Intellectual Property Office

BL O/518/15

06 November 2015

PATENTS ACT 1977

BETWEEN

University of Warwick — Claimant

Dr Geoffrey Graham Diamond — Defendant

PROCEEDINGS

Reference under section 12 of the Patents Act 1977 in respect of US Patent Application 12/306505

HEARING OFFICER Phil Thorpe

DECISION

Introduction

1. This decision concerns entitlement to US Patent Application 12/306505 ("the application"). The application relates to apparatus for and method of inspecting an article using electromagnetic radiation. The application names Tat Hean Gan, David Arthur Hutchins and Geoffrey Graham Diamond as inventors. All three inventors were employed at some point by the University of Warwick. Two of the inventors have assigned any rights they have in the application to the University but Dr Diamond has declined to do the same.

2. The University of Warwick initiated proceedings under section 12 of the Patents Act against Dr Diamond on 8th August 2013. It claims that it is entitled to be granted a patent for the invention set out in the application on the basis that Dr Diamond was at the time that the invention was made an employee of the University. It therefore seeks an order requiring Dr Diamond to execute an assignment in favour of the University of Warwick. This is resisted by Dr Diamond who claims that the University has no right in his contribution to the invention. Rather he claims that the invention belongs to a company called G-Tronix.

3. I would note that from the outset Dr Diamond has represented himself in these proceedings. I have endeavoured to assist Dr Diamond as much as I could in terms of clarifying the law and procedure. I have also advised Dr Diamond on a number of occasions to consider seeking professional representation.

4. The course of proceedings has not been smooth. Dr Diamond in particular has raised a number of procedural and substantive issues along the way. These resulted in me issuing two preliminary decisions[1] one of which Dr Diamond appealed to the High Court. That appeal was struck out. The substantive matter finally came before me at a hearing on 2nd and 3rd of June 2015. The University of Warwick was represented by Mr Henry Ward of Counsel instructed by HGF. Dr Diamond appeared in person.

The witnesses and their cross-examination

5. The University of Warwick provided witness statements from Mr David Calvert, Professor Roger Green and Ms Gillian McGratten. Mr Calvert was from 2000 until 2009 a business development consultant at Warwick Ventures which is a wholly owned subsidy of the University of Warwick tasked with protecting, managing and commercialising the research and innovations produced by the University. Ms McGratten is the Director of Human Resources at the University. Her witness statement focused on the employment history of Dr Diamond at the University. Professor Green is a Professor in the University's School of Engineering. His brief statement centred on a spin-out company from the University, Shibden Technologies, with which he and Dr Diamond were connected. Nothing turns on this and hence I will say no more about Professor's Green evidence.

6. Dr Diamond submitted a witness statement from himself.

7. Only Dr Diamond and Mr Calvert were cross examined. I discuss their evidence in more detail later however I need to say a little first about the cross examination of these two witnesses and how credible they were.

8. I will start with Mr Calvert. I would note first that there did appear to some animosity between Mr Calvert and Dr Diamond which meant the cross examination by Dr Diamond was at times personal. In addition it was at least in part directed at trying to belittle Mr Calvert's achievements in his role. This was not particularly relevant to the matter in issue. Notwithstanding that Dr Diamond was able to highlight the odd minor inconsistency in Mr Calvert's evidence for example Mr Calvert had mistakenly stated the date of incorporation of Warwick Ventures as 2009 when in fact it was 2010. However overall I found Mr Calvert to be generally a credible witness who sought to answer questions put to him in a straightforward manner and who was fully prepared to admit if he did not know something.

[1] BLO/208/14 and BLO/225/15

9. Dr Diamond was cross examined at some length by Mr Ward. I found him to be a combative witness who tended at times to respond in a manner that he thought best supported his case. This included occasionally seeking to avoid answering the question entirely. A flavour of this can be seen in the following exchange from his cross-examination:

> Mr Ward – Yesterday you said on two different occasions that you never worked with Dr Gan?
>
> Dr Diamond – No, I had never worked with him, as part of the same contract, within the university or same team within the university. I met him socially many times.
> ..
>
> Mr Ward – Did you ever publish any papers together?
>
> Dr Diamond – We were never paid out of the same project.

10. Mr Ward then went on to reveal at least one paper that was authored by both Dr Diamond and Dr Gan.

11. Mr Ward also sought to highlight the general lack of precision in Dr Diamond's evidence. For example in his witness statement Dr Diamond had stated that the invention belonged to G-Tronix. He then went on to indicate that he was an employee of G-Tronix. This was challenged at the hearing:

> Q. So you say it was created by G-Tronix because it was invented by its shareholders. Is that right?
>
> A. It is a loose definition. I do not suppose I could articulate it much better than that. But basically we were working on this independently for the benefit of G-Tronix ultimately and the shareholders which we were the three principal shareholders
>
> ...
>
> Q. ... How were you working for G-Tronix? Are you suggesting ---
>
> A. Okay what was I physically doing?
>
> Q. No no. In what way is G-Tronix the creator of this invention? Did it employ the three of you?
>
> A. It was work in kind.
>
> Q. Did it employ the three of you?
>
> A. It was work in kind.

12. Dr Diamond then went on to admit that he was not actually employed by G-Tronix. When directed to the part of his witness statement that clearly suggested he was an employee of G-Tronix, Dr Diamond sought to suggest that was merely a "slip of the pen".

13. Perhaps more concerning about Dr Diamond as witness were the things he claimed to have no knowledge of or that he did not mention in his statement of case and witness statement and which then just appeared during his cross examination. Chief among these was the suggestion that he had

devised a basic prototype of the invention in his workshop at home. Nowhere is this specifically mentioned in either his statement of case or witness statement. Dr Diamond did try to argue that this fell somehow within the "independent efforts and resources of G-Tronix" to which he does refer earlier. It was not a convincing argument. Even again allowing for him being a litigant in person and possibly that, at least at the start of proceedings, he was unclear what the central issues were likely to be, it is inconceivable that by at the latest my issuing of a preliminary evaluation some 2 months before the hearing, he wasn't aware that this was a potential key piece of information. Why did he not then raise it? Unsurprisingly Mr Ward suggested that the reason it wasn't raised earlier was because it was simply untrue.

14. The key issue on which he claimed to have no real knowledge was on the origins of some of the figures in the patent application. In particular Dr Diamond claims to have no knowledge of how figures 5a and 5b in the application were produced. As I discuss later these figures are I believe significant yet when pressed on them at the hearing Dr Diamond first speculated that they may be ultrasound images included by mistake, then that they may have been produced on the prototype he claims to have made, then that they might have been produced by some form of camera device. Dr Diamond was by his own admission heavily involved in providing much of the technical detail for the patent. He liaised closely with the patent attorney drawing up the PCT application that gave rise to the application in issue here. Is it conceivable that he did this, including reviewing drafts of that application, without once asking about figure 5a and 5b or without seeking to confirm that it was as the application claims produced by an embodiment of the invention which included his contribution?

15. I should also mention one other issue that Mr Ward claims clearly goes to credibility. Dr Diamond has advanced a position that the invention was devised by "G-Tronix" and then in effect "brought into the University". The reasons why he believes this happened is perhaps best set in his original statement of case where he notes:

> "It was during this time [2006] that it was suggested to me by Dr Gan and Mr Calvert that it would be far more expedient when it came to filing IP relating to the NIR technology if the university would take care of things purely in an administrative role whilst G-Tronix Ltd would meet the associated costs of patent filing etc.
>
> It was also suggested to me that such an arrangement would enable extra sources of funding secured by Mr Calvert and a mechanism to allow this to happen would be that the NIR technology would be bolted onto a clause in a previously existing licence to the company relating to ultrasound. The understanding was then that the University would go through the formality of granting a licence and immediately make a permanent and irrevocable assignment of any and all IP to the company".

16. Mr Ward picked up on this at the hearing suggesting that either this was clearly untrue or it was tantamount to an admission by Dr Diamond that the University and G-Tronix and hence Dr Diamond himself were engaged in fraudulently passing off something as belonging to the University when it didn't. Whilst Mr Ward clearly felt that the most plausible and simple explanation was that all concerned clearly considered the invention to belong

to the University, he also suggested that both scenarios were equally damaging to the credibility of Dr Diamond as a witness. Either he had lied about this alleged “arrangement” or he was a party to a fraud.

17. I again found Dr Diamond’s responses on this during his cross-examination to be unconvincing. He firstly said he was not claiming that the actual invention in issue here had been subject to this sort of arrangement. He was rather merely trying to paint a more general picture of how Warwick Ventures was desperate to secure further grants. When pressed on this and when he was directed to the actual wording of his earlier statement he reverted back to his earlier position that the invention was in effect transferred to the University on the understanding that it would be assigned back to G-Tronix. He did however continue to argue that there was nothing dishonest in this. He suggested that the invention was in effect just being used as “background IP” in order to secure further work for the University and G-Tronix. For reasons that I explain later I have concluded that in all probability that there was no such arrangement to “bring the invention” back into the University. Rather everyone involved with the invention, including Dr Diamond behaved from the off as if the invention did belong to the University.

18. So what do I conclude about the credibility of Dr Diamond as a witness? As I have noted Dr Diamond chose to litigate the case in person despite advice to the contrary. That was his decision. It has however I believe clearly led to a lack of clarity and precision in his case and in his evidence. That is perhaps understandable. However he compounded that by his general approach to these proceedings including at the hearing. He contested anything that he thought might hurt his case, even when it was apparent that it was either not relevant or any challenge was hopeless. This together with his at times evasiveness and his partial and unconvincing recollection of events meant he was not a particularly credible or reliable witness. Hence even if I reject, as I am minded to do, Mr Ward’s claim that Dr Diamond was a dishonest witness, I must I believe still treat his evidence with great caution unless it is supported by corroborating evidence or unless it helps the claimants case.

