Neutral Citation Number: [2019] EWCA Civ 1646

Case No: A3/2018/1510
A3/2019/0550
A3/2019/0826

IN THE COURT OF APPEAL (CIVIL DIVISION)
ON APPEAL FROM THE HIGH COURT OF JUSTICE
BUSINESS AND PROPERTY COURTS OF ENGLAND & WALES
INTELLECTUAL PROPERTY LIST (ChD)
Mr Roger Wyand QC sitting as a Deputy High Court Judge
[2018] EWHC 843 (Pat)

Royal Courts of Justice
Strand, London, WC2A 2LL

Date: 09/10/2019

Before:

LORD JUSTICE LEWISON
LORD JUSTICE FLOYD
and
LORD JUSTICE PETER JACKSON

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Between:

(1) ANAN KASEI CO. LTD
(2) RHODIA OPERATIONS S.A.S. **Claimants**

- and -

(1) NEO CHEMICALS AND OXIDES LIMITED
(formerly MOLYCORP CHEMICALS AND OXIDES (EUROPE) LIMITED)
(2) NEO PERFORMANCE MATERIALS INC **Defendants**

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Richard Meade QC and **Adam Gamsa** (instructed by **Bird & Bird LLP**) for the **Defendants**
Thomas Mitcheson QC and **Miles Copeland** (instructed by **Hogan Lovells International LLP**) for the **Claimants**

Hearing dates: 17-18 July 2019

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Approved Judgment

Lord Justice Floyd:

1. A patentee limits his claim by the words "consisting essentially of" a particular oxide. One issue in the first of three appeals which are before the court is whether those words give rise to such uncertainty as to lead to invalidity of the patent. The patentee also limits his claim by reference to a desirable physical characteristic for such an oxide, namely high specific surface area, and specifies that it remains the same after being subjected to a high temperature heating test. The second issue in the first appeal is whether, a claim so drawn insufficiently describes the invention, and is invalid for that reason. The judge, Mr Roger Wyand QC, sitting as a Deputy High Court Judge, held, in outline, that the "consisting essentially of" language did not give rise to objectionable uncertainty, and that the claim breadth was justified because everything covered by the claim was unified by a common principle. I will refer to the appeal from his decision dated 23 April 2018 and his consequent order as "the patent appeal".

2. The proceedings below were commenced by the claimants and respondents Anan Kasei Co. Ltd and Rhodia Operations S.A.S. (together "Rhodia") for infringement of European Patent (UK) No 1 435 338 ("the patent"). The defendant, Molycorp Chemicals and Oxides (Europe) Limited (now named Neo Chemicals and Oxides (Europe) Limited ("Neo UK")) denied infringement and counterclaimed for revocation of the patent on the grounds of lack of novelty, obviousness and insufficiency. The lack of novelty objection was abandoned at the trial, and the judge rejected the objections of obviousness and insufficiency, holding the patent to be valid. He found that Neo UK had infringed the patent by dealing in its commercial products in the UK. Neo does not appeal the judge's rejection of the obviousness objection or his conclusion that, if the patent is valid, it is infringed. The appeal is solely against the judge's rejection of the insufficiency ground.

3. The remaining two appeals (which I will refer to as "the procedural appeals") relate to events since the judgment of Mr Wyand QC. They raise issues concerning whether Neo Performance Materials Inc ("Neo Canada"), the parent company of Neo UK, can be joined to the proceedings in order to hold it responsible for any damages awarded against Neo UK. Rhodia seek to do this on the basis, first, that Neo Canada was a joint tortfeasor with Neo UK in the period ("the Neo Canada period") when it was the parent of Neo UK, and, secondly, on the basis that Neo Canada has acquired the liabilities of Neo UK's previous parent company, Neo Cayman Holdings Inc. ("Neo Cayman"). It is alleged that Neo Cayman had also acted as a joint tortfeasor with Neo UK during the earlier period ("the Neo Cayman period") when it was the relevant parent company of Neo UK.

4. In a judgment dated 18 December 2018, Mr Caddick QC, sitting as a Deputy High Court Judge, held the allegation of joint tortfeasance by Neo Canada in the Neo Canada period to be arguable but refused to allow joinder of Neo Canada in respect of any assumed liabilities of Neo Cayman in the Neo Cayman period. In a further judgment dated 19 March 2019, HHJ Hacon sitting as a Deputy High Court Judge held, on an *inter partes* application to set aside Mr Caddick's order, that the allegation of joint tortfeasance against Neo Canada was limited to specific acts in relation to a particular seizure of goods ("the seized goods"). Rhodia appeal against both judgments. Neo does not challenge Mr Caddick's conclusion that it is arguable that Neo Canada was jointly liable with Neo UK in respect of the seized goods, but resists

the attempt to make it liable more widely or for acts of Neo Cayman. Neo contends that it is not arguable that Neo Cayman incurred any liability as a joint tortfeasor with Neo UK, and, even if it did, it is not arguable that Neo Cayman transferred that liability to Neo Canada.

The patent appeal

5. It is convenient to deal first with the patent appeal. In this section I will refer to Mr Wyand QC as "the judge".

The patent and the invention

6. The patent is concerned with ceric oxide or ceria, which is an oxide of the element cerium, and is a catalyst known for use in a variety of applications. The particular use with which the patent is concerned is as a catalyst for purifying vehicle exhaust gases. It was well known to use ceric oxide in combination with another oxide catalyst (co-catalyst) for this purpose. Zirconium oxide (zirconia) was a well known co-catalyst.

7. In order to function effectively in exhaust gas purification devices, the oxide material needs to have a high specific surface area (SSA) at low temperatures and to maintain that high specific surface area at the high temperatures encountered in vehicle exhaust systems. The high SSA maximises the available physical surface on which the gases can interact with the catalyst. It was well known to add zirconia to ceric oxide to stabilise the SSA of the ceric oxide at high temperatures. Without the presence of added oxides such as zirconia, ceric oxide was known to undergo sintering at high temperatures, thus reducing its SSA, and thus its otherwise desirable characteristics. A ceric oxide which was resistant to sintering at high temperatures, thus maintaining its high SSA, but which did not require the use of a co-catalyst was desirable, but no such product was known.

8. The patent has five product claims relating to specific characteristics of a ceric oxide with a high surface area. It is sufficient to consider claim 1, because Rhodia do not seek to uphold any of the other product claims if claim 1 is, contrary to the judge's finding, invalid. It is in these terms:

> "A ceric oxide consisting essentially of a ceric oxide, and wherein said ceric oxide has a specific surface area of not smaller than 30.0 m^2/g when subjected to calcination at 900˚C for 5 hours."

9. Calcination is high temperature heating. The claim has some implicit limitations in addition to the express ones. As calcination will not increase SSA, it is implicit that the ceric oxide has a SSA of not less than 30.0 m^2/g before the calcination test as well, i.e. in the product as supplied. Further, it is implicit that the ceric oxide is in solid form (i.e. not in solution): if it were otherwise there could be no measurement of SSA, and the calcination test would not make sense either.

10. The fact that the ceric oxide of the claim "consists essentially of ceric oxide" might be thought to be a tautology, but would be understood as being specified in order to exclude from the claim mixed oxides such as ceria/zirconia mixtures. The requirement for a specific surface area not smaller than 30.0 m^2/g after the specified

calcination step is thus a test for the performance of the essentially ceric oxide material under high temperature conditions.

