Intellectual Property Office

BL O/312/15

06 July 2015

PATENTS ACT 1977

APPLICANT The Boeing Company

ISSUE Whether patent application GB1109923.1 is excluded under section 1(2) of the Patents Act 1977

HEARING OFFICER J Pullen

DECISION

Introduction

1 Patent application GB1109923.1, entitled 'Fleet performance optimization tool enhancement' was filed on 13 June 2011 and claims a priority date of 23 June 2010 from a US application. The application was published as GB2481500 A on 28 December 2011.

2 Following a number of amendment rounds, the examiner has maintained that the invention relates to a method of doing business and a computer program and is, therefore, excluded from patentability under section 1(2) of the Patents Act 1977. The examiner had also raised and deferred objections relating to inventive step and to the clarity of the claims. Therefore, the only issue to be decided at this point is whether the invention is excluded subject matter.

3 The applicant requested a hearing, which took place via telephone on 14 May 2015. The applicant was represented by Dr Caelia Bryn-Jacobsen. Also attending were the hearing assistant, Mr Mark Simms, and the examiner, Mr Stuart Purdy.

The invention

4 The invention relates to maintenance procedures for aircraft. As indicated by the title of the application, it is particularly suitable for the maintenance of fleets of aircraft.

5 During the maintenance of an aircraft, a component of an aircraft system may be removed for maintenance procedures and then replaced. Each component is given a unique identifier, such as a bar code, so that it can be identified by scanning. A history of health management data unique to each component can then be accumulated over the life of the component.

6 The health management data associated with a specific component is then used to determine an operating parameter for that specific component. Suggested operating

parameters include average operating lifetime and failure rate. The operating parameter is then compared with a baseline operating parameter, which has been calculated using data, which is not specific to a single component. If the operating parameter, determined from the data for a specific component, deviates from the baseline operating parameter by more than a predetermined amount, then the component is considered to be a rogue component and should be discarded.

7 In the most recently filed claims, filed 9 February 2015, there are three independent claims. Claim 1 is to a method, claim 6 is to a server to carry out the method and claim 11 is to a system to carry out the method. Claims 6 and 11 will stand or fall with claim 1, which reads as follows:

> *1. A method to discard a rogue component from an aircraft system that includes a plurality of components, said method comprising:*
> *identifying a first component of the plurality of components; comprising scanning the first component for an identifier comprising a serialized part number, that uniquely identifies the first component to a history of data to be accumulated for the first component; and maintaining the history of data by scanning the first component when it is removed from a first position, and rescanning the first component when it is replaced;*
> *determining, using the history of data, an operating parameter that is uniquely related to the first component;*
> *comparing the operating parameter to a predefined baseline for the first component wherein the baseline is not unique to the first component and is representative of a standard component of a same type as the first component; and*
> *determining whether the first component is a rogue component dependent upon the history of data comprising determining a severity of deviation of the operating parameter from the baseline;*
> *generating an alert, based on the determination, that indicates if the first component is a rogue component*
> *presenting the alert, to a user of the system, indicative of the severity of the deviation;*
> *presenting to the user a ranking of the first component with respect to the plurality of components based upon the severity of deviation; and*
> *enabling the discarding of the rogue component when presenting the alert to the user indicates that the first component is a rogue component.*

The Law

8 The examiner has raised objections under section 1(2)(c) of the Act that the invention is not patentable as it relates to both a method of doing business and a program for a computer as such; the relevant provisions of the Act are shown in bold below:

> *1(2) it is hereby declared that the following (amongst other things) are not inventions for the purposes of the 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 provisions shall prevent anything from being treated as an invention for the purposes of the Act only to the extent that a patent or application for a patent relates to that thing as such.*

9 In accordance with established case law, the starting point for determining whether an invention falls within the exclusions of section 1(2) is the judgement of the Court

of Appeal in *Aerotel/Macrossan*[1]. Also of relevance is the decision of the Court of Appeal in *Symbian*[2] .

10 *Symbian* arose under the computer program exclusion, but as with its previous decision in *Aerotel/Macrossan*, the Court gave general guidance on section 1(2). Whilst in the *Symbian* case the Court approached the question of excluded matter primarily on the basis of whether or not 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 of *Aerotel/Macrossan* was not a new departure in domestic law; that it remained bound by its previous decisions, particularly *Merrill Lynch*[3] which rested on whether or not 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* judgement 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.

11 Subject to the clarification provided by *Symbian*, it is therefore necessary 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) Indentify the actual/alleged contribution.*
> *(3) Ask whether it falls solely within the excluded matter.*
> *(4) If necessary check whether the actual/alleged contribution is actually technical.*

12 The *Aerotel/Macrossan* approach has been used consistently throughout the prosecution of this application.

13 In addition, guidelines for considering computer implemented inventions were given i*n AT&T/CVON*[4] and refined in *HTC/Apple*[5]*.*

Application of the Aerotel/Macrossan Approach

Step 1: Properly construe the claim

14 Although the claims are generally clear, there are some elements, which need to be considered.

15 Firstly, the claim 1 is to a method “to discard a rogue component”. However, the body of the claim refers only to enabling the component to be discarded. This is done by providing an alert to a user that the component is a rogue component and presenting the user with data relating to this. As such, the invention is a method of alerting a user to the presence of a rogue component thereby enabling a rogue component to be discarded.

