Intellectual Property Office

BL O/089/22

03 February 2022

PATENTS ACT 1977

APPLICANT	Amer Sports Digital Services OY
ISSUE	Whether patent application GB1615991.5 complies with section 1(1)(b), 1(2)(c) and 3 of the Patents Act 1977
HEARING OFFICER	Phil Thorpe

DECISION

Introduction

1. Patent application GB1615991.5 was filed on 20th September 2016 and published as GB2545769A on 28th June 2017.

2. The case was searched, and an examination opinion was issued covering novelty, plurality and excluded matter. After two rounds of amendments the applicant has been unable to satisfy the examiner that the application meets the requirements of the Act, with the examiner remaining of the opinion that the claimed invention is obvious and also excluded from patentability.

3. A letter issued by the examiner on 22nd October 2021 offered a hearing and the applicant subsequently requested that a decision be made based on the papers on file.

The Invention

4. The invention relates to determining an intensity level of an activity for example running or swimming in which a user is engaged. The user has a wearable device such as a smart watch which includes or is coupled to a kinematic sensor such as an acceleration sensor or angular velocity sensor. The wearable device can also be connected to a heart sensor or the like. The wearable device is communicatively coupled with a communications network including a back-end server. The device can store sensor data to enable subsequent identification of particular activity sessions based at least partly on the stored sensor data. Each activity session can be associated with a unique activity identifier.

5. The invention involves a calibration step to provide a user-specific calibration metric, such that subsequently an intensity level of an activity may be determined in the absence of the heart rate sensor, using instead the kinematic sensor and the calibration metric.

6. The claims under consideration were filed on 4th May 2021. Claim 1 reads as follows:

> An apparatus comprising:
>
> - memory configured to store a user-specific calibration metric;
> - at least one processing core, configured to:
>
> - obtain the user-specific calibration metric by causing the apparatus to participate in a calibration procedure, the calibration procedure including communicating heart rate data of the user with a back-end server;
>
> - determine an activity type identifier of an activity a user is engaged in, and to determine a user-specific intensity level of the activity while the user is not wearing a heart rate sensor, wherein determining the user-specific intensity level is based at least partly on the identifier of the activity type, the user-specific calibration metric and data obtained from a kinematic or speed sensor, and
>
> - present the user-specific intensity level of the activity to the user.

and claim 9:

> A method comprising:
>
> obtaining a user-specific calibration metric by causing the apparatus to participate in a calibration procedure, the calibration procedure including communicating heart rate data of the user with a back-end server;
>
> storing in an apparatus the user-specific calibration metric;
> determining an activity type identifier of an activity a user is engaged in, and to determine a user-specific intensity level of the activity while the user is not wearing a heart rate sensor, wherein determining the user-specific intensity level is based at least partly on the identifier of the activity type, the user-specific calibration metric and data obtained from a kinematic or speed sensor; and
>
> presenting the user-specific intensity level of the activity to the user.

7. There are also claims to a program and computer readable medium which include much of the wording of claims 1 and 9. I am satisfied that they stand or fall with claims 1 and 9.

Inventive step: The Law

8. Section 1(1) states:

> 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;

(c) it is capable of industrial application;

(d) the grant of a patent for it is not excluded by subsections (2) and (3) or section 4A below;

9. Section 3 then sets out how the presence of an inventive step is determined. It says:

> 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).

10. In *Pozzoli*[1] Jacob LJ approved of the four-step test proposed in *Windsurfing*[2] for assessing inventive step; but elaborated upon it and reformulated it as follows:

> (1)(a) Identify the notional "person skilled in the art"
> (1)(b) Identify the relevant common general knowledge of that person;
> (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 Windsurfing/Pozzoli test

Step 1 – Identify the skilled person and their knowledge

11. The applicant has not given an indication of who they think would be an appropriate skilled person in this case, nor what knowledge they would have.

12. The examiner discusses the skilled person and the common general knowledge, in their exam dated 25th June 2021 and their pre-hearing report of 29th October 2021, though falls short of identifying who the skilled person is.

