



## PATENTS ACT 1977

APPLICANT	Lexisnexis
ISSUE	Whether patent application GB1202590.4 complies with Sections 1(1)(d) and 1(2)(c) of the Act
HEARING OFFICER	Peter Mason

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### DECISION

#### Introduction

- 1 Patent application GB1202590.4 derives from PCT application WO 2011/011254 A1, with international filing date of 15/7/10 and having priority of 20/7/09. The GB application entered the national phase 15/2/12, and was republished as GB 2485108 A 2/5/12.
- 2 A first examination report was issued 22/6/16, in which the Examiner, Mr Jake Collins, objected to the invention as being excluded from being patented as a program for a computer. Several rounds of correspondence followed between the examiner and the applicant without any agreement being reached. Accordingly the matter came before me at a telephone hearing held on 18/7/17, at which the applicant was represented by Mr Ben Lincoln of Potter Clarkson LLP.
- 3 I note that all other aspects of the examination, including the search update, have been deferred. So if I find the invention not to be excluded as a computer program, the application will need to be returned to the Examiner for the search to be updated and for the examination of outstanding matters to be completed.

#### The Invention

- 4 The invention is concerned with searching a database for documents. Documents in the database are matched to a search criteria, and ranked according to relevancy. Relevancy is determined by a mathematical process applied to each document found. A probability distribution function, representative of the distribution within that document of terms matching the search criteria, is determined; a standard deviation of that probability function is calculated; and relative distances between those terms in that document are thereby determined.

5 I note here that the invention is defined in the independent claims and presented throughout the specification as being computer-implemented. Also, that the documents searched and ranked are likewise presented throughout the specification as being electronic (i.e. storable in a database or transmittable across a network). There is no suggestion within the specification that the inventive method may be performed other than by a computing device or that the documents may be other than electronic, nor any support for any non-computing or non-electronic embodiment.

6 There are four independent claims:

*1. A computer-implemented ranking method comprising:  
performing a search on a database according to search criteria;  
receiving, from the database over a network, a document resulting from the search, the document containing terms that match the search criteria;  
calculating a standard deviation of a probability distribution function representing a distribution of the terms in the document that match the search criteria;  
determining relative distances between the terms in the document that match the search criteria according to the standard deviation;  
calculating a proximity boost value using the relative distances;  
applying the proximity boost to a base relevancy score of the document to determine a relevancy ranking for the document; and  
ranking the document according to the relevancy ranking.*

*8. A computer-readable storage medium storing instructions which, when executed by a processor, perform a ranking method, the method comprising... [the steps defined in claim 1].*

*15. An apparatus comprising:  
a memory device storing instructions for determining relevant search results;  
and a processor executing the instructions to perform the steps of... [the method defined in claim 1].*

*22. A computer-implemented ranking method comprising:  
sending, to a remote computer system via a network, a search query containing query terms;  
obtaining, at the remote computer system, documents resulting from performing the search query on a document database, the documents containing terms that match the search query;  
determining base relevancy scores for the documents;  
adjusting the base relevancy scores by measuring relative distances between the terms that match the search query in the documents using a probability distribution function; and  
ranking the document according to the adjusted base relevancy scores.*

## The Law

- 7 The Examiner has objected that the invention is excluded from being patented as a program for a computer. The relevant sections of the Act are Sections 1(1)(d) and 1(2)(c), the most relevant provisions of which (with my emphasis added) are:

### *Section 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.

### *Section 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 ... mathematical method;

(b) ...;

(c) a ... method for ... 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.

- 8 There is a large amount of case law in relation to the provisions of section 1(2). The most significant recent judgments of the Court of Appeal on the matter are *Aerotel/Macrossan*<sup>1</sup> and *Symbian Ltd's Application*<sup>2</sup>. Following the guidance in *Symbian I* I will use the four-step approach explained at paragraphs 40-48 of *Aerotel* and ensure in my consideration of steps (3) and (4) that I determine whether the invention makes a technical contribution. The steps are :

(1) Properly construe the claim;

(2) Identify the actual contribution;

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<sup>1</sup> *Aerotel Ltd v Telco Holdings Ltd and Macrossan's Application* [2006] EWCA Civ 1371; [2007]

<sup>2</sup> *Symbian Ltd v Comptroller-General of Patents* [2009] RPC 1

(3) *Ask whether it falls solely within the excluded subject matter;*

(4) *Check whether the actual or alleged contribution is actually technical in nature.*

The Court said in *Symbian* (see paragraphs 8-15) that the structured four-step approach to the question in *Aerotel* was not a new departure in domestic law and that it remained bound by its previous decisions, particularly *Merrill Lynch*<sup>3</sup>. The *Aerotel* test is intended to be equivalent to the prior case law test of “technical contribution”.

