similar effect G Kolle ‘Interpretation of patents and the doctrine of equivalents’ (2007) OJ EPO Special edition 2/2007 –13th European Patent Judges’ Symposium 124, at 130. See also Fisher, above n 6, at 146–147.

The principles of equivalents and colourable evasion (taking the ‘pith and marrow’) continued to be applied by UK Courts well into the twentieth century notwithstanding legislative changes formalising the definitional role of the claims.⁴⁹ As noted by Laddie, the argument that these changes demanded abandonment of the established principles of equivalents and colourable evasion was consistently rejected, ‘no more clearly than in the House of Lords decision in *Van der Lely v Bamfords*’.⁵⁰ This particular decision provides unusual insight into the doctrine of equivalents as understood and applied in the UK partly because the alleged infringing variant manifestly and unarguably performed the same function in the same way so as to obtain the same result as the patented invention. In *Van der Lely* then, the clarity of the reasoning was not clouded by consideration of the extent and significance of the differences in structure and function between the claimed invention (a mechanical hay-rake) and the alleged infringing device.⁵¹ This differed from the patented invention in only one respect. In the former, the three foremost wheels were dismountable whereas in the latter this was a feature of the three hindmost wheels. There was no functional advantage gained by the variant, which was adopted by the defendants only to avoid falling within the express wording of the relevant claim. This referred to the dismounting of, ‘wheels situated hindmost in the direction of motion’.⁵²

The decision is also insightful because, notwithstanding that the patented invention and alleged infringing device were indisputably mechanically equivalent, the House of Lords was divided on the question of whether there had been an infringement.⁵³ There is accordingly an unusual degree of transparency and detail in the reasoning of the judicial committee. Lord Reid alone held that there was infringement because the ‘pith and marrow’ of the invention had been taken:

It must be true... that in framing their specification the appellants did not appreciate that the same result could be achieved by moving the foremost wheels, for otherwise they would have made their claim wide enough to cover this. But surely the same must be true of most if not all cases where there is an attempt to avoid infringement by the substitution of a mechanical equivalent: if the patentee had foreseen that possibility he would have made his claim cover it. If that were a good reason for refusing protection to the patentee against a person who later thinks of and adopts the mechanical equivalent, it seems to me that there would be very little left of this principle.⁵⁴

The majority however, held otherwise. All accepted that the ‘pith and marrow’ principle was good law.⁵⁵ Equally, there was no doubt that the patented machine and the allegedly infringing variant were mechanically equivalent. But this was understood only as a factor to be taken into account in deciding whether there had been infringement. For the majority, overriding this was the specificity and narrowness with which the relevant claims had been drafted by the patentee and the clarity of the signal this sent out to competitors. Lord Jenkins, for instance, observed that:

⁴⁹On which see Laddie, above n 42, at 10–11 and note also the comments of Lord Diplock in *Beecham Group v Bristol Laboratories* [1978] RPC 153 at 200 (‘The increasing particularity with which the claims are drafted and multiplied in modern specifications may have reduced the scope of application of the doctrine of pith and marrow, but I am unable to accept the argument... that this has made the doctrine obsolete. It still remains a part of patent law...’).

⁵⁰[1963] RPC 61; Laddie, above n 42, at 19.

⁵¹This distinguishes the case from the later decision of the House of Lords in *Rodi & Wienberger v Henry Showell* [1968] FSR 100 where the differences were greater and there was more argument over the significance of those differences.

⁵²[1963] RPC 61 at 75.

⁵³Cf *Beecham Group v Bristol Laboratories* [1978] RPC 153 in which the extraordinary finding that there could be equivalence of a claim to a product led to a unanimous holding of infringement. That decision is an outlier in other ways. As Laddie notes, ‘... it is a rare case of courts in the UK finding that the substitution of an essential feature of the claims did not avoid infringement. What Bristol had done made use of Beecham’s inventive concept and the court was prepared to say that such use was colourable, even if it was outside the words of the claim’: Laddie, above n 42, at 22.

⁵⁴[1963] RPC 61 at 76.

⁵⁵[1963] RPC 61 at 77 (Viscount Radcliffe); and at 80 (Lord Devlin and Lord Hodson).

... whatever the reason, the appellants deliberately framed [their] claim... so as to exclude the use of the foremost wheels. That, I apprehend, left it open to the respondents to arrange their wheels in any way they chose provided they did not interfere with the appellants' arrangement. I do not think the doctrine of pith and marrow applies here.⁵⁶

Where Lord Reid differed from his colleagues in *Van der Lely* was in his open acknowledgement of the difficulty facing the draftsman in anticipating competitors' responses especially in light of deliberate efforts by those competitors to avoid the territory marked out in the claims. What Lord Reid recognised was that drawing a clearly discernible borderline by limiting protection to the literal wording of the patent claim allows third parties to circumvent an expressly claimed feature and still appropriate the material aspects of the invention. It is clear that he had this species of behaviour in mind when he said:

[c]opying an invention by taking its 'pith and marrow' without textual infringement of the patent is an old and familiar abuse which the law has never been powerless to prevent. It may be that in doing so there is some illogicality, but our law has always preferred good sense to strict logic. The illogicality arises in this way. On the one hand the patentee is tied strictly to the invention which he claims and the mode of effecting an improvement which he says is his invention. Logically it would seem to follow that if another person is ingenious enough to effect that improvement by a slightly different method he will not infringe. But it has long been recognised that there 'may be an essence or substance of the invention underlying the mere accident of form; and that invention, like every other invention, may be pirated by a theft in a disguised or mutilated form..' ⁵⁷

More fundamentally, it could be said that the difference lay in where Lord Reid saw the boundary between fair and unfair competition, and in this it is important to note that the focus is on the operation of the market and is not on some notion of a fair reward in light of the patentee's inventive contribution.

The particular significance of the 'purposive construction' of claims, as formulated by Lord Diplock in *Catnic Components v Hill & Smith* nearly 20 years after *Van der Lely*, is that it provided a single integrated test aimed at striking an appropriate balance between the competing interests and a patent-peculiar neutral standpoint from which to apply it. Lord Diplock directed that a patent specification should be given a purposive construction:⁵⁸

The question in each case is: whether persons with practical knowledge and experience of the kind of work in which the invention was intended to be used, would understand that strict compliance with a particular descriptive word or phrase appearing in a claim was intended by the patentee to be an essential requirement of the invention so that any variant would fall outside the monopoly claimed, even though it could have no material effect upon the way the invention worked.⁵⁹

In terms of substance the *Catnic* decision arguably effected little change.⁶⁰ Certainly, and as before, it demanded courts take account of whether a variation had a material effect on the way the invention

⁵⁶[1963] RPC 61 at 80. A consequence of how the majority in *Van der Lely* approached the question of infringement was that in subsequent cases, 'textual infringement' and infringement of the 'pith and marrow' tended to be argued as separate causes of action; an outcome criticised and remedied by Lord Diplock nearly two decades later in *Catnic*, in which he expressed the view that there was no such dichotomy but a single cause of action: [1982] RPC 183 at 242.

⁵⁷[1963] RPC 61 at 75 citing James LJ in *Clark v Adie* (1873) LR 10 Ch 667.

⁵⁸For a more detailed account of this aspect of the *Catnic* decision see D Booton 'How to be bad: the importance of perspective in intellectual property disputes' (2018) *Intellectual Property Quarterly* 279.

⁵⁹[1982] RPC 183 at 243.