13. *Technip France*[3] considered various precedent and approved of the approach taken in *Technograph v Mills*[4]:

> "… the hypothetical addressee is a skilled technician who is well acquainted with workshop technique and who has carefully read the relevant literature. He is supposed to have an unlimited capacity to assimilate the contents of, it may be, scores of specifications but to be incapable of scintilla of invention."

14. In this instance I believe the skilled person to be a designer of personal wearable devices that are associated with measuring activity levels when the wearer undertakes a physical activity. They would be capable of making routine workshop developments but unable to exercise inventive ingenuity. The examiner suggests that the only common general knowledge required by the skilled person in such a case is that taught principles about one type of operation can apply to

---

[1] *Pozzoli SPA v BDMO SA [2007] EWCA Civ 588*
[2] *Windsurfing International Inc. v Tabur Marine (Great Britain) Ltd, [1985] RPC 59*
[3] *Technip France SA's Patent [2004] RPC 46*
[4] *Technograph v Mills & Rockley [1972] RPC 346*

others which are also taking place, as would be familiar to any specialist concerned with the processing of data.

15. There would be a lot of literature relevant to this skilled person and so a comprehensive list of their knowledge is not practical. However, it seems relevant to the present case that they would be familiar with 'cloud computing' where smart devices communicate with a remote server for remote storage, processing and/or retrieval of data.

Step 2 – Identify/construe the inventive concept

16. Both the applicant and examiner appear to have considered all features of the independent claims relevant to the inventive concept. I think this is appropriate. Therefore, the inventive concept of claim 1 is as follows:

> A device with a memory programmed to store a user-specific calibration metric and processor programmed to: obtain the user-specific calibration metric by communicating user heart rate data with a remote server; and without the user having to wear a heart sensor determine the present activity type, obtain sensed kinematic/speed data, and calculate and present a user intensity level based on the user-specific calibration metric, the activity type and the data.

Step 3 – Identify the difference(s) between the inventive concept and the state of the art

17. Four documents have been cited by the examiner and considered by the applicant: WO2015/087164, US2007/276200, GB2513585 and US2014/372064. However, in the pre-hearing report, the examiner indicated that WO2015/087164 represented the closest prior art and that if the invention was inventive over this document then it would also be inventive over the other listed documents. I will therefore focus initially on WO2015/087164.

WO2015/087164

18. WO2015/087164 discloses a wearable device (referred to as pod 102) that includes at least one sensor that is able to communicate with a server. The sensors provide information about the state of the user (e.g. heart rate and bike cadence give us more information about how the athlete is performing). The wearable device has a memory and a processor that allows it to analyse data from the sensor/s and compare that with one or more signatures of known activities to enable identification of the activity of the user. Further it notes that signatures are stored in a database on a server and can be downloaded to and stored on the pod. The description at [10] refers to an embodiment where:

> "a system determines when a user performs an activity. The system includes a first pod configured with the user and a server. The first pod having a sensor for generating sensor data indicative of characteristics of the user and a first transceiver for wirelessly transmitting the sensor data. The server includes a processor, a second transceiver for receiving the sensor data, a memory for storing a signature definition corresponding to the activity and the sensor, and an algorithm having machine readable instructions that, when executed by the processor , are capable of matching the sensor data to the signature definition to determine if the user is performing the activity."

19. Paragraph [140] of the description explains how the device can estimate the heart rate when a heart rate monitor is not being worn by the user. It notes that:

> "Calibration may be determined from actual heart rate measurements by the user. For example, the user may wear a wireless heart rate monitor (often called a "heart strap") with either electrodes or PPG placed against the skin for measurements that may be used to calibrate signatures within pod 102. In another example, pod 102 wirelessly couples with the heart strap for self-calibration. When the heart strap is not worn by the user, pod 102 estimates heart rate based upon the signatures and state management."