The Law

19. These proceedings have been brought under section 12 of the Patents Act 1977 which reads as follows:

> 12.-(1) At any time before a patent is granted for an invention in pursuance of an application made under the law of any country other than the United Kingdom or under any treaty or international convention (whether or not that application has been made) –
>
> > (a) any person may refer to the comptroller the question whether he is entitled to be granted (alone or with any other persons) any such patent for that invention or has or would have any right in or under any such patent or an application for such a patent; or

(b) any of two or more co-proprietors of an application for such a patent for that invention may so refer the question whether any right in or under the application should be transferred or granted to any other person;

and the comptroller shall determine the question so far as he is able to and may make such order as he and the comptroller shall determine the question so far as he is able to and may make such order as he thinks fit to give effect to the determination.

20. In this particular case there is no question that Dr Diamond was a co-inventor of the invention. Rather what is in dispute is whether by virtue of his employment by the University of Warwick at the time that the invention was made, the rights of Dr Diamond to the application belong to the University.

21. The relevant provision relating to rights of employers and employees to inventions made in the course of employment is section 39. This reads:

> 39(1) Notwithstanding anything in any rule of law, an invention made by an employee shall, as between him and his employer, be taken to belong to his employer for the purposes of this Act and all other purposes if –
>
> (a) it was made in the course of the normal duties of the employee or in the course of duties falling outside his normal duties, but specifically assigned to him, and the circumstances in either case were such that an invention might reasonably be expected to result from the carrying out of his duties; or
>
> (b) the invention was made in the course of the duties of the employee and, at the time of making the invention, because of the nature of his duties and the particular responsibilities arising from the nature of his duties he had a special obligation to further the interests of the employer's undertaking.

22. The claimant relies only on section 39(1)(a). Furthermore it contends only that the invention was made in the normal course of his duties and not in the course of duties specifically assigned to him. Hence in order for me to decide the matter I need to determine i) what were the normal duties of Dr Diamond at the time that the invention was made ii) was the invention made in the course of those duties and iii) were the circumstances such that an invention might reasonably be expected to have resulted from the carrying out those duties.

23. Mr Ward submits that the leading case when it comes to considering what the normal duties of an employee are is the Court of Appeal judgment in *LIFFE Administration & Management v Pinkava*[2]. This case considered the question of whether an employee, Dr Pinkava, was entitled to an invention made whilst he was employed by Liffe. In considering how the duties of Dr Pinkava should be determined Jacob LJ. first considered the relevance of section 42 of the Patents Act, which prevents contracts of employment

[2] LIFFE Administration & Management v Pinkava [2007] EWCA Civ 217

diminishing an employee's right under section 39 before going on to consider section 39. He notes:

> 94 Standing alone s.42(2) is at first sight startling—it says that any term in a contract which diminishes an employee's rights in an invention is unenforceable. That would apply even to a case where everyone agrees that an invention should belong to the employer, for instance a term in a research engineer's contract that inventions made by him pursuant to his contract belong to the employer. That makes no sense on its own. But it is not on its own. s.39 covers the situation—so it is not the term of the contract which gives ownership to the employer but s.39 itself.
>
> 95 I think that must be the true explanation for s.42(2) . Ownership of inventions between employer and employee is not governed by direct contractual provisions as to ownership, but by s.39(1) and (2) alone. Section 42(2) is the mechanism by which the anti-contracting out recommendation has been implemented.
>
> 96 Note however that s.42(3) preserves the employee's duty of confidentiality. So if an employee makes an invention which it is his duty to keep confidential as being an idea which belongs to his employer, that duty continues notwithstanding s.42(2) .
>
> 97 It is against that background that one comes to s.39(1) . Both (a) and (b) focus on the employee's duties ("normal" or "specifically assigned" for (a) and a "special obligation to further the interests of the employer" for (b)). How then does one ascertain the nature of the employee's duties? "Duty" is the language of obligation. As between the employer and employee the primary source of a duty are the terms of the contract. What is it that he is employed to do must be the key question. That is not the same thing as was suggested by Mr Tritton—what is his day-to-day work? Take for instance a research chemist working on a cancer cure for the last 10 years. Suppose he came up with a cure for arthritis. He could not seriously contend that he owned the invention because he was day-to-day working on a cancer cure. His duty as a research chemist is clearly wider than his day-to-day work.
>
> 98 On the other hand the contract cannot be sole arbiter of the duty. Otherwise employers would be able to include overbroad duties in contract terms and s.42(2) would not operate to make the contract unenforceable. As I have noted, that was specifically a matter of concern to the Banks Committee. Section 42(2) will have effect to deal with overstated duties. The "duties" of s.39(1) are determined realistically.
>
> 99 Since one cannot go by the contract alone I do not think one can be too precise about how the duty is to be ascertained. The contract and the general nature of the job both call for examination. It is not possible to be too analytical about this. In the end one is asking whether the employee is employed to try to innovate and, if he is, what general sort of areas his innovation duties cover. It is here that I think Kitchin J. got too far into the detail of Dr Pinkava's day-to-day work, accepting that he was under a duty to innovate new types of future of a conventional kind but not other types of product which would be of commercial interest to LIFFE.
>
> 100 Clearly another factor relevant to the determination of duties is the extent to which the common law imposes a duty of confidence on the employee. Section 42(3) makes it clear that Parliament was not intending to abrogate this duty in relation to employee inventions. So if in the course of his work an employee comes up with an idea which the common law would require him to hold as confidential to his employer, that will be covered by s.39 . Any other conclusion leads to the absurd result that an invention would belong to the employee and yet he would owe a duty of confidence to his employer. Parliament cannot have intended such a stalemate. It follows that to some extent at least, although s.39(1) is a complete code, it lets the common law back in via the concept of "duty."

24. Mr Ward was keen to highlight the importance of not focusing too much on the day-to-day activities but as Jacob LJ noted above to consider more broadly whether Dr Diamond was employed to try to innovate and if so in what general sort of areas did his innovation duties cover.

25. In advance of the hearing I also raised two other cases that considered the duties of an employee and which I thought might be relevant here. The first is *Greater Glasgow Health Board's Application*[3]*.* Here an employee Dr Montgomery made an invention whilst working as a Registrar in the Department of Ophthalmology at the Western Infirmary which was under the control of the Greater Glasgow Health Board. In assessing the normal duties of Dr Montgomery, Jacob J as he was then noted:

> So, what were the normal duties of Dr. Montgomery? They appear from his contract. The actual contract of 11 November 1985 says:
>
> "Your duties are as defined in the job description already issued."
>
> Going to that document, one finds the duties of the post, and under that heading the description says:
>
> "The appointee will have clinical responsibilities in the Out-Patient Department and in Casualty and will also have duties relating to the ophthalmic and general care of in-patients including ophthalmic surgery.
> .....
>
> The job description also describes a number of other things which are not described as "duties". In relation to teaching it says:
>
> "The appointee will be expected to participate in undergraduate and postgraduate teaching of Ophthalmology."
>
> It then says of research opportunities:
>
> "The Department is active in both basic and clinical research and the appointee will be expected to avail himself of the facilities provided."

26. The second case that I highlighted was *University of Western Australia v Gray*[4]. This was a judgment from the Australian Court. Dr Gray was a Professor of Surgery at the University of Australia. His responsibilities unlike Dr Montgomery clearly extended to undertaking research. Although the judge in this case discussed at some length the nature of Dr Gray's research and the general principles of entitlement to inventions made by university researchers, including an exploration of the position in the UK, I do not believe that in the end this case really helps me here. It was firstly a judgement of the Australian Court. Also as Mr Ward pointed out the decision in that case ultimately rested on implied terms rather than on any statutory basis similar to section 39. I will say no more about this case.

The invention

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[3] *Greater Glasgow Health Board's Application* [1996] R.P.C. 207
[4] *University of Western Australia v Gray* [2008] FCA 498

27. The invention set out in the application is concerned with imaging apparatus and a method for investigating the internal structure of an article.

28. According to the patent, the invention seeks to overcome some of the problems and drawbacks associated with conventional imaging techniques, such as x-ray and terahertz imaging. Known systems often come at high-cost, are large and bulky, and can present a risk to health and safety if ionizing radiation is used. They may also be of limited use when imaging certain materials: the application talks about the limitations of terahertz imaging to analyse biological samples and the limitations of x-ray to provide sufficient contrast in samples with relatively small concentrations of different material.

29. With reference to Figure 1 of the application (reproduced below), the essential features of the imaging apparatus (100) of the invention are:

-a controller (this can be can be computing device 105 or reference signal generator 110) for generating a drive signal having a periodic amplitude variation;

- a source (shown as 120) which is operable by the controller to emit a source beam of electromagnetic radiation (EMR) to irradiate an article (shown as 190), the source beam having a periodic amplitude variation corresponding to that of the drive signal; and

- a detector (shown as 125) configured to detect a portion of the source beam that has been transmitted through at least a portion of the article, and to generate a detector signal having an amplitude variation corresponding to the amplitude variation of said portion of the source beam,

- the controller being further configured to generate a difference value corresponding to a difference between the amplitude of the detector signal and the amplitude of a reference signal.

