Intellectual Property Office

BL O/0055/24

25 January 2024

PATENTS ACT 1977

APPLICANT	Amazon Technologies Inc
ISSUE	Whether GB 2106686.5 complies with Section 1(2) of the Patents Act 1977
HEARING OFFICER	Peter Mason

DECISION

Introduction

1 Patent Application GB 2106686.5 is the national phase of a PCT application, published as WO 2020/112692 A1. It claims a priority date of 26th November 2018. The national phase application was subsequently republished as GB 2592538 A on 1st September 2021.

2 The international search was completed on 17th February 2020. This search was updated by the Examiner on 17th May 2023. The Examiner has found that the claimed invention in its current form is novel and inventive, but that it is excluded from patentability.

3 Despite several rounds of correspondence, the applicant has been unable to persuade the Examiner that the application is allowable under section 1(2) of the Act. The Examiner's letter of 18th May 2023 invited the applicant to request a hearing. A request to be heard was subsequently received on 21st June 2023.

4 The hearing took place on 31st August 2023 by video conference. The applicant was represented by Dr. Terence Broderick and Ms. Kate Harkness of Murgitroyd & Company Limited. I would like to thank Dr. Broderick for the comprehensive skeleton arguments submitted before the hearing and for the helpful comments provided on 4th September, in response to my invitation. I was assisted at the hearing by Mr. Peter Burns, Senior Patent Examiner. The Examiner, Mr. Ian Choi, attended as an observer.

The Issue

5 The only substantive matter before me is whether the invention is a program for a computer as such and is consequently excluded under Section 1(2)(c) of the Act.

The Claims

6 Dr Broderick, when filing his skeleton argument provided a set of auxiliary claims. At the hearing he requested I base my decision on these claims. Normally I would consider the claims on file in the first instance and then the auxiliary claims should I need to.

7 However, in this instance the claims are similar incorporating as they do an additional feature (emphasis added below). As a consequence, I agreed to decide the issue based upon the auxiliary claims provided on 23rd August.

8 I will consider the effect upon the contribution later in this decision. It is however clear that if I find the auxiliary claims to be excluded, then the invention as presently claimed will be excluded by the same reasoning.

Section 20

9 The Section 20 compliance period expired on 26th July 2023, having previously been extended by the applicant under Rule 108(2) by their Form 52 filed on 24th February 2023. Should I find in favour of the applicant it will be necessary to further extend the compliance period so that the claims of the application can be so amended.

10 I indicated to Dr. Broderick that if a retrospective request for a further extension were made by 26th September 2023, I would be willing to afford my discretion to allow it.

The Application

11 The application relates a database management system. It sets out a method of using a SQL query to define a virtual view of a database table which comprises a mapping between a column of a virtual view and of the table. The system deals with handling a request to create an index of the virtual view. It does this by identifying the mapping of the virtual column to the table column.

12 This allows for an index to be created based in the virtual view based on a reference to the original table column. When a second query is received, results can be generated form the virtual view using the index.

13 It is worth noting at this point that a “view” is considered to be non-materialised. In essence, it is only constructed as and when needed by running a query. This presents a problem as you cannot create an index on a non-materialised view. The applicant has provided a solution to this problem by parsing the statement creating the view to obtain the references to the columns in the original tables from which the view was created. In doing this, they are then able to create a materialised index on the virtual table (albeit via the query)

The Claims

14 The auxiliary claims include just two independent claims: claim 1 is directed to a computer-implemented method; claim 9 to a non-transitory computer-readable storage medium. The other features of these claims are substantively the same, to the extent that any decision I make on claim 1 will also apply to claim 9 mutatis mutandis. Claim 1 reads as follows:

Claim 1

A computer-implemented method, comprising, at a database management system:

storing a query language statement defining a virtual view of ***a*** *database table,* ***wherein the database table is stored as a journal of immutable transactions,*** *the query comprising a column and a mapping between the column of the virtual view and a column of the database table;*

receiving a first request to create an index of the virtual view;

in response to the request, determining that the column of the virtual view is related to the column of the database table by identifying the mapping;

generating an index of the virtual view, the index of the virtual view comprising a reference to the column of the database table and not comprising a reference to the column of the virtual view, the reference to the column of the database table included in the index of the virtual view based at least in part on the column of the virtual view being related to the column of the database table;

and

in response to asecond request received from a client, generating results of a query on the virtual view, the results generated based at least in part on the index of the virtual view, and providing the results to the client.