9 When considering the computer programme exclusion, it can be helpful to consider the ‘signposts’ set out in paragraph 40 of *AT&T/CVON*<sup>4</sup> which provide guidelines when considering whether a computer program makes a relevant technical contribution beyond the exclusion. The fourth signpost was subsequently reworded by the court of appeal in paragraphs 50-51 of *HTC v Apple*<sup>5</sup> following *Gemstar*<sup>6</sup>; The five reworded signposts are as follows:

*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.*

10 I note that whilst the Examiner has suggested in his pre-hearing report of 25/4/17 that he “can see strong arguments” that the invention might fall into other excluded categories (those in Section 1(2) above, not in bold) he has not actually raised any objection that it does do so. Therefore I have not required the Agent to address me in relation to these (though he has provided comments in relation to each in his skeleton arguments, and he made some reference to them in the hearing). For completeness I note that I have not considered these (or any other) potential objections in this decision.

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<sup>3</sup> *Merrill Lynch's Application* [1989] RPC 561

<sup>4</sup> *AT&T Knowledge Ventures/CVON Innovations v Comptroller General of Patents* [2009] EWHC 343 (Pat)

<sup>5</sup> *HTC v Apple* [2013] EWCA Civ 451

<sup>6</sup> *Gemstar-TV Guide International Inc v Virgin Media Ltd* [2010] RPC 10

## Arguments and Assessment

### *(1) Properly construe the claim*

- 11 The Examiner and the Agent are agreed that the independent claims are clear, and that there is therefore no difficulty in construing them. I concur.

### *(2) Identify the actual contribution*

- 12 *Aerotel/Macrossan* provides some guidance for this second step of identifying the actual contribution in paragraph 43 (my emphasis added):

“it is an exercise in judgement 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.”

- 13 In his first examination report of 22/6/16 (and repeated in his pre-hearing report of 25/4/17) the Examiner provided a statement of what he considered the actual contribution to be:

“a method of searching for documents using search criteria whereby the relevancy ranking for a document takes into account the relative distances between terms in the document that match the search criteria according to the standard deviation of a probability distribution function representing the distribution of terms in the document that match the search criteria”.

- 14 The Examiner has expanded on this by stating, in his pre-hearing report, that this “has the advantage of the documents having an improved relevancy ranking and that the document received by a user will be more relevant to the user”. (For completeness, I note that in his first examination report the Examiner identified the advantage as just the first part of this, relating only to the improved relevancy ranking of the document.)
- 15 I note that in the correspondence it is the nature and extent of the “advantage” that is primarily under dispute, rather than the Examiner’s statement defining what he sees as the actual contribution.
- 16 Mr Lincoln argues that the contribution is considerably broader than is acknowledged by the Examiner, and the advantages considerably greater. In his opening discussion of the invention in the skeleton arguments, filed 11/7/17 ahead of the hearing, he states that the contribution is provided “in the field of **natural language processing**... in which **computers are used to analyse the meaning of language**” (my emphasis). He argues that this provides “a better method for analysing the content of a document in order to quantify the extent to which the meaning of the document matches, or is relevant to, search criteria”.