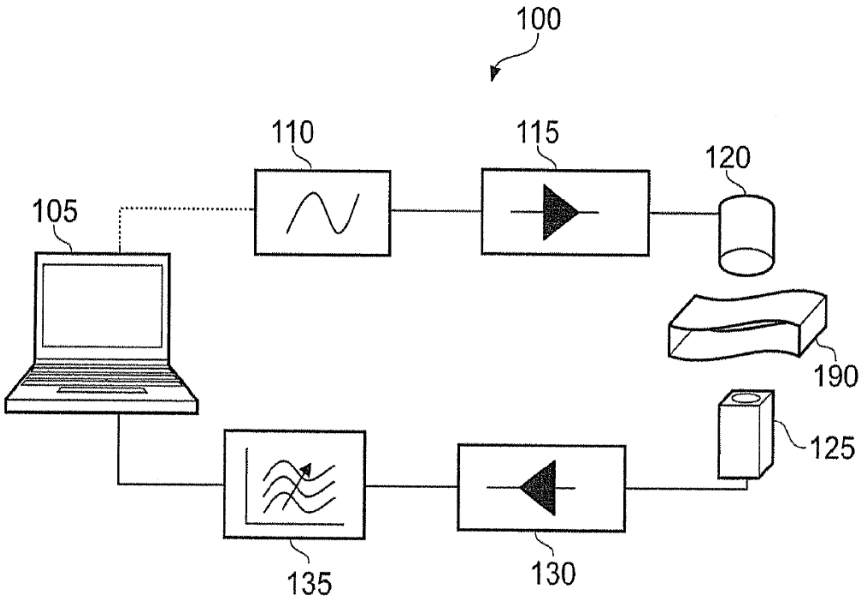

FIG. 1

30. Within the illustrated embodiment of Figure 1, the invention includes a ‘reference (drive) signal amplifier’ (shown as 115), a ‘detector signal and conditioner’ (130), and a ‘signal processing module’ (135).The signal processing module is important to the invention as it receives a feed of the reference signal produced by reference signal generator and a feed of the detector signal originating from the detector. It is within the signal processing module that the process of ‘autocorrelation’ of the two signals takes place and which enables the module to produce the ‘difference value’ output that is referred to above.

31. The autocorrelation may be performed using single frequency lock-in by means of an analogue circuit, or digitally using a suitable software program running on a computer. In some embodiments, the apparatus may employ “other types of small signal recovery techniques including a variety of other lock-in detection techniques”.

32. It is envisaged that the apparatus can be configured to operate in either:

i) a transmission mode, as shown in Figure 1, where the detector detects EMR transmitted through an article with detector and source on opposite sides of the article; or

ii) a reflection mode where the detector is arranged to detect reflected EMR (either EMR reflected from a surface of an article or EMR that has been reflected back through the article via a reflector).

33. It is also envisaged that the apparatus could operate in both modes simultaneously. The apparatus can also be provided in the form of a handheld device having a chamber into which samples are inserted.

34. A preferred but not essential feature of the invention is the use of EMR having a wavelength in the range 700 to 2000nm. Such EMR is referred to as 'near infrared radiation' ("NIR").

35. Many possible uses of the invention are proposed within the application, such as: inspection of food samples for foreign bodies; the quality or characteristics of food items (including the packaging); the clinical screening and investigation of patients, for example the detection and characterisation of cysts and tumours; and the security of persons and property, for example scanning mail for keywords or identifying prohibited articles and substances within envelopes, handbags or suitcases, or being carried in or on the human body. It is stated the invention can be used within a wide range of materials and products.

36. I will for reasons that will shortly become apparent also highlight figures 5(a) and 5(b) in the application which are reproduced below. According to the description these show:

> " an image of a portion of a food sample obtained by means of apparatus according to the first embodiment of the invention. FIG. 5(b) is a schematic illustration of a portion of an array of pixels of the image corresponding to the area circled in FIG. 5(a). Each pixel corresponds to a detector element of the detector 125. Overlaid on each pixel is a number corresponding to the amplitude of the signal generated by the detector element corresponding to that pixel."

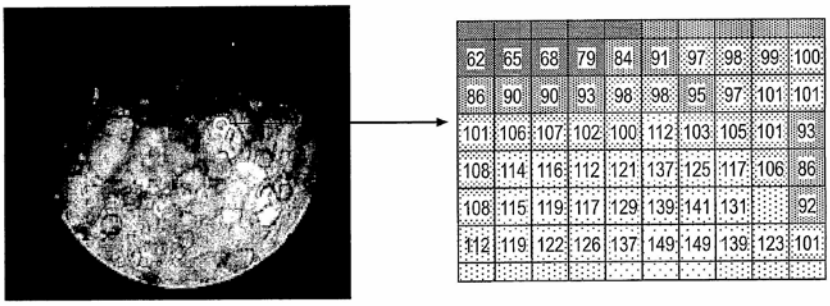

FIG. 5(a) FIG. 5(b)

I would add that the description notes earlier that:

> "The radiation source 120 according to the first embodiment is a solid state light emitting diode (LED) device configured to emit electromagnetic radiation with a wavelength of around 900nm."

and

> "According to the first embodiment of the invention autocorrelation is performed using single frequency lock-in by means of an analogue circuit. Analogue circuits may be constructed having very high sensitivity to small differences in the amplitudes of the reference and detector signals, enabling high quality images of an internal structure of an article to be obtained."

Dr Diamond's contribution to the Invention

37. It is not disputed that the three named inventors in the application Professor Hutchins, Dr Gan and Dr Diamond all contributed to the invention. Dr Diamond's contribution was I believe best summed up in Dr Diamond's opening remarks at the hearing when he noted

> *"My scientific contribution itself was based on two things. It was something called lock-in detection which is a homodyne technique from the old days of continuous wave NMRs for this fantastically superb signal to noise capability which it offered and I implemented it via old fashioned analogue electronics. That was part of my egg. The other one was the choice of near-infrared wavelengths themselves because prior to that people were talking about infrared, not specifying."*

38. This is not challenged by the claimant. Where there is less agreement is in relation to when Dr Diamond made the contribution and the circumstances in which that contribution was made.

Dr Diamond's employment by the University of Warwick

39. Dr Diamond had initially sought to argue that he was not an employee of the University at the time that the invention was made. This he argued was because he did not, as requested by the University, sign and return various letters setting out the details of extensions to his contract of employment. However by the time of the hearing he had rightly in my view dropped this line of argument.

40. It is now accepted by both sides that during the period when the invention was devised Dr Diamond was employed by the University of Warwick as a Research Fellow in the School of Engineering. His initial contract ran from 1st August 2002 until 31st January 2003.

41. Dr Diamond's appointment was then extended by a series of short-term, rolling extensions. From October 2004 onwards the various short term extensions to his appointment were made dependent upon the continuation of specific projects and their funding. This is something that Dr Diamond believes is especially significant so I have taken the opportunity to summarise the caveats placed upon the extensions of his employment here:

> **For the 3 months spanning 1 October 2004 to 31 December 2004** – "*dependent upon UK NDE Centre funded project, and will be subject to the continuation of the availability of funding and the project*";
>
> **For the 6 months spanning 1 January 2005 to 30 June 2005** – "*dependent upon UK NDE Centre - RESEE0065SRA funded project, and will be subject to the continuation of the availability of funding and the project*";
>
> **For the 2 months spanning 1 July 2005 to 31 August 2005** – "*dependence upon the UK NDE Centre funded project, and will be subject to the continuation of the availability of funding and the project*";

For the 3 months spanning 1 September 2005 to 31 October 2005 – terms and conditions of appointment unchanged;

For the 5 months spanning 1 November 2005 to 31 March 2006 – initially dependent upon UK NDE Centre project but amended **from 1 December 2005** to be "*dependent upon funding from the UK NDE Centre (extension), and the continuation of both availability of funding and the project*";

For the 3 months spanning 1 April 2006 to 30 June 2006 – "*dependent upon the Spinner Grant funded project, and will be subject to the continuation of the availability of funding and the project*".

42. After this date, Dr Diamond had two further extensions; the first being dependent upon the continuation of the "Spinner Award and UK NDE Centre" projects, the second being dependent upon an "Ultrasonics Discretionary" funded project. From April 2007, Dr Diamond's appointment was extended on an indefinite basis, subject to work on the "Defra Award - Near IR Sensor Arrays for Food Quality Assessment" funded project.

The University's Ultrasonics Group

43. It is not in dispute that the University had at the time that the invention was devised a dedicated "ultrasonics group" headed by Professor Hutchins. Dr Diamond joined this group in August 2002.

44. The work of the ultrasonics group was funded and consequently directed to some degree by various research grants. Details of various grant applications made by the University have been submitted as part of these proceedings. Included amongst these is an application for a grant[5] for the period 1st February 2001 to 31st January 2004 to research a "new ultrasonic transducer system for the detection of defects in engineering composites". The principal investigator is named as Professor Hutchins.

45. I have also been directed to a grant application[6] by a number of Universities including the University of Warwick, for funding for "The UK Research Centre in NDE (non destructive evaluation)". According to the application the Research Centre isto do world class research in NDE and related fields. The grant application was seeking to secure funding for the period 1st April 2003 until 31st March 2008 and for what it describes as "longer term, adventurous research". The application also names Professor Hutchins as one of a number of investigators.

46. Dr Gan was according to Mr Ward also a member of the ultrasonic group though Dr Diamond submits he never worked in any team with Dr Gan. What isn't in dispute is that Dr Gan undertook research including in the field of ultrasonics before he left the University around March 2006. That he also contributed to the invention in issue here is not disputed.

[5] Engineering and Physical Sciences Research Council Grant GB/R04379/01
[6] Engineering and Physical Sciences Research Council Grant GR/S09388/01

The COAP Document

47. The claimant contends that by January 2005 Dr Gan's research had ventured beyond the use of ultrasonic transducers and into using infrared imaging systems. To support this it has provided a copy of a document purporting to be Warwick Venture's summary of Dr Gan's work on an infrared imaging system. This summary is contained in a 'Commercial Opportunity Appraisal Process' (COAP) document given COAP reference number 05005.

