

PATENTS ACT 1977

APPLICANT Innovation Science Pty Limited

ISSUE Whether patent application number
GB1001729.1 complies with Section 1(2)

HEARING OFFICER Ben Buchanan

DECISION

- 1 Patent application GB1001729.1 entitled "Visit feasibility using scheduled transport within a network of connected nodes" was filed by Innovation Science on the 4 July 2008 and published as WO2009/003241. The application claims an earliest priority date of 4 July 2007, and was republished on 7 April 2010 with the serial number GB2464054. The application was examined on 21 June 2011 and under rule 30(2)(b) the normal unextended compliance date was set at 21 June 2012. This period has been extended under rule 108(2) until 21 August 2012.
- 2 The examiner has maintained throughout the proceedings that the invention as claimed in this application is excluded from patentability under section 1(2) of the Patents Act 1977. The applicant has not been able to satisfy the Examiner that this objection is overcome, despite amendments to the application.
- 3 The matter therefore came before me at a hearing on 3 July 2012 where the inventor Michael Haddy attended and was represented by his attorneys Dr. Cerian Jones and Gregory Mark Davies of Urquhart-Dykes and Lord LLP. The Examiner, Stuart Purdy, was also present.

The Invention

- 4 The invention relates to the determination of the possible location and timing of objects (including people) in a transportation network. Using information about the network including nodes (e.g. stations or depots), paths (e.g. routes between nodes) and timings (e.g. scheduled timetable or actual transition times), the invention determines (i) which objects could have been at a particular place at or within a particular time and (ii) the feasibility of a particular object being able to travel from one place to another, at or within particular departure and arrival times.

- 5 The purpose of the invention is to quickly reduce the number of possible objects under investigation, which satisfy specific criteria, when analysing the movement of objects within a network. Objects joining and leaving the network are detected by sensors such as ticket barriers, number plate recognition and biometric or image recognition means. Data recording when transportation means moves between nodes in the network may also be used. The invention aims to improve the accuracy of object determination by combining transportation data from diverse sources and logically processing it to produce more specific results. Existing methods involving manual processing may use a narrower range of data sources and may be subject to time and resource constraints. The invention may be used to track parcels that have become separated from an identification tag or label; when trying to identify parcels which have become damaged in transit; or when trying to determine the locations and timing of possible contamination from a leaking container. A potential use not disclosed in the application, but described at the hearing and in the skeleton arguments, is to track terror suspects in a public transport network based on entry and exit constraints.

The Claims

- 6 The most recent set of claims were filed on 28 March 2012 and include two independent claims: A method of computationally determining the subset of the one or more objects that could have been at a predetermined location during a predetermined time period (claim 1); and a method of computationally determining the feasibility of an object being able to transit from one predetermined location at an associated time period to a second predetermined location at a second associated time period via other locations and time periods (claim 17). A third claim (claim 18) defines a system for receiving and manipulating the information generated in an object transportation network comprising a processing means which performs the method of the method claims.

Claims 1, 17 and 18 read as follows:

1. A method for computationally determining the subset of the one or more objects that could have been at a predetermined location during a predetermined time period in an object transportation network for further review, the time period being a single point in time or an extended period of time and the network comprising one or more transportation means that transport at discernible times zero, one or more objects between nodes of the network via paths joining adjacent nodes of the network and comprising one or more sensors for detecting an object entering, exiting or in the network, wherein the discernible times are actual or scheduled times that the transportation means arrived at or departed a node, the method comprising the steps of:

a) associating one or more nodes with the predetermined location

b) associating at least one detection location and detection time period with each detected object, wherein an object detection may be a detection of the object entering, exiting or in the network and the detection time period may be a single point in time or an extended period of time;

c) associating a set of times with a node, wherein the set of times comprises a reference time and the latest possible time that an object could have departed each other node in the network and arrived at the node by the reference time, and zero, one or more sets of times are associated with each node of the network, and associating a set of times with each transportation means, wherein each set of times associated with a transportation means comprises a reference time and the latest known time that an object could have departed each node in the network prior to the reference time, and wherein the sets of time associated with the nodes and the transportation means are exchanged and/or merged to enable information on the fastest way to move around the network to be generated such that for a set of times associated with a node, and a set of times associated with a transportation means, exchanging and/or merging of the times in the two sets of times is performed such that the time associated with each other node is the most recent time from the two sets of times; and

