Intellectual Property Office

BL O/748/19

06 December 2019

PATENTS ACT 1977

APPLICANT	TrakM8 Ltd
ISSUE	Whether GB1801427.4 complies with Section 1(1)(b) of the Patent Act 1977
HEARING OFFICER	Stephen Brown

DECISION

Introduction

1 Patent Application GB1801427.4 was published on 13th June 2018 as GB2557073. It is a divisional application that takes its priority date of 20th April 2015 from the parent application, GB1506643.4 (GB2537612).

2 After several rounds of correspondence, the applicant and the examiner are unable to agree whether the application makes the required inventive step or not. The matter thus came before me at a hearing on 23rd October 2019. The applicant was represented by Julia Mills and Judith Coghlan of Script IP. The inventor, Mathew Cowley, of TrakM8 also attended. I was assisted by Nigel Hanley. The examiner, James Palmer, and an observer, Aquilla Brandon-Salmon, were also present.

The Application

3 Poor battery condition can often cause breakdowns in motor vehicles. One of the main purposes of batteries in vehicles is to provide a short, but large, burst of energy as part of the cranking cycle during the ignition of internal combustion engines.

4 The applicant has devised a method of monitoring the state of battery health by capturing information relating to the cranking cycle and sending it for analysis at a remote processor. The remote processor can collect information from many different vehicles. This allows the cranking signature waveform from a single vehicle to be compared with multiple others to make a prediction of future battery failure. As Mr Cowley explained during the hearing, a key feature of the method is the use of a remote processor which allows the use of “big data” in this analysis and prediction.

The Claims

5 The current set of claims was filed on 10th July 2018. It comprises two independent claims. Claim 1 reads:

A method of determining a current battery state of batteries mounted on a plurality of vehicles, said method comprising:

> *Receiving data from monitoring circuitry mounted on said plurality of vehicles said data being indicative of an output of a battery during at least a portion of a cranking cycle triggered by an ignition event on a vehicle and including a vehicle identifier indicating a type of said vehicle;*
>
> *For data received from each of said vehicles, analysing said data to determine a current state of said battery on said vehicle;*
>
> *Wherein said received data comprises data indicative of changes in an output of said battery during said at least a portion of said cranking cycle and said analysing step comprises comparing using pattern matching techniques a waveform formed from said data with stored waveforms formed from data collected from other vehicles to determine said state of said battery; and*
>
> *Outputting a result of said analysing step.*

Claim 14 reads:

An analysing device for determining a current battery state of batteries mounted on a plurality of vehicles, said analysing device comprising:

> *An input operable to receive data from monitoring circuitry mounted on said plurality of vehicles , said data being indicative of an output of a battery during at least a portion of a cranking cycle triggered by an ignition event on a vehicle and including a vehicle identifier indicating a type of said vehicle;*
>
> *An analyser operable to analyse data received form each of said vehicles to determine a current state of said battery on said vehicle wherein said analyser is operable to compare waveforms formed from said data using pattern matching techniques with stored waveforms formed from the data collected from other vehicles to determine said state of said battery; and*
>
> *An output operable to output a result of said analysing step.*

The Law

6 Section 1(1) of the Act sets out what is required of a patentable invention as follows:

> *A patent may be granted only for an invention in respect of which the following conditions are satisfied, that is to say -*

(a) The invention is new;

(b) it involves an inventive step;

…

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

7 Section 2 of the Act sets out what 'new' means as follows:

2(1) An invention shall be taken to be new if it does not form part of the state of the art.

2(2) The state of the art in the case of an invention shall be taken to comprise all matter (whether a product, a process, information about either, or anything else) which has at any time before the priority date of that invention been made available to the public (whether in the United Kingdom or elsewhere) by written or oral description, by use or in any other way;

2(3) The state of the Art in the case on an invention to which an application for a patent or a patent relates shall be taken also to comprise matter contained in an application for another patent which was published on or after the priority date of that invention, if the following conditions are satisfied, that is to say:-

(a) That matter was contained in the application for that other patent both as filed and as published; and

(b) The priority date of that matter is earlier than that of the invention

8 Section 3 of the Act states:

An invention shall be taken to involve an inventive step if it is not obvious to a person skilled in the art, having regard to any matter which forms part of the state of the art by virtue only of section 2(2) above (and disregarding section 2(3) above).

9 In addition to statute, the courts have long used the so called *Windsurfing* test to assess issues of inventive step. This test was reformulated by the Court of Appeal in *Pozzoli*[1]. Paragraph 23 of this decision lays out the test as:

(1) (a) Identify the notional "person skilled in the art"

(b) Identify the relevant common general knowledge of that person;

[1] Pozzoli Spa v BDMO SA & Anor [2007] EWCA Civ 588

(2) Identify the inventive concept of the claim in question or if that cannot readily be done, construe it;

(3) Identify what, if any, differences exist between the matter cited as forming part of the "state of the art" and the inventive concept of the claim or the claim as construed;

(4) Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps which would have been obvious to the person skilled in the art or do they require any degree of invention?

Applying the Pozzoli test

Step 1: Who is the Skilled Person and what is their common general knowledge?

10 Ms Mills argued that the skilled person is a designer of diagnostic systems for mounting on vehicles. Their common general knowledge would necessarily include the use of a CANBUS system. They would be aware of the idea of remote transmission of data but that would be the limit of their common general knowledge. In particular, they would see monitoring as a more of a workshop discipline rather than a fleet management function.