⁶⁰As noted in commentary made at the time of the decision, for instance: R Annand 'Infringement of patents – is 'Catnic' the correct approach for determining the scope of a patent monopoly under the Patents Act 1977?' (1992) 21 *Anglo-American Law Review* 39 at 46. Laddie argues that as an example of the contextual approach to construing claims

worked, but it did not lead to an approach that looked only to the ‘essence’ of what was claimed and with this findings of infringement merely because that essence had been made use of by the alleged infringer.⁶¹ Rather, following *Catnic*, the protected invention lay in the what the inventor claimed to be the essential features of the new product or process set out in the patent specification and claims, but only those novel features claimed to be essential constituted the so-called ‘pith and marrow’ of the claim.⁶²

As noted in the introduction, this purposive approach remained the bedrock of claims construction notwithstanding the coming into force of the Patents Act 1977.⁶³ Mostly this was done by application of the three-stage reformulation of the *Catnic* approach following the analysis undertaken by Hoffmann J in *Improver Corp v Remington Consumer Products Ltd*:

If the issue was whether a feature embodied in an alleged infringement which fell outside the primary, literal or acontextual meaning of a descriptive word or phrase in the claim (‘a variant’) was nevertheless within its language as properly interpreted, the court should ask itself the following three questions:

- (1) Does the variant have a material effect upon the way the invention works? If yes, the variant is outside the claim. If no—
- (2) Would this (ie that the variant had no material effect) have been obvious at the date of publication of the patent to a reader skilled in the art. If no, the variant is outside the claim. If yes—
- (3) Would the reader skilled in the art nevertheless have understood from the language of the claim that the patentee intended that strict compliance with the primary meaning was an essential requirement of the invention. If yes, the variant is outside the claim.

On the other hand, a negative answer to the last question would lead to the conclusion that the patentee was intending the word or phrase to have not a literal but a figurative meaning (the figure being a form of synecdoche or metonymy) denoting a class of things which included the variant and the literal meaning, the latter being perhaps the most perfect, best-known or striking example of the class.⁶⁴

The effect of *Catnic*, as explained in *Improver*, was thus as follows:

... Although equivalents and pith and marrow could no longer extend protection outside the wording of the claims, they could be used in restricted circumstances to expand the meaning of the words of the claim. The monopoly was to be restricted to the area mapped out in the claims but, in rare cases, the location of the fence posts on the edge of the map could be adjusted by application of principles of equivalents. In the result, in numerous cases after 1990, patentees in the English courts argued for a broadened scope of protection by applying the *Improver* Questions.⁶⁵

In *Kirin-Amgen*, Lord Hoffmann reiterated the view that the *Catnic* principle of construction was precisely in accordance with the Protocol,⁶⁶ but cast doubt on the universal utility of the Protocol

Catnic represented little more than a restatement of the old law together with the use of the expression ‘purposive construction’: Laddie, above n 42, at 23–24.

⁶¹*Codex Corporation v Racal-Milgo* (1983) RPC 369 at 381–382.

⁶²[1982] RPC 183 at 243.

⁶³Under which infringement ceased to be an issue determined according to common law – a change given added significance because, as noted above, the 1977 Act was enacted to bring the law of the UK into conformity with the corresponding provisions of the EPC.

⁶⁴[1990] FSR 181 at 188–189.

⁶⁵Laddie, above n 42, at 25.

⁶⁶[2004] UKHL 46 at [45]–[48].

questions. But by the time of the litigation between Eli Lilly and Activis, application of the Protocol questions was again being seen as helpful, not least of all because continental courts had by then adopted comparable approaches.⁶⁷ The questions' resurrection was secured, albeit with some exegesis and reformulation, by Lord Neuberger in *Activis* in the context of tackling the question of what makes a variation 'immaterial'.⁶⁸ The significance of this is considered in the final section of this paper.

2. Patents as bargains

In the previous section it was noted that UK courts have long adopted the same approach to the construction of patent claims and to the construction of contracts. Indeed a central plank in the reasoning employed by the Supreme Court in *Activis* was that the interpretation of claims should be subject to the same general principles applied in the interpretation of commercial contracts. There is some value in consistency of approach as an end in itself.⁶⁹ However, the object of this section is to show that there are sound reasons for seeing patents as a species of contract and, as a consequence, for interpreting claims in a way that is consistent with this understanding.

The vast economic literature on patents is in accord that the patent system is justified because the market advantage arising from having exclusive rights in an invention encourages investment in innovation.⁷⁰ The most frequently voiced contemporary argument in favour of patents relies on the 'monopoly-profit-incentive' thesis.⁷¹ This asserts that without intervention of some kind, a market will undersupply inventions because of the failure caused by free-riding. In an unregulated market, potential producers will be deterred from making necessary investments in innovation for fear that they will not be able to appropriate the value of any resulting invention because competitors will free-ride on their investment by taking the benefit of the invention without compensating them for the costs sunk in producing it. There are, however, social costs associated with the patent system. Most obviously, patent protection is an obstacle to competition and so undermines what benefits a free market brings to any industry. These static costs of the patent system are tolerated because they are outweighed by dynamic benefits. The static view sees the patent system primarily as a means by which the patent owner gains a monopoly over a product or process for which there may be no easily obtainable substitute. However, this is offset by the dynamic impact of the patent system on investment in innovation.⁷²

Courts sometimes observe that it is necessary to strike a balance between competing interests and relate this object to their understanding of the economics underpinning patent law. In *Activis*, for instance, Lord Neuberger said of the two questions to be addressed in deciding infringement actions

⁶⁷Note in this respect the comments of Arnold J at first instance in *Activis* [2014] EWHC 1511 (Pat) at [117] and of Lord Neuberger in the Supreme Court: [2017] UKSC 48 at [59].

⁶⁸[2017] UKSC 48 at [56].

⁶⁹As argued for instance by Crawford Jamieson: Jamieson, above n 35, at 150.

⁷⁰See for instance the seminal account in F Machlup *An Economic Review of the Patent System. Study No 15 of The United States Subcommittee on Patent, Trade marks and Copyrights* (Washington DC: US Government Printing Office, 1958) pp 77–78. See also W Landes and R Posner *The Economic Structure of Intellectual Property Law* (Cambridge, Mass: Belknap, 2003) pp 20–21; R Posner *Economic Analysis of Law* (Austin: Wolters Kluwer Law & Business, 7th edn, 2007) p 38; D Guellec and B van Pottelsbergh de la Potterie *The Economics of the European Patent System – IP Policy for Innovation and Competition* (Oxford: Oxford University Press, 2007) p 4; R Epstein and F Kieff 'Questioning the frequency and wisdom of compulsory licensing for pharmaceutical patents' (2011) 78 *University of Chicago Law Review* 71 at 72. There is considerably less accord when it comes to mapping insights about incentives onto legal doctrine: see for example S Maurer 'Ideas into practice: how well does US patent law implement modern innovation theory' (2013) 12 *John Marshall Review of Intellectual Property Law* 643.

⁷¹For a more complete review of contemporary and historical justifications of the patent system see Machlup, above n 70, pp 20–25 and from which the term 'monopoly-profit-incentive' is taken; and M Fisher 'Classical economics and the philosophy of the patent system' (2005) *Intellectual Property Quarterly* 1 at 6–24.