11. Other claims of the patent are directed to methods of making the ceric oxide of claim 1. These methods are described in examples in the specification. There is no attack on the validity of the method claims. The product claims are of course potentially broader as they are not limited to ceric oxide made according to the methods so described and claimed. Patentees prefer product claims because they are easier to enforce, as the defendant is unlikely to have made public the details of the process by which its product is made.

12. The specification contains a grid of worked examples of the patentee's method, showing the achievement of the desired SSA after calcining over a wide range of values above 30.0 m^2/g. There is no insufficiency attack on the basis that the promise of these highly desirable properties is not met across a large range of values. Rather it is complained that the claim extends to ceric oxide products having the desirable characteristics of the claim, but which are not made by the patentee's process, or any process which owes anything to it.

Construction

13. It is necessary to say something about the words "consisting essentially of". In patent jargon there is a distinction between a claim for a composition of matter which "consists" of something and a claim for such a composition "comprising" something. The first formulation will normally be taken to impose a requirement that nothing else is present, while the latter formulation is simply a minimum requirement, agnostic as to whether other things are present as well. So a claim to a cake mix "consisting of sugar, eggs, butter and flour" is not infringed by one containing chocolate chips, but that would not be the case if the word "comprising" was substituted for "consisting of".

14. The words "consisting essentially of" are something of a hybrid of these two formulations. The words obviously do not restrict the claim to the specified ingredient alone, and might be said to give rise to some uncertainty in the absence of some further guidance as to what it means. The parties are agreed, however, that the skilled person would have regard to a practice of the EPO to regard such claims as meaning that, apart from the mandatory ingredient (in this case ceric oxide), no other ingredients are present which materially affect the essential characteristics of the product. That this is a legitimate approach to construction gains support from the observations of Jacob LJ in *Virgin Atlantic v Premium Aircraft* [2009] EWCA Civ 1062 at [12] – [15], to the effect that the skilled reader of a patent has some knowledge of patent law and practice. The words would therefore be understood to provide a penumbra around the core of the claim, which is to pure ceric oxide having the required characteristics. How much of a penumbra is determined by the point at which the added ingredient starts to have a material effect on the essential characteristics of the product. The judge so concluded, and there is no appeal from his decision in that respect.

Neo's pleaded insufficiency attack

15. The first pleaded insufficiency attack in the heavily amended Grounds of Invalidity is as follows:

> "The specification does not contain any directions or explanation as to the meaning of the term "*consisting essentially of ceric oxide*". In the premises the skilled person would be unable to implement the invention or determine whether he was working the same without undue effort or at all."

16. That allegation, if it is a ground of insufficiency at all, could not survive the judge's conclusion as to the meaning of the contested phrase. The "premises" of the plea fall away. It was not pleaded that, even if the skilled person had sufficient directions or explanation as to the meaning of the phrase, it would present an undue burden on the skilled person to determine whether something infringed. Further, it did not give any example of a ceric oxide containing an added ingredient where a problem would exist in fact.

17. Further allegations of insufficiency were contained in the amended grounds of invalidity, but none of these bears any resemblance to the attacks as they are now argued. The actual attacks advanced at trial emerged partly in the reply report of Neo's expert, Dr Brophy, and partly in Neo's skeleton argument for trial. Rhodia did not contend that the complete lack of pleading or the late formulation of the arguments should prevent Neo from arguing these matters on the appeal. Nevertheless, they submitted that it is a factor to bear in mind in determining whether Neo has established any of the insufficiencies on which it relies.

The first insufficiency attack advanced

18. Notwithstanding the pleasing agreement on what the claim means, the first limb of Neo's invalidity attack is that the words "consisting essentially of" render the claim invalid for insufficiency, for the following reasons. First, where the alleged infringing ceric oxide contains an ingredient other than ceric oxide, the skilled person is required to perform a test to determine whether the presence of the extra ingredient has a material effect on the essential characteristics of the product ("the materiality test"). The materiality test which the skilled person would need to perform would be to compare the alleged infringing sample with a control which, whilst otherwise identical, did not have the added ingredient. The test would involve testing the two products in the calcination step of the claim and determining whether the results for SSA after calcining were materially different between the two.

19. This requirement for a comparator, so the argument runs, gives rise to difficulty for the skilled person. Because the method by which solid ceric oxides are made will always involve a final heating step, the added ingredient will be baked in and it will not be possible to remove it. To pursue the cake analogy, to determine whether an added ingredient has a material effect, one would have to take the ingredient out of the cake after it was cooked. Thus, the skilled person will not be able to obtain the control sample which he needs for the materiality test. Neo say that it is no answer to suggest that the skilled person can obtain a comparator by manufacturing one from

scratch, because a person in possession of the alleged infringing sample must be able to tell from the product alone whether it infringes, and will not necessarily know the process by which it was made, which may be secret. Even if he could obtain access to the process, the argument continues, that would not be enough. The skilled person would not know whether it was the presence of the added ingredient in the final product which was affecting the properties, or whether the added ingredient had affected the process, for example by altering the way in which precipitation occurred. The claim requires a focus on the effect of the added ingredient in the product, teased apart from process effects.

20. The judge gave this argument extremely short shrift. He considered that the argument amounted to no more than a contention that there was a "fuzzy boundary" at the edge of the claim. There were often limits at the edge of a claim where the precise limit is difficult to ascertain. That did not lead to a finding of insufficiency.

21. The starting point for the analysis of this, and indeed any, insufficiency attack is the statutory language. Section 72(1)(c) of the Patents Act 1977, which reflects Article 83 of the European Patent Convention makes it a ground of invalidity to show that:

> "the specification of the patent does not disclose the invention clearly enough and completely enough for it to be performed by a person skilled in the art."

22. There is therefore only one statutory question. Nevertheless, insufficiency has been found to arise in a number of distinct ways. The kind of insufficiency on which Neo rely for this attack on the patent is illustrated by the decision of the House of Lords in *Kirin Amgen and others v Hoechst Marion Roussel Ltd and others* [2004] UKHL 46 ("*Kirin Amgen*"). In that case it was alleged that claim 19 of the patent was insufficient because it defined the invention, recombinant erythropoietin or rEPO, by the requirement that it have a higher apparent molecular weight measured by a particular method than urinary erythropoietin or uEPO. That would not have presented a problem if uEPO had a known molecular weight. The molecular weight of uEPO, however, varied depending on such matters as source and method of isolation, and the specification did not tell the reader which one to use for the test. In addition, samples of uEPO were extremely hard to come by. The skilled reader could not rely for the test on the first uEPO to come to hand, because, in Lord Hoffmann's words, this "would turn the claim into a lottery". On the other hand it would be burdensome to work one's way through all the uEPOs one could find, and even that would provide no guarantee of non-infringement, because it did not follow that another one would not turn up with a lower molecular weight. The judge had held that the claim was incapable of being infringed, but he was reversed in the Court of Appeal on the grounds that this was merely a lack of clarity at the edge of the claim, or a fuzzy boundary. The House of Lords restored the judge's judgment. Lord Hoffmann said at [129]:

> "All the skilled man can do is try to guess which uEPO the patentee had in mind, and if the specification does not tell him, then it is insufficient."

23. The House of Lords did not throw any doubt on the principle that a claim is not rendered insufficient because there is some room for doubt, or fuzziness, at the edge

of the claim. The claim in *Kirin Amgen* was insufficient because it was conceptually uncertain.

