Intellectual Property Office

BL O/1058/23

07 November 2023

PATENTS ACT 1977

APPLICANT	Landmark Graphics Corporation
ISSUE	Whether patent application GB2103745.2 complies with Section 1(2) of the Patents Act 1977 (as amended)
HEARING OFFICER	Peter Mason

DECISION

Background

1 This decision relates to the issue of whether patent application GB2103745.2 ("the application") meets the requirements of sections 1(2) of the Patents Act 1977 ("the Act") and, in particular, whether the claimed invention consists of a program for a computer and/or the presentation of information as such.

2 The application is titled "Seamless Scaling Geomodelling" and is the GB national phase application of PCT/US2018/066899, published as WO2020/131078 by the International Bureau and republished as GB2591898 by the IPO. The prescribed period for putting the application in order, referred to in section 20 of the Act and defined by rule 30 of the Patents Rules 2007 (as amended), ended on 20 August 2023. The period was extended under section 108(2) of the Act to 20 October 2023 and further extended to 20 December 2023.

3 The PCT application was searched in the international phase and an International Preliminary Report on Patentability (IPRP) was issued by the International Bureau in September 2019. This report identified a prior art document, also by the present applicant, which it concluded demonstrated that the claims were not inventive.

4 The first examination report in the national phase (dated 29 April 2022) acknowledged the IPRP and adopted its findings. The examiner went on to raise further objections to the clarity of the claims as well as being excluded as a computer program and the presentation of information as such. The search was also completed at this point.

5 The applicant amended the claims in August 2022. In response, the second examination report (dated 17 October 2022) raised an objection to added subject matter and restated the excluded matter objection. A further objection was raised to the sufficiency of the application with doubts raised about whether the skilled person could implement the invention.

6 The applicant amended the claims in December 2022. The examiner remained unconvinced that the amendments overcame the excluded matter objections with a series of telephone calls taking place with the attorney. The discussions centred around restricting the use of the model to certain applications (similar claims form the basis for a set of auxiliary claims filed before the hearing). A third examination report (dated 24 February 2023) again raised objections to sufficiency, excluded matter as well as further objections to support and plurality.

7 The applicant amended the claims in May 2023, including removing the restrictions to particular uses (the subject of the previous sufficiency objection). A fourth examination report (dated 17 May 2023) was issued and given the most recent amendments the objections to sufficiency, support and plurality were dropped. However, the excluded matter objection remained and the examiner forwarded the case to a hearing. This was followed by the pre-hearing report (dated 28 June 2023) in which the matter to be decided, whether the claims are excluded under section 1(2), was set out in full.

8 The hearing took place by videoconference on 15 August 2023. The applicant was represented by attorneys Mr Alistair Russell and Mr Richard Smith of Hoffmann Eitle, who submitted detailed skeleton arguments and three auxiliary claim sets in advance.

9 The specification, including the amended claims, the objections raised by the examiner and the applicant's arguments and observations can all be viewed at the IPO's online file inspection service: Intellectual Property Office - Patent document and information service (Ipsum) (ipo.gov.uk)

The invention

10 An integral part of oil and gas exploration involves the creation of three-dimensional volume data sets which are typically prepared at different scales appropriate for the task to be performed. For the purposes of exploration, a volume and data set may be prepared for a large land area, such as a continent. During the production process, a volume and data set will be restricted to a much smaller area, such as an underground formation. Each volume and data set is constructed individually and therefore when changing task a user must switch between the appropriate volume and data set.

11 The claimed invention provides a system and method to construct a seamless, scalable geological model whereby the user can adjust the scale from a planet scale down to a pore scale. By using a single model, the user is able to zoom in from a continent down to the details of an individual well.