d) determining the subset of the one or more objects that could have been at the predetermined location during the predetermined time period wherein if,

at least one associated detection location and time period for the object and at least one of the zero, one or more sets of times associated with each node in the network permit the object to be transported to or from the one or more nodes associated with the predetermined location, said transportation to occurring prior to or during the predetermined time period, and said transportation from occurring during or after the predetermined time period

then the object is a member of the subset of objects that could have been at the predetermined location during the predetermined time period.

17. A method for computationally determining the feasibility of an object being able to transit from one predetermined location at an associated time period to a second predetermined location at a second associated time period via zero or more other predetermined locations that also have an associated time period in a object transportation network for providing the object for further review if the transit is feasible, the time periods being a single point in time or an extended period of time and the network comprising one or more transportation means that transport at discernible times zero, one or more objects between nodes of the network via paths joining adjacent nodes of the network and comprising one or more sensors for detecting an object entering, exiting or in the network, wherein the discernible times are actual or scheduled times that the transportation means arrived at or departed a node, the method comprising the steps of:

a) associating zero or more sets of times with each node in the network wherein each set of times comprises a reference time and the latest possible time that an object could have departed each other node in the network and arrived at the node by the reference time and associating a set of times with each transportation means, wherein each set of times associated with a transportation means comprises a reference time and the latest known time that an object could have departed each node in the network prior to the reference time, wherein the sets of time associated with the nodes and the transportation means are exchanged and/or merged; and

b) representing each predetermined location and its associated time as one or more predetermined locations and associated times that are each associated with a single node; and

c) arranging the set of predetermined locations and associated times into chronological order of associated times; and

d) for each adjacent pair of predetermined locations in the chronologically ordered set, starting with the most recent and second most recent predetermined locations: using the zero or more sets of times associated with each node in the network to determine if an object could have been transported via zero or more object transportation means from the least recent predetermined location in the pair at or after the start of the least recent associated predetermined time, to arrive at the more recent predetermined location in the pair at or before the end of the more recent associated predetermined time; and

e) if traversal between all pairs of predetermined locations considered in step d) were possible within the respective predetermined times, the set of predetermined locations at the associated predetermined times is determined to be feasible.

18. A system for receiving and manipulating the information generated in an object transportation network, the network comprising one or more transportation means that transport at discernible times zero, one or more objects between nodes of the network via paths joining adjacent nodes of the network, the system comprising:

an object detecting means wherein the detecting means detects an object at a location in the network, and records the time of that detection;

a transportation means location detector wherein the transportation means location detector detects the location of a transportation means in the network, and records the time of that detection; and

a processing means which performs the method of any one of claims 1 to 17 to provide objects for further review in response to a received query.

The Law

7 The examiner has raised an objection under section 1(2) of the Patents Act 1977 that the invention is not patentable because it relates to a program for a computer as such. The provisions of this section of the Act are shown below:

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 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.

8 As explained in the notice published by the UK Intellectual Property Office on 8 December 2008¹, the starting point for determining whether an invention falls within the exclusions of section 1(2) is the judgment of the Court of Appeal in *Aerotel/Macrossan*².

9 The interpretation of section 1(2) has been considered by the Court of Appeal in *Symbian Ltd's Application*³. *Symbian* arose under the computer program

¹ <http://www.ipo.gov.uk/pro-types/pro-patent/p-law/p-pn/p-pn-computer.htm>

² *Aerotel Ltd v Telco Holdings Ltd and Macrossan's Application* [2006] EWCA Civ 1371; [2007] RPC 7

³ *Symbian Ltd v Comptroller-General of Patents*, [2009] RPC 1

exclusion, but as with its previous decision in *Aerotel/Macrossan*, the Court gave general guidance on section 1(2). Although the Court approached the question of excluded matter primarily on the basis of whether there was a technical contribution, it nevertheless (at paragraph 59) considered its conclusion in the light of the *Aerotel/Macrossan* approach. The Court was quite clear (see paragraphs 8-15) that the structured four-step approach to the question in *Aerotel/Macrossan* was never intended to be a new departure in domestic law; that it remained bound by its previous decisions, particularly *Merrill Lynch*⁴ which rested on whether the contribution was technical; and that any differences in the two approaches should affect neither the applicable principles nor the outcome in any particular case. But the *Symbian* judgment does make it clear, that in deciding whether an invention is excluded, one must ask “does it make a technical contribution”? If it does then it is not excluded.