⁷²Wide-ranging empirical studies suggest that the negative impact of patent protection on prices and profits does not outweigh the advantages to the economy as a whole from having access to products dependent on patent protection: C Taylor and Z Silberston *The Economic Impact of the Patent System – A Study of the British Experience* (Cambridge: Cambridge University Press, 1973) p 334.

that that these involved balancing the competing interests of the patentee and of clarity as much as they sought to balance the encouragement of inventions and their disclosure with the need for a competitive market.⁷³ What is not articulated is precisely how the adoption of a contractual approach to the interpretation of patent claims contributes to achieving this balance. Typically when courts refer explicitly to patents as contracts, this refers to a supposed bargain between the state and the inventor under which the disclosure of the invention is understood as the consideration for the grant of the patent.⁷⁴ As a justification in support of the system the notion that patents encourage the disclosure of that which would otherwise be kept secret is independent of the justification based on the monopoly-profit-incentive thesis. It is, however, a very poor free-standing justification for the patent system.⁷⁵

On the other hand, seeing patents as a kind of bargain sits uncomfortably with the rather more credible view outlined above that the patent system spurs innovation by granting inventors monopoly rights in their inventions. As observed by Sedley LJ in *BASF v Smithkline Beecham*:

Because the law has historically been suspicious of monopolies for well-known reasons of public policy, there is no useful analogy between a patent and a deed or a written contract. The latter two will have been drafted for a purpose which, assuming it not to be illegal or contrary to public policy, the law will do what it properly can to uphold. A patent, by publicising an invention, makes it the patentee's sole property for twenty years, so that the patentee's immediate interests are in opposition to those of the rest of the world. It is in society's longer-term interests that, by setting the two things in balance, genuine innovation should be protected and rewarded without stifling further invention.⁷⁶

The remainder of this section is directed to demonstrating that there is another way of understanding patents as bargains, unconnected with the idea that patents are granted in exchange for disclosure, and which accords with the monopoly-profit-incentive thesis.

In his famous paper on the problem of social cost,⁷⁷ Ronald Coase, in addressing behaviours that caused harm to others, departed from the solutions advocated under orthodox welfare economics

⁷³[2015] UKSC 74 at [54]. The terms of the Protocol can similarly be seen as reflecting the same core economic concerns. As recently observed by Lord Sumption, '... claims fall to be interpreted, in accordance with the Protocol on the interpretation of Article 69 EPC, on a basis which "combines a fair protection for the patent proprietor with a reasonable degree of legal certainty for third parties." What is fair or reasonable for these purposes falls to be considered in the light of the central objectives of this area of law'. Those objects, he said, included rewarding and incentivising complex and expensive processes of research and testing: *Warner-Lambert v Generics (t/a Mylan)* [2018] UKSC 56 at [82].

⁷⁴For instance, Lord Hoffmann in *Kirin-Amgen* said, '[a]n invention is a practical product or process, not information about the natural world. That seems to me to accord with the social contract between the state and the inventor which underlies patent law. The state gives the inventor a monopoly in return for an immediate disclosure of all the information necessary to enable performance of the invention': [2004] UKHL 46 at [77].

⁷⁵For instance, in his account of the costs and benefits of the patent system, Fritz Machlup observes that, '... society would lose little or nothing if some inventors tried to guard their secrets, because few producers could succeed in doing so for very long and, moreover, similar ideas are usually developed by several people within a short time, if not simultaneously. The most cogent objection [rests] on a simple reflection: An inventor who, optimistically, thinks he need not fear that others would either find out his secret or come independently upon the same idea, will not go to the expense and trouble of taking a patent; he will disclose only what he fears cannot be kept secret': Machlup, above n 70, p 24 [notes omitted].

⁷⁶[2003] EWCA Civ 872 at [104] cited with approval by Lord Briggs in *Warner-Lambert v Generics (t/a Mylan)* [2018] UKSC 56 at [95]. Also notable are the comments of Lord Upjohn in *Rodi & Wienberger v Henry Showell* who said that, '... it must be remembered that unlike a conveyance or a commercial document which is normally inter partes and must be interpreted, frequently very broadly, so far as possible to give effect to what appears to have been the intentions of the parties; a patent is a grant of a monopoly forbidding others to enter a part of the general commercial territory open to all of Her Majesty's subjects and so in the interests of those subjects that territory must be marked out with reasonable clarity by the claim, construing it fairly in the light of the relevant art': [1968] FSR 100 at 121. Too similar effect see also the comments of Arnold J in *Generics (UK) Ltd (t/a Mylan) v Yeda Research and Development Co Ltd* [2017] EWHC 2629 (Pat) at [138] and those of Lord Kitchin in *Icescape v Ice-World* [2018] EWCA Civ 2219 at [60].

⁷⁷Coase, above n 18.

directed to internalising externalised costs.⁷⁸ Coase instead saw such behaviours in terms of a conflict in a demand for the use of resources. Coase's insight was in understanding that irrespective of any initial set of legal entitlements and duties, providing that the transaction costs involved in arriving at an agreement were low, then an appropriate economic solution would be reached through bargaining between the affected parties. Put simply, an efficient allocation of resources between parties would result from private bargaining provided that bargaining was not impeded.

The normative implication that follows from this so-called Coase theorem is that where transaction costs are so high as to inhibit bargaining, then the law should be formulated with the aim of reducing those costs. But if this is not possible then the law should aim to create a set of rights and duties that the affected parties hypothetically would have agreed to if bargaining had been possible. The patent system can be understood as formulated to serve this latter object.

A starting point in understanding why this is so is the observation that infringement of a patent is a statutory tort and the Coasean perspective on tortious liability is that it serves as a substitute for explicit contracting in those circumstances where private bargaining is costly.⁷⁹ Anthony Ogus illustrates the relationship by considering the legal rules that determine the level of care which one individual must exercise towards another. He notes that in situations where the parties already have some relationship, for example, that of employer and employee, it will be relatively easy to make the determination of care by explicit contract. But such contractual arrangements are not realistically possible especially where the parties have no pre-existing relationship before the event that caused the loss or harm. Where this is so, the task for the law is then to prescribe by means of tort law the level of care which the parties presumptively would have agreed if they had been able to make the relevant bargain.⁸⁰

If we are to apply the same kind of reasoning to the patent system, then the first necessary adjustment requires substitution of the allocation of a liability based on a hypothetically agreed duty to take care with the allocation of a privilege based on an agreed hypothetical acceptance of a burden of risk. To illustrate, consider for instance two firms competing in the marketplace with similar capacities such that each is able to maintain a competitive position vis-à-vis the other. Both firms invest in innovation to improve their competitive position. In making individual investment decisions, each firm will take account of the following:

The costs of any particular research project up to the point when a potentially useful invention results together with the costs of incorporating that invention into a marketable product and bringing it to market (X).

The overall income generated by marketing the product incorporating the invention (taking account of manufacturing costs). This will be a function of consumer demand over time (Y).

The probability of arriving at a useful invention (P).⁸¹

For either firm, a research project will only be initiated if $P(Y - X)$ is positive. Since the firms have similar (though precisely different) capacities, then for any given project, whether $P(Y - X)$ is positive

⁷⁸So far as property is concerned, Harold Demsetz famously developed a theory based around the argument that property rights arise when it becomes economic for those affected by externalities to internalise benefits and costs: H Demsetz 'Toward a theory of property rights' (1967) 57 *The American Economic Review*, Papers and Proceedings of the Seventy-ninth Annual Meeting of the American Economic Association 347. Patents can be understood in similar terms: a property right in an invention enables inventors to internalise at least part of the social benefit arising from their invention as monopoly profits.

⁷⁹A Ogus *Costs and Cautionary Tales: Economic Insights for the Law* (Oxford: Hart Publishing, 2006) pp 74–76 and 86.

⁸⁰*Ibid*, p 74. He goes on to note that as between individuals in similar circumstances, say two car drivers, it might be relatively easy to reach a solution, because presumably the hypothetical agreed duty would be a mutual level of care, hence reasonable care as prescribed by the law of negligence.

⁸¹Of course this paints a rather simplified picture and each of these factors could be dissected to identify meaningful sub-factors. Whilst no doubt there are arguments which would benefit from a more nuanced analysis, this level of detail is sufficient to illustrate how bargaining between the parties leads to an efficient allocation of the burden of risk.

or negative is likely to be the same for both. Note, however, that just because $P(Y - X)$ is positive this does not guarantee an invention will be arrived at (assuming P is always less than 1) and still less that any profit will be generated from that invention.