24. The form of insufficiency exemplified by *Kirin Amgen* is sometimes, inaccurately called "ambiguity". Ambiguity usually refers to a situation where words are capable of more than one meaning. Under the Patents Act 1949 it was a ground of revocation (no longer available) that "*the complete specification does not sufficiently and fairly define the invention…*": see section 32(1)(i). Patent lawyers tended to abbreviate this ground, which is specifically directed to the definition of the invention, as "ambiguity": see for example *Terrell on the Law of Patents* 12th Edn 1971 at paragraphs 240-245. It was recognised, however, that the mere fact that the claim was capable of two different constructions did not render the claim invalid under this ground if the normal process of construction through the eyes of the skilled person could resolve the issue. The vagueness or uncertainty of the claim had to go beyond this. The use of the word "substantially", for example in the expression "substantially as described", did not render a claim invalid for ambiguity.

25. As Lewison LJ points out in his judgment, the objection to the claim in *Kirin Amgen* is not correctly described as "ambiguity". The claim was conceptually uncertain. This type of insufficiency is far better described as "uncertainty". The process of interpretation could not resolve the question of what uEPO the patentee had in mind for the necessary test. The consequent burden which this placed on the skilled person meant that the specification was insufficient. Jacob J gave an example in *Milliken Denmark AS v Walk-Off Mats Limited and another* [1996] FSR 292 at 301 of a property which was required to be measured in the non-existent "Pinocchio units". That would give rise to uncertainty in the *Kirin Amgen* sense.

26. Mr Mitcheson QC, who appeared for Rhodia, submitted that this form of insufficiency was only available if it was impossible to tell *in any case* whether a product infringed. Where, as here, there was no doubt that pure ceric oxide would infringe, any uncertainty about the scope of the phrase "consisting essentially of" was irrelevant. He submitted that this approach was supported by paragraph 125 of *Kirin Amgen* where Lord Hoffmann said, with the original emphasis:

> "The judge decided that the lack of clarity made the specification insufficient. It did not merely throw up the possibility of doubtful cases but made it impossible to determine in *any* case whether the product fell within the claim."

27. I think that Lord Hoffmann's emphasis was simply intended to draw attention to the distance between the judge's finding and a case which presented doubtful cases at the edge of a claim. For my part, I do not agree that the objection of uncertainty is answered simply because there is something within the claim which is clear, if there is a large territory (more than a fuzzy boundary) where the claim is uncertain.

28. Nevertheless, in my judgment, Neo's insufficiency attack fails. First, this is not a case where there is any argument about the criterion which one needs to apply and possibly test for once the argument about the construction of the claim is resolved, as it has been. It is simply whether the added ingredient has a material effect on the essential characteristics of the product.

29. Secondly, Neo's case, insofar as it depends on a purchaser not having access to process details in order to make a comparator, is based on a false premise. The test for sufficiency is whether the specification of the patent discloses the invention clearly enough and completely enough for it to be performed *by a person skilled in the art*. The test is not whether a purchaser of the product lacking the relevant skill in the art could determine whether it infringes. There are many situations countenanced by patent law (product by process claims being one example) where a purchaser will not be able to test for infringement without access to process details.

30. Thirdly, and most fundamentally, the suggestion that determining whether a product was inside or outside the claim would impose an undue burden on the skilled person was not made out on the evidence. The judge did not make any detailed findings on the nature of the task which would face the skilled person in deciding whether specific products fell within the "consisting essentially of" wording. I would reject straight away the suggestion that the skilled person would think that he was being required to create a comparator with the added ingredient removed from the baked composition. The skilled person would not think that he was being asked to perform the impossible.

31. Professor Burch, Rhodia's expert, was cross-examined about a ceric oxide incorporating various quantities of zirconia. His view was the skilled person would look at the chemical analysis of any individual product, something which was routinely provided in the industry. The skilled person would be able to say from his experience that quantities of zirconia up to 0.1% would not materially affect the properties. As soon as one saw quantities above 1%, however, he would assume it had been added deliberately to achieve an effect, and would do so. Understandably he was not pressed on where the precise edge of the claim would lie between these two values. The judge was fully entitled to conclude that this was no more than a fuzzy boundary, and did not lead to insufficiency by reason of uncertainty.

32. Neo also relied on a further example which they contended gave rise to insufficiency, namely a case where surfactant had been used in the manufacture of the product and residues of surfactant or its breakdown products, which include carbon, were present in the product. Dr Brophy's evidence, however, was that carbon as an additive would have no effect on the properties of the product. Further, the evidence was that every effort would be made to avoid the presence of such residues in the product. It is true that the standard tests did not have an ability to detect carbon, or at least not in a way which distinguished between atmospheric carbon and carbon included in the composition. But if it is not having any effect, I fail to see how that can matter.

33. I would uphold the judge's conclusion on insufficiency due to uncertainty.

The second insufficiency attack advanced

34. Neo's second insufficiency attack focuses instead on the breadth of claim 1. Neo contends that the claim merely describes an obviously desirable product, namely an essentially pure ceric oxide with high SSA which it keeps after prolonged exposure to high temperature. Such a claim could have been written as a wish list, and required no invention. It is true that Rhodia have a novel and non-obvious method of *making* pure ceric oxide with these desirable characteristics, but that is the only contribution to the art which has been made. Patent law does not permit an inventor who has come up

with one method of achieving products with desirable characteristics to claim all products having those characteristics.

35. I start with a few well-established but nevertheless important general points.

36. First, the burden of establishing the objection is on the person attacking the patent. An insufficiency objection does not establish itself, merely because the claim may seem broad in relation to the inventive step: *Generics (UK) Ltd and others v H. Lundbeck A/S* [2009] UKHL 1; [2009] 2 All ER 955 ("*Lundbeck HL"*).

37. Secondly, the specification must enable the invention to be performed across the full width of the claim. Thus, there is no general rule that one method of making a product falling within a product claim will always be enough: *Biogen Inc v Medeva plc* [1997] RPC 1 ("*Biogen*") at pages 47-49 (per Lord Hoffmann).

38. Thirdly, this does not mean that everything that would be an infringement of the claim must be enabled. If the claim has features A, B and C, but it is possible to postulate an embodiment with feature D as well which the specification does not enable, it does not follow that the specification is insufficient just because the addition of feature D is not excluded by the claim. Otherwise almost every claim would be invalid on this ground. A claim may cover improvement inventions, which are, by definition, not enabled.

39. Fourthly, some inventions may be claimed in apparently broad terms where the patentee has invented a general principle which would be expected to work equally well not only in relation to embodiments which the skilled person may make with the aid of the patent and his common general knowledge, but also to any others which may come along, sometimes referred to as "components of the future". See the discussion of *Genentech I/Polypeptide expression* (T 292/85) [1989] OJ EPO 275 in *Biogen* at page 48. *Regeneron Pharmaceuticals, Inc v Kymab Ltd.* [2018] EWCA Civ 671; [2018] RPC 14 is an example of this class of case. Thus, the objection of insufficiency is highly sensitive to the nature of the invention: see *Kirin Amgen* at [103].

40. Much of the argument in the present case concerned the two leading modern House of Lords cases on insufficiency: *Biogen* and *Lundbeck HL*.