- 17 In the skeleton arguments he went on to suggest that “an improved ordered set of documents can be a physical object, i.e. an ordered set of physical documents”. In this he draws an analogy with the contribution identified in *Halliburton*<sup>7</sup>.
- 18 At the hearing I raised this with Mr Lincoln, noting that I had found no support for the concept of physical documents. He acknowledged that the method of the invention is performed in a computer, and that the documents are not physical. But he suggested that electronic documents can be thought of in the same way as physical ones, and that the fact that the documents are not physical should not change the thinking regarding the contribution that the invention makes: “Just because the documents are electronic does not take away anything from the contribution that’s being made”.
- 19 I will not deliberate here as to how analogous the contribution of the present invention might have been with that of *Halliburton* had there been any support for the present invention resulting in an ordered set of physical documents. As noted above and as acknowledged by Mr Lincoln, there is no such support. The advantage of the present invention and its actual contribution cannot reside in the provision of physical documents. The invention itself, and therefore also its actual contribution, are restricted to being computer-implemented.
- 20 The skeleton arguments helpfully provide a full assessment of the invention following the *Aerotel* test. For the second step the contribution made is identified firstly as: “an improved method for determining the relevance of a document to search criteria based on an analysis of the configuration of terms that match the search criteria, within the document”. But it is later also stated that:
- “the contribution is an improved method for **natural language processing** that provides an improved assessment of the relevance of a document to search criteria by better **analysing the meaning of the content** of the document than prior art methods allowed.” (My emphasis.)
- 21 At the hearing Mr Lincoln expanded on what he meant when he said that the contribution lay in the field of “natural language processing”. In discussing step two of the *Aerotel* test he said, “What we see as the contribution, is a contribution in the field of natural language processing. So it’s a method of **giving a computer an understanding of the meaning of a document** in respect of the distribution of words relating to the search term therein, using a distance measure which involves the calculation of the standard deviation.” (My emphasis.)
- 22 Throughout the hearing Mr Lincoln repeatedly emphasised that the contribution lay in the computer understanding the documents. He said, “... the contribution that they have made is to provide a method that **allows a computer to quantitatively understand the content of the document.**” (My emphasis.) I pressed Mr Lincoln on this point, challenging whether the computer is understanding the documents, rather than just running a program which gives an ordered list based on an assigned criteria at the end. In answering Mr Lincoln made clear that he was not claiming that the computer was conscious/sentient, or that it was understanding in the way that a human understands, rather, “The contribution that this invention is providing, it’s a quantitative way of scoring the documents that **gives the computer an**

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<sup>7</sup> *Halliburton Energy Services Inc’s Applications* [2011] EWHC 2508

**understanding that's equivalent to a human understanding of the document... I do think that the computer ends up with an understanding of the meaning of the document."** (My emphasis.)

- 23 In an attempt to move beyond a possible semantic impasse, I invited Mr Lincoln to propose any alternative phrasing for this concept of the computer "understanding". He stated, "When we use the word "understanding" I think we can also think of it in terms that it's **allowing the computer to have an assessment of the meaning of the document** in terms of the distribution of words therein." (My emphasis.)
- 24 In general terms I have no objection to speaking in terms of a computer "understanding" something. As discussed with Mr Lincoln, I appreciate that a computer does not "understand" in the way that a human does – but that this can be a useful way of representing how data may be input to a computer, analysed/ processed by it, and useful resultant data output by it. However, I do not see that a computer demonstrates any "understanding" of the document when it performs the method of the present invention. By analogy, a non-English speaker might trawl through a set of documents looking for the words "dog" and "lead" and noting their relative proximity in the documents in which they both occur. It would not be necessary for him to comprehend the meaning of those words, or to know how they may be translated into his own language, either in isolation or in context, or to have any understanding of the documents in which they occurred, in order to perform that task. In performing the task he would be analysing the documents, and assessing their relevance against the search criteria provided to him, but he would not gain any understanding of the meaning of the documents by performing that task.
- 25 Throughout the hearing, Mr Lincoln qualified his references to the computer "understanding" with "quantitatively", or by immediate reference to "distribution of words" (or some equivalent phrase). Even so, I do not see any way in which the computer performing the method of this invention may be considered to be understanding the meaning of the document.
- 26 I am happy to accept Mr Lincoln's alternative rendering up to a point, inasmuch as the invention allows the computer "to have an assessment... of the document in terms of the distribution of words therein". But I am of the opinion that the computer does not have "an assessment of the meaning of the document" in any terms.
- 27 Similarly I disagree that the invention lies in the field of natural language processing. It was noted in the skeleton argument that in natural language processing "computers are used to analyse the meaning of language"; whereas this is not the case in the current application.
- 28 However, though not understanding the meaning of the documents, the computer performing the method of the present invention does quantitatively assess the relevance of the documents, it does make an assessment in terms of the distribution of words therein.
- 29 The actual (or alleged) contribution is therefore more than was acknowledged by the Examiner; particularly in the absence of any cited prior art to establish the state of the art as a basis for determining what the inventor has added to human knowledge.