11 The Examiner, on the other hand, has argued that the skilled person is a designer of remote monitoring systems for vehicle batteries. Furthermore, that they would have an understanding of the remote monitoring needs of companies which operate multiple vehicles.

12 After careful consideration, I will broadly accept the attorney's view of the skilled person. I believe though that they would be aware that remote monitoring is possible. However, I do not believe that the idea of processing battery data from multiple vehicles at a remote location would necessarily be part of their common general knowledge.

13 I will also add one further caveat. Page 3, lines 20-26, of the specification as filed, refers to an on-board diagnostic or OBD_II socket. This may be used during servicing to "determine information regarding the vehicles current status but can also be used when the vehicle is in use to monitor signals from the engine including signals indicative of the output of the battery". I believe that the skilled person would be aware of this OBD connector and would also be aware of its diagnostic codes, where to look them up and what they mean. By way of example the diagnostic code 0902 will return a 17 character Vehicle Identification Number (VIN).[2]

Step 2: Construe the Claim and Identify the Inventive Concept

14 Construing the claim does not present a major problem in this case but I would like to consider what is meant by the terms "data being indicative of the output of a

[2] https://en.wikipedia.org/wiki/OBD-II_PIDs#Service_09

battery" and a "waveform formed from said data". I raised this specifically at the hearing and the applicant described this is as "a cranking cycle signature". Furthermore, I note that it is specifically referred to as a "cranking signature" on page 11, line 1, of the specification. I thus construe the data being recorded and transmitted as being "a cranking cycle signature".

15 Turning to the inventive concept of the claims, at first glance this would seem to be essentially the same as claim 1. However, the attorney argued that it is wider than this. Specifically, she argued that the concept lies in the recognition that the output of the battery during the cranking cycle provides a good indication of battery health but that this varies according to many factors. Furthermore, the concept includes remote analysis which allows the use of "big data techniques", such as collating data from many sources, to account for these variations.

16 While I am not sure that I can stretch the inventive concept quite so far, I do agree that the collection of 'cranking signatures' from multiple vehicles which is analysed at a remote location are key features. I thus identify the inventive concept to be collecting cranking signature data from a plurality of vehicles, transmitting each signature, along with a vehicle identifier, to a remote processor where it is pattern matched to signatures collected from other vehicles to determine the state of the battery.

Step 3: What is the Difference between the inventive concept and the State of the Art?

17 The prior art relied upon by the Examiner is US 2005/0182536. This describes a system for acquiring a crank waveform from a battery during a starting event. The system comprises detection logic that then analyses one or more characteristics of the battery waveform to determine the condition of the battery. Specifically, the detection logic determines the characteristics of the battery by using reference parameters that are stored in a memory. These parameters may be derived from earlier collected information or maybe downloaded from a remote system (see Paragraph 0040). In one embodiment, the system may also transmit battery information to the remote station for further analysis. This may be stored as part of the operation and maintenance record of the vehicle (paragraph 0026).

18 What then are the differences? One difference is that the prior art determines a number of parameters from the cranking signature such as voltage dip or overall duration of the starting event. It then compares these parameters to known values to determine battery health rather than comparing the entire signature to other signatures.

19 Another difference is that in the prior art all the analysis is done locally against parameters received from a remote station. While there is a suggestion that some further analysis can be done at the remote station, this is in addition to the local analysis and only in the instance where a parameter has been exceeded. Furthermore, I can see no suggestion in the prior art of any comparison with data from other vehicles. Next, the prior art does not explicitly mention that its technology

is applied to multiple vehicles. Neither is there any explicit mention of a vehicle type identifier being transmitted along with battery data.

Step 4: Would these differences be obvious to the skilled person?

20 I will consider each of the above identified differences one at a time, in no particular order. Firstly, while the prior art does not specify transmitting a vehicle type identifier along with its battery data I believe that such an option would be obvious to the skilled, but uninventive, person. As mentioned above in paragraph 13, I believe that it would be part of their common general knowledge that a suitable identifier is available from the OBD socket interrogated to obtain the battery data. Likewise, I believe that it would be obvious to extend the teaching of the prior art to cover monitoring multiple vehicles.

21 The difference concerning processing data at a remote location though is harder to dismiss. The prior art teaches local processing and I can see little that would tempt the skilled person to depart from this. While I think they would appreciate that processing *could* be done at a different location, that is different to deciding that it is an obvious variation to try.

22 Then there is the difference that the current application compares the entire cranking signature to signatures from other vehicles using pattern matching techniques. The prior art teaches directly away from this, distilling its data into a handful of simple parameters. With only a few parameters to compare to known values there is no compelling need for the prior art to process data remotely. Neither does it need to employ pattern matching techniques. This, I think, is a key difference and I conclude that it would not be obvious to the skilled person. I therefore find that the current application makes the required inventive step.

Conclusion

23 I have found that the application makes the required inventive step. I therefore remit it back to the examiner for further processing.

Next Steps

24 Given the key inventive difference I have noted above, the applicant may wish to consider clarifying the claims to bring out the role of the “cranking cycle signature” and how it is compared, using pattern matching, to signatures collected from other vehicles.

25 I also note that the compliance date for this application is 20th December 2019. I am aware that this is imminent and I am happy to indicate in advance that I will allow a further extension of 2 months on filing of the appropriate form and fee should it be required.

Appeal

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

Stephen Brown
Deputy Director, acting for the Comptroller