41. In *Biogen*, the invention was based on work performed by a Professor Murray to produce antigens to the hepatitis B virus (HBV) at a time when recombinant DNA technology was in its infancy, but was rapidly developing. Professor Murray had worked without knowledge of the DNA sequence by purifying DNA from a particle ("the Dane particle") believed to contain the relevant sequence, which he then cut into fragments with restriction enzymes and then proceeded by conventional steps to test for HBV antigen specificity. The principal claim at issue was to a recombinant DNA molecule characterized by a DNA sequence coding for a polypeptide or a fragment thereof displaying a HBV antigen specificity. This was a claim to a product, a molecule identified partly by the way in which it had been made ("recombinant DNA") and partly by what it did (express a polypeptide with HBV antigen specificity). As Lord Hoffmann explained at [40]:

> "This was a generalisation of what Professor Murray had done in two ways. First, as to the results he had achieved. He had made a particular form of recombinant plasmid (pBR322 with fragments of Dane particle DNA) which had transformed E. coli and, he said, caused it to express the genes of HBcAg and HBsAg. The claim was for any recombinant DNA molecule which expressed the genes of any HBV antigen in any host cell. Secondly, there was generalisation of the method which he had used. He had made his DNA molecule from a standard pBR322 plasmid and large fragments from Dane particle DNA, chosen simply on the basis that they should be large. This was a technique imposed upon him by lack of information about the coding sequences. Thereafter, he employed conventional means to express the DNA in a conventional bacterial host. The claim was for any method of making a DNA molecule which would achieve the necessary expression."

42. The House proceeded on the assumption that a claim in this form was novel and not obvious. It went on to consider whether the claim was entitled to its claimed priority based on Biogen's earlier filing, Biogen 1. This required an analysis of whether the invention claimed was "supported by matter disclosed" in Biogen 1: Patents Act 1977, section 5(2)(a). Lord Hoffmann explained at [57] that "support" in this context brought with it the notion of an "enabling disclosure" that is to say, disclosure of the invention in a way which will enable it to be performed by a person skilled in the art. He went on to conclude that the courts below, by focusing only on whether Biogen 1 enabled the skilled person to make the antigens concerned had lost sight of whether the claim was nevertheless too broad by extending to ways of producing the antigens which owed nothing to Professor Murray's contribution. The reasoning is summarised at [70]:

> "But the fact that the skilled man following the teaching of Biogen 1 would have been able to make HBcAg and HBsAg in bacterial cells, or indeed in any cells, does not conclude the matter. I think that in concentrating upon the question of whether Professor Murray's invention could, so to speak, deliver the goods across the full width of the patent or priority document, the courts and the EPO allowed their attention to be diverted from what seems to me in this particular case the critical issue. It is not whether the claimed invention could deliver the goods, but whether the claims cover other ways in which they might be delivered: ways which owe nothing to the teaching of the patent or any principle which it disclosed."

43. Lord Hoffmann went on to explain that there was more than one way in which the breadth of a claim may exceed the technical contribution to the art embodied in the invention:

> "The patent may claim results which it does not enable, such as making a wide class of products when it enables only one of those products and discloses no principle which would enable others to be made. Or it may claim every way of achieving a

> result when it enables only one way and it is possible to envisage other ways of achieving that result which make no use of the invention."

44. It was this last, apparently general statement of principle which required further consideration in the *Lundbeck* case. The drug citalopram, in common with many other biologically active materials, was capable of existing in two different enantiomeric forms. When made by conventional methods, however, the drug would be a mixture of the (+) and (-) enantiomers. It was well known in such circumstances that the biological activity would be likely to be due, or due predominantly, to only one of the enantiomers. A promising line of research was therefore to endeavour to produce the enantiomers in pure form and market only the active or more active enantiomer. Lundbeck undertook this research and devised a method for making the pure (+) enantiomer which was, they established, the active one. They were the first to do so, and the claim to the pure (+) enantiomer was held to be novel and not obvious.

45. It was argued against the patent that Lundbeck's contribution to the art was only the method of making the enantiomerically pure (+) enantiomer. There were other ways which could be envisaged of making it, including high pressure liquid chromatography (HPLC). If such alternative methods could be made to work to produce the pure (+) enantiomer, the product would be caught by the claim, but the use of such methods would owe nothing to Lundbeck's method and thus to their contribution to the art. In Lord Hoffmann's words from Biogen, the patent claimed "*every way of achieving a result when it enables only one way and it is possible to envisage other ways of achieving that result which make no use of the invention*."

46. That argument was rejected by the Court of Appeal (which included Lord Hoffmann as an additional judge) and by the House of Lords. The flaw in the argument was that it was wrong, in the case of the claim in issue in *Lundbeck*, to define the patentee's contribution to the art by reference to the "inventive step", rather than the technical contribution to the art. Once it was established that the (+) enantiomer was a novel product, the contribution to the art was that product, not the method by which it was made. Provided that the specification enabled the product to be made, the existence of other possible methods did not render the claim insufficient.

47. The parties in our case embarked on a debate about the nature of the restriction (if it be such) of the general principle derived from *Biogen* which *Lundbeck* had created. Mr Meade submitted that the claim in *Lundbeck* was a narrow, single product claim, and *Biogen* applied with full force where a claim, like the present claim, covers a range of products. Mr Mitcheson submitted that the restriction applied to all product claims, that is to say all claims which lacked any process element. This led to an analysis of the speeches in the House of Lords to see what clues could be found in one direction or the other. Thus Lord Walker at [11] summarised the decision of the Court of Appeal as being that "the judge had extracted too broad a principle from *Biogen*, which was not a simple product claim but a "product-by-process" claim, and moreover a claim to a wide class of such products." He went on at [21] to [25] to describe the wide variety of possible product claims, concluding:

> "A single chemical compound is a product … of a special character, since it is a product which, simply as a chemical compound (as in claim 1 of the patent in suit), can have only

> one embodiment (though if it is used in a pharmaceutical preparation it can of course have numerous embodiments in terms of dosages and non-active ingredients, as in claims 3 and 5 of the patent in suit). Statements of general principle relating to inventions with many embodiments may be irrelevant to an invention which consists of a single chemical compound."

48. At [26] to [27] Lord Walker distinguished *Biogen* on the basis that the claim in *Biogen* was one to a very large number of possible embodiments, in contrast to the claim in *Lundbeck* which was to a single chemical compound.

49. Lord Mance at [49] rejected the submission that the claim in *Biogen* was a "simple claim to a novel product". Whether such a claim is invalid for insufficiency because it extends to the product made by methods which owe nothing to the invention was therefore an open question: see [52].

50. Lord Neuberger distinguished *Biogen* in a passage from [92] to [99]. He points out that *Biogen* "was not dealing with a simple product claim, as is involved in this Patent". Rather the claim in *Biogen* was "to a product, a molecule identified partly by the way in which it has been made …. and partly by what it does". At [99] he said:

> "In my opinion, therefore, in agreement with the Court of Appeal, the opinion of Lord Hoffmann in *Biogen* [1997] RPC 1, though a tour de force as Lord Walker says, is of no assistance to the appellants in this case. It applied in the light of the very unusual nature of the claim in that case. Far from being a straightforward product claim (as in this case) or even a product-by-process claim (as discussed in Kirin-Amgen [2005] RPC 9, paras 86-91 and 101), the claim was to a product identified in part by how it was made and in part by what it did - almost a process-by-product-by-process claim."