- 10 Subject to the clarification provided by *Symbian*, it is therefore appropriate to proceed on the basis of the four-step approach explained at paragraphs 40-48 of *Aerotel/Macrossan* namely:
- 1) Properly construe the claim
 - 2) Identify the actual contribution (although at the application stage this might have to be the alleged contribution).
 - 3) Ask whether it falls solely within the excluded matter, which (see paragraph 45 of *Aerotel/Macrossan*) is merely an expression of the “as such” qualification of section 1(2).
 - 4) If the third step has not covered it, check whether the actual or alleged contribution is actually technical.
- 11 The operation of this test is explained at paragraphs 40-48 of the decision. Paragraph 43 confirms that identification of the contribution is essentially a matter of determining what it is the inventor has really added to human knowledge, and involves looking at substance, not form. Paragraph 46 explains that the fourth step of checking whether the contribution is technical may not be necessary because the third step should have covered the point.
- 12 Dr Jones acknowledged that the Examiner was correct in following this approach and she applied it in response in skeleton arguments and at the hearing. She also confirmed that the consideration of steps 3 and 4 together was the approach she would take.

Construing the claims

- 13 The first step of the test is to construe the claims. I do not think this presents any real problems since both the applicant and the examiner agree as to the meaning of the claims. In the official letter dated 30 May 2012 setting out his final position, the examiner acknowledged that the latest amended claims filed on 28 March 2012 address his previous concerns.

⁴ *Merrill Lynch's Application* [1989] RPC 561

Identify the actual contribution

- 14 For the second step, it is necessary to identify the contribution made by the invention. Paragraph 43 of *Aerotel/Macrossan* explains that this is to be determined by asking what it is - as a matter of substance not form - that the invention has really added to human knowledge having regard to the problem to be solved, how the invention works and what its advantages are.
- 15 On this point, the Examiner and the applicant did not initially agree. At the hearing Dr. Jones reiterated that the actual contribution reflected a new method of processing data rather than the result per se; that this required a new system albeit comprising a combination of conventional apparatus; and processing data in a 'technical' manner. These arguments are set out in full in the skeleton arguments filed on 26 June 2012. The actual contribution she identified was:

A new investigative system and method using data from a range of sources within a transportation network for identifying the subset of objects which could have been at a pre-determined location within the network during a predetermined time period, so as to reduce the amount of man hours required to carry out the investigative work and query response time.

- 16 This seems to me to be a reasonable summary of the advantage and operation of the invention defined by the claims, consistent with the Court's interpretation of step 2 of the test in *Aerotel/Macrossan*. On the basis of Dr. Jones' identified actual contribution, which I accept, I shall now consider steps 3 and 4.

Does the contribution fall solely within excluded subject matter? Is the contribution technical in nature?

Program for a computer

- 17 There is no doubt in my mind that the contribution requires a computer program for its implementation. Dr. Jones' skeleton arguments filed on 26 June 2012 state as much when assessing step 3, and the application supports this. However, the mere fact that the invention is effected in software does not mean that it should be immediately excluded as a computer program as such.
- 18 Dr. Jones argues that following *Halliburton*⁵ the correct approach to establish whether an invention relates solely to a program for a computer is to ask, as the Court did at paragraph 38:

What if the task performed by the program represents something specific and external to the computer and does not fall within one of the excluded areas?

- 19 She emphasises that the task allows the rapid identification of objects in a transport network. The invention begins with real world objects and data and enables real world suspects or objects relating to a specific event in a network

⁵ *Halliburton Energy Inc's Patent* [2011] EWHC 2508 (Pat)

to be identified. This, she argues, represents something specific and external to the computer. She then points out that the Court in *Halliburton* went on to say⁶:

Put in other language, when the task carried out by the computer program is not itself something within the excluded categories then it is likely that the technical contribution has been revealed and thus the invention is patentable.