12 The application has one independent claim to a method for creating and using a viewable and scalable geological model. Dependent claim 13 defines a system configured to carry out the method of claim 1. For reference, the current version of claim 1 (filed 2 May 2023) reads as follows:

> A method for creating and using a viewable and scalable geological model, switchable between volume and data sets of the model seamlessly, the method comprising:

identifying a plurality of geological scales for a studied area or volume, each scale defined by a set of geological units, the plurality of geological scales including a well scale, wherein the well scale is a permeable facie petrophysical property or an impermeable facie petrophysical property, the petrophysical property being a continuous variable;

establishing a geological tiered system wherein the geological units are consistent with each other such that geological units of a finer scale are sub-units of geological units at a coarser scale;

identifying one or more graphical resolution levels for each of the plurality of geological scales, the resolutions of the model differing in the amount of data, representing detail, retained and shown for the respective geological scale;

assimilating the plurality of scales of geological data to form a scalable geological model;

utilizing a point cloud method to handle one or more continuous variables;

producing a post-process model.

13 If I find the main claim to be excluded, I will need to consider the auxiliary claim sets filed before the hearing. These claim sets limit the post-process model to a particular use, a geomechanical model to predict induced fracture propagation during hydraulic fracturing (auxiliary claim set 1), flow simulation for reservoir production forecasting (auxiliary claim set 2) and utilising the model for both uses (auxiliary claim set 3).

The law

14 The relevant provision is section 1(2) of the Act which sets out categories of things which are not considered to be inventions under the Act:

> *1(2). It is hereby declared that the following (among other things) are not inventions for the purposes of this Act, that is to say, anything which consists of –*
>
> *(a) a discovery, scientific theory or mathematical method;*
>
> *(b) a literary, dramatic, musical or artistic work or any other aesthetic creation whatsoever;*
>
> ***(c) a scheme, rule or method for performing a mental act, playing a game or doing business, or a program for a computer;***
>
> ***(d) the presentation of information;***
>
> *but the foregoing provision shall prevent anything from being treated as an invention for the purposes of this Act only to the extent that a patent or application for a patent relates to that thing as such.* [my emphasis]

15 The Court of Appeal's judgement in Symbian[1] tells us that in order to determine whether an invention falls solely within the any of the exclusions listed in section

[1] Symbian Ltd. v Comptroller-General of Patents [2008] EWCA Civ 1066

1(2), the four-step test set out in its earlier judgement in Aerotel[2] must be used. The four steps are:

> *(1) properly construe the claim(s);*
> *(2) identify the actual (or alleged) contribution;*
> *(3) ask whether it falls solely within the excluded subject-matter;*
> *(4) check whether the actual or alleged contribution is actually technical in nature.*

16 The fourth step of the test is to check whether the contribution is technical in nature. In paragraph 46 of Aerotel it is stated that applying this fourth step may not be necessary because the third step should have covered the question. I shall consider whether the contribution is excluded alongside the question of whether the contribution is technical in nature, meaning I will consider the third and fourth steps of Aerotel together.

General principles

17 Before applying the law to the present application, Mr Russell and Mr Smith put forward some initial comments relating to the examination process thus far. These relate to the burden of proof imposed on the Applicant to demonstrate the claims are not excluded, the proper application of the tests for patentability and in particular the identification of the technical contribution and lastly the number of relevant decisions by the UK courts relating to the presentation of information exclusions.

Standard of proof

18 Mr Russell and Mr Smith argued that the approach taken by the examiner for this application has been more restrictive than the approach taken in the courts. They referred to paragraphs 7 and 9 of the decision in Macrossan[3] to support their view that the examiner should give the benefit of the doubt should be given to the applicant. They also referred to paragraph 1.10 in the Manual of Patent Practice which outlines the Office practice that an examiner is not permitted to give any allowance for the benefit of the doubt. A similar argument was made in Decision O/112/18[4] which concluded with the Hearing Officer stating at paragraph 17:

> *"…an applicant should be given the benefit of the doubt unless there is no reasonable doubt to be had. Insofar as this reasonable doubt is the same as the substantial doubt to which Mann J refers, I can agree with this principle. I consider that the question for me is whether or not there is such substantial doubt regarding each of these seven applications, such that where an applicant makes a reasonable case that their invention is patentable then I am bound to find in their favour. I shall proceed on this basis."*

19 While Decisions of the office are not binding upon me, I have followed the arguments as put forth in the previous decision and see no reason to deviate from them in this instance. I shall also proceed on the above basis.