51. Lord Scott agreed with Lord Neuberger, and Lord Philips agreed with all the members of the House.

52. I draw the following from the speeches in these two cases:

1. The principle in *Biogen* is concerned with permissible scope of claim in the light of the patentee's contribution to the art.

2. In general, that principle is that the claim must not extend to embodiments which owe nothing to the patentee's contribution to the art.

3. In the case of a claim to a single novel chemical compound, the patentee's technical contribution is that compound. Such a claim will not be insufficient if the single compound is enabled by a method in the specification, notwithstanding the fact that there may be other methods of making it which owe nothing to the disclosed method.

4. The same must be true of a claim to a class of compounds, each of which can be made by the application of a method disclosed in the specification. There is

no requirement that the patentee disclose more than one method, where one method will do.

5. This does not mean that all claims to a class of products by definition comply with the *Biogen* principle. The conclusion in *Biogen* shows that a claim which is formally to a class of products may cover embodiments which owe nothing to the patentee's technical contribution.

6. The reason why the claim in *Biogen* offended the principle was not because it had "process components" but because the language of the claim was so generalised (both in relation to the manner in which the product was made and in relation to its function) that it extended to embodiments which owed nothing to the patentee's contribution to the art. A claim to a product defined by its function (e.g. any heavier than air flying machine referred to by Lord Hoffmann at page 52 in *Biogen*) is capable of extending to subject matter which owes nothing to the patentee's contribution to the art.

53. The claim in the present case is to a class of products identified by their composition (consisting essentially of ceric oxide), their physical characteristics (their SSA), and their performance in the calcining test. That it is a class of products is plain from the fact that the claim can be satisfied by a range of degrees of purity, and SSA, and from the fact that performance in the calcining test may vary from pass to distinction.

54. I reject Rhodia's contention that this claim complies with the *Biogen* principle simply because it is formulated as a product claim (see proposition 6 in paragraph 52 above). Claims defined by reference to desired properties of a product need to be scrutinised carefully for reasons explained by Jacob LJ in *Lundbeck (CA)* at [60] – [62]:

> "60. Some careful thinking is called for in considering claims to desirable ends. There are different sorts of these. I quite agree that a patentee may not normally frame his claim simply by reference to known desirable properties of a product – what is sometimes called a "free beer" claim. The Guidelines for Examination at the EPO put it this way:
>
> > "4.1 The area defined by the claims must be as precise as the invention allows. As a general rule, claims which attempt to define the invention by a result to be achieved should not be allowed, in particular if they only amount to claiming the underlying technical problem."
>
> and:
>
> > "4.10 Result to be achieved
> >
> > The area defined by the claims must be as precise as the invention allows. As a general rule, claims which attempt to define the invention by a result to be achieved should not be allowed, in particular if they only amount to claiming the underlying technical problem. However, they may be allowed if the invention either can only be defined in such

> terms or cannot otherwise be defined more precisely without unduly restricting the scope of the claims and if the result is one which can be directly and positively verified by tests or procedures adequately specified in the description or known to the person skilled in the art and which do not require undue experimentation (see T 68/85, OJ 6/1987, 228)."
>
> 61. So, for example, if a man finds a particular way of making a new substance which is 10 times harder than diamond, he cannot just claim "a substance which is 10 times harder than diamond." He can claim his particular method and he can claim the actual new substance produced by his method, either by specifying its composition and structure or, if that cannot be done, by reference to the method (see *Kirin-Amgen* at [90-91]) but no more. The reason he cannot claim more is that he has not enabled more – he has claimed the entire class of products which have the known desirable properties yet he has only enabled one member of that class. Such a case is to be contrasted with the present where the desirable end is indeed fully enabled – that which makes it desirable forms no part of the claim limitation.
>
> 62. Those examples form two extremes – there may be cases in between where the invention may lie in appreciating that a particular combination of desirable properties is of special value. The validity of that sort of claim will be particularly sensitive to the context of the teaching of the patent and the prior art."

55. I do not read Jacob LJ in that passage as saying that claims limited by function or result are necessarily invalid for that reason alone. The underlying rule, as he explains, is that the patentee cannot claim more than he had enabled. Whether he has claimed more than he has enabled is a question of fact which falls for decision on the evidence in the case.

56. Neo point to the fact that the range of SSAs covered by the claim is due to the fact that the ceric oxide may vary in physical structure. Particles of ceric oxide are porous, coral-like structures rather than impervious with smooth surfaces. The particles themselves vary in size and size distribution, and their pores have various sizes ranging from less than 2 nanometres to more than 50 nanometres. The combination of porosity, pore size distribution and particle size distribution is referred to as "morphology". The SSA of the oxide is influenced by its morphology.

57. Neo also rely on evidence which suggested that different methods of synthesis of ceric oxide could well affect the morphology of the freshly prepared product, and its thermal stability. Hence the judge found that attempts had been made at the priority date to improve the resistance to sintering of pure ceric oxide by altering its method of preparation or post-preparation.

58. On the basis of this evidence Neo submit that the claim extends to subject matter which owes nothing to the patentee's technical contribution. Of the wide range of

potential morphologies, Rhodia's contribution to the art enabled only those which could be made by the method disclosed in the patent.

59. Neo are undoubtedly correct that the specification enables only those structures which could be made by the skilled person by the methods disclosed in the specification, coupled with the common general knowledge. To establish that the claim offended against the *Biogen* principle as explained in *Lundbeck*, however, Neo had to go further. They had positively to establish that there were structures which were covered by the claim which could not be made with the benefit of that teaching. There is no reason for the court to assume that the claim covers structures which owe nothing to Rhodia's contribution to the art.

60. In my judgment the evidence on which Neo rely does not take them nearly far enough. The most that appears to have been established is that other methods of manufacture might well affect the morphology of the cerium oxide. Even assuming that to be so, there are two possibilities. One possibility is that the products of those other methods fail to satisfy the calcining test, in which case the claim does not cover them. The other possibility is that the claim does cover those products, in which case it needs to be established that the structure in question is incapable of being replicated by Rhodia's method, or a suitable common general knowledge adjustment to it.

61. The judge accepted the evidence of Neo's expert that the specification of the patent disclosed sufficient to make a wide range of products having a range of different SSAs after calcining. The missing link in Neo's case, as it seems to me, is the lack of any evidence that there are structures which fall within the claim but which could not be made using the body of teaching in the patent.

62. I would accordingly reject Neo's second insufficiency attack as not having been established on the evidence.

The procedural appeals

63. The order of Mr Wyand QC was made when Neo UK were the only defendants to the action. His order directed an inquiry as to the damages suffered by Rhodia or, at their option, an account of the profits accrued to Neo UK by reason of its infringements of the patent. Subsequently, Rhodia became concerned as to the ability of Neo UK to meet the award for damages and applied for (a) permission to join Neo Performance Materials Inc ("Neo Canada") as a second defendant to the action, and (b) permission to amend the Amended Claim Form, the Amended Particulars of Claim and the Re-amended Particulars of Infringement so as to set out its the claim against Neo Canada. The basis of the application was that Neo Canada was liable as a joint tortfeasor for certain acts of the existing defendant, its subsidiary Neo UK. The application came before Mr Caddick QC, sitting as a deputy High Court judge. Neo Canada did not appear and were not represented.

