Intellectual Property Office

BL O/029/19

16 January 2019

PATENTS ACT 1977

APPLICANT	General Electric Company
ISSUE	Whether Patent application GB1116031.4 complies with Section 1(2)
HEARING OFFICER	MRS S E Chalmers

DECISION

1 Patent application number GB 1116031.4 was filed on 16 September 2011 claiming a priority date of 28 September 2010 from an earlier US application. It was published as GB 2484182 on 4 April 2012.

2 The first examination report, dated 27 October 2017, raised objections that the invention lacked novelty in view of seven documents and appeared to be excluded from patentability as a computer program as such.

3 Amendment of the claims overcame the objection to novelty. Arguments that the invention defined by the claims were more than a computer program as such failed to satisfy the examiner of this and the applicant's representatives requested a hearing based on the documents on file to resolve the matter. In considering these documents, I identified an issue in respect of the novelty and inventiveness of the claims. In fairness to the applicant and in view of the imminent compliance date, I instructed the examiner to notify the applicant of my decision on patentability informally and to raise the Section 1(1) points ahead of the issue of this formal decision.

The invention

4 The application is entitled "Monitoring and diagnosing generator operation" and is said to relate generally to generator technology, and more particularly, to tools for monitoring and diagnosing generator operation. It is said that due to the complexity of modem generators, problems within the generator, which may initially be small and hidden, may escalate if not corrected, causing ever larger problems, eventually leading to forced outages. To address this the operation of a generator is evaluated by a computer using diagnostic data obtained from one or more sensors in the generator. A determination is made whether an anomaly exists and if so a fault code is provided to a user indicating the nature of an error that caused the anomaly. The evaluation utilises a knowledge base that is specific to the type of generator and the individual generator that is being monitored.

5 The computer may be co-located with the generator or be remotely located. The fault code includes a unique indicator such as a numeric or alphanumeric code, or more detailed description of the error, such as a word, phrase, sentence or paragraph describing the error.

The claims

6 There are three independent claims numbered 1, 6 and 11 that define a computer-implemented method, computer system and computer program respectively. Each independent claim includes the same features so will stand or fall together. Claim 1 reads:

> *A computer-implemented method of evaluating generator operation, the method comprising:*
> *obtaining diagnostic data from a first sensor in a generator, the diagnostic data including a series of data values observed by the first sensor over time;*
> *evaluating, by a computer system, the diagnostic data to determine whether an anomaly exists as the diagnostic data is obtained using a knowledge base that includes data from parameters that are specific to a type of generator and from parameters that are specific to the generator from which data is obtained; and*
> *based on a determination that the anomaly exists, providing, by the computer system, a fault code that indicates a nature of an error in the generator that caused the anomaly.*

The law

7 The section of the Act concerning inventions excluded from patentability is Section 1(2), which reads:

> *"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)...*
> *(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."*

8 In order to decide whether an invention relates to subject matter excluded by Section 1(2), the Court of Appeal has said that the issue must be decided by answering the question of whether the invention reveals a technical contribution to the state of the art. The Court of Appeal in Aerotel/Macrossan[1] set out the following four-step approach to help decide the issue:

> *1) Properly construe the claim;*

[1] Aerotel Ltd v Telco Holdings Ltd (and others) and Macrossan's Application [2006] EWCA Civ 1371

2) Identify the actual (or alleged) contribution;
3) Ask whether it falls solely within the excluded subject matter;
4) Check whether the actual or alleged contribution is actually technical in nature.

9 The operation of the approach is explained at paragraphs 40-48 of the judgment. In paragraph 43 Jacob LJ sets out that identification of the contribution 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'*

10 Paragraph 47 adds that a contribution which consists solely of excluded matter will not count as a technical contribution.

11 In Symbian[2] the Court of Appeal reaffirmed the Aerotel approach while considering a question of "technical contribution" as it related to computer programs emphasising the need to look at the practical reality of what the program achieved, and to ask whether there was something more than just a "better program".

12 The case law on computer implemented inventions was further elaborated in AT&T/CVON[3] which provided five helpful signposts to apply when considering 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. The 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 make 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 merely being circumvented.*

Application of the Aerotel approach

Step 1: Properly construe the claim

13 Both the examiner and agree the claims are clear and no special construction is required of any of the words or phrases. On the whole I agree. However, I believe

[2] Symbian Ltd's Application [2009] RPC 1
[3] AT&T Knowledge Ventures LP and CVON Innovations Limited v Comptroller General of Patents [2009] EWHC 343
[4] HTC v Apple [2013] EWCA Civ 451

that a brief comment on how I have construed some of these words and phrases would be beneficial.

14 Firstly, claim 1 is directed towards a method of evaluating a generator wherein diagnostic data obtained from a sensor and a knowledge base of data from parameters is used to provide a fault code pertinent to the generator. The description includes an embodiment wherein a power plant type generator includes a gas turbine engine and wherein sensors S1…Sn are distributed throughout the power plant rather than being exclusive to the generator. In one embodiment, discussed at page 11 lines 19-28, diagnostic data is obtained from sensors S1 and S2 and is used to generate a fault code that is indicative of leak within a seal. Sensors S1 and S2 are arranged in a compressor section of a gas turbine engine and a skilled reader would understand the leak to also reside in the compressor section. Therefore, the term 'generator' is not restricted to a generator per se but extends to include a component of a power plants comprising an electrical generator.