Because their precise capacities differ, we might expect each firm to vary in respect of any or all of X , Y and P such that, for a particular project, $P(Y - X)$ will be greater for one compared to the other. This will reflect, for that particular project and that particular firm, a higher probability of success, and/or lower costs, and/or a higher capacity for generating income.

In the entirely hypothetical situation of low transaction costs and perfect information (that is to say accurate knowledge of P , Y and X for themselves and the other party) then as rational economic entities the firms would bargain so as to allocate between themselves the costs and the benefits of the research project in light of the risk of failure. If, for example, that for firm A, $P_A(Y_A - X_A) = 50$ whilst for firm B, $P_B(Y_B - X_B) = 100$ an agreement would be entered into under which firm B would agree to bear the risk of undertaking the research project in return for some form of valuable consideration from firm A.⁸²

The uncertainty of success underpins firm B's incentive to enter into such an agreement; an effect amplified by likelihood that the investments made in the project will be irreversible.⁸³ For Firm B then, entering into the agreement reduces the costs of possible failure.⁸⁴ The incentive for firm A is in the possibility of access to any arising invention (and with this the benefits flowing from that) at a lower cost than if firm A attempted the project itself. In essence, then, firm A is outsourcing.⁸⁵

Since the incentive for firm A is in gaining access to any arising invention, then the agreement would necessarily include the condition that Firm B disclose any arising invention to Firm A. But the obligation to disclose is not Firm B's sole consideration and indeed is contingent on Firm B's primary obligation which is to bear the risk of undertaking the research project. This is an important difference between this view of the patent bargain and the one traditionally advanced.

In reality such bargains are not possible for a number of reasons. In the first place it is extremely difficult to attach values to the variables P , X and Y even within a firm. Whether a particular research and development project succeeds depends on an 'inextricable tangle of objective uncertainties'.⁸⁶ Of course firms will try to evaluate the cost effectiveness of any proposed project⁸⁷ but at the point where early investment decisions are made nearly all the variables that feed into a decision to invest in a

⁸²What form this consideration might take is considered below.

⁸³Typically the costs of a research project cannot be recouped if a project fails because the assets utilised tend to be 'idiosyncratic' and cannot be redeployed without sacrifice of productive value. This is because a large proportion of R&D supports the salaries of research personnel: D Czarnitzki and A Toole 'Patent protection, market uncertainty, and R&D investment' (2006) ZEW – Centre for European Economic Research Discussion Paper No 06-056, available at <http://ssrn.com/abstract=925621> (last accessed 30 July 2020) p 1; and R Goel and R Ram 'Irreversibility of R&D investment and the adverse effect of uncertainty: evidence from the OECD countries' (2001) 71 *Economic Letters* 287 at 288.

⁸⁴There is empirical evidence that supports that course of action being seen as rational by Firm B. Generally firms have a tendency to seek safeguards or 'buffers' against uncertainty: R Langlois 'The vanishing hand: the changing dynamics of industrial capitalism' (2003) 12 *Industrial and Corporate Change* 351 at 354–355. Furthermore, empirical studies have also shown that most large firm executives are risk adverse, see for example: K MacCrimmon et al *Taking Risks: The Management of Uncertainty* (New York: The Free Press, 1986) p 260.

⁸⁵Outsourcing generally is a way for organisations to reduce costs and investment whilst focusing on what they do well: S Doig et al 'Has outsourcing gone too far?' (2001) 4 *The McKinsey Quarterly* 25. Of course the other side of this is that it allows organisations to avoid that which they don't do well. A key driver of any firm's decision to use markets to acquire a resource (a decision 'to buy') versus a decision to acquire that resource internally (a decision 'to make') is the set-up and transaction costs of making compared to buying: R Coase 'The nature of the firm' (1937) 4 *Economica* 386.

⁸⁶K Arrow 'Economic welfare and the allocation of resources for invention' in *The Rate and Direction of Inventive Activity: Economic and Social Factors. A Report of the National Bureau of Economic Research* (Princeton: Princeton University Press, 1962) p 613. Note also that 'the outcome of any research project is necessarily uncertain and the most important results are likely to come from projects whose degree of uncertainty to begin with was greatest': K Arrow *Essays in the Theory of Risk-Bearing* (Amsterdam: North-Holland Publishing Co, 1974) p 138.

⁸⁷E Mansfield and S Wagner 'Organisational and strategic factors associated with probabilities of success in industrial R&D' (1975) 48(2) *The Journal of Business* 179 at 190.

particular research project will be uncertain. The costs that will be necessary to arrive at a desirable outcome cannot be known with certainty until they are actually incurred and these will be borne long before any revenue is realised. At that stage, the likelihood that a particular research project will be successful in the sense of producing something useful also cannot be known with certainty. And assuming that the project is successful, the revenue-generating value of any product coming out of the project will only become clear once that product is commercialised.⁸⁸ In short, substantial uncertainty surrounds the entire process and output can never be predicted with much accuracy from the inputs.⁸⁹

Under this imagined arrangement, neither of the firms' interests are in opposition to the other: both anticipate benefiting under the arrangement. But although both parties anticipate profiting, third party free-riders risk undermining this.⁹⁰ Without the ability to exclude others, neither firm will be able to profit if the project succeeds and no degree of risk will be considered worth bearing.⁹¹ On the face of it, this impediment catastrophically undermines the notion that the patent system serves as a substitute for explicit bargaining between private individuals. Only the state is in a position to accord a legally enforceable monopoly right in an invention exercisable against the whole world. It would seem to follow that if we are to think in terms of bargains, then the state must occupy the position of Firm A since only the state can offer Firm B valuable consideration in the form of a monopoly right in return for Firm B's undertaking to invest in research. This reasoning returns us to the commonplace understanding under traditional welfare economics that a patent is a state-granted monopoly granted to a private individual so allowing that individual to internalise what would otherwise be positive externalities arising from their investments in innovation.

There is, however, an alternative way of thinking about the problem of third party free-riders which accords with Coasean economics. This involves a more detailed analysis of the parties to the hypothetical bargain. Both firms are active economic entities with a capacity to undertake research and development and which are capable of profiting from that activity by utilising any invention that arises. For a particular set of values of P, X and Y, Firm A cannot match Firm B's efficiency in R&D, and so opts to buy this service rather than undertake it in-house. For different values of P, X, and Y then the respective commitments might be reversed. Up to this point it has been convenient to imagine these firms as close competitors where the differential is slight and differences in their respective capabilities subtle. But there is no reason why Firm A should be understood to be in direct competition with Firm B. Indeed, as noted above, in the hypothetical agreement Firm A is engaged in outsourcing. In circumstances where the two firms operate in different markets, barriers to market entry will have a significant effect on all of the values of P_A , X_A and Y_A . But this is just a matter of degree and from Firm A's perspective this just makes the case for outsourcing more compelling.

If Firm A is understood to be any and all firms no matter how remote their normal market is from that of Firm B, then the problem of third party free-riders disappears: there are no third parties whose interests differ in anything other than degree from those of either Firm A or B such that they cannot be conceived of as parties to the hypothetical agreement. The position is similar to the Coasean perspective on the rules in tort that determine the level of care that car drivers owe to each other. Under this view, contractual arrangements as between all car drivers are not realistically possible and tort law thus prescribes the level of care which the parties presumptively would have agreed if they had been able to make the relevant contract. Despite any number of differences between drivers that in other contexts might matter, they are united by shared use of public roads and when driving they are in

⁸⁸M Kamien and N Schwartz 'Market structure and innovation: a survey' (1975) 13 *Journal of Economic Literature* 1 at 2; and R Blair and T Cotter *Intellectual Property. Economics and Legal Dimensions of Rights and Remedies* (Cambridge: Cambridge University Press, 2005) pp 42–44.