64. Until 1 September 2016, Neo UK was part of a group whose ultimate parent was Molycorp Inc. In June 2015, Molycorp Inc. and certain of its subsidiaries filed a voluntary petition for re-organisation under Chapter 11 of Title 11 of the US Bankruptcy Code and were provided with Chapter 11 bankruptcy protection. On 31 August 2016 the business was re-organised so that Neo UK became a subsidiary of Neo Cayman.

65. On or about 30 November 2017 the shares in Neo Cayman were acquired by Neo Canada. As a result of this acquisition, Neo Canada became the parent company of Neo Cayman but Neo Cayman remained the parent company of Neo UK.

66. The period between 31 August 2016 and 30 November 2017 (when Neo Cayman was the parent company of Neo UK) was referred to by Mr Caddick QC as "the Neo Cayman period" and the period after 30 November 2017 as "the Neo Canada period." I will adopt the same descriptions.

67. Rhodia's case is that Neo Canada is liable (i) for infringing acts of Neo UK carried out in the Neo Canada period on the basis that Neo Canada was a joint tortfeasor and (ii) for infringing acts of Neo UK carried out in the Neo Cayman period on the basis that Neo Cayman had been a joint tortfeasor and that Neo Canada has assumed that liability. No claim is made against Neo Canada in respect of acts carried out before 31 August 2016 because any joint liability of Neo UK's then parent (Molycorp Inc) would have been extinguished under the Chapter 11 process and would not have passed to Neo Cayman and, thereafter, to Neo Canada.

68. Mr Caddick found that there was a triable issue that Neo Canada was liable as a joint tortfeasor with Neo UK in the Neo Canada period. The pleaded basis of Rhodia's claim in this regard was that two shipments of cerium oxide ("the seized goods") had been seized by the UK Border Force in July 2017. However, after these goods were released to Neo UK in December 2017, a portion of them were exported by Neo UK to Germany. Rhodia's argument was that, given the significance of the event, the decision to export a portion of the goods could only have been taken or procured by Neo Canada. There is no appeal from Mr Caddick's conclusion in this respect.

69. Mr Caddick was not, however, persuaded that there was a triable issue that Neo Cayman was liable as a joint tortfeasor with Neo UK in respect of the Neo Cayman period. He considered that the various matters relied on were insufficient to make it arguable that Neo Cayman was involved in the acts of infringement of Neo UK. Rhodia needed to show something more than the existence of the sort of control which a parent company exercises over a subsidiary, and they had failed to do so. Mr Caddick also concluded that the matters relied on by Rhodia were insufficient to make it arguable that Neo Canada had acquired the liabilities of Neo Cayman.

70. At the subsequent, *inter partes* hearing before HHJ Hacon, sitting as a deputy High Court judge, Neo argued that Rhodia's pleading should be limited to joint liability in respect of acts committed in relation to the seized goods, and not extend to joint liability for all acts of infringement committed in the Neo Canada period. HHJ Hacon accepted that contention.

Neo Canada and Neo UK as joint tortfeasors

71. It is now common ground that there is a triable issue that Neo Canada was liable as a joint tortfeasor with Neo UK. Mr Caddick explained his reasons in this way:

> "43. The basis of Rhodia's claim in this regard is set out in paragraph 12 of the ReRe-Amended Particulars of Infringement. The claim is that, presumably at Rhodia's request, two shipments of cerium oxide had been seized by the

> UK Border Force in July 2017. However, after these goods were released to Neo UK in December 2017, a portion of them were exported by Neo UK to Germany and the rest retained. Mr Mitcheson submitted that given the significance of the event, the decision (presumably meaning the decision to export a portion of the goods) could only have been taken or procured by Neo Canada.
>
> 44. In my judgment there is a triable issue as to whether Neo Canada is a joint tortfeasor in this regard. What distinguishes this from the position during the earlier Neo Cayman period, is that the seizure, release and subsequent dealings with shipments of a product that was said to infringe all took place in the context of the on-going litigation with Rhodia. This was litigation in which (as mentioned above) Mr Morris in his capacity as a representative of Neo Canada was actively involved and was giving instructions on behalf of Neo UK."

Neo Cayman and Neo UK as joint tortfeasors

72. As is apparent from the passage I have just cited from his judgment, Mr Caddick was not persuaded that there was a triable issue that Neo Cayman was jointly liable with Neo UK in the Neo Cayman period. That was because it was necessary for Rhodia to show a triable issue that Neo Cayman had been involved in the infringing activities of Neo UK. For this purpose it was not enough to rely on the ability of Neo Cayman to exercise corporate control over Neo UK.

73. At paragraph 39 of his judgment, Mr Caddick explained the role of Mr Morris:

> "Kevin Morris was previously Executive Vice President and Chief Operating Officer of Molycorp Inc. and later of Neo Cayman. He is now the Executive Vice President, Chief Operating Officer and a Named Executive Officer of Neo Canada. Rhodia point out that he has had an ongoing role supervising the present legal proceedings on behalf of Neo UK. The evidence is that he attended the trial and that, in his capacity as "Executive Vice President and Chief Operating Officer at Neo Cayman (the parent company of [Neo UK])", he provided Neo UK's disclosure statement dated 7 April 2016. Moreover, in a letter dated 28 November 2016, Bird & Bird confirmed that he was "the person within our client's organisation from whom we take instructions". In *Birlea Furniture Ltd v Platinum Enterprise (UK) Ltd* [2018] EWHC 26 at [55] somewhat similar factors were present. However, it was decided that whilst they demonstrated the role that the individual in question had played in the affairs of the defendant company, they did not demonstrate that he was involved in its wrongful acts. In *Birlea* there was a great deal of other evidence as to the individual's extensive involvement in the company's wrongful acts. In the present case, by contrast, there is no other evidence to suggest that Mr Morris in his capacity as

> an officer of Neo UK's parent company, was directly involved in the infringing acts carried out by Neo UK in the Neo Cayman period."

74. Mr Mitcheson submitted that Mr Caddick was wrong to distinguish between the involvement of Neo Cayman and Neo Canada in relation to the seized goods. The importation and seizure of the goods (albeit not their release) took place in the Neo Cayman period, and in the context of the litigation. Mr Morris had had an ongoing role. It was therefore inconsistent to hold it arguable that Neo Canada was jointly liable with Neo UK, but not Neo Cayman.

75. Mr Mitcheson also relied on the group structure of the Neo companies in the following way. The group has a "segment" referred to as "C&O" of which Neo UK formed a part. The group's 2017 Annual Information Form (at p.14) and the Prospectus (at p.58) stated that:

> "The C&O sales organization consists of 14 people located across three continents in order to support customers on a local level. The primary sales activities are deployed on a regional basis while certain large multinational customers are managed globally. The sales team members report to a sales director who has responsibility for the segment's global sales. Four members of the sales team focus exclusively on sales for the C&O business"

76. Mr Mitcheson noted that there were, according to published documents, only 7 people who worked for Neo UK. The judge accepted that this material supported a case that the Neo group operated globally as a group and that the separate segments operated across territorial and corporate boundaries such that staff from other group entities may have been involved in Neo UK's activities. He went on to say, however, that this did not establish a triable issue that Neo Cayman in particular was directly involved and had furthered or assisted Neo UK in its acts of wrongdoing so as to make it a joint tortfeasor.