48. The COAP document is entitled "Infra-Red Imaging" and discusses an 'invention' that takes the form of an imaging system which uses an infrared source, such as an infrared LED, to image various items, including food and the human body. The infrared emitted from the source is passed through a sample and detected using a simple camera – a webcam is suggested - and together the source and camera are able to scan in the 'X' and 'Y' directions to build up a 2D map that represents a layer within the sample. With refocusing, information in the z-direction can also be provided. The author of the document explains that Dr Gan will be developing the software processing capabilities of the equipment and a scanning platform in order to produce a versatile piece of equipment. There is also discussion of patent applications which might be licensed to a company called G-Tronix. I will discuss this company shortly. It is said that the development work could be the subject of a "spinner application" or an "EPSRC follow-on fund application".

49. The date on the COAP document is January 2005. The claimant has sought to verify this date by providing a screenshot of the digital properties of the electronic file containing the COAP document. This shows that the document was created and last modified on 28th January 2005. Somewhat confusingly the screenshot also shows that the document was last printed on 15th December 2003. Mr Calvert is convinced that this last entry relates to an earlier document which was overwritten by the COAP document.

50. Dr Diamond questions both the authenticity and the technical relevance of this COAP document, suggesting that the technical disclosure would have been far greater had Dr Gan actually provided it. He also questioned Mr Calvert's explanation for the conflicting dates that appear on the computer screenshot of the properties of the COAP document.

51. I believe however that this document is most likely as Mr Calvert claims a record of a meeting between someone at Warwick Ventures and an academic with a new idea, in this instance Dr Gan and a new imaging system he has been developing. The content of this document is not drafted by Dr Gan but rather a synopsis of a discussion between Dr Gan and most likely someone with much less technical knowledge than him. There is a background section that includes a discussion of confocal microscopes and their high costs, and then a disclosure of Dr Gan's alternative, low cost imaging system. The document talks very clearly about passing infrared light from an LED source through various samples.

52. This document provides I believe the first documented evidence that I have of the evolution of the invention that is described in the application in issue.

The 05 patent application

53. The claimant goes on to contend that in March 2005 the University began to protect the intellectual property associated with the infrared imaging invention discussed in the COAP document. It refers first to patent application GB0505675.9 ("the '05 application"). Neither side has produced a copy of this application which was never published nor any receipts associated with its filing. The fact that it was filed on 19th March 2005 is not however in dispute. The filing (or "lodging") of the application is part of the public record and can be verified via the IPO website. This shows that the title of the application is "Real-time infrared measurement and imaging system". The applicant is named as the University of Warwick. I should also explain here that due to the IPO's policy for the retention and disposal for patent records, the IPO no-longer holds a copy of this 05 application.

54. In the absence of a copy of the actual application, the claimant has provided a copy of what it claims is a draft for the application. The draft was attached to an email sent by Dr Gan to Mr Calvert dated 1st March 2005. The draft consists of an abstract, 2 pages of description, a 2 page claim set and 6 figures spread across 4 pages of drawings.

55. The description begins by introducing the invention as an EMR/optical method "for the detection of internal structure and properties of materials such as food products using transmitted coded signal from an infrared source". It goes on to say that the invention provides "a non-destructive and non-invasive imaging system including one or more infrared source(s), an array of photo-sensitive detectors or CMOS/CCD sensors, and a computer for generation of coded signals and the reception of signals for conditioning and processing". This is reflected in figure 1 which is described as showing the "heart of the imaging system".

56. I have not reproduced figure 1 here because, apart from using different reference numerals, it is the same as figure 1 of the application in issue (reproduced above). I would add that the application in issue here also includes all the other figures provided in the draft 05 application with the exception of figure 4.

57. The description of figure 1 explains that a coded signal is generated via a computer or electronics system and passed through an amplifier to an infrared source. The signal is then transmitted through a test media, for example a food source, and captured by an array of infrared sensors or cameras. Once detected, the signal is conditioned with a low noise amplifier before a signal processing stage to filter out noise. The signal is then fed to the computer for data analysis, image reconstruction and image processing. The system may be used with static test media or media on a moving conveyer belt. The components of the system may also feature within a hand-held device.

58. The draft application envisages that the imaging system can be used in various applications from measuring foreign bodies or contaminants in a sample thorough to measuring various characteristics of food samples, through to packaging quality and the measurement or imaging of body parts.

59. The application does not specifically refer to lock-in nor does it provide any information about the wavelength of the infrared source. It does however refer to various image processing methods such as threshold, correlation, wavelet and matched filtering.

60. Dr Diamond expressed surprise that the claimant was not able to provide an actual copy of the application filed and instead had to rely on a "draft application". In the event I do not believe anything further would have been learnt if it had been able to provide the final version of the application. Given the contents of the later 2006 application then I suspect the draft application submitted is very close if not identical to the application that was filed in 2005.

The Spinner Pathfinder Grant

61. Shortly after the 05 patent application was filed, an application was made by the University for a "Spinner – Pathfinder Grant" for a "*Novel non-contact infrared (IR) system for food quality inspection*". Dated 14th July 2005, the grant application names Tat Gan as the "academic/inventor" and provides a high level summary of the technology that the grant would support. In particular, it discusses the use of "a combination of advanced signal processing technology on infrared signals" that have been "transmitted across a food sample". The application also states that a patent application has been filed, quoting GB 0505675.9 as the application number. The document explains that a one-dimensional infrared system has been developed and the next stage of development to prove commercial viability is to provide a linear arrays of scanners and detectors. If successful, it is stated that the IPR in the invention will be "licensed to G-Tronix for commercial exploitation". A timescale of 15-20 weeks for the work is given.

The '06 application

62. The University's 05 patent application was terminated before publication. A further application was however filed which became the priority application for the PCT application that led to the application in issue here. This priority application was UK patent application GB0613165.0. It is entitled "*Real-time infrared measurement and imaging system*", and was filed 28th June 2006 by The University of Warwick, under University reference "*COAP 05005 Infrared System*". Tat Hean Gan, David Arthur Hutchins and Geoffrey Graham Diamond are the named inventors with the Statement of Inventorship form that accompanied the application noting that the applicant derives the right to be granted a patent by virtue of the "*regulations relating to all staff and students*". As filed, the application comprised the same abstract, description, and figures as the draft 05 application. Claims were never filed.

The PCT application

63. PCT application PCT/GB07/050368 was subsequently filed 28th June 2007 with a priority claim based on GB0613165.0. It was published as WO2008/001141 on 3rd January 2008. The application again named the University of Warwick as the applicant. Signed declarations of inventorship were subsequently filed by all the named inventors Dr Diamond's signed declaration is dated 4th September 2007. As noted the PCT application gave rise to the application in issue here. That application was published as US2009/0279773 on November 12th 2009.

64. The claimant has provided a series of email exchanges between the patent attorney handling this PCT application, Mr Mark Yeadon of Harrison Goddard Foote (HGF) and Mr Calvert. What is clear from these exchanges is that Mr Yeadon considered the 06 application to be lacking in technical detail. The evidence shows that Mr Yeadon sought and obtained further technical information about the invention particular from Dr Diamond. Indeed it is clear that Dr Diamond met and liaised closely with Mr Yeadon on the preparation of the PCT application.

G-Tronix and the further development and commercialisation of the invention

65. According to Mr Calvert, the model adopted by the University to exploit research carried out by the University is to licence the results of the research including any intellectual property to spin-out companies who then develop the technology. In some instances the University will assign the intellectual property to the spin-out company.

66. G-Tronix was established in June 2004 by Dr Gan. At that time he was the only Director. There was some dispute about the nature of this company especially as to whether it was strictly a University spin-out company. Dr Diamond highlighted that the University did not have any stake in the company when it was founded though it did become a shareholder in 2005. I do not believe anything turns on the precise basis on which this company was formed. The company was initially set up by Dr Gan to exploit work he had been doing on ultasonics. This is brought out in the company directors' report for the period to June 2006 which was signed by Dr Diamond. It notes that the company was set up "in order to exploit the IP relating to air coupled ultrasonic emitters and their application in the analysis of food processing." It goes on to note that "The IP is owned by the University of Warwick and exclusively licenced to the company in exchange for an equity share".

67. The report also notes that in February 2006 Dr Diamond and Professor Hutchins were appointed as directors and at the same time Dr Gan resigned as a Director.

68. The claimant has provided copies of two licence agreements entered into between the University of Warwick and G-Tronix. In the first dated 29th August 2005 the University licences to G-Tronix the technology contained inter alia in the 05 application and in the second dated 5th December 2007 the technology in inter-alia the 06 and PCT applications. The first agreement, which also refers to know-how relating to air coupled ultrasonics, was signed

on behalf of G-Tronix by Dr Gan and the second was signed on behalf of G-Tronix by Professor Hutchins. Both licences state that the licensed technology will remain the exclusive property of the University. The latter licence in particular also states that the University will pay any fees to maintain the 06 and PCT applications with G-Tronix reimbursing the University for any such fees that are paid.

69. A number of further grants were obtained by the University to further develop and apply the invention. These included a grant from DEFRA in early 2007 to develop near infrared sensor arrays for food quality assessment and a grant from the Home Office covering Near Infrared Spectroscopy for personal screening. The University subsequently sought to subcontract some of the work for the Home Office to G-Tronix by way of an agreement dated 30th June 2008.

70. There were also discussions between Warwick Ventures and G-Tronix about possibly assigning the invention to G-Tronix.

71. From around 2008 onwards however the relationship between the University and G-Tronix became strained and then ultimately broke down completely. I have been provided with various documents relating to this breakdown. It is not necessary to set out the detail however the reluctance or refusal of the University to assign the patent to G-Tronix appears to have been one area of dispute. As is often the case there are also matters relating to money including money allegedly owed to G-Tronix by the University under the sub-contract relating to the Home Office grant and questions about some payments made by G-Tronix to the University in respect of one or both of the 06 and PCT applications.

When did Dr Diamond make his contribution to the invention?