(My emphasis added to show incorporated subject matter in the auxialliary claim)

The Law

15 The examiner raised an objection under Section 1(2) of the Act. Section 1 of the Act sets out what is required of a patentable invention and the relevant portions of the provisions are shown below:

1.-(1) A patent may be granted only for an invention in respect of which the following conditions are satisfied, that is to say –

(a) …

(b) …

(c) …

(d) the grant of a patent for it is not excluded by subsections (2) and (3) or Section 4A below;

and references in this Act to a patentable invention shall be construed accordingly.

(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) …

(b) …

(c) a scheme, rule or method for performing a mental act, playing a game or doing business, or a program for a computer;

(d) …

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.

16 The assessment of patentability under Section 1(2) is governed by the judgment of the Court of Appeal in *Aerotel*[1], as further interpreted by the Court of Appeal in *Symbian*[2]. In *Aerotel,* the court reviewed the case law on the interpretation of Section 1(2) and set out a four-step test to decide whether a claimed invention is patentable:

(1) properly construe the claim;

(2) identify the actual 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.

17 The Court of Appeal in *Symbian* made it clear that the four-step test was not intended to be a new departure in domestic law; it was confirmed that the test is consistent with the previous requirement, set out in case law, that the invention must provide a "technical contribution". Paragraph 46 of *Aerotel* states that applying the fourth step of the test may not be necessary because the third step should have covered the question of whether the contribution is technical in nature. It was further confirmed in *Symbian* that the question of whether the invention makes a technical contribution can take place at step 3 or step 4.

18 The case law on computer-implemented inventions was further elaborated in *AT&T/CVON*[3], which provided five helpful signposts to apply when considering

[1] Aerotel Ltd v Telco Holdings Ltd and Macrossan's Application [2006] EWCA Civ 1371; [2007] RPC 7
[2] Symbian Ltd v Comptroller General of Patents [2009] RPC 1
[3] AT&T Knowledge Venture/CVON Innovations v Comptroller General of Patents [2009] EWHC 343 (Pat.), paragraph 8

whether a computer program makes a relevant technical contribution. In *HTC v Apple*[4], Lewison LJ reconsidered the fourth of these signposts and felt that it had been expressed too restrictively, highlighting an observation made by Mann J at paragraph 42 of *Gemstar*[5]*.* The revised signposts 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; and

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

19 The relevance of the legislation and legal precedent has gone uncontested throughout the proceedings.

20 In the skeleton argument and at the hearing, the decisions set out in both *Protecting Kids the World Over*[6] and *Lantana*[7] were also relied upon.

Argument and analysis

Step 1 – properly construe the claim

21 The Examiner and the applicant agree on how the claim is to be construed although following the filing of the auxiliary claims the applicant makes the point that it is a database of immutable transactions.

22 Although I do not generally disagree with this view, I think it is helpful to make clear what some of the terms mean in context. Doing so will allow me to ensure I fully understand the claim. In understanding the claim, it is helpful to refer to Figure 8 of the specification,

[4] HTC Europe Co Ltd v Apple Inc [2013] EWCA Civ 451
[5] Gemstar-TV Guide International Inc v Virgin Media Ltd [2009] EWHC 3068 (Ch.) [2010] RPC 10
[6] Protecting Kids the World Over (PKTWO) Ltd's Patent Application [2011] EWHC 2720 (Pat.) [2012] RPC 13
[7] Lantana v Comptroller-General of Patents [2013] EWHC 2673 (Pat)