30 Taking all of this into account, I identify the actual contribution as: a computer searching for and ranking documents according to their relevance, as determined by a quantitative assessment of the distribution therein of words matching the search criteria.

***(3) Ask whether it falls solely within the excluded subject matter***

31 As discussed above, the invention is a computer-implemented method, that is, it will be effected by a program for a computer. The actual contribution does not fall outside the scope of being a program for a computer. The question to be determined then is whether it is anything more than “a program for a computer... as such”.

32 Whether the invention provides a relevant “technical contribution” which renders it more than “a program for a computer... as such” may be determined with reference to the *AT&T* signposts. As noted above, the Agent had alluded to these in his response to the first examination report. But I had asked him to be prepared to address me in relation to these at the hearing, and he came prepared to do so. I will deal fairly briefly with the first three sign posts as I do not see that they pose any real difficulty, and Mr Lincoln did not discuss these in much detail at the hearing. His main arguments related to the fourth and fifth signposts, and I will deal with those in more detail.

***(i) Whether the claimed technical effect has a technical effect on a process which is carried on outside the computer***

33 As discussed above, regardless of whether the ordered list of documents created by the computer performing the method of the present invention may subsequently be printed out as a set of physical documents, the invention itself does not provide any such physical object. There is no effect on any process carried on outside the computer (or network of computers).

***(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***

34 The invention relates to the operation of the computer, how it searches for and ranks documents. There is no effect on the architecture of the computer itself.

***(iii) Whether the claimed technical effect results in the computer being made to operate in a new way***

35 The computer processes data (the documents, the words therein, the search criteria) and performs functions (determining a probability distribution function and a standard deviation, measuring distances). In doing so it does not operate in any new way.

***(iv) Whether the program makes the computer a better computer in the sense of running more efficiently and effectively as a computer***

36 In relation to this signpost, Mr Lincoln said, “Given that the contribution is in the field of natural language processing... the applicant has provided a way of more efficiently allowing the computer to understand the content of the document based on the distribution of words therein.” However, as discussed above, I cannot see that the

contribution is in the field of natural language processing, or that the method of the invention does indeed allow the computer to understand the content of the document.

- 37 The invention provides a method for the computer to find and rank documents, and I can see that the method is more efficient and more effective than other ranking methods might be (or than having no ranking of the documents would be). But it is only the method, or the program, which is more efficient or effective, not the computer itself, and so the computer itself is not a better computer.

***(v) Whether the perceived problem is overcome by the claimed invention as opposed to merely being circumvented***

- 38 Addressing the fifth signpost, Mr Lincoln said, “We see the problem as being how to give the computer a better understanding of the meaning – how to give the computer a better understanding of the document in terms of the distribution of the words therein that relate to the search terms”. And he argued that this problem was not being circumvented: “The claimed method is attacking that head on by providing a robust technique of making this assessment, of giving the computer that understanding of natural language, using this technique, in terms of relative distances of the standard deviation.”
- 39 In its context this fifth signpost is particularly concerned with the technical nature of the problem, on the basis that a solution to a technical problem may itself be considered technical, and so fall outside of the excluded categories. I asked Mr Lincoln at this point therefore whether he felt that the problem overcome was technical. On the grounds that he sees the problem as relating to the computer understanding documents, he confirmed that he does see that as a technical problem.
- 40 Again however, my problem with this argument is that I cannot accept that the computer is gaining any understanding of the document, or of natural language, by the invention. The problem is how to find relevant documents, or how to rank documents found according to their relevancy. The invention provides a method for a computer to do this. But there is no technical problem being overcome by the invention.

***(4) Check whether the actual or alleged contribution is actually technical in nature***

- 41 This fourth step has already effectively been performed in the assessment of the third step, particularly in relation to the fifth *AT&T* signpost. I do not consider the invention to overcome a technical problem, and I do not consider it to make a relevant technical contribution.

**Decision**

- 42 I therefore conclude that the invention defined in the claims is excluded from being patented under s.1(2)(c) as a program for a computer as such. Having considered the whole specification I do not see any saving amendment which might be made.

43 I therefore refuse this application under s.18(3).

**Appeal**

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

**PETER MASON**

Deputy Director, acting for the Comptroller