---

[2] Aerotel Ltd v Telco Holdings Ltd and Macrossan's Application [2006] EWCA Civ 1371
[3] Macrossan v Comptroller-General of Patents [2006] EWHC 705 (Ch)
[4] BL O/112/18 Landmark Graphics Corporation Application

The contribution

20 The attorney has argued that the contribution put forward by the Applicant has not been accepted by the examiner and instead the examiner has put forward a narrower contribution, resulting in the contribution being found to be excluded. It is also argued that the Office must generally accept what the inventor says is his contribution.

21 A further argument was raised that the examiner applied the exclusions too widely, again resulting in the claims being found to be excluded.

22 For now, I note these arguments and will revisit them when working through the appropriate steps of the Aerotel test.

Presentation of Information precedents

23 Within the skeleton argument several UK court precedents relating to the presentation of information have been helpfully set out. This includes examples where the contribution has been ruled as excluded, as well as those found to be allowable. As noted by the attorney, there are relatively few cases within this area. However, it is well established that if the presentation of information relates to another excluded area then it will be found to be excluded. It is also established that the presentation of information can have a technical contribution, and if this is the case it will not be considered to be excluded. The selected cases reinforce these principles and I am bound to follow decisions made in the UK courts. Each case must be determined on the facts presented, but I will follow the above established principles in determining if the contribution is deemed technical.

Application of the Aerotel test

Step 1 - properly construe the claim(s)

24 The first step is to consider the construction of the claim. During the hearing, and in the skeleton argument, the attorney has disagreed with the examiner's construction of the claim, and in particular how several of the terms have been construed. I have set out several phrases below which are key to understanding the invention, along with how I have construed them, in accordance with the specification as filed.

25 Firstly, the phrase 'geological scales' refers to the scales as shown in Table 1 below, (reproduced from page 6 of the description) i.e. Global, Regional, Basin, Reservoir and Well scale. These scales can also be seen in graphical form in Figures 3A to 3E, with each figure representing a scale. The scales are defined by a set of geological units within that scale. So, for example, the Global scale may be defined by a 'continent', which at the Regional scale is defined by 'continental setting' and 'deltaic system'. This is clear from the table and the figures.

Table 1

Global scale	Regional scale	Basin scale	Reservoir scale	Well scale
Continent	Continental setting	Flood plain	Flood plain permeable facies	Permeable facies petrophysical properties
			Flood plain impermeable facies	Impermeable facies petrophysical properties
	Deltaic system	Levees	Levees permeable facies	Permeable facies petrophysical properties
			Levees impermeable facies	Impermeable facies petrophysical properties
		Fluvial channels	Fluvial channels permeable facies	Permeable facies petrophysical properties
			Fluvial channels impermeable facies	Impermeable facies petrophysical properties
Ocean	Continental shelf/Shallow marine setting	Shoreface	Shoreface permeable facies	Permeable facies petrophysical properties
			Shoreface impermeable facies	Impermeable facies petrophysical properties
	Deep marine setting	Continental slope break	Continental slope break permeable facies	Permeable facies petrophysical properties
			Continental slope break impermeable facies	Impermeable facies petrophysical properties
		Offshore	Offshore permeable facies	Permeable facies petrophysical properties
			Offshore impermeable facies	Impermeable facies petrophysical properties