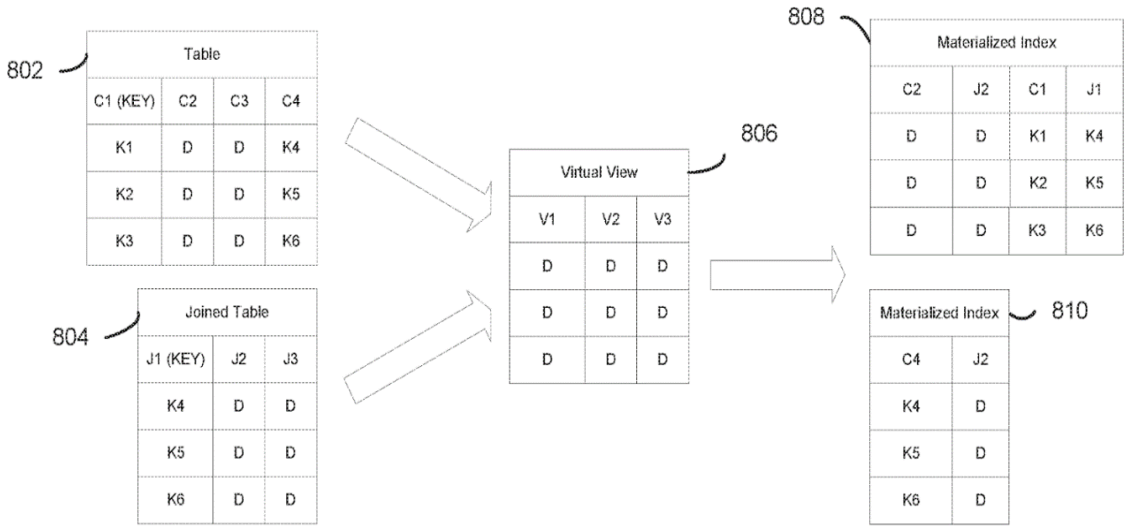

FIG. 8

23 The underlying data structure is a database table, is said be stored as a journal of immutable transactions.

24 As summarised at paragraph 0016 of the description:

> "*In various embodiments, the database is ledger-based. A ledger, as used herein, comprises journal and summary data structures adapted for use in a database management system. A journal records an immutable history of transactions performed on a document managed by the system, and a summary provides a synopsis of the document's current state.*"

25 Although this adds some details it is essentially describing the table in terms of the data being stored. Ultimately, it is has no bearing on the creation of the view which relies on a table formed of columns as its source. That the data may be immutable or otherwise does not change how I construe the view or the indices.

26 Claim 1 refers to a query comprising a column, and a mapping between the column of a virtual view and a column of the database table. I have no doubt that the skilled person would understand this as a "create view" query that creates a virtual table comprising columns from several tables such that a column of the virtual view maps onto a column in the database table. (See 802, 804 & 806 Fig 8)

27 When a first request is received to create an index of the virtual view, the mapping is identified to determine the relationship. I am thankful for Dr. Broderick's explanation of this which highlighted that the received query is parsed to reveal hints to the mapping. I also note it does not appear in the claim. These hints are used to identify relevant fields of the database table. This is supported at figure 9 and associated passages of the description. I take this to mean that the identification step is to identify the mapping to the original database column.

28 This allows an index of the virtual view to be generated, which comprises a reference to the column of the database table, based in part upon the identified relationship. I understand the references may comprise joins, pointers, links, computations and the suchlike, or combinations thereof.

29 I take the claim to be a method of creating an index on a virtual view by using references to the columns of the original tables used to create the view

Step 2 – identify the actual contribution

30 There has been little contention in identifying the contribution. In the pre-hearing report, the Examiner assessed the contribution to be:

> *a computer-implemented method of, in response to receiving a first request to create an index of the virtual view, identifying a mapping between a column of the virtual view and a column of the database table as defined in the query; generating an index of the virtual view to include a reference to the column of the database table and not the column of the virtual view, based on the column of the virtual view being related to the column of the database table; and in response to a second request, generating results of a query on the virtual view based on the index of the virtual view, such that the results can be provided to the client quicker than running the virtual view each time it is queried.*

31 In the skeleton argument and at the hearing, three further points were offered as important aspects of the contribution. In summary, these are:

- that the results are provided more quickly to the client than has previously been possible, enabling resources allocated to the connection with the client to be reallocated more promptly, at both the client and database side; and

- that the response is generated using minimal storage, as only an index and query language statement need to be stored, further freeing computing resource at both the database management system and at the client; and

- that the virtual view can be restricted to a column in the underlying table such that sensitive or privileged fields will not appear in a response, making the querying of the database more secure, hiding the underlying database structure from malicious third parties for example.