⁸⁹Arrow (1962), above n 86, p 616.

⁹⁰This is essentially the same as the problem of the communal ownership of land noted by Harold Demsetz: H Demsetz 'Toward a theory of property rights' (1967) 57 *The American Economic Review*, Papers and Proceedings of the Seventy-ninth Annual Meeting of the American Economic Association 347 at 354–355.

⁹¹Unless, of course, the parties can keep the invention secret which will be rare (see above).

similar circumstances. Thus the hypothetical agreed duty can be assumed to be a mutual level of care.⁹² So it is that although there are manifest differences between all firms operating in the market, they have in common that investment decisions, including those relating to research and development, require them to consider whether to ‘make or buy’.

If Firm A is understood to be any and all firms no matter how remote their normal market is from that of Firm B, a further impediment to bargaining, in addition to the unknowable values of P, X and Y, is the costs associated with entering into a finite but nevertheless very large number of agreements. For the same reason that it is not practically feasible for all car drivers to enter into contractual arrangements with all others prescribing the levels of care owed, so too is it not possible for firms operating in the market actually to arrive at an agreement that allocates the costs and the benefits of innovation.⁹³

Generally it is desirable for any firm entering into an outsourcing agreement to specify what is within the agreement and to accurately define levels of service.⁹⁴ Earlier in this section I noted that Firm B’s primary obligation under the hypothetical agreement is to bear the risk of undertaking research. A problem facing Firm A is knowing if Firm B has fulfilled its obligations: a problem that becomes acute if the two firms normally operate in different markets and have different capabilities. Motivated by a desire to increase the prospect of a reward under the bargain, Firm B might for instance prefer to invest in merely incremental innovation because the outcome is more predictable. Firm A can avoid this by including within the bargain determinable measures of risk. For instance, a demand that what is arrived at make some advance over the state of the art would prevent Firm B from claiming success where its ‘innovation’ involved no more than clever marketing efforts that dressed up an existing product or process as something new.⁹⁵ Firm B could be pushed into a higher degree of risk-taking by a requiring that the arrived at outcome not be an obvious development over the prior art.⁹⁶ In many respects then the hypothetical agreement for which the patent system acts as a substitute can be seen as relating to the provision of a service (in effect research and development). The utility of the outcome of the research effort is guaranteed by the requirement that anything arrived at be of some use in industry. But because the patent system must serve as a substitute for multiple hypothetical agreements spanning many technologies, the measure of success can be no more specific than demanding that which is arrived at is new, involves an inventive step and is capable of industrial application.⁹⁷ In this respect the patent system can be seen as operating in much in the same way as, for instance, the tort of negligence, which supports claims to any number of unspecified harms providing only that these are foreseeable consequences of the tortfeasance.

In return for Firm B’s obligation under the hypothetical agreement to bear the risk of undertaking research, the consideration provided by Firm A could take one of three forms, the relative value of each turning on the values of P, X and Y:

- 1 Firm A may agree itself not to exploit any arising invention for an agreed period. This option will be especially attractive to A if ‘P’ is low and to B if ‘Y’ is high.
- 2 Firm A may agree to pay all or some of the costs for firm B to undertake the project with then an agreement for A to share the benefits of any arising invention. This will be especially attractive to A if ‘P’ is high and to B if ‘X’ is high).

⁹²Hence reasonable care as prescribed by the law of negligence: Ogus, above n 79, p 74.

⁹³As a brief aside, it perhaps worth noting that the notion that the patent system serves a substitute for agreements between economically active entities explains why liability for infringement is limited to commercial activities: Patents Act 1977, s 60 (5)(a).

⁹⁴Although it is common for this not to be the case: V Narayanan and A Raman ‘Aligning incentives for supply chain efficiency’ (2009) (May) Harvard Business Review 94.

⁹⁵Hence the condition that a patent may be granted only for an invention which is new: Patents Act 1977, s 1(1)(a).

⁹⁶Hence the condition that a patent may be granted only for an invention which involves an inventive step: Patents Act 1977, s 1(1)(b).

⁹⁷The conditions demanded of an invention if it is to be patentable: Patents Act 1977, s 1(1); EPC, Art 52.

- 3 Or Firm A may promise to pay Firm B a set fee on the successful completion of the project. This will be especially attractive to A if ‘P’ is low and to B if ‘Y’ is low).

There is no need here to engage in a detailed evaluation of these forms. It is enough to note that if the substitute for explicit bargaining adopted the first form of consideration, the substitute would look something like the patent system. If the substitute adopted however the second form, it would look rather like a system of subsidies, whilst adoption of the third would produce a substitute in the form of a system of prizes. That ex ante typically the values of P, X and Y are in reality uncertain goes some way to explain not only why all three means of encouraging inventive activity exist contemporaneously but also why there are vigorous arguments as to which is to be preferred.

Of course ex ante, the specific content of the claims cannot be specified: specific claims can only be drafted ex post assuming Firm B’s efforts result in an invention. However, that doesn’t mean to say that there can be no ex ante agreement as to how to approach the interpretation of the claims – that is to say a shared intention as to their effect. An ex ante bargain that adopts form 1 sees the intended role of the claims as defining the scope of the obligations of Firm A under the agreement. This understanding corresponds to the approach to the interpretation of claims adopted by UK courts prior to *Actavis*. For instance, Lord Hoffmann’s account of the ‘purposive’ approach to the reading of patent claims in *Kirin-Amgen* is based on an imagined dialogue:

Construction, whether of a patent or any other document, is of course not directly concerned with what the author meant to say. There is no window into the mind of the patentee or the author of any other document. Construction is objective in the sense that it is concerned with what a reasonable person to whom the utterance was addressed would have understood the author to be using the words to mean. Notice, however, that it is not, as is sometimes said, ‘the meaning of the words the author used’, but rather what the notional addressee would have understood the author to mean by using those words.⁹⁸

The following section evaluates the Supreme Court’s decision in *Actavis* in light of the understanding that the patent system serves as a substitute for a hypothetical bargain between economically active entities under which a duty is accepted by one party in return for acceptance of a burden of risk by the other.

3. Interpretation, implication and equivalents

As noted earlier in this paper, Lord Neuberger has repeatedly said that the principles applicable to the interpretation of patent claims are common to those applicable to the interpretation of contracts. However, in *Actavis* he said that those principles applied only to the question of whether an alleged infringer’s variant falls within the scope of any of the claims as a matter of ‘normal interpretation’. Lord Neuberger was of the view that normal interpretation, so understood, was capable of capturing only certain kinds of equivalents.

While normal principles of interpretation could, I think, accommodate the notion that ‘vertically’ extended to an item which was not at precisely 90° to another item, I do not see how such principles could possibly lead to the conclusion that a slotted rubber rod was within the expression ‘helical metal spring’. As Hoffmann J said in *Improver...*, ‘the angle of the support member [in the allegedly infringing product in *Catnic...*] can be regarded as an approximation to the vertical’, but ‘[t]he rubber rod is not an approximation to a helical spring’.⁹⁹

⁹⁸*Kirin-Amgen* [2004] UKHL 46 at [32].

⁹⁹[2015] UKSC 74 at [55].