FIG. 3A

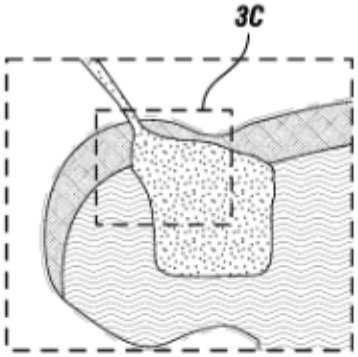

FIG. 3B

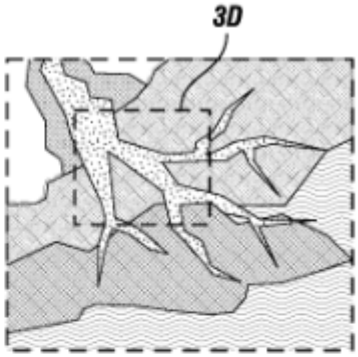

FIG. 3C

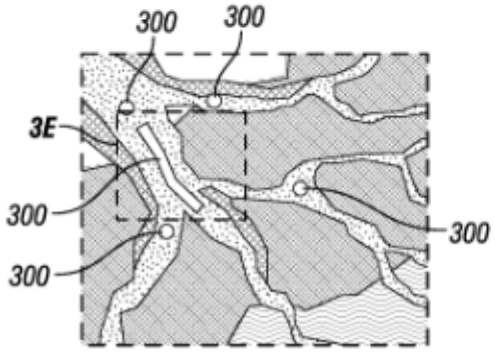

FIG. 3D

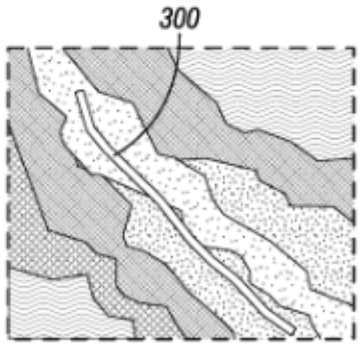

FIG. 3E

26 The term ‘geological tiered system’ also requires some further clarification. This is the relationship between geological units of neighbouring scales. It defines how to render a geological unit of one scale in a different scale. Again, using an example, data relating to a ‘flood plain permeable facie’ on the Reservoir scale should be rendered as ‘flood plain’ on the Basin scale. This is required to build the seamless nature of the model.

27 A ‘graphical resolution level’ is defined for each geological scale and relates to the amount of data is shown for that scale. The user can zoom between different resolution levels for a given scale with more or less data being shown on the screen accordingly. However, the same geological units are present when remaining within the same scale.

28 The phrase ‘seamlessly’ also needs construing as it is essential to understanding how the claimed invention works. As noted above, in the prior art geological models would typically be created for each scale. In the present claim a single geological model is created to encompass all of the geological scales above. This allows a user to move through the multiple datasets without loading a separate geological model and also that the same datasets are viewable on multiple scales. This is construed as more than just combining discrete models – there is some further manipulation involved to allow datasets to be viewable between the different scales.

29 The producing of a post-process model is construed to be any model that can be used in a further system.

Step 2 – identify the actual (or alleged) contribution

30 Paragraph 43 of Aerotel provides some guidance regarding the second step:

> *43. The second step – identify the contribution - is said to be more problematical. How do you assess the contribution? Mr Birss submits the test is workable – it is an exercise in judgment probably involving the problem said to be solved, how the invention works, what its advantages are. What has the inventor really added to human knowledge perhaps best sums up the exercise. The formulation involves looking at substance not form – which is surely what the legislator intended.*

31 In the pre-hearing report the examiner has taken the contribution to be:

> *“A method of organising geological data by identifying a plurality of geological scales defined by geological units, each scale having associated graphical resolution levels, the scales and levels being used to create a single geomodel in which continuous variables such as a petrophysical properties are handled using a point cloud method”*

32 The attorney disagrees with the examiner’s identification of the contribution as being too narrow and has set out an alternative contribution within the skeleton arguments as follows:

> *“A method for creating and using a viewable and scalable geological model which is switchable between volume and data sets of the model seamlessly.*