32 I agree with Dr Broderick that the advantages offered by the invention do not necessarily need to be fully detailed in the specification. As explained in *Aerotel*, identifying the contribution is perhaps best summed up by asking what the inventor has really added to human knowledge in substance. However, I am also mindful of paragraph 44 of that judgment:

> *"If an inventor claims a computer when programmed with his new program, it will not assist him if he alleges wrongly that he has invented the computer itself, even if he specifies all the detailed elements of a computer in his claim.*

In the end the test must be what contribution has actually been made, not what the inventor says he has made."

33 However, I am not persuaded that the advantages Dr Broderick claims can be fairly deduced from the current claims or the invention as a whole. Leaving aside that none of the features appear in the claims, there is no clear and compelling disclosure to suggest that any of the claimed advantages exist as a result of the claimed invention. For example, the use of views is well known in database systems and their main advantage is to allow the user to view data of interest in a single table without the requirement to interrogate the original tables. It is unclear how an additional index would provide a better use of resources when in fact it includes a materialised index. This also speaks to the minimal storage advantage claimed. The index requires additional storage which may be minimal but is still a greater storage requirement.

34 Neither am I persuaded by the advantage in terms of data security when querying a virtual view is a contribution made by the present invention. That is because it appears to be a known advantage inherent to the nature of virtual views, which is already well-documented in the art. In short, a virtual view is created from columns of an underlying table or set of tables. Any security considerations occur then and not as a result of this invention.

35 I therefore find myself broadly in agreement with the contribution set out by the Examiner, but informed by additional points raised in the skeleton arguments and at the hearing. I consider the contribution to be:

> A computer-implemented method of, in response to receiving a first request to create an index of the virtual view, identifying a mapping between a column of the virtual view and a column of the database table as defined in the query; generating an index of the virtual view to include a reference to the column of the database table and not the column of the virtual view, based on the column of the virtual view being related to the column of the database table; and in response to a second request, generating results of a query on the virtual view based on the index of the virtual view, such that the results can be provided to the client quicker than running the virtual view each time it is queried, enabling quicker re-allocation of client and database system resources allocated to their connection and using minimal storage resource on both sides.

Step 3 – ask whether it falls solely within the excluded subject matter

36 The invention is a feature of a database management system which is a program for a computer and there has been no dispute on this fact.

37 The question is whether this computer program makes a relevant technical contribution. Though not exhaustive, to answer this question, I turn initially to the AT&T signposts.

The first signpost

38 In the pre-hearing report, the Examiner set out their view that the contribution did not include an effect outside the computer. Instead, rapidly responding to a client request by receiving a request, identifying a mapping, generating an index and by providing results all occurs within the computer on which the program is run.

39 At the hearing and in the skeleton arguments, Dr. Broderick was keen to make the distinction that the client is external to the computer or computer network upon which the database management system runs. The rapid results and small storage requirements consume fewer resources and time at the client side, including the resource required to maintain connection with the database management system since this can be re-allocated more quickly. Therefore, he submits, there is a technical effect on the client and external to the database management system, because re-allocation of resources is a technical task designed for example by a systems engineer.

40 I agree that the decision in *Lantana* highlights the importance of identifying the extent of the computer, when assessing whether there is a technical effect on a process outside of it. The judgment also highlights that a claim being novel and inventive is not the determinant of it avoiding the exclusions. The comments of Birss J at paragraphs 30 and 31 of the judgment state:

> *"…this invention consists entirely of software running on a conventional computing arrangement. I use the term "computing arrangement" rather than computer because the applicant is at pains to point out that this system requires two computers connected by "a telecommunications network". So it does but at the relevant date (2008) two computers connected across the internet was an entirely conventional computing arrangement. The fact that two computers and the internet are required is not what makes a software invention patentable.*
>
> *…everything is going on inside the computer, or rather inside the computing arrangement. Thus the first signpost cannot assist the applicant."*