- 20 This is the crux of Dr. Jones' argument. Data from diverse sources (e.g. different sensors, locations and transport mechanisms) is brought together and processed by the computer. Objects which fulfil the criteria of an investigation can be identified on the basis of this processed data. This task, she argues, does not fall solely into any of the excluded categories as such.
- 21 At the hearing, Mr. Haddy kindly provided a very helpful demonstration to illustrate the task, using a computer program which implements the invention. He explained that the processing is done using algorithms based on heuristics. He and Dr. Jones contend that this is technical in nature because it takes account of real physical objects and reduces the number under consideration. I shall now assess whether the task falls outside of the excluded areas and makes a contribution to the art which is technical in nature⁷.

Mathematical method

- 22 Undoubtedly the invention involves mathematics, as in *Halliburton*, but is the data on which the mathematics is performed specified so as to represent something 'concrete' as in *Halliburton*? The data claimed in *Halliburton's patent* relates to parameters of cutting elements, and roller cone profiles. The claim specifies that physical considerations which determine the optimum design are simulated and forces acting on the cutting element are thereby calculated. At paragraph 74, the Court states:

The detailed problems to be solved with wear and ability to cut rock and so on are highly technical problems with technical solutions. Accordingly finding a better way of designing drill bits in general is itself a technical problem. The invention is a better way of carrying that out.

- 23 Dr. Jones argues that by analogy the same applies to the present invention; it is a better way of determining a subset of or the feasibility of object(s) fulfilling certain criteria; the data relates to physical objects, and thus represents something concrete. She also argues that the invention has a technical effect on the investigation that occurs outside the computer in that it reduces the set of possible objects under investigation by identifying only those which meet the predetermined criteria.
- 24 Taking these points in turn, I am not sure the first of these is an equivalent consideration. In *Halliburton* the problem was an engineering one; as the court acknowledged, a *highly technical* one. In the present invention, the problem seems to me to be a logistical rather than a technical one. Its solution, achieved

⁶ *Halliburton Energy Inc's Patent* [2011] EWHC 2508 (Pat) at para. 38

⁷ *Halliburton Energy Inc's Patent* [2011] EWHC 2508 (Pat) at para. 32

by using a computer to perform logical mathematical – heuristic – processing on logistical data, likewise does not seem to be technical. The invention, unlike *Halliburton*⁸, comprises a mathematical method as such. But what about the effect on the investigation outside the computer? Does that fall within one of the excluded areas? Is it a technical effect?

Method for doing business

- 25 At the hearing and in the skeleton argument, reference was made to the applicability of the system to identifying terror suspects such as those responsible for the 7/7 London bombings. No such examples are disclosed in the application, which relates only the tracking of parcels and the determination of contamination from a leaking container by way of example. I consider all of these examples of investigation to be logistical problems. A logistical problem is a type of business problem, whether the business is policing, delivering goods or containment of contamination. I cannot identify anything specific and external to the computer which does not fall within the category of a method of doing business. The argument put forward by Dr. Jones that the objects may be 'real world' does not change this. Determining where and when they might have been in a network is still a logistical task.
- 26 The advantages put forward of reducing manual effort and speeding up the process of identification are precisely what would be expected when automating a logistical task; the benefits of reduced labour and processing time are evident outside the computer but are not indicative in themselves of anything more than computerised automation of the process being carried out inside the computer, which I have determined to be in an excluded field. I therefore consider the actual contribution also to fall within a method for doing business.

Technical contribution

- 27 I have found that the actual contribution falls solely within the excluded matter, and is not technical and so the invention is not patentable. I come to the same conclusion considering the issue through the lens of technical effect.
- 28 Dr. Jones cited *Protecting Kids the World Over (PKTWO) Ltd*⁹ in which Floyd J found that monitoring the content of electronic communications and generating an alarm was physical rather than abstract, and that the effect, viewed as a whole, was technically superior¹⁰. Dr. Jones identified the parallel with the present invention as monitoring and identifying something for consideration in the real world. In her opinion, the argument for a technical contribution is strengthened by the invention relating to physical objects within a transport network.
- 29 The claims are not limited to physical or otherwise 'real world' objects though, and as I have said above I do not think it would make a difference if they were.