The model is built by identifying a plurality of geological scales for a studied area or volume, each scale defined by a set of geological units. The plurality of geological scales includes a well scale, wherein the well scale is a permeable facie petrophysical property or an impermeable facie petrophysical property. The petrophysical property is a continuous variable. A geological tiered system is established wherein the geological units are consistent with each other such that geological units of a finer scale are sub-units of geological units at a coarser scale. One or more resolution levels are identified for each scale. The plurality of scales are assimilated into a single scalable geological model. The continuous variables are handled using a point cloud method and a post-process model is produced"

33 At this point I turn to the attorneys previous argument regarding giving the benefit of the doubt to the Applicant regarding the identification of the contribution. In this case, the contribution identified essentially lists all of the features of claim 1. While this identifies how the invention works the contribution must go beyond the features of claim 1 and should further identify the problem to be solved and its advantages. The contribution should identify what the inventor has added to human knowledge.

34 The question of what has been added to human knowledge is helpfully addressed at paragraphs 1.21-1.21.2 of the Office's Manual of Patent Practice (MOPP) for reference I have recited the relevant passages in the Appendix.

35 The problem identified within the description is that prior art systems build each volume and data set individually and there is no function to transfer between volume sets. The invention seeks to solves this problem using a single scalable model which moves through data sets seamlessly. The contribution must therefore include reference to the data sets and must also include the seamless nature of the transitions through the model. It is fair to say this is more involved than just connecting the various models together and requires further manipulation of data between different scales to allow the seamless manoeuvring through the model by a user. It is also fair to say that no new detail is displayed in the model, the invention relates to how existing information is displayed within a single model in a seamless fashion, including the displaying of geographical units from one scale on another scale.

36 For the avoidance of doubt, there is no suggestion that the hardware running the model is anything other than conventional. Therefore, this can not be considered part of the contribution. Taking the above into account I have identified the contribution as follows:

"A method for creating and using a viewable and scalable geological model, which allows a user to move seamlessly between various volume and data sets across geological scales wherein geological units within each scale are consistent with those of a finer and coarser scale. Each scale has a resolution level representing a differing amount of data shown for the respective scale. The point cloud method is used to handle one or more continuous variables and a post process model is produced"

Steps 3 & 4 – ask whether the contribution falls solely within the excluded subject matter and check whether it is actually technical

37 To assist in determining whether the contribution relates solely to a program for a computer, we use the signposts to technical contribution set out in AT&T/CVON[5] and by the Court of Appeal in HTC v Apple[6]. These are:

i) whether the claimed technical effect has a technical effect on a process which is carried on outside the computer;

ii) whether the claimed technical effect operates at the level of the architecture of the computer; that is to say whether the effect is produced irrespective of the data being processed or the applications being run;

iii) whether the claimed technical effect results in the computer being made to operate in a new way;

iv) whether the program makes the computer a better computer in the sense of running more efficiently and effectively as a computer;

v) whether the perceived problem is overcome by the claimed invention as opposed to merely being circumvented.

38 These signposts are useful guidelines only, providing a list of some of the factors that can assist in determining whether a contribution may be technical. I note that in Section 4.4 of the skeleton several aspects are put forward to establish a technical character. I shall consider these against the relevant signpost.

Signpost i) whether the claimed technical effect has a technical effect on a process which is carried on outside the computer

39 I accept that some further manipulation of the data is taking place, beyond merely co-locating existing models, within the contribution which allows the user to seamlessly zoom through the scales of the model. In particular, it is accepted that a geological tiered system is established that allows geological units to remain consistent across neighbouring scales. All of this is undertaken within the computer program itself. It was argued by the attorney that the technical contribution (i.e. the effect outside the computer) is that it assists the user in performing geological and engineering tasks. While the single, seamless model will no doubt be easier for a user to navigate, it does not follow that it provides a technical contribution to those further tasks. There is no new technical data presented to the user over the data generated by prior art systems. The effect stops at how the model is created and displayed to the user.