41 I accept that the client may be distinct from the database system and that a network connection is required. The connection uses a network connection, as well as the computing resources at both sides needed to establish and maintain that connection. However, this arrangement was entirely conventional at the priority date in 2018 and consequently cannot form part of the identified contribution. Following the principles set out in *Lantana (at paragraph 30 and 31):*

> *30. I start by noting that this invention consists entirely of software running on a conventional computing arrangement. I use the term "computing arrangement" rather than computer because the applicant is at pains to point out that this system requires two computers connected by a "telecommunications network". So it does but at the relevant date (2008) two computers connected across the internet was an entirely conventional computing arrangement. The fact that two computers and the internet are required is not what makes a software invention patentable.*
>
> *31. The invention here is therefore in the tricky territory I identified in Halliburton (paragraph 37) because everything is going on inside the*

computer, or rather inside the computing arrangement. Thus the first signpost cannot assist the applicant.

I do not consider that this element of the contribution should be considered to provide any effect outside of the computing arrangement. Instead, the client forms part of the computing arrangement and I cannot find any reason to treat the client as being external to “the computer”, insofar as the first signpost is concerned.

42 My attention was further directed to *Protecting Kids the World Over,* that judgment re-iterating the principle that if a technical contribution can be established outside the computer, the invention may fall outside the excluded subject matter. In addressing the signposts, I am seeking to follow that principle. I note that Floyd J made clear at paragraph 35 of *Protecting Kids the World Over* that the judgment was made on the very specific facts of that case.

43 I also find it helpful to return to another principle highlighted at paragraph 17 of Lantana EWHC 2673 (Pat) in *Lantana:*

Simply put is because it is possible to construct a generalised category which includes both the claimed invention and a previous decision in which a claim was held to patentable does not help. It shows that such things can be patentable in some cases but does not show that the invention in this case is patentable therefore find that the first signpost does not point towards there being any relevant technical effect, because I do not find there to be any effect outside the computing arrangement.

I agreed at the hearing that the first signpost is potentially the most relevant, however I will continue to address the others. *The remaining signposts*

44 I now turn to the second signpost. Simply put this application finds its use purely in the area of accessing a data within a database. It is clearly not operating at the architecture of the computer. It is without doubt operating within a database program and therefore does not operate irrespective of the data being processed.

45 The third signpost concerns whether the computer operates in a new way. Whilst the applicant maintains there is an increase in performance by using the virtual view this is specific to when the database management program is being run. It is achieved by a program running at the application level on a standard computer program.

46 Moving on to the fourth signpost, I find myself in agreement with the Examiner. The method of querying a virtual view may be more performant, but it remains a matter of program design. The method may make the database management system a better database management system, but a database management system is merely a computer program. There is no effect beyond the running of the individual program on the wider computing arrangement.

47 I now turn to the fifth signpost. I understand the perceived problem to be that you cannot create an index on a virtual view. The claimed invention does not change that it merely provides a work around or in the terms of the signpost a circumvention. It does this by parsing a statement to identify the source columns to create an index.

48 Consequently, I find that that the fifth and final signpost does not point to their being a relevant technical effect.

49 Since there is no technical effect, I find the invention set out in the auxiliary claims is a computer program as such, falling solely within the excluded matter. I do not need to consider step 4 of *Aerotel* because it has already been answered under step 3.

50 The claims of the application in its present form do not provide any contribution that has not already been identified from the auxiliary claims. If follows that they are similarly excluded.

I cannot identify any further saving amendment containing patentable content, within the disclosure of this application.

The Claims on file

51 I made it clear that I would consider the auxiliary claim at the hearing. If I found that to be excluded, as I have, then it would follow that the current claim on file was also excluded. For avoidance of doubt, I make it clear here that the claim currently on file is excluded under Section 1(2)(c) of the Act

Conclusion

52 I have found that the claimed invention falls solely within the matter excluded under Section 1(2) as a program for a computer as such. I therefore refuse the application under Section 18(3).

Appeal

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

PETER MASON

Deputy Director, acting for the Comptroller