⁸ *Halliburton Energy Inc's Patent* [2011] EWHC 2508 (Pat) at para. 72

⁹ *Protecting Kids the World Over (PKTWO) Ltd, Re* [2011] EWHC 2720 (Pat)

¹⁰ *Protecting Kids the World Over (PKTWO) Ltd, Re* [2011] EWHC 2720 (Pat) at para. 34

In fact the application covers non-physical objects; there is an example of *an abstract representation of a container (such as...electronic encapsulation/packet etc.) that can transport objects...or information (such as data in for example digital form) between nodes at discernible times* in the specification as filed on page 10 at lines 26-28. At the hearing Mr. Davies suggested that this very applicability of the present invention to data packets in an electronic network reinforced the parallel with *PKTWO*.

- 30 I am not convinced by either of these lines of reasoning. I do not think that *PKTWO* bears sufficient similarity with the present case to permit the Floyd J's reasoning to apply. In *PKTWO* it was the content of communications that was monitored and an alarm generated dependent upon the determined content. Floyd J states quite clearly at paragraph 35 that his judgement is based on *the very specific facts of the case before me*. To my mind the facts differ. Monitoring content is not the same as determining the logistical feasibility or presence of objects in a network. I do not therefore find that *PKTWO* helps to identify a technical contribution in the present application.

The AT&T Signposts

- 31 Finally I shall consider the *five signposts*¹¹ which Lewison J set out in *AT&T Knowledge Ventures' Application and CVON Innovations Ltd's Application* [2009] FSR 19 (*AT&T*). Following *AT&T*, in *Really Virtual Co Ltd v UK Intellectual Property Office* [2012] EWHC 1086 (Ch). John Baldwin QC (sitting as a Deputy Judge) noted that the *AT&T signposts*, although useful, are no more than signposts. With this in mind, I shall consider each of the signposts in turn:

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

As I have determined above, the benefits to the investigative process carried on outside the computer derive from the effect of automating the mathematical process - heuristic analysis - carried on inside the computer. The process carried on outside the computer is a method for doing business. The reduction of manual effort and increase in speed of identification are not therefore indicative of a technical effect.

- 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;*

The claimed technical effect does not operate at the level of the architecture of the computer and is entirely dependent upon the data being processed.

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

¹¹ *AT&T Knowledge Ventures' Application and CVON Innovations Ltd's Application* [2009] FSR 19 para. 40

The claimed technical effect is achieved using a general purpose computer as the description on page 40 at line 13 acknowledges.

iv) *whether there is an increase in the speed or reliability of the computer;*

The operation of the computer; its speed and reliability; are unchanged by the claimed technical effect.

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

The skeleton argument on page 7 states that the problem is 'identifying suspects'; but it is more than that. The problem is determining which objects in a transport network fulfil certain criteria. The present invention solves this problem by combining and processing diverse data, filtering out what is logically unfeasible, just as a conventional manual process would. The existing manual method could consider all the data, but it would be resource and time intensive to do so. Does the invention 'overcome' the problem or circumvent it with computer processor power? I think it is the latter.

32 I therefore find that the *AT&T* signposts do not indicate that the invention provides a relevant technical contribution.

Conclusion

33 I have found that the invention, whilst implemented by a computer program, takes data from a transport network and performs a task which, in that it identifies objects outside the computer, represents something specific and external. However I consider the actual contribution to fall solely within the excluded areas of a program for a computer, a mathematical method and a method for doing business. No aspect of the actual contribution is suggestive to me of being *technical in nature* or of providing the required *technical contribution*.

34 I conclude that the invention as claimed is excluded under section 1(2). Having read the application I do not think that any saving amendment is possible. I therefore refuse the application under section 18(3).

Appeal

35 Under the Practice Direction to Part 52 of the Civil Procedure Rules, any appeal must be lodged within 28 days.

Ben Buchanan

Deputy Director, acting for the Comptroller