72. Initially both sides had agreed that the invention including Dr Diamond's contribution was made sometime in the window of late June 2004 to 28th June 2006. The earlier date is the date that Dr Gan set up G-Tronix whilst the latter date is the filing date of the 06 application. Mr Ward however suggested that the contents of the draft 05 application pointed to the contribution being made in a much narrower window.

73. Mr Ward did not argue that the precise date was necessarily relevant to his main claim that the invention belongs to the University. In particular he did not argue that Dr Diamond's normal duties as an employee of the University changed significantly within the agreed broader window or that any of the other factors relevant to section 39 changed in that period. Rather this effort to narrow the window was related to Dr Diamond's claim that the invention belongs to G-Tronix.

74. Of particular interest and the focus of Mr Ward's questioning of Dr Diamond during cross examination was figure 5 of the application in issue.

> Mr Ward – ... Figures 5(a) and Figure 5(b)
>
> ...

Mr Ward – There is an image that you have taken. This is not...

Dr Diamond – I never took that ... That is an ultrasound picture of something. I do not even know what that is

Mr Ward - You do not know what that is?

Dr Diamond – No

At that point Mr Ward took Dr Diamond through the description of the application highlighting the passages that I set out above which explain that the image was made using his contribution.

Mr Ward - The point is that figure 5 is an image taken using this first embodiment of the invention which is a piece of apparatus using lock-in and near infrared to image the food sample. Correct?

Dr Diamond - Correct. I recognise it.

75. He then went on to argue that since the image in figure 5 of the 05 application was the same as that in the application in issue then the 05 image was also produced using lock-in and near infrared. This would then date Dr Diamond's contribution as no later than 1st March 2005, the date of the email from Dr Gan to Mr Calvert to which the draft 05 application was attached.

76. Dr Diamond's response to this and indeed his responses in general on the provenance of figure 5 were far from convincing. Indeed he shifted one way and then another during the cross examination. At one point later in the cross-examination he suggested that the image in figure 5 was likely produced on a prototype that he produced at his home. By the end of the hearing he had however reverted to his earlier position that he simply did not know where the image came from. I find that both surprising and unlikely. Of all the inventors Dr Diamond was most closely involved with the drafting of the PCT application. He provided the additional detail that the patent attorney thought was lacking from the 06 application. He met and spoke with the attorney on more than one occasion and he clearly reviewed various iterations of the PCT application. Is it conceivable that he did all of this not knowing what figure 5 was or where it came from? If he really thought it was an ultrasound picture mistakenly included would he not have checked or at least mentioned it to the attorney?

77. Hence in this instance I believe on the basis of the text of the application itself and the lack of any persuasive evidence to the contrary, that the invention was most likely devised by the time of the draft 05 application. This then narrows the window to between June 2004 and March 2005. This was prior to Dr Diamond and Professor Hutchins becoming Directors of G-Tronix.

78. In case I am wrong on this I will use in my analysis of the requirements of section 39 the wider window accepted by both sides. Hence the relevant period that I am considering is late June 2004 to 28th June 2006.

79. I would add one further observation which is that for the purposes of section 39 what matters is when the invention was devised. It is often not possible to be exact about when that happened. As here an invention may evolve over time. However once working apparatus incorporating the invention has been made, even if it is only a prototype, then the invention will by then have most likely been devised. There may be additional steps to take before a patent can be sought, for example a proper application will need to be drafted. But drafting that application or adding additional detail to something that has already been drafted is not normally part of the process of devising the invention.

The normal duties of Dr Diamond whilst employed as a research fellow

80. I now turn to the normal duties of Dr Diamond as a Research Associate at the University during the relevant period. Both sides refer in this respect to the University's general "*Conditions of Appointment for Research Staff*" ("the Conditions") and the associated "*Charter, Statutes, Ordinances and Regulations*" ("the Regulations"). It is not in dispute that Dr Diamond was bound by these Conditions and Regulations.

81. Paragraph 1of the Conditions reads as follows:

> *Duties*
>
> *Duties will be specified by the Chair of Department, or his/her designated deputy. Research Fellows and Associates may be required to undertake teaching, demonstrating or examining duties of up to six hours each week with or without payment in addition to the research duties they perform.*

82. There is no dispute that whilst employed by the University, Dr Diamond worked under Professor David Hutchins who ran the ultrasonics group within the School of Engineering. Professor Hutchins is as noted a co-inventor of the invention in question. Unfortunately because of illness neither party felt it possible to call upon Professor Hutchins to provide evidence for these proceedings. Such evidence in particular on the duties he specified for Dr Diamond would obviously have been useful. I would add that Mr Calvert was of no help to the claimant on this as he accepted that he had no knowledge of the duties of any of the inventors.

83. The main evidence I have on Dr Diamond's duties comes from Dr Diamond himself. He argues that he was a relatively low-ranking, non-permanent assistant with a highly prescriptive set of tasks to perform within a short period of time. He says his duties were always being redefined by his line manager with each new job, changing on average every month or two. He was he argues always under the constant supervision of a supervisor or principle investigator.

84. With regards to his day-to-day tasks Dr Diamond gave a few examples:

"I was given things to do which were designed by other people and basically told to take a few measurements"

"*These experiments were designed by my line manager because he was the named researcher on the contract. He designed it and then said put some equipment together, take your measurement, here is your oscilloscope, here is your source, take the measurements, what is the result?*"

"I entered at the same level as everybody else, which was at the bottom rung, just a guy not quite cleaning test tubes, but certainly at the bottom of the pecking order in terms of research duties".

85. Dr Diamond went on to summarise his role as follows:

"I was a back room boy. Actually, no, I was more like a galley slave on the bottom with a single oar. My contribution may have moved the ship forward but I was no way directing where it would make landfall"

86. The sort of activities that Dr Diamond was undertaking at the University was also touched on in an email exchange in April 2006 between Mr Calvert and Professor Hutchins to which Dr Diamond was also copied in. This related to a review of the work done under a different Spinner grant. Professor Hutchins notes that:

"Geoff has constructed and tested prototypes for air speed measurements".

87. He goes on to ask for additional funding so that he could "employ Geoff Diamond to prepare the two patent applications".

88. In a further email Mr Calvert notes:

"Our accounts dept is assuming that whatever records are kept on timesheets for Geoff, they can demonstrate that he spent the time on this project".

89. Whilst this exchange related to different technology to that in issue here, it does nevertheless give an insight into the sort of duties that Professor Hutchins was asking Dr Diamond to perform. The latter exchange also lends support to Dr Diamond's claim that he was working on particular grants. Indeed he argues that during the relevant period his normal duties were effectively restricted to working on specific grants most notably the NDE Research Centre Grant and the Spinner Pathfinder Grant.

90. A further indication that the remit of a research fellow is often tied to a specific contract can perhaps be seen in the University's prospectus, dating from 2006, for "Postgraduate Opportunities in the School of Engineering - Division of Electrical and Electronic Engineering" put forwarded by the claimant. The claimant's reason for submitting this document was to provide evidence of the facilities available to the ultrasonics group at the time of the invention. I will come to that shortly but the document also discusses

opportunities for postgraduate research fellowships in the School. Under the heading “Academic Opportunities” it says

> “There are several organisations... which support individuals to pursue postdoctoral fellowships. In the majority of cases a research fellow is a research assistant to an academic member of staff who has won a research contract for a specific project.”

91. What isn’t so clear is whether Dr Diamond was also working on things unrelated to specific grants as part of his normal duties as a Research Fellow. Mr Ward raised this with Dr Diamond during cross-examination. Dr Diamond’s response was that all the research being done in the ultrasonics group was linked to a particular grant or contract.

92. Mr Ward also suggested that an understanding of Dr Diamond’s duties could be obtained by considering those of Professor Hutchins. I suspect he is right however Mr Ward did not back this up with any real evidence as to what Professor Hutchins was doing at the relevant time.

93. Rather the focus of Mr Ward’s submissions was less on the day-to-day activities and more on the broad nature of Dr Diamond’s duties. He argues that Dr Diamond’s primary duty was clearly concerned with research and hence his role could be likened to the “research engineer” referred to by Jacob L in *Liffe*. Furthermore like Dr Pinkava in *Liffe,* Dr Diamond was employed to try to innovate.

94. Dr Diamond resists this arguing that he was not a researcher or a research engineer. He sought to contrast his duties with those of Dr Pinkava in *Liffe.* In particular he did not work independently and was not responsible for the direction or outcome of the work being undertaken. His role could not organically grow or develop to increase in scope

95. Mr Ward also referred me to the Regulations governing research staff and more particularly the section titled “*Regulations covering the Patenting and Commercial Exploitation of Research Results*”. These are lengthy and I do not consider it necessary to reproduce them here; suffice to say that they set out the particular circumstances under which ownership of a patent resides with the University and the circumstances under which ownership might reside with an individual member of staff. In essence, they reflect section 39 of the Act but go on to place obligations upon staff to keep potentially patentable material confidential (so as not to jeopardise the validity of any patent filings) and to assist with the patent application process and the exploitation of the invention.

96. The claimant had originally sought to argue that if it did not succeed under section 39 then the invention would still belong to the University by virtue of these Regulations alone. That claim was rightly dropped by the time of the hearing, Mr Ward recognising that section 39 alone determined entitlement. He did however suggest that the Regulations helped understand what the expected duties might be. Although he did not perhaps develop his thinking on this as far perhaps as he could, I took Mr Ward to be relying on

the comments on whether an employee was subject to a duty of confidentiality made by Jacob LJ. In *Liffe*. However in this instance I do not believe the duty of confidentiality imposed on Dr Diamond's through the Regulations helps since that duty only applies to inventions made in the course of his normal duties.