But in Lord Neuberger's view, an equivalent lying outside the scope of the claims interpreted 'normally' may nevertheless infringe because it varies from the claimed invention immaterially. This requires not merely identifying what the words of the claim would mean in their context to a notional addressee but also a consideration of the extent to which the scope of protection should extend beyond that meaning.¹⁰⁰ On the face of it this second question is of a different character from the first. If, as argued above, Coasean economics supports the purposive approach to claims construction as understood and applied by Lord Hoffmann in *Kirin-Amgen*, the question following *Actavis* is whether Lord Neuberger's distinction between interpreting a claim and the extent of the protection afforded by a claim undermines this foundation. In particular, the issue is whether Lord Neuberger's second question, as much as the first, can be understood and so justified as giving effect to the presumed intentions of the parties to the hypothetical agreement, or is it that in the case of a patent the words alone, 'properly interpreted', mark the limits of what the parties can be said to have intended the effect of the claims to be.

In other legal contexts, courts do not confine themselves only to 'normal interpretation' in divining the presumed intention behind a document. Notably, there are manifest parallels between the two-stage approach to the construction of patent claims adopted in *Actavis* and how courts see the relationship between interpretation and implication. As explained by Lord Hodge:

Whether words are to be implied into a document depends on the interpretation of the words which the author or authors have used. The first question therefore is how to interpret the express words...

Interpretation is not the same as the implication of terms. Interpretation of the words of a document is the precursor of implication. It forms the context in which the law may have to imply terms into a document, where the court concludes from its interpretation of the words used in the document that it must have been intended that the document would have a certain effect, although the words to give it that effect are absent.¹⁰¹

As Lord Hodge makes clear, although the stages of interpretation and implication are distinct, they nevertheless both aim at arriving at the intended object of the document. So far as contracts are concerned, it has long been recognised that courts will imply terms where this is necessary to give effect to the presumed intentions of the parties. Frequently cited in this respect are Bowen LJ's observations in *The Moorcock*:

Now, an implied warranty..., as distinguished from an express contract or express warranty, really is in all cases founded on the presumed intention of the parties, and upon reason. The implication which the law draws from what must obviously have been the intention of the parties, the law draws with the object of giving efficacy to the transaction and preventing such a failure of consideration as cannot have been within the contemplation of either side; and I believe if one were to take all the cases, and they are many, of implied warranties or covenants in law, it will be found that in all of them the law is raising an implication from the presumed intention of the parties with the object of giving to the transaction such efficacy as both parties must have intended that at all events it should have.¹⁰²

¹⁰⁰Ibid, at [56].

¹⁰¹*Trump International Golf Club Scotland v The Scottish Ministers (Scotland)* [2015] UKSC 74 at [33]–[35]. Lord Hodge was speaking specifically in relation to the interpretation of a consent to build a wind farm granted under the Electricity Act 1989, s 36, but makes clear earlier in his judgment that he understands these to be general rules on the interpretation of documents: *ibid* at [33].

¹⁰²*The Moorcock*, (1889) 14 PD 64 at 68. Bowen LJ's observations were described by Lord Neuberger as one of three classic statements as to the requirements which have to be satisfied before a term can be implied into a detailed commercial contract: *Marks & Spencer v BNP Paribas Securities Services Trust* [2015] UKSC 72 at [16].

The initial point to draw from the way courts approach the implication of terms is that the hypothesis that patent law is best understood as a substitute for an explicit bargain does not of itself demand that claim scope be limited by the ‘normal interpretation’ afforded to the express words used in a claim. Beyond that, it is worth highlighting some of the similarities between the approach to the implication of contractual terms and the approach to the construction of patent claims advocated by Lord Neuberger in *Actavis*. A term will be implied in circumstances where a court finds that on a contract’s proper construction, the parties must have intended to include that term and this task is undertaken in the light of the express terms, commercial common sense, and the facts known to both parties at the time the contract was made.¹⁰³ The proper construction of patent claims takes account of essentially the same set of concerns, albeit using the more structured application of the ‘Protocol questions’.¹⁰⁴ Thus, the third Protocol question takes account of the express wording of the claims whilst the facts known to the parties is accounted for in the first question. The application of ‘commercial common sense’ is more contextualised in claims’ construction finding expression in the second protocol question’s enquiry into what the person skilled in the relevant art would find obvious, and in that person’s understanding of the patentee’s choice of words contained in the third question.

The adoption of the objective viewpoint of the person skilled in the relevant art does not undermine the argument that the construction of patent claims has in common with the implication of contractual terms a search for presumed intention. In the first place, what is suggested above is that the law substitutes for a hypothetical agreement and the person skilled in the relevant art is a convenient occasional proxy for one or other party. Furthermore, in the case of actual agreements, the process of implication, though said to be a search for presumed intention, does not depend on establishing the actual intention of the parties. Rather, courts approach the exercise from the perspective of notional reasonable people in the position of the parties at the time at which they were contracting.¹⁰⁵ The similarities between this perspective and that of the person skilled in the relevant art in construing claims becomes clearer in the alternative formulation of how implication is to proceed articulated by Lord Neuberger in *Marks & Spencer v BNP Paribas Securities Services Trust*:

... the notion that a term will be implied if a reasonable reader of the contract, knowing all its provisions and the surrounding circumstances, would understand it to be implied is quite acceptable, provided that (i) the reasonable reader is treated as reading the contract at the time it was made and (ii) he would consider the term to be so obvious as to go without saying or to be necessary for business efficacy. (The difference between what the reasonable reader would understand and what the parties, acting reasonably, would agree, appears to me to be a notional distinction without a practical difference.)¹⁰⁶

To take the specific example of claims construction that troubled Lord Neuberger in *Actavis*, the question then is not whether the a slotted rubber rod falls within the expression ‘helical metal spring’ as a matter of interpretation, but rather whether the parties to the hypothetical contract that lay at the heart of the *Improver* litigation, acting reasonably and knowing its provisions and the surrounding circumstances, can be presumed to have intended that ‘a slotted rubber rod’ was to be within the scope of the claim to a ‘helical metal spring’. Since we are construing a patent, the Protocol questions are deployed in order to answer to this question. The construction of the claims at the centre of the *Catnic* litigation can be thought of in the same way. Although Lord Neuberger was prepared to concede that normal

¹⁰³*Marks & Spencer plc v BNP Paribas Securities Services Trust* [2015] UKSC 72 at [15], citing in partial support *Geys v Société Générale* [2013] 1 AC 523 at [55].

¹⁰⁴As reformulated by Lord Neuberger in *Actavis* [2017] UKSC 48 at [56].

¹⁰⁵*Marks & Spencer plc v BNP Paribas Securities Services Trust* [2015] UKSC 72 at [21], citing in support *Equitable Life Assurance Society v Hyman* [2002] 1 AC 408 at 459. That the enquiry is a search for presumed rather than actual intention is justifiable as a means of reducing transaction costs. This argument is explained and developed below.

¹⁰⁶[2015] UKSC 72 at [23], commenting on the earlier Privy Council decision in *Attorney General of Belize v Belize Telecom* [2009] UKPC 10.

principles of interpretation could accommodate the notion that ‘vertically’ extended to an item which was not at precisely 90° to the horizontal, accommodation of that variant could also be achieved by implying the word ‘substantially’ into the relevant claim on the basis of presumed intention.¹⁰⁷

Because implied terms operate as ad hoc gap fillers,¹⁰⁸ there must be some gap to fill. So when it comes to considering the centrally relevant words to be interpreted, the less clear they are (or the worse their drafting), the more ready a court will be to depart from their natural meaning. Conversely, the clearer the natural meaning the more difficult it is to justify departing from it.¹⁰⁹ In contract law then, express terms are taken to be primary indicators of presumed intention. Extending the same reasoning to patent claims would lead to the conclusion that greater precision makes it harder for courts to construe a claim as embracing a variant that falls outside the wording of the claim.¹¹⁰

It is in this respect that the approach to claim construction advocated by the Supreme Court’s in *Actavis* ceases to parallel the approach taken to the construction of contracts and with this risks undermining a justification of the approach grounded in Coasean economics. It is also in this respect that the decision in *Actavis* departs most significantly from the approach to claims construction previously advocated by UK Courts, both pre- and post *Catnic*.