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[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] *Merrill Lynch’s Application* [1989] RPC 561
[4] AT&T Knowledge Ventures LP and CVON Innovations Limited [2009] EWHC 343
[5] HTC v Apple [2013] EWCA Civ 451

16 The claims refer to a “history of data” and to “maintaining the history of data by scanning the first component”. The claims do not suggest what data is maintained, other than the unique identifier of the component. However, the description refers to a “history of health management data”. Figure 4 gives examples of this data, which includes the results of tests. As such, it is apparent that data, other than just the component identifier, is included in the history and that this data relates to the state of the component.

17 I believe the correct construction of the claim 1 to be a method for identifying and alerting a user to a rogue component in an aircraft system, thereby enabling it to be discarded, by generating an operating parameter from a history of health management data, the data being linked to a specific component using a unique identifier scanned from the component, and by determining if the operating parameter deviates from a baseline operating parameter, which is representative of components of the same type.

Step 2: Identify the contribution

18 The starting point for assessing step 2 can be found in the well known statement of Jacob LJ, in paragraph 43 of *Aerotel/Macrossan,* who said:

> *‘It is an exercise in judgment probably involving the problems 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’*

19 Dr. Bryn-Jacobsen stated that she considered the contribution to be the comparison of data unique to a single component to baseline data, which is not unique to a particular component, in order to identify a rogue component. She argued that a person could not do this in real time and that the computer implemented method allowed identifying and discarding rogue components, which could not previously be achieved.

20 However, the prior art identified by the examiner includes three documents that disclose comparing historical health data of a particular component to values for normal components. This allows the identification of rogue components.

21 EP1895452 A1 (ABB RESEARCH) discloses a method for estimating the life of components in a process control environment. Paragraphs 43–48 and figure 7 disclose a comparison of the performance data for a given component with fault-free or normal performance. This is the performance that would be representative of components of the same type.

22 WO2008151240 A1 (ACCENTURE) discloses performance based logistics. Paragraphs 108–110 disclose comparing data collected about components, assemblies or systems and comparing the data with reference data, which is representative of item of the same type. If the observed data deviates from the reference data by a significant amount, the item is flagged as suspect and maintenance is scheduled.

23 US2007198679 A1 (DUYANOVICH et al) discloses automatic abnormality detection. Performance and workload histories are compiled for components. If the

performance and workload measurement for a particular component is beyond a threshold distance from the average value, then the component may be put in a quarantine table for further analysis. If the measurements are not considered random, then the abnormality is reported.

24 These disclosures show that using statistical techniques, which compare the health data of components of a system with normal, average or baseline health data, is known. However, none of these relate to aircraft systems.

25 The examiner also cited an additional document, US2007200703 A1 (BAKER et al), which discloses the use of an RFID scanner to track components in a process control environment. This disclosure shows that the use of scanners to track components in a system during maintenance is known. Again, this does not relate to aircraft systems.

26 Therefore, I consider that the contribution made by the invention is the application to aircraft system maintenance of known analytical techniques for identifying potentially faulty components and of the use of known scanning procedures to track those components.

Step 3: Ask whether it falls solely within excluded subject matter

27 The examiner argued that the invention is no more than an administrative procedure, and as such, is a method for doing business. However, aircraft maintenance is an inherently technical process and an improved method of identifying potentially faulty components during aircraft maintenance is more than just an administrative procedure or a resource management activity, as it has real implications for improved aircraft safety. As such, the contribution made by the invention is considered to be more than a mere business method.

28 The examiner also argued that the invention is a computer program. Although computer programs are excluded from patentability under Section 1(2), it is settled law that a computer program which makes a technical contribution is not a computer program as such, and falls outside the exclusion.

Step 4: Check whether the contribution is actually technical in nature

29 In *AT&T/CVON*, Lewison J set out five signposts that he considered to be helpful when determining whether the contribution made by a computer implemented invention is technical in nature, which he then reviewed in *HTC/Apple*.

30 The first signpost is particularly relevant to this application:

> *Does the claimed technical effect has a technical effect on a process which is carried on outside the computer?*

31 The contribution, as identified above, does not lie in the analysis of data and the subsequent identification of potentially faulty parts, but in the application of these techniques to aircraft maintenance procedures. The aircraft system is not part of the computer -the maintenance of the aircraft system is a process which is carried out outside the computer and the identification of potentially faulty parts has an effect on that process. This has a number of effects, as listed in paragraph 35 of the

application, as filed. Among these are extending the life of the aircraft and improving the safety of the aircraft which are technical effects. As such, the identified contribution is technical and is not a computer program as such.

32 Dr Bryn-Jacobsen drew my attention to the second of the sign posts:

> *Does 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?*

33 It is clear that the computer itself is running a conventional application and processing data specific to that application. There is no effect at the level of the architecture of the computer. As such, this signpost does not give any indication of a technical contribution.

34 Dr Bryn-Jacobsen did not rely on any of the remaining signposts and I agree that they are not relevant to the circumstances of the case at hand.

Conclusion

35 I find that the invention as claimed in the current claim set is not excluded under Section 1(2).

36 As issues of inventive step and clarity have been deferred, the application will be remitted to the examiner for further substantive examination. It should be noted that the compliance period ended on 23 June 2015.

Appeal

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

J Pullen

Deputy Director, acting for the Comptroller