40 It was also argued that the geological model can be used to produce a post-process model relating to technical tasks. However, as has been previously stated, there is nothing within the claimed geological model that allows the technical task to be performed in an improved way. The model produced, as per the description, can be used for many different purposes but the contribution lies in how the user is able to interact with the model, and not in how the resulting task is undertaken.

---

[5] AT&T Knowledge Venture/CVON Innovations v Comptroller General of Patents [2009] EWHC 343 (Pat)

[6] HTC Europe Co Ltd v Apple Inc [2013] EWCA Civ 451

41 Therefore, signpost i) does not point towards the required technical contribution.

Signposts ii)-iv) operates at an architectural level, results in a computer operating in a new way or running more efficiently or effectively

42 As identified previously, there is no suggestion that the contribution relates to any type of hardware. Therefore, signposts ii)-iv) which relate to effects at the architectural level of the computer or relate to the computer operating in a new or more efficient way can be disregarded reasonably straightforwardly. (I note that there are no arguments regarding these signposts within the skeleton argument.)

Signpost v) whether the perceived problem is overcome by the claimed invention as opposed to merely being circumvented

43 It was argued that the technical problem of having volume and data sets which transfer between volume sets is solved. I agree that this is the problem set out in the description and intended to be solved. I also agree that the problem is not circumvented. However, I do not agree that this is an inherently technical problem. Accessing separate models, although inconvenient for a user, does not prevent them from undertaking any specific engineering or geological task. No specific technical issue is described within the description which corresponds to the drawback of using separate models. The problem, which is considered non-technical, is solved by putting existing data into a single model. As discussed under signpost i), I accept there would need to be further manipulation of the data to establish the geological tiered system and to ensure the geological units are consistent. However, the end result is directed towards how the information is presented. There is no further or additional technical information provided as a result of working the invention. Therefore, signpost v) also does not point towards a technical contribution.

Presentation of information

44 It is accepted that the geological model is built from real-world technical data and renders continuous variables reflecting a real world system. However, it is not accepted that that is technical in and of itself. The attorney argued that the invention dynamically selects which information to present to the user based on which scale is currently being viewed and drawn a parallel to Starsight[7] where program schedule information being selectively displayed was considered a useful way of presenting information. I do not see the parallel here. The user is in control of moving through the various resolutions and scales of the model and is therefore in control of the information presented. The selection of what to view is performed by the user and not the model. Therefore, this does not provide the required technical contribution.

45 Finding no patentable subject matter in the claims as presently on file, I must now turn to the auxiliary claim sets.

Auxiliary Claims

46 Each of the auxiliary claim sets are essentially the same as claim 1 above, but limit the use of the post-process model to a certain application as follows:

[7] Starsight Telecast Inc & Anor v Virgin Media Ltd & Ors [2014] EWHC 828

Aux Claim Set 1

"...producing a post-process model by utilizing the scalable geological model as an input to a geomechanical model to predict induced fracture propagation during hydraulic fracturing"

Aux Claim Set 2

"…producing a post-process model by utilizing the scalable geological model in a flow simulation for reservoir production forecasting"

Aux Claim Set 3

"…producing a post-process model by:

utilizing the scalable geological model in a flow simulation for reservoir production forecasting; and

utilizing the scalable geological model as an input to a geomechnical model to predict induced fracture propagation during hydraulic fracturing"

47 Essentially, all three sets of claims seek to limit the post-process model to a real world use and therefore the same arguments apply against all three claim sets equally. The attorney has argued that by limiting the claim to a technical use, then in effect signpost i) is met. (I note that the applicant has included a number of features in the auxiliary claims that the examiner previously identified as being insufficient. I will not consider this issue further as it is not germane to my ultimate decision).

48 However, the contribution is not intrinsically linked to the end use. As discussed previously, working the invention results in a model which allows a user to better navigate through various scales and data sets. There is no suggestion that the end result is produced more efficiently or provides a more accurate model. The post-process model is general enough to be used in a wide variety of further tasks. The contribution provided by the invention does not result in the applied task working in an improved way. Therefore, I fail to see how using the model in a further process provides the required technical step.