The claim in issue, owned by Eli Lilly, was to the use of pemetrexed disodium in the manufacture of a medicament for use in combination with vitamin B12 for the treatment of cancer. The defendants, Actavis, produced products also for use in the treatment for cancer consisting of either a different pemetrexed salt, or pemetrexed diacid, in combination with vitamin B12. Actavis argued that their products did not infringe because the claims of the patent were limited to the specific salt: pemetrexed disodium.

The Court of Appeal considered that the notional addressee on reading the specification would appreciate that the patentee has chosen to claim narrowly and by reference to a single chemical, and not broadly by reference to any class. Floyd LJ observed that pemetrexed disodium was a highly specific chemical compound and that, ‘there is no obvious leeway as a matter of language for giving it a broad as opposed to a narrow construction’.¹¹¹

Lord Neuberger in the Supreme Court was of the view that this approach placed too much weight on the words of the claim, adding that this demonstrated:

... the risk of treating the issue raised by the third question as being one of normal interpretation. (Another way of looking at the point is, in the language of Sir Hugh Laddie, that it involves wrongly conflating the issue of interpretation with the issue of scope of protection.) As already explained, if it was a decisive point it would make a nonsense of asking the three questions: if one cannot depart from the language of the claim when considering those questions, what is the point of the questions in the first place?¹¹²

On the face of it, this willingness to depart from the specific language of a narrowly drawn claim is inconsistent with a search for the presumed intentions of the parties to the hypothetical bargain for which patent law serves as a substitute. A preliminary conclusion then might be that the approach to claims construction advocated by Lord Hoffmann in *Kirin-Amgen* is to be preferred over the formulation adopted by Lord Neuberger in *Actavis*.

¹⁰⁷In the contract context it is not unusual for the same result to be arrived at by way of a correction by interpretation or by implication. See for example the comments of Lord Carnwath in *Arnold v Britton* [2015] UKSC 36 at [115].

¹⁰⁸As put by Lord Steyn in *Equitable Life Assurance Society v Hyman* [2002] 1 AC 408 at 459.

¹⁰⁹*Arnold v Britton* [2015] UKSC 36 at [18].

¹¹⁰This then explains the view of the majority in *Van der Lely* [1963] RPC 61 considered above.

¹¹¹[2015] EWCACiv 555 at [72]. Arnold J at first instance employed similar reasoning: [2014] EWHC 1511 (Pat) at [131], [132], [145] and [149].

¹¹²[2017] UKSC 48 at [71]. Lord Neuberger observed that in this, the Court of Appeal and Arnold J at first instance were following the guidance given by Lord Hoffmann in *Kirin-Amgen*: *ibid*.

However, there are good reasons to doubt that the same intention can be presumed from narrowness and specificity as a feature of the terms of a contract and from the same characteristic of patent claims. The assumptions underpinning the implication of terms in contracts is that specificity is costly. It is this understanding that informs how far, in any individual case, ‘textualism’ is privileged over ‘contextualism’ in ascertaining the meaning of the language which the parties have chosen to express their agreement.¹¹³ Put another way, courts assume that a contract will be incomplete if, at the time it was made, the transaction costs to the parties of explicitly contracting for a particular contingency were seen as greater than the benefits. Typically this will be the case if the parties thought the probability of the contingency occurring was low.¹¹⁴ The way courts approach the implication of terms thus aims to minimise the costs of contracting. In default, courts will imply terms that notional reasonable people in the position of the parties at the time at which they were contracting would have agreed to. The parties thus do not have to bear the costs of explicitly addressing remote contingencies. But it follows from this that if the parties do bear the costs of specifying what is to happen in a particular circumstance, then they must have intended that outcome even if a reasonable person in the same position would have thought otherwise.

Patent claims differ from contractual terms in that generally narrow and specific claims that cover only one particular embodiment of the invention involve lower drafting costs than claims of wider scope that attempt to capture a range of variants. A patent specification does two things – its purpose is to both to describe and to demarcate an invention.¹¹⁵ The first of these is fundamental, and the closer these two objects the lower are the costs of drafting. As explained above, any bargain under which a privilege is allocated in return for acceptance of the burden of risk associated with innovation will include the essential condition that any arising invention be disclosed. In patent law this fundamental condition finds expression in the requirement that the specification must describe the claimed invention clearly and completely if a patent is to be granted.¹¹⁶

The costs of so describing an invention are thus inescapable. The costs of demarcation are not but they can be reduced by piggy-backing on a description of the specific embodiment that the patentee has reduced to practice. Until recently the easiest way this could be done was by way of an ‘omnibus claim’ in the form, ‘what is claimed is “X” substantially as described herein with reference to any accompanying drawings’ or some formula to similar effect. This was a claim form that was typically understood to be limited to the specific embodiments described and depicted.¹¹⁷ Prior to the use of such claims being restricted under the UK Patents Rules,¹¹⁸ such claims were considered useful for achieving a quick grant and/or where the anticipated benefits from grant required only a narrow scope of protection.¹¹⁹ They were also often routinely included in specifications as a guard against all other claims being found bad.¹²⁰ The key point to understand is that the benefits obtained from such claims were gained at a very low drafting cost.

¹¹³See the account of Lord Hodges in *Wood v Capita* [2017] UKSC 24 at [13], considered above.

¹¹⁴Rational parties will weigh costs against benefits of explicitly addressing a particular contingency in the contract. If they believe the contingency unlikely to occur or otherwise its effects likely to be small then the contract may be insensitive to that contingency. For a more detailed analysis see: I Ayres and R Gertner ‘Filling gaps in incomplete contracts: an economic theory of default rules’ (1989) 99 *Yale Law Journal* 87 at 92–93.

¹¹⁵As observed by Lord Hoffmann in *Kirin-Amgen* [2004] UKHL 46 at [33].

¹¹⁶Patents Act 1977, s 14(3). Furthermore, a patent may be revoked if the specification fails to disclose the invention clearly enough and completely enough for it to be performed by a person skilled in the art: Patents Act 1977, s 72(1)(c).

¹¹⁷See for examples *Raleigh Cycle v Miller* (1948) 65 RPC 141 and *Surface Silos v DCS Beal* [1960] RPC 154.

¹¹⁸As a result of the Patents (Amendment) (No 2) Rules 2016, it is not possible to include omnibus claims in UK patent applications unless this is the only way to define the technical features of the invention clearly and concisely. The problem addressed by this amendment is that the scope of protection of omnibus claims is often unclear since the description typically includes both inventive and non-inventive elements.

¹¹⁹For example in order to obtain certain tax exemptions. Since 2013, in the UK a lower rate of corporation tax has been applicable to profits earned from patented inventions.

¹²⁰See the discussion of Lord Morton in *Raleigh Cycle v Miller* (1948) 65 RPC 141 at 158–159. Immediately prior to the change to the Patents Rules that restricted their use, 35% of UK patent applications included such omnibus claims: Impact

In the majority of cases a patentee will seek to maximise the scope of protection by claiming beyond the specific product they have made or specific process they have implemented. For instance, if the invention is a new product which has a beneficial effect, a patentee seeking to maximise the scope of protection will set out to demonstrate that there is a common principle by which that effect will be shared by other products of the same class.¹²¹ To do so goes beyond the costs of providing a description that would allow the skilled addressee to arrive at an effective product. The inescapable and minimum costs are in describing a single embodiment that can, ‘deliver the goods’ but there are greater costs involved in drafting claims that cover other ways in which they might be delivered.¹²² In *Van der Lely*, Lord Reid tangentially acknowledged these costs in his observation that if the patentee had foreseen the possibility of avoiding infringement by the substitution of a mechanical equivalent, he would have made his claim cover it.¹²³ However, to do so would have been more costly than simply claiming the specific arrangement of wheels actually adopted in the patentee’s hay-rake. As Lord Reid indicates, narrow and specific claims do not necessarily evidence intended scope and to this extent, patent claims should be treated differently from contractual terms.