97. How then do I best summarise Dr Diamond's normal duties? Unlike in *Liffe* and *Greater Glasgow* there is little documentary evidence to help me. There are no written job descriptions or performance appraisals of any kind. There is no direct evidence from his manager or from any of his co-workers. Taking what I have into account, I consider that Dr Diamond's normal duties were broader than he suggests. His duties clearly included undertaking research. Indeed research was I believe his primary duty. More specifically it was to undertake research as directed by Professor Hutchins. I do not believe Dr Diamond's normal duties would have necessarily been limited to working on specific research grants notwithstanding that the short-term extensions to his appointment were often linked to continued grant funding. It would I believe have been within his normal duties to assist Professor Hutchins in research unconnected to any grant.

98. Dr Diamond's normal duties clearly included a hands-on, practical role with the undertaking of experiments and conducting of tests. From the available evidence I believe his duty to assist would have included assisting with the development and management of project proposals, as well as reporting and presenting the findings of the research. He also had a role in helping to protect the fruits of the research and also in seeking to secure further funding for the University.

99. Within all of this was there a duty to try to innovate as Mr Ward suggests? I believe there was – even if his day-to-day tasks, as assigned by Professor Hutchins were of a very specific, controlled nature. Dr Diamond's duty to innovate was probably not in the realms of blue-sky thinking but rather as a research fellow focusing on specified projects in an engineering department. He would be expected to exercise ingenuity and to explore different ways of doing things, for example producing prototypes and devising new testing methods.

100. As for the general sort of areas that Dr Diamond's innovation duties covered, then these would I believe clearly cover any duties specified by Professor Hutchins. On the basis of the evidence before me it would however be pure conjecture on my part to suggest that Dr Diamond's general area of innovation extended beyond this, for example into other activities of the school of engineering's ultrasonic team with which he was not tasked by Professor Hutchins.

Was the invention made in the course of these normal duties?

101. The claimant has not put forward any primary evidence that the invention was made in the course of Dr Diamond's normal duties. It has not for example provided any witness statements to that effect from anyone closely involved in developing the invention. It has also not provided any

direct documentary evidence of this. What Mr Ward has sought to do is to demonstrate from a range of secondary evidence and through various submissions that the only reasonable conclusion is that the invention was made in the course of Dr Diamond's normal duties. The individual strands of this are as follows:

i. The breadth of the research grants that Dr Diamond and Professor Hutchins were working on was broad enough to cover the invention.

ii. Dr Diamond was working under the guidance of Professor Hutchins such that if Professor Hutchins made the invention in the course of his normal duties then it would follow that Dr Diamond also made his contribution whilst performing his normal duties for the University.

iii. All those involved in the project behaved at the time and subsequently as if the invention was in effect a University invention.

iv. The University had at the time the facilities to enable the invention to be devised and prototypes made.

102. For his part Dr Diamond notes in his original statement of case that:

> "During the period of Dr Gan's departure from the University in early 2006 to join industry, I joined G-Tronix working most evenings and weekends, in order to develop saleable technology for the company based on NDT inspection using principles other than ultrasound and it was during this time that I developed the NIR technology which operated on a very small band of NIR wavelengths and incorporated lock-in detection as its key small-signal recovery."

103. During his oral evidence he sought to expand on this by arguing that his contribution was made in various discussions with Dr Gan outside of his normal University duties and via prototypes made by him in his workshop in his house.

The NDE Grant

104. I will consider first the nature of the grants that both sides appear to agree Dr Diamond was employed to work on. Mr Ward suggests that the scope of the NDE grant was broad and it was aimed at funding high risk adventurous research. That is I suspect true but what Mr Ward hasn't shown is what Dr Diamond or for that matter Professor Hutchins was actually doing under this grant.

105. Dr Diamond has provided extracts from the *Engineering and Physical Sciences Research Council* ("EPSRC") website. The EPSRC was the body responsible for awarding grants to the University including the NDE grant. The first extract carries EPSRC reference "GR/S09388/01" and a title of "UK Research Centre in Nondestructive Evaluation". The extract goes on to provide details of what the grant of approximately £1.6m was intended to fund, namely the establishment of a centre for carrying out world-class research into non-destructive evaluation (NDE) and related fields. It is stated

that "[t]he EPSRC funds that are the subject of this proposal will support the longer term, adventurous research [that is planned as part of the Centre's portfolio of activity]". Imperial College London is named as the lead Organisation for the grant. Professor Hutchins is named as one of nine "Other Investigators". According to the extract the funding was proposed to run from 1st April 2003 until 31st March 2008. Under "key findings" which appears to be a record of what was has been achieved under the grant, it is noted that the centre had been established and that it is undertaking a wide range of activities. It notes that the centre has a number of industry members including Rolls-Royce, BP and Shell.

106. I asked Dr Diamond about the NDE Grant and also the Spinner Pathfinder Grant at the hearing:

> THE HEARING OFFICER: And you are saying you worked on these ----
>
> DR. DIAMOND: Absolutely. I am not saying, but HR1[7] says it. It mentions it specifically in my contract of employment. It references the NDE contract. These are those.
>
> THE HEARING OFFICER: Okay, thank you.
>
> DR. DIAMOND: Materials, composites, turbine blades, motorway bridges. These were the things I was involved with. All I did -- I say all I did; it was a full-time job – were formal experiments. These experiments were designed by my line manager because he was the researcher named on the contract. He designed it and then he said put some equipment together, take your measurement, here is your oscilloscope, there is your source, take the measurements, what is the result? Here are some samples from Rolls-Royce. See what signal we get through here. You get the general idea. It was Rolls-Royce, British Nuclear Fuels and a few more people who made up the NDE Centre who are the sponsors of this research contract.

107. Throughout his cross examination Dr Diamond maintained his position that any work that he was doing under the NDE Grant was unrelated to the invention.

108. Dr Diamond argues that further support for the contention that the invention was not made under the NDE or any other grant comes from an email from Professor Hutchins to Ms Emma Peak who worked as a Contracts Officer in the Research Support Services section of the University. The email titled "G-Tronix proposed replacement licence" is dated 4th November 2008. Around this time G-Tronix was seeking to commercialise the invention through cooperation with a company called Mettler. Such cooperation would according to G-Tronix be facilitated if the terms of the licence granting it a licence to the invention were amended. As part of the exchanges between the University and Professor Hutchins on this, Ms Peak had queried whether the invention had been developed under any research contract. More specifically in an email addressed amongst others to Messes Hutchins, Diamond and Calvert she noted first that it was her understanding that:

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[7] HR1 refers to the evidence submitted by Ms McGrattan detailing Dr Diamond's conditions of appointment which I have set out above

> "The technology developed in the field concerned was developed by the University but not under the research contracts concerned and the patent can be shown to pre-date these two contracts."

She then went on to query the following:

> In order to be able to defend any challenge regarding when and under what terms the concerned technology was developed, I would be grateful if the date of filing of the patent could be confirmed as well as the fact that this was not developed under any research contract. If it was developed under a different research contract other than the Defra or Home Office contracts, I would need to check the terms of that contract.
>
> I need confirmation as to whether this patent/technology has been used in any research contracts i.e. has it been taken as Background IP to any of the research projects (specifically of concern being the Defra and Home Office contracts)?

109. A response was provided by Professor Hutchins a day later on 5th November 2008 in an email to Ms Peak copied to Mr Calvert and Dr Diamond. The response notes:

> The patent application PCT/GB2007/050368 was filed on 28th June 2006 which predates the Defra and Home Office contracts/grants on Near Infrared (NIR). Also no IP cited in this patent application was developed under any other university research contract; it was invented and formulated from "cold".

110. There is nothing before me to suggest that any of those copied in on the email, in particular Mr Calvert, disagreed with Professor Hutchins on this point. There was a brief exchange between Dr Diamond and Mr Ward at the hearing as to the precise meaning of the phrase "from cold". In this instance I think it is clear that Professor Hutchins is saying at least that the invention including Dr Diamond's contribution was not developed under any research contract.

111. If the claimant had been able to show that the invention was made under a specific research contract, and that Dr Diamond had been employed by the University to work on that contract, then that would have considerably strengthened its case. But it has not been able to do that. Notwithstanding that the NDE grant was broad enough in scope to cover NIR research, all the evidence I have is that the invention was not developed under that grant or for that matter under any other grant awarded to the University.

112. This is not though fatal to the claimant's case if it could show that the invention was made in the course of Dr Diamond's duties for the University that were not tied to specific grants.

The contribution of Professor Hutchins to the invention

113. Mr Ward submits that Professor Hutchins made his contribution as part of his normal duties for the University and the ultrasonics group in particular, and therefore it follows that Dr Diamond's, as a person working for that group and working under and for Professor Hutchins, was also likely to have made his contribution as part of his duties for the University.

114. It would I believe have strengthened the claimant's case had it been able to show what Professor Hutchins was doing at the relevant time. However as I mentioned above, I simply have no evidence of this. I do not know what the circumstances were that led Professor Hutchins to make his contribution to the invention. Indeed neither side has actually said what his contribution was though I should add that neither side is questioning that he did make a contribution.

115. Mr Ward did suggest that because Professor Hutchins assigned any rights he had in the application to the University that this supports his case that his contribution was made as part of his normal or specially assigned duties for the University. Dr Diamond however suggests that there may have been other factors, such as their continued involvement with the University, which might have led both Professor Hutchins and also Dr Gan to assign their rights. Again I have no real evidence to help me. The actual assignment that Professor Hutchins signed does not indicate the basis on which the assignment is made. In particular it does not state that the assignment of his rights flowed from the invention having been made within the normal or other duties he had at the University.