77. Mr Mitcheson submitted that the judge had failed to acknowledge the position of Mr Jeffrey Hogan, who at the material times was Executive Vice-President of the C&O segment. Mr Hogan was appointed a director of Neo UK on 27 June 2016 (see the 2016 Financial Statement, at p.3). The evidence also showed that he was referred to as a "Named Executive Officer" of Neo Canada. The judge accepted that it was arguable that Mr Hogan (as head of the C&O segment) was involved in the activities of Neo UK, but not that it had been shown to be arguable that Mr Hogan was acting on behalf of Neo Cayman.

78. Mr Mitcheson also relied on the fact that the group, presumably with the approval of the parent company, had been funding the litigation. Mr Caddick dealt with this at [34]:

> "It may well be correct that the £2m which Neo UK has paid in respect of litigation costs and that the £650,000 letter of credit it has provided were funded by the group with, presumably, the approval of the parent company (then Neo Cayman). I do not

> accept, however, that this use of group funds of itself gives rise to the inference that Neo Cayman was a joint tortfeasor in relation to Neo UK's acts of alleged infringement carried out during the Neo Cayman period (which ended on 30 November 2017)."

79. In *MCA Records Inc and another v Charly Records Limited and others* [2001] EWCA Civ 1441 Chadwick LJ (with the agreement of Simon Brown and Tuckey LJJ) summarised the principles applicable to a claim of joint tortfeasance in respect of an intellectual property right. At [78] to [79] he said this in relation to liability of directors and shareholders:

> "78. First, a director will not be treated as liable with the company as a joint tortfeasor if he does no more than carry out his constitutional role in the governance of the company – that is to say, by voting at board meetings. That, I think, is what policy requires if a proper recognition is to be given to the identity of the company as a separate legal person. Nor, as it seems to me, will it be right to hold a controlling shareholder liable as a joint tortfeasor if he does no more than exercise his power of control through the constitutional organs of the company – for example by voting at general meetings and by exercising the powers to appoint directors. Lord Justice Aldous suggested, in *Standard Chartered Bank v Pakistan National Shipping Corporation and others* (No 2) [2000] 1 Lloyd's Rep 218, 235 – in a passage to which I have referred – that there are good reasons to conclude that the carrying out of the duties of a director would never be sufficient to make a director liable. For my part, I would hesitate to use the word "never" in this field; but I would accept that, if all that a director is doing is carrying out the duties entrusted to him as such by the company under its constitution, the circumstances in which it would be right to hold him liable as a joint tortfeasor with the company would be rare indeed. …
>
> 79. Second, there is no reason why a person who happens to be a director or controlling shareholder of a company should not be liable with the company as a joint tortfeasor if he is not exercising control through the constitutional organs of the company and the circumstances are such that he would be so liable if he were not a director or controlling shareholder. In other words, if, in relation to the wrongful acts which are the subject of complaint, the liability of the individual as a joint tortfeasor with the company arises from his participation or involvement in ways which go beyond the exercise of constitutional control, then there is no reason why the individual should escape liability because he could have procured those same acts through the exercise of constitutional control…"

80. To my mind the evidence here did make it at least arguable that Neo Cayman stepped beyond the sphere of the exercise of constitutional control. Its precise role in the running of the C&O segment is not crystal clear, but it is a reasonable inference that the running of a cross-group segment involves control by the parent company at executive level. The evidence did establish an arguable case in that respect in relation to the involvement in the infringing acts of Neo Canada (when it was the parent company), and, as Neo Canada took over the business of Neo Cayman, it is reasonable to infer, at least to the level necessary to allow the claim to continue, that the arrangements were the same in relation to Neo Cayman. That the position is not yet fully elucidated is not surprising, given that disclosure is yet to be given by Neo Canada.

Transfer of liability from Neo Cayman to Neo Canada

81. The sole question here is whether the materials relied on by Rhodia were sufficient to raise a triable issue that the liabilities of Neo Cayman passed to Neo Canada. Neo Canada is now a party, but it has put in no evidence as to what occurred and runs no positive case.

82. The first document relied on by Rhodia is Neo Canada's Annual Information Form for the year ended 31 December 2017 which contains the following passage:

> "The Arrangement
>
> On November 30, 2017, Neo and Neo Cayman completed the Arrangement pursuant to which, Neo acquired all of the outstanding ordinary shares of Neo Cayman in exchange for an aggregate of 39,873,383 Common Shares. The effect of the Arrangement is that Neo Cayman became a wholly owned subsidiary of Neo and it now carries on the business of Neo Cayman as carried on immediately prior to the Arrangement."
>
> ""Arrangement" means the Cayman Islands scheme of arrangement completed on November 30, 2017 pursuant to which Neo acquired all of the outstanding ordinary shares of Neo Cayman in exchange for an aggregate of 39,878,383 Common Shares and following which Neo Cayman become a wholly-owned subsidiary of Neo;"

83. Mr Caddick held that this passage only showed that Neo Canada had acquired 100% of the shares in Neo Cayman with the result that Neo Cayman had become its wholly owned subsidiary. I do not agree. Later in the document one finds the definition of "Arrangement", to which Mr Caddick may not have been referred:

> ""Arrangement" means the Cayman Islands scheme of arrangement completed on November 30, 2017 pursuant to which Neo acquired all of the outstanding ordinary shares of Neo Cayman in exchange for an aggregate of 39,878,383 Common Shares and following which Neo Cayman become a wholly-owned subsidiary of Neo;"

84. To an English lawyer's eyes this language suggests a court-approved scheme of arrangement. One would expect such a scheme to have provided for protection of the interests of creditors, both actual and contingent. In my judgment it is at least arguable that Neo Canada would have been obliged to protect the interests of such creditors, including Rhodia pursuant to the Arrangement.

85. The fact that it was a court-approved scheme of arrangement is confirmed by other material relied on by Rhodia, including Neo Canada's Interim Consolidated Financial Statements for the three months ended on 31 March 2018. At page 246 one finds this:

> "On November 30, 2017, the Company finalized *the court approved Arrangement* with Neo Cayman whereby the Company acquired all of the issued and outstanding shares of Neo Cayman in exchange for the issuance of an aggregate of 39,878,383 common shares." (emphasis supplied).

86. In my judgment it is arguable on the basis of these documents that Neo Canada assumed the liabilities of Neo Cayman pursuant to the Arrangement. There is more than sufficient to go to trial on this issue. I would therefore allow the appeal against Mr Caddick's refusal to allow the claim to proceed in relation to the Neo Cayman period.

Scope of the proceedings against Neo Canada

87. The issue here is whether, as Neo contend, the proceedings against Neo Canada are to be limited to the seized goods, or whether, as Rhodia contend, they can rely on other infringements in the enquiry as well.

88. HHJ Hacon, before whom this particular issue was debated, treated this question as at least to some extent determined by what it was that Mr Caddick had decided. This was, however, the first *inter partes* hearing of the issue, and it was for HHJ Hacon to determine the matter on the materials then before him. In any event, it does not seem to me that Mr Caddick expressly decided this question.

89. It is important to distinguish two issues at the outset. The first concerns the scope of the common design between Neo Cayman and Neo Canada on the one hand and Neo UK on the other. The second concerns whether the pleading rules in patent cases enable Rhodia to claim an inquiry as to all cases of joint infringement if it succeeds in establishing one of them.