Although narrow and specific claims do not necessarily evidence intended scope, there are circumstances where claims are deliberately so drafted with the intention of narrowing the scope of protection. Commonly this will be done so as to avoid some piece of prior art and so meet an actual or potential objection that the claimed invention either lacks novelty or is an obvious development in light of the prior art. There will thus be circumstances where the presumed and actual intention do not coincide.

The Supreme Court’s decision in *Actavis* has done little to change the reluctance of UK courts to consider and act on extrinsic evidence of actual intention as to claim scope. In particular courts have discouraged, without prohibiting, the use of the patent office file (the ‘prosecution history’ of the patent) in aid of construction.¹²⁴ In *Actavis* Lord Neuberger accepted the established position as apt and added that:

... reference to the file would only be appropriate where (i) the point at issue is truly unclear if one confines oneself to the specification and claims of the patent, and the contents of the file unambiguously resolve the point, or (ii) it would be contrary to the public interest for the contents of the file to be ignored. The first type of circumstance is, I hope, self-explanatory; the second would be exemplified by a case where the patentee had made it clear to the [patent office] that he was not seeking to contend that his patent, if granted, would extend its scope to the sort of variant which he now claims infringes.¹²⁵

The scepticism displayed in relation to extrinsic evidence is consistent with the understanding that patents are sophisticated and complex documents and like other forms of commercial agreement, textual analysis is the principal tool used in their interpretation.¹²⁶ However, the factual matrix is not entirely irrelevant and whilst of less significance in interpreting such documents, courts have acknowledged that it can occasionally provide assistance. In particular, courts have acknowledged that the negotiators of complex formal contracts may not achieve a logical and coherent text and the factual matrix may be helpful in interpreting unclear provisions.¹²⁷ So far as patents are concerned, courts

Assessment: changes to the Patents Rules 21/07/2016, available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/541239/Impact-Assessment-system-changes-to-the-Patents-Rules.pdf (last accessed 30 July 2020). On them being a common feature of UK practice see also the EPO Technical Board of Appeal decision: T 0150/82 (*Claim Categories*) reason 11.

¹²¹For a fuller discussion see *Biogen v Medeva* [1997] RPC 1 at 47–49.

¹²²Borrowing the language used by Lord Hoffmann in *Biogen v Medeva* [1997] RPC 1 at 50.

¹²³[1963] RPC 61 at 76 and considered above.

¹²⁴See for instance the comments of Lord Hoffmann in *Kirin-Amgen* [2004] UKHL 46 at [35].

¹²⁵[2017] UKSC 48, [88] and applied in *Icescape v Ice-World* [2018] EWCA Civ 2219 at [76]–[79].

¹²⁶See *Wood v Capita* [2017] UKSC 24, considered above.

¹²⁷*Wood v Capita* [2017] UKSC 24 at [13].

have similarly acknowledged that whilst access to the patent office file will typically be of limited assistance, it will sometimes be useful.¹²⁸ The specific circumstances identified by Lord Neuberger where this would be so are consistent with the notion that the patent system serves as a substitute for a hypothetical bargain under which a duty is accepted by one party in return for acceptance of a burden of risk by the other. As explained above, under this understanding, the claims set out the scope of the duty owed by the outsourcing party. As with contractual terms, if the claims are unclear then it is appropriate to look to the factual matrix to help in their interpretation. In return the other party offers to take on the risks associated with research and development; an obligation guaranteed by demanding that any claimed invention be new and inventive. Lord Neuberger's second circumstance provides some protection against claims extending to that which is old and obvious, so allowing one party to gain an unmeritorious advantage over the other.

Conclusions

The analysis presented above supports the approach to claims construction advocated by the Supreme Court in *Actavis*. But the reasoning advanced by the Court shares with the decisions that preceded it a lack of theoretical foundation, making the conclusions that that can be drawn from Lord Neuberger's reasoning rather narrower than they might otherwise be. This, notwithstanding that the *Actavis* decision, as much as the ones that preceded it, claims to implement relevant rules and give effect to relevant principles. But other than an occasional and passing reference to the competing interests at play, what is absent is a grounding in the economics of the patent system. This lack of theoretical foundation makes any approach vulnerable and this is as true of the Supreme Court's decision in *Actavis* as much as it is of the earlier UK decisions that the Supreme Court criticised in that case. A few months after the Supreme Court handed down its ruling, the Singaporean Court of Appeal was called upon to consider whether the principles enunciated in *Actavis* ought to be applied in Singapore.¹²⁹ The Court noted that the position in Singapore was largely aligned with that in the UK as it stood prior to the decision in *Actavis* and that Singapore courts had endorsed and applied the purposive approach to patent construction developed by UK courts. Nevertheless it declined to embrace a doctrine of equivalents as that was understood and applied by Lord Neuberger. In line with the reasoning adopted by Lord Neuberger, the Singaporean Court was of the view that the doctrine of equivalents was made part of UK law only by virtue of Article 2 of the Protocol and the legal position was otherwise in Singapore.¹³⁰

It is certainly the case that Lord Neuberger built his argument around the wording of the terms of the Protocol, and in particular Article 2 which he said meant that equivalents must be taken into account. But at the same time he acknowledged that no guidance was given as to how that was to be done.¹³¹ That being so, Lord Neuberger's interpretation of the demands of Article 2 of the Protocol is no more compelling than that of Lord Hoffmann who, in *Kirin-Amgen*, expressed the view that Article 2 required only that equivalence be included within the background of facts known to the skilled man that informed his understanding of the claims.¹³² The vague directions of both versions of the Protocol have admitted a range of approaches to claims construction and to this extent provide an insecure foundation for any one, including that advocated in *Actavis*.

The argument advanced in this paper is that economic theory provides a better foundation for the approach adopted in *Actavis* and indeed for UK courts approach to claims construction more generally. In particular, from a Coasean perspective, the patent system can be seen as a substitute for an explicit bargain between economically active entities operating in the market under which a privilege is allocated in return for acceptance of a burden of risk. This understanding provides a foundation for

¹²⁸*Kirin-Amgen* [2004] UKHL 46 at [35].

¹²⁹*Lee Tat Cheng v Maka GPS Technologies* [2018] SGCA 18.

¹³⁰*Ibid*, at [51].

¹³¹[2017] UKSC 48 at [33].

¹³²[2004] UKHL 46 at [49].

the adoption of methods typically applied to the interpretation of contracts to the construction of patent claims. That common approach has been a feature of UK law for decades. Of course there is no evidence that in this Courts have embraced economic theory or have otherwise appreciated the implications arising out of Ronald Coase's paper on the problem of social cost. This happy coincidence is probably an artefact of an approach to claims construction in which the focus is on the effect that a particular construction will have in the market, rather than one which attempts to reward the patentees' inventive contribution. Interests are thus typically defined by way of a process that pitches an individual right against an individual correlative duty. In light of this it is unsurprising that UK courts recognise and apply common general principles in construing patent claims and contract terms. A core object of those common general principles, applied to the interpretation and implication of terms, is to give effect to presumed intention of the parties; an object which implicitly takes account of the costs of bargaining and the operating presumptions of UK patent law can be rationalised as minimising these costs.