116. I should perhaps mention that Dr Diamond did provide details of an earlier grant which bore the EPSRC Reference "GR/R04379/01" and had a title of "New Ultrasonic Gas-Jet Transducers For Defect Detection In Fibre-Reinforced Composites". The grant detailed in this extract is for a focussed piece of research that will "investigate the design and properties of a new ultrasonic transducer system for the detection of defects in engineering composites". The research is to be carried out by the University of Warwick. Professor Hutchins is named as the "Principle Investigator". The grant started 1st February 2001 and ran until 31st January 2004. It wasn't clear why Dr Diamond thought this to be relevant. It doesn't cover the relevant period here. At best it does perhaps show that Professor Hutchins was, in the years prior to the invention being made, to some extent involved in research relating to ultrasonic transducers.

Did the parties all behave as if the invention belonged to the University?

117. Mr Ward argues that since all those involved in the invention behaved as if it was the result of a University project that this also points to it having been made in the course of Dr Diamond's normal duties. I will come on to whether this is perhaps a leap too far shortly but first I will consider the evidence of how those involved with the invention behaved.

118. Mr Ward points first to the COAP document. He suggests that the significance of this is that as far back as 2005 Dr Gan considered the invention to belong to the University. If he hadn't then would he really have approached the University's commercial arm, Warwick Ventures, with the idea? Would he have allowed the University to file the 05 application in its own name if it was not a University invention and why would the University pay for the application if it didn't believe that it owned the invention?

119. Similarly why did the University then apply for a Spinner grant to further develop the invention and in the grant application clearly paint the invention as belonging to the University? Mr Ward goes on to highlight the subsequent filing by the University of the 06 and the PCT applications. At no point did any of the inventors question whether the invention might not belong to the University. Further why did G-Tronix enter into licence agreements with the University to access the invention if, as Dr Diamond claims, the invention was already owned by G-Tronix?

120. Even some years after the invention had been devised the inventors, including Dr Diamond, were according to Mr Ward still presenting it as a University invention. He refers for example to a paper in the May 2008 volume of INSIGHT which is published by the British Institute of Non-Destructive Testing. The authors of the paper, which is titled "A near infrared technique for non-destructive evaluation" are G Diamond, D Hutchins, T H Gan and P Pallav. The paper notes that the authors are with the School of Engineering at the University of Warwick except for T H Gan who is with the NDT Technology Group TWI Ltd. The paper discusses a number of experiments undertaken using NIR signals and lock-in detection. Various images are used to show the results of these experiments. Mr Ward highlights one showing images of University of Warwick ID cards. He then goes on to argue that the significance of this paper is that it is clearly presenting the invention as a University project – the authors with the exception of Gan are all identified as being with the University, the experiments were done on University passes and as conceded by Dr Diamond, the experiments referred to in the paper were conducted in the University's laboratories.

121. Mr Ward argues that a similar conclusion comes from another paper that Dr Diamond wrote on his own for the International Society for Optics and Photonics (SPIE) in 2008. In the paper Dr Diamond discusses how the invention can be used for security and defence related applications. Mr Ward highlights the passage that notes that "The technique developed at the University of Warwick uses NIR beams of light ... and signal recovery techniques commonly used in astronomy". The paper goes on to describe the benefits and uses of lock-in NIR imaging systems. Dr Diamond is again noted as being from the University of Warwick.

122. Mr Ward also refers in this regard to the email exchange noted above between Ms Emma Peak and Professor Hutchins. In particular he notes that Professor Hutchins did not challenge in his response Ms Peak's understanding that the invention had been developed by the University. On this I would note that Professor Hutchins in his response did not explicitly agree that the invention had been developed by the University rather his response was directed more to the question of whether it had been developed under any grant.

123. According to Mr Ward, it was only when relations between G-Tronix and the University broke down that the issue of entitlement was raised.

124. Dr Diamond's response was that rather than undermining his case, the behaviour of all concerned is consistent with his position that the invention

was devised by G-Tronix and then in effect "brought into the University" after it had been devised.

125. He sought further support for his case that the invention belongs to G-Tronix from an email from Professor Hutchins to Ms Pauline Spetsioti at DEFRA dated 8th March 2006. Apparently enclosed with the email was the business plan for G-Tronix (this was not submitted as evidence). The email so far as is relevant notes:

> The business plan is highly detailed and is intended primarily to show to potential investors. It has not been edited specifically for use by DEFRA, but as you will see, we have mentioned the DEFRA Foodlink programme to Warwick, and that G-Tronix Ltd is intended to be the route to market for the non contract ultrasound system. The University of Warwick has licenced its background IP to G-Tronix for this technology. Also note that the company hopes in the future to look more at IR technology, about which we spoke yesterday with regard to Bridgelink. The University of Warwick has applied for a patent on some of our ideas; however, we still need an in-depth study to look at the full range of possibilities for IR methods. However, if they are useful, G-Tronix will again be the route to market, and hence it is in the business plan.

126. Dr Diamond suggests that this is a clear statement from Professor Hutchins that the invention belongs to G-Tronix. Mr Ward however argues that Professor Hutchins is in fact referring either to the University's ultrasonics group or just the three individual inventors rather than G-Tronix. The date of the email is just after Professor Hutchins and Dr Diamond joined G-Tronix and Dr Gan left. It is also before the 06 application was filed hence it is likely that Professor Hutchins is referring to the 05 application when he says a patent has been filed. Given the earlier reference to a licence from the University for "the ultrasound IP" and the suggestion that this enabled G-Tronix to be the route to market, then there is I believe merit in Mr Ward's submission that this email also envisages a similar licence for the infrared technology. Hence I believe within the context of the whole email, that the reference to "our ideas" is most likely a reference to inventorship rather than entitlement. In other words "our ideas" refers to the fact that the idea for the infrared technology came from him and Dr Diamond.

127. There is one further email that Dr Diamond seeks to rely on. This is an email dated 20th April 2010 from Ms Judith Bodenham to the patent attorneys handling the PCT application. Ms Bodenham was then an Administrative Assistant at Warwick Ventures. The purpose of the email is to ask the then patent attorneys, HGF, to pass on the files relating to the patent to Mark Yeadon who by then appears to have left HGF to set up his own firm. The email has as its subject "*FW: Your Ref COAP 05005B; Our ref CJW/P118161JP; Japanese Patent Application No JP2009-517444;Imaging Apparatus and Method; University of Warwick*" and so far as is relevant reads as follows:

> Further to the emails we have recently exchanged on this patent. The patent is the invention of one of our spin out companies and they have requested that the files be sent to Mark Yeadon (who originally wrote it and is intimately cognisant of the subtleties of this technology) ... The University agrees to this …

128. JP2009-517444 is the Japanese national patent stemming from the PCT application. Dr Diamond suggests that this email provides further proof that the invention originated within G-Tronix. It is however far from clear as to what Ms Bodenham actually knew of the origins of the invention and without that insight I do not think I can really give this email any weight when considering entitlement to the invention.

129. So what can I conclude under this head. From the various documents submitted I believe that all those involved with the invention did behave as if the invention belonged to the University. This started with Dr Gan taking his initial idea to Warwick Ventures. It continued with the University applying for the various patents and then with the licencing of the invention from the University to G-Tronix in two separate licences signed on behalf of G-Tronix by Dr Gan and Professor Hutchins. It continued further with the University and Dr Diamond seeking to get further grant funding or contracts on the back of the invention.

130. What perhaps isn't so clear is why the various parties behaved in this way. It is perhaps understandable that Warwick Ventures when approached by an academic would assume that the invention belonged to the University. There is certainly nothing before me to indicate that it was concerned in any way at that time about its entitlement to the invention. It follows that I am not persuaded that the University through Warwick Ventures was as Dr Diamond suggests acting in just a purely "administrative" way for the inventors. Rather it was behaving as I would expect the representative of the owner of the invention and a body with the expertise and resources to pursue the patent applications to be acting.

131. Equally in the absence of any evidence to the contrary I must I believe conclude that both Dr Gan and Professor Hutchins also behaved as they did, from the time that the invention was devised until as recently as when they assigned their rights to the application in issue, because they believed the invention to be the property of the University. Although the basis for this belief is not clear.

132. As for Dr Diamond, it seems implausible that he was unaware that the patent applications were being made in the name of the University and that the licence agreements were presenting the invention as the property of the University. He did not at the time question any of this. Was this because he was part of some sort of "fraud" with Professor Hutchins, Dr Gan and Mr Calvert? I very much doubt it was. It was much more likely in my opinion because Dr Diamond either believed it did belong to the University or that at the time he wasn't overly concerned about whose name the patents were in. From the evidence it seems the focus of Dr Diamond's attention around the period just after the invention was made was on exploiting the invention and using it to secure further contracts for the University and, either as a result of that or separately, further commercial work for G-Tronix. As he admitted he played a leading role in for example securing the Home Office contract. It is not clear whether he was doing this in his capacity as a Research Fellow at the University or as a Director of G-Tronix. In any event securing further contracts or grants would have likely benefitted Dr Diamond in either capacity

through his commercial interest in G-Tronix and as discussed above his employment with the University was inextricably linked to funding from grants and contracts.

The facilities of the University and the manufacture of the prototype

133. To further support his claim that the invention was indeed a University project Mr Ward sought to show that the invention was developed or put into practice through prototypes produced on University premise and using University equipment.

134. Much of the discussion on this at the hearing centred again on figures 5a and 5b of the application. As I have already mentioned Dr Diamond's recollection of the provenance of this image was somewhat sketchy. He did however suggest at one point that it may have been produced by a primitive prototype of the invention. This consisted of a single NIR source and detector mounted on an x-y table produced from a dot matrix printer. When then asked more about this prototype, Dr Diamond explained that it was made in his workshop at home; a back bedroom.

135. Mr Ward unsurprisingly questioned Dr Diamond as to why if this was the case had he not mentioned it previously in any of his statements or submissions. Dr Diamond's unconvincing response was that he had referred broadly to the invention being made "using the resources of G-Tronix" and that these clearly included facilities that he had available to him.