90. On the first issue, the starting point is that I have concluded that it is arguable that Neo Cayman and Neo Canada did the acts in relation to the seized goods as part of common designs with Neo UK in their respective periods. That conclusion is founded at least in part on the inference that Neo Cayman and Neo Canada exercised executive control (i.e. more than constitutional control) over the activities of Neo UK. It seems to me that it would be wrong in principle, at this stage of proceedings, to hold that the common design extended to the seized goods and no further. That may turn out to be correct, but in the absence of any positive case from Neo, the existence of a wider common design, covering all Neo UK's acts of infringement, seems to me to be plainly arguable.

91. Mr Mitcheson submitted that the same conclusion could be arrived at because of the provisions of CPR Part 63 PD 4.1, which provides:

> "In a claim for infringement of a patent –
>
> (1) the statement of case must–
>
> …
>
> (b) give at least one example of each type of infringement alleged; …"

92. The issues of liability and quantum in patent infringement cases are invariably split. The advantages of doing so are obvious, as a long and complicated financial inquiry may be avoided if the patent is found invalid or not infringed. Further, experience shows that once liability is established, the inquiry can be settled. Those advantages would be lost if at the liability phase the patentee needed to prove multiple different cases of infringement on pain of losing the right to claim damages for those infringements thereafter. The practice direction reflects the flexible practice of the Patents Court whose purpose is to prevent the proceedings becoming over-complicated by numerous factual allegations of infringement. The patentee is only required to prove examples of each "type of infringement". The trial then proceeds by reference to exemplary infringements alleged, and can focus on whether the accused product or process infringes the claim.

93. The approach which I have outlined means that the inquiry as to damages against Neo UK will certainly not be limited to acts in relation to the seized goods. Mr Mitcheson submits that the same applies to the inquiry against Neo Canada if Rhodia succeeds in showing joint liability for the seized goods. Rhodia need only show an example of one type of joint tortfeasance to be entitled to pursue an enquiry in relation to all of them.

94. I am not persuaded by this alternative ground. This case was unusual, in that Neo Canada was not a party during the liability phase. Had it been a party, the question would have been whether there was a common design to commit the exemplified infringements relied upon against Neo UK, which include not only the seized goods, but other transactions in the infringing product. This would involve a trial of the scope of the common design. If the conclusion at the trial was that the common design was the wider one, covering all Neo UK's acts of infringement, the inquiry against Neo Canada would be correspondingly wide. If the conclusion was that the common design was limited to the seized goods, however, then it would follow that the inquiry against Neo Canada was correspondingly limited.

95. In my judgment, therefore, if Rhodia had not established that there was an arguable case in relation to the wider common design, Part 63 PD 4.1 would not come to its rescue. The Practice Direction is not intended to relieve the patentee of the burden of proving material facts relating to the scope of the common design.

Conclusion

96. It follows that, for the reasons I have given, I would dismiss the patent appeal, but allow both the procedural appeals.

Lord Justice Peter Jackson:

97. I agree with both judgments.

Lord Justice Lewison:

98. I agree that the patent appeal should be dismissed, and the procedural appeals allowed, for the reasons given by Floyd LJ. I wish to add a few words on the question of "ambiguity".

99. A patent is personal property, without being a chose in action. We know that because section 30 (1) of the Patents Act 1977 tells us so. The essence of a right of property is that it distinguishes between what is mine and what is not mine. So there needs to be a boundary. If someone crosses the boundary, he invades my property right. The function of the claims is to delineate that boundary. As Lord Russell put it in *Electrical & Musical Industries v Lissen Ltd* (1939) 56 RPC 23, 39:

> "The function of the claims is to define clearly and with precision the monopoly claimed, so that others may know the exact boundary of the area within which they will be trespassers."

100. In the case of an invention which, *ex hypothesi*, is new it may not be easy to delineate the boundary with precision. In the same way as a conveyance of land may not tell you precisely where the boundary is, with the result that any dispute may have to be resolved by looking at topological features on the ground, so the boundaries of an invention may have to be determined as a matter of interpretation in the light of the common general knowledge that the skilled person would possess. But once that exercise has been carried out (these days including the possibility of equivalents), the court will be able to answer the question whether someone has crossed the boundary "yes" or "no". That, I think, is what Lord Hoffmann meant in *Kirin-Amgen Inc v Hoechst Marion Roussel Ltd* [2004] UKHL 46, [2005] RPC 9 at [126] by a "fuzzy boundary" (a phrase which is now part of the jargon of patent lawyers). The boundary may be fuzzy, but it is still a boundary.

101. In my judgment Mr Meade was right to submit that there is a difference between a fuzzy boundary in that sense, and a boundary whose location is impossible to ascertain. It may be impossible to ascertain because it is described in meaningless terms (the famous example of Pinocchio units given by Jacob J in *Milliken Denmark AS v Walk Off Mats Ltd* [1996] FSR 292); or because the patent does not explain how to decide where the boundary is (as in *Kirin Amgen* itself). Patent lawyers have traditionally called this "ambiguity" but I do not think that that expression is accurate. Something is ambiguous when it is capable of having two (or more) meanings, and ultimately the court will be able to decide which of them is the correct meaning. Rather, in my judgment, the issue here is that of uncertainty. If the court cannot ascertain the boundary, having used all the interpretative tools at its disposal, it must

conclude that the specification does not disclose the invention clearly enough and completely enough for it to be performed by a person skilled in the art.

102. So in *Sandvik Intellectual Property Ltd v Kennametal UK Ltd* [2011] EWHC 3311 (Pat), [2012] RPC 23 the patent claimed a coating. One of the integers of the claim was "a texture coefficient (TC) larger than 1.3, preferably larger than 1.5". A formula was given which required use of "ASTM standard powder diffraction data". The specification of the patent did not identify which of two ASTM standard data cards ("PDF cards") to use or the manner in which the X-ray diffusion analysis should be carried out. Arnold J found that the results would differ according to which PDF card was used. He said at [164]:

> "Although these effects will only make the difference between infringement and non-infringement for coatings which are reasonably close to the lower limit in integer [5], be it 1.3 or 1.5, in such circumstances it is impossible to say whether the product falls within the claim or not, because it is uncertain what the correct test is. Thus it is not merely a case of the claim having a fuzzy boundary. Accordingly, I consider that counsel for Sandvik was right to concede that in this event the Patent is insufficient."

103. Likewise, in *Generics UK Ltd v Yeda Research and Development Co Ltd* [2012] EWHC 1848 (Pat) Arnold J said at [193]:

> "…it is necessary to distinguish between claims that are difficult to construe or that have a "fuzzy boundary" …on the one hand from claims that are truly ambiguous on the other. It is regrettably common for claims to be difficult to construe, but the court will nevertheless strive to give such claims a sensible meaning having regard to the inventor's purpose. It is also common for claims to have a fuzzy boundary, because an integer of the claim involves some question of degree or an imprecise functional limitation. It is well established that is not itself objectionable. If a claim is truly ambiguous, so that it is unclear what is the correct test to determine whether or not a product or process infringes, however, then the claim is insufficient, as discussed below."

104. With the substitution of "uncertain" for "ambiguous" I agree. This court approved this passage on the appeal from Arnold J: [2013] EWCA Civ 925 at [193] where Floyd LJ also said:

> "It is sometimes difficult to determine where the precise boundary of a claim lies. In such cases what matters is whether the skilled person knows what the test is he has to apply to determine infringement."

105. For the reasons given by Floyd LJ I do not consider that the patent in suit in the present case is insufficient. In the case of the first insufficiency attack, the attack fails in principle. In the case of the second, it fails on the evidence.