15 Secondly, the phrase "…data from parameters that are specific to a type of generator…" requires consideration. The description gives examples of the data being "specific to the type of generator" as being specific to the make, model, family of the generator but the claims are not thus restricted and therefore encompass generators which are a different make, model and/or family to the generator but which would, nonetheless, be regarded as being of the same "type". I accept that as a matter of ordinary English usage specific "type" of generator carries a connotation of something more than just a similar generator. However, the extent of this is not well defined and I therefore regard the two as coterminous.

16 Furthermore, the data from parameters that are specific to the type of generator are understood not to be exclusive to the original operator specifications, but additionally extends to any data that is specific to that type of generator including, for instance, observed behaviour as highlighted at page 9 lines 18-19.

17 The claims concern a computer-implemented method of evaluating generator operation by evaluating a series of diagnostic data values obtained from a first sensor in a generator over time to determine whether an anomaly exists using a knowledge base including data that is specific to a type of generator and data specific to the generator being evaluated and if an anomaly is determined providing a fault code indicating a nature of an error that caused the anomaly.

Step 2: Identify the actual (or alleged) contribution

18 The actual contribution, what the application adds to human knowledge, isn't necessarily defined by what is new and inventive in the claim but knowledge of the prior art does play a role in assessing it. The prior art identified by the examiner includes several documents that disclose identifying anomalies in generators predictive of failure events before they occur and issuing alerts. US 2009/0100293 is a particularly pertinent aid in this consideration.

19 US 2009/0100293 discloses a system which predicts power generation equipment (e.g. a generator) failure events using statistical techniques to identify anomalous operational data from sensors within the equipment compared to small sets of related operational data from a recent time period and issue an alert. The related

operational data can be taken from the target unit's past performance and the performance of the target unit's peers (from, for example, paragraphs [0038] to [0040]). The peers are similar equipment such as having the same frame-size and the alert can be audio and/or visual signals displayed by the team's computers.

20 The agent's comments on the relevance of this document (and the other documents cited originally) to the novelty (no comment is made regarding inventive step) of the amended claims in their letter of 26 February 2018 state that "using a knowledge base that includes data from parameters that are specific to a type of generator and from parameters that are specific to the generator from which data is obtained is not disclosed…" in this document. They do not elaborate on this statement and the examiner did not maintain the novelty objection or raise an inventive step objection. It is not clear to me that the "…data from parameters that are specific to a type of generator…" in claim 1 is substantially different from data regarding "the performance of the target unit's peers" in US`293.

21 I am therefore at a loss to identify any substantial feature in the presently claimed invention which could be said to have been added to human knowledge as compared to the disclosure in US 2009/0100293. Different terminology is used but that is not enough.

22 I will continue with the application of the *Aerotel* approach based on the following alleged contribution and if I find this to be excluded then there is nothing more to it. However, if I find this is not excluded then I must remit this case to the examiner to (re)consider the novelty and inventive step of the claims in view of the disclosure in US 2009/0100293. The alleged contribution made by the invention is:

> *A computer-implemented method of identifying faults which may lead to failure of a generator by evaluating diagnostic data obtained from a sensor in the generator to determine whether an anomaly exists using data that is specific to a type of generator and data specific to the generator being evaluated and if an anomaly is identified providing a fault code indicating the cause.*

23 The examiner argues that the generator, sensors and computer system performing the evaluation do not form part of the contribution which instead lies solely in the nature of the data used and in the generation of a fault code. This assertion is not correct[5]; the data and fault code are not isolated entities which exist independently of the apparatus/method in which they are used (as would be the case for a novel story or computer program to implement a business method stored on a conventional medium). Instead they are an integral part of a method of identifying faults in a generator using data obtained from sensor and the contribution must reflect that.

Steps 3 and 4: Ask whether it the contribution falls solely within the excluded subject matter and whether it is technical

24 Claim 11 defines a computer program and the computer-implemented method of claim 1 and computer system of claim 6 would be affected by a computer program

[5] As stated in paragraph 64 of Lantana v Comptroller-General of Patents [2014] EWCA Civ 1463

running on a conventional computer as a matter of practical reality. I must therefore consider whether this computer program makes a relevant technical contribution.

25 When considering the first AT&T signposts the examiner finds that the creation of a fault code does not provide for an effect outside the computer as no maintenance (or other real-world effect) is performed automatically based on the creation of a fault code.

26 It is trite law that giving visual indications automatically about conditions prevailing in an apparatus or system is basically a technical problem[6]. Monitoring and diagnosing generator operation of generators is plainly more than a computer program as such. Generator maintenance is a technical process and an improved method of identifying potentially faulty components has real world implications. Methods of such should not be denied a technical effect just because no maintenance (or other real-world effect) is performed automatically in the definition of the method steps. I therefore find that the alleged contribution is not excluded.

Decision

27 I have found that the alleged contribution made by the invention defined by the claims is not excluded under Section 1(2). However, in the light of the issues raised in paragraphs 19-21, the case cannot be sent for grant. I have therefore remitted this case to the examiner to (re)consider the novelty and inventive step of the claims in view of the disclosure in US 2009/0100293.

Appeal

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

Mrs S E Chalmers

Deputy Director, acting for the Comptroller

[6] This is taken from paragraph 87 of *Aerotel* quoting IBM/Text processing (1988) T 115/85 as part of the analysis of what is regarded as technical from earlier decisions.