136. Mr Ward pushed Dr Diamond further as to the nature of this prototype. He asked for example where the 'reference signal generator' came from. Dr Diamond explained that it was formed from a number of components, "*a couple of op-amps, a resistor and a capacitor working at low audio frequencies, about 10 kilohertz*". According to Dr Diamond, the 'op-amps' were sourced from the high-street. He also said that he owned a signal generator in the form of an old oscilloscope. When asked again where the equipment for the invention was built, Dr Diamond re-iterated that the "very first single pixel with the LED and photodiode detector" was built in his workshop at home.

137. Mr Ward then attempted to demonstrate that the image was more likely to have been produced using equipment available to researchers in the University. This was not however one of his stronger arguments. Indeed he was only able to refer to the document entitled "Postgraduate Opportunities in the School of Engineering" that he claimed dated from 2006. Mr Ward highlighted the section headed "Ultrasonic Transducers and Systems" which referred to Professor D.A Hutchins and Dr D R Billson and noted that the available facilities included a high powered near infra-red pulsed laser (NdYAG). It is however a long way from saying that the University had a piece of equipment to showing that it was used to develop the invention here. When asked about this Dr Diamond simply responded that he had not used this particular laser nor did he have any knowledge of anybody else using it.

138. Mr Ward also refers to the contents of the Spinner Pathfinder grant application and an invitation to tender document relating to subcontracting of work for the Home Office. The Spinner grant application notes that "Recently research at the University of Warwick has identified a novel method of inspecting different types of food material using an infra-red system. The application notes that at this stage a one-dimensional infrared system has been developed. The Spinner application goes on to explain that additional funding is being sought to develop the invention by using a line array of scanners and detectors.

139. The invitation to tender document dated March 2008[8] inviting parties to tender to make various prototypes under the Home Office contract notes in section 6 of under Technical Background that "Research discoveries in the properties of near infrared (NIR) signals in our laboratories are to be used to investigate security-related problems." Both of these documents provide he suggests further proof that the invention was developed within the University.

140. Dr Diamond notes that the date on these documents is after the invention had been made and again reflected the further research work which he readily concedes was undertaken within the University. That is certainly true for the Home Office tender document but the Spinner Pathfinder Grant application was made in 2005 and was therefore much more contemporaneous.

Conclusions on whether the invention was made in the course of Dr Diamond's normal duties.

141. So where does all this leave me on the question of whether the invention was made in the course of Dr Diamond's normal duties? Was it made in the course of those duties as the claimant claims or was it in effect a "frolic of his own" as Dr Diamond claims?

142. The evidence from neither side is particularly strong. On the basis of what evidence I have I am satisfied that Dr Diamond did not make his contribution in the course of his duties so far as those duties were directed to working on specific grants. Decisive here is the email from Professor Hutchins where he clearly states that the invention was developed "from cold". But Dr Diamond's duties as I have found them extended beyond just working on specific grants. His duties included assisting Professor Hutchins more broadly in his research activities. So what evidence do I have on what Professor Hutchins was doing at the relevant time? The answer to that is unfortunately nothing. In particular there is nothing to show how Professor Hutchins and Dr Gan moved from working on ultrasonic transducers for inspecting engineering composites and foodstuffs to working on infrared transducers. Notwithstanding that the basis on which the University is entitled to the contributions of Dr Gan and Professor Hutchins is not in issue here, it would nevertheless have been beneficial to the claimant's case in particular if it had provided evidence from either of these individuals or some supported narrative as to how those two individuals came to make their contributions to

[8] Contract Reference 08-ENG-HOC-POPNISS-DC (Exhibit GD14)

the invention. This is especially true of Professor Hutchins since the claimant is in part relying on Dr Diamond's duties in support of Professor Hutchins' research.

143. Whilst I have nothing to indicate what exactly Professor Hutchins was doing at the relevant period, his behaviour around that time is as Mr Ward suggests consistent with someone who considered that their contribution did belong to the University. I would add that I am satisfied that Dr Gan also behaved as if the invention belonged to the University.

144. But it does not necessarily follow that because Professor Hutchins and Dr Gan behaved as if the invention belonged to the University that the contribution made by Dr Diamond must also have been made in the course of his normal duties for the University. It is quite conceivable that both Professor Gan and Dr Diamond could have behaved in this way irrespective of the actual circumstances in which Dr Diamond made his contribution. If Dr Gan and Professor Hutchins had in fact been working on infrared transducers as part of their normal or other duties for the University yet Dr Diamond had as he claims made his contribution outside of his normal duties then would Dr Gan and Professor Hutchins still have done and behaved as they did. I suspect they would have.

145. As for Diamond's behaviour, this was at least up until the publication of the SPIE paper in 2008 also consistent with someone who either believed that the invention belonged to the University or was content for the applications to proceed in the University's name. However I very much doubt that at the time he had even considered section 39 of the Patents Act or understood what it might mean. As is clear from previous entitlement cases, questions of entitlement to inventions can be complex. In *Greater Glasgow* for example neither side appeared to have understood the legal position and hence both in effect agreed to bring the action to resolve the issue. That case also perhaps demonstrates the added complexity that can arise when an invention is made by someone working for a body such as a university or a health board. So the fact that Dr Diamond might have believed at the time, as I suspect he did, that the invention belonged to the University is not in my view on its own enough for the claimant to succeed. What the claimant needed to show was why Dr Diamond believed this to be the case and it simply hasn't done that.

146. If the claimant had been able to show that Dr Diamond made his contribution within the University's laboratories and using university equipment then that would have helped. But again it has not done that. The closest it has come to that is the statement in the 2005 Spinner Grant but that is not in my view sufficiently specific on the activities of Dr Diamond.

147. As to the strength of Dr Diamond's case then that in the end comes down to whether I believe his claim that he made his contribution outside of any duties he had for the University, in the course of casual conversations with Dr Gan and using prototypes produced in a work shop in his home. I have already explained why I believe it necessary to treat his evidence with great caution especially when it is not supported by any corroborating evidence. Unfortunately for him, he has not been able to provide any evidence

to support his version of events. There is nothing from either of his co-inventors, in particular Dr Gan to corroborate that he made his contribution outside of his normal duties for the University. Nor has he provided any evidence to support his belated claim that he made a prototype of the invention in his workshop at home.

148. The paucity of reliable or useful evidence presented by the parties makes it extremely difficult for me to make a finding of fact on this point. It is generally the position that the party bringing a case has the onus on it to make its case. However as confirmed recently in *Andrew Cooke v Watermist Limited*[9]*,* the situation in which a judge or a hearing officer is entitled to resort to the burden of proof in a case such as this has to be exceptional.

149. I have reluctantly come to the conclusion that this is such an exceptional case. Neither side has presented any reliable or useful evidence as to how Dr Diamond came to make his contribution to the invention and whether that was in the course of his normal duties as a Research Fellow of the University. The onus was on the claimant to do this, and notwithstanding that Dr Diamond was a litigant in person and that the way that he has prosecuted this case has been far from ideal, it was I believe clear what the claimant needed to show. It hasn't done that and therefore it must fail with its claim.

Were the circumstances such that an invention might reasonably be expected to result from carrying out his duties?

150. I will for completeness consider whether the circumstances would have been such that an invention might reasonably be expected to result from Dr Diamond carrying out his normal duties, assuming of course that the invention was made in the course of those duties. I can I believe be relatively brief on this question.

151. Dr Diamond sought to highlight the tight control that he was operating under and that it would not have been reasonable to expect an invention to arise under such circumstances. He suggests that his position is similar to that of Paul Auckland in *Auckland v Enderby construction Ltd*[10]. I am not persuaded. The facts of that case differ considerable from those here. There the inventor, Mr Auckland was working as a Health and Safety Officer for Enderby when he invented a temporary man-hole cover. Even though I found that the invention was made in the course of Mr Auckland's normal duties, I then went on to conclude then it was not reasonable to expect an invention to result arise from him carrying out those duties. In reaching that conclusion I noted that although Mr Auckland was an ideas man, he was not employed to invent. Furthermore Enderby was not a company that undertook research or development or had any history of invention. That is not the situation here.

152. As I have already found, Dr Diamond was employed to try to invent. He was working in a research team in the School of Engineering of a university.

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[9] *Andrew Cooke v Watermist Limited* 2014 EWHC 125 (Pat)
[10] Paul Auckland and Enderby Construction Ltd BLO/343/06

The focus of the research in that team was more applied than theoretical. The team clearly had an interest in developing new products methods or applications and the sort of fields it was involved in were such that the expectation that an invention would arise would be clearly high.

153. I would add that Dr Diamond is clearly an intelligent and practical person hence to the extent that that is relevant to this question, and *Liffe* says it is, then that also points to it being reasonable that an invention would result.

154. Hence if the invention had been made in the normal course of Dr Diamond's duties then I believe the circumstances were such that an invention might reasonably be expected to result from carrying out his duties.

Summary and findings

155. I find that the claimant has not shown that the invention was made in the course of Dr Diamond's normal duties and therefore its application under section 12 in respect of US Patent Application 12/306505 fails.

156. I should add for the benefit of Dr Diamond in particular as he raised this at the hearing that this decision relates only to Dr Diamond's right to continue to be named as an applicant on US Patent Application 12/306505.

157. I am conscious that my decision leaves that patent application in joint names. I would hope that the parties can agree a way forward with the application however if they are unable to do so then they can come back for an appropriate order.

Costs

158. Both sides have asked for costs. I will therefore allow both sides to make submissions. As such submissions will address the costs in the entirety of these proceedings no assumption should be made as to in whose favour any cost award will be made.

Appeal

159. Any appeal should be made within 28 days.

Phil Thorpe

Deputy Director acting for the Comptroller