49 Having found that the auxiliary claims are excluded, I do not need to come to a decision on if they are sufficient.

Conclusion

50 Having considered all of the arguments put forth during the hearing and in the skeleton argument and all correspondence on file, I am of the view that the

contribution made by the invention falls solely within the computer program and presentation of information exclusions.

51 I therefore, find that the invention claimed in GB1820734.0 is excluded by Section 1(2)(c) as a computer program and 1(2)(d) as the presentation of information. I therefore refuse the application under Section 18(3).

Appeal

52 Any appeal must be lodged within 28 days after the date of this decision.

Peter Mason

Deputy Director, acting for the Comptroller

Appendix

1.21-1.21.2 of the Office's Manual of Patent Practice

1.21 As Jacob LJ stated in Aerotel/Macrossan, this is the summation of what the contribution is, and all of the other factors (see 1.21.2-1.21.4) weigh in to making this determination. The starting point for that assessment is the claims. It may be helpful to consider what makes the invention novel (see 1.20.1); however, it is then necessary to place that in its proper context and ensure that the effects of the invention are taken into account. It is not correct to eliminate everything in the claim that is known to arrive at that which is unknown, and then to conclude that the unknown part must be the contribution; i.e., as the Court of Appeal in Genentech [1989] RPC 205 put it, it is not the case that "an invention is unpatentable if the inventiveness was contributed only by matters excluded under section 1(2)". This approach – which is sometimes referred to as "Falconer reasoning", from its originator; or, less formally, "salami-slicing" – was expressly rejected by the Court of Appeal in that decision. Birss J, in Lenovo (Singapore) PTE Ltd v Comptroller General of Patents [2020] EWHC 1706 (Pat) at paragraph 16, summarised matters thus; "invention can lie in a new combination of old features and so, while identifying an individual feature as disclosed in prior art is a relevant thing to do, it will always be necessary to consider it in the context of the invention as a whole before reaching a conclusion." In Lantana v Comptroller-General of Patents [2014] EWCA Civ 1463 paragraph 64, Kitchin LJ set out the importance of considering the proper context of an invention when assessing the contribution, accepting "[a] submission that it is the claim as a whole which must be considered when assessing the contribution which the invention has made, and that it is not permissible simply to cut the claim into pieces and then consider those pieces separately and without regard to the way they interact with each other". However, at paragraph 65, Kitchin LJ qualified this by observing: "[n]evertheless, I also have no doubt that, approached in this way, it is the actual contribution to the art which the invention has made which must be considered. 1 Symbian Ltd. V Comptroller -General or Patents [2008] EWCA Civ 1066 2 Aerotel Ltd v Telco Holdings Ltd and Macrossan's Application [2006] EWCA Civ 1371

1.21.1 The courts have consistently found that, where claims recite standard hardware, such conventional apparatus does not form part of the contribution. This is often the case in computer program inventions – an application relating to a computer program cannot be saved simply by claiming conventional computer hardware programmed in a particular way. Jacob LJ remarked on this in paragraph 44 of Aerotel/Macrossan, and specifically rejected the use of standard hardware when determining the contribution of the Macrossan application in paragraph 73.

1.21.2 What constitutes a technical contribution can change over time. Therefore the view that, once a technical contribution is made, that same contribution will always be technical may not apply. In paragraph 16 of Lantana v Comptroller-General of Patents [2013] EWHC 2673 (Pat), Birss J addressed this point, noting that "[t]he fact that in the IBM case [T6/83] the method of communication between programs and files [...] was held patentable in 1988 does not mean that any method of communicating between programs and files [...] necessarily involves a technical contribution today". This was endorsed by Arden LJ in paragraph 43 of the Court of Appeal judgment Lantana v Comptroller-General of Patents [2014] EWCA Civ 1463.