20. Hence the device is able to provide user specific intensity data (estimated heart rate) based on the calibrated signature and the sensor output. The examiner and applicant appear to agree that WO2015/087164 differs from that in the claimed invention only in that it does not disclose communicating user heart rate data with a server as part of the calibration step; but that each discloses the device communicating with a server at some point.

Step 4 – Assess without hindsight whether these difference(s) would be obvious to the skilled person

21. Upon reading WO2015/087164 the skilled person is taught that a server should be provided to receive data from a smart device; analyse the data; and transmit resulting parameters back to the device [0087]. Such remote data processing is presented as an equivalent alternative to local data processing [0087]. The data includes 'raw data, signatures and direct truth measurements' [0087].

22. Later, and separately, WO2015/087164 teaches that a calibration metric is determined based on the user's heart rate (direct truth measurements) [0140]. The calibration metric can be subsequently used to estimate heart rate (a proxy for activity intensity level) based on activity type and sensed kinematic data, circumventing the need to actually measure the heart rate [0140].

23. The applicant suggests in its response of 4th May 2021 to one of the examination reports that "the server communication in the calibration process produces the technical benefits disclosed in the application as filed [0042], namely, that the calibration is more precise as it may draw on information from more than just the one user device". That is however not a step that is specifically set out in the claim. Further it is not clear how such drawing of information is not possible on the device itself. I would also note that the concept of aggregating of calibration information from more than one user on either the pod or the server is also clearly disclosed in WO2015/087164 [see for example paragraphs [0086]-[0087]].

24. Hence in view of their familiarity with 'cloud computing', the skilled person would realise that the server envisaged in paragraph [0087] could perform any calculation or data storage/retrieval step that can be done on a device itself. Therefore, they would think to calculate the calibration metric of paragraph [0140] on the remote server. This would require heart rate data to be communicated to the server. Hence any difference between the claimed invention and WO2015/087164 would be obvious to the skilled person.

25. Therefore claim 1 does not appear to involve an inventive step over the disclosure of WO2015/087164. Claims 9, 17 and 18 appear obvious for analogous reasons. WO2015/087164 would also appear to disclose the additional features of each dependent claim so these also do not contribute to an inventive step.

26. I will briefly discuss the other citations referred to by the examiner. Each of GB2513585, US2014/372064 and US2007/276200, discloses wearable devices for measuring activity, which include heart rate monitors, and which involve some form of calibration or correlation and wherein the devices are in communication with external networks or servers.

GB2513585

27. GB2513585 is principally concerned with improving communication between a heart rate and activity monitor and an external entity. Upon reading GB2513585 the skilled person is taught that after learning the correlation between heart rate and kinematic data; the arrangement can predict the users heart rate profile based on kinematic data and the correlation, circumventing the need to actually measure the heart rate (paragraph spanning pages 5 and 6). The application does not specify whether this prediction is made by the smart device or a server.

28. Later, and separately, GB2513585 teaches that a server (external entity) should be provided to receive and analyse data from the smart device (page 7, line 23-33). The data includes activity data and heart rate date and the analysis includes calculating correlations which constitute a calibration metric.

29. Hence, contrary to the examiner's and the applicant's arguments, this document does appear to disclose transmitting heart data to a server as part of the correlation or calibration procedure. Where the document differs from the claimed invention would be in that it does not clearly provide for the device to determine an activity type identifier of an activity a user is engaged in, nor to determine a user-specific intensity level based at least partly on the identifier of the activity type, the user-specific calibration metric and data obtained from a kinematic or speed sensor. These differences are not such that the invention would be obvious from this document.

US2014/372064

30. US2014/372064 discloses a system for monitoring activity including accelerometers that in one embodiment are foot mounted, a chest mounted heart rate sensor both able to communicate wirelessly with a wrist mounted device. The device has capability to determine if for example the user is running or walking. The description also discloses the various devices connected to a network server. The server can receive data from the wrist mounted device; analyse the data; and transmit resulting parameters back to the device [0202]. Precisely what data is received, analysed or transmitted is not specified.

31. Later, and separately, US2014/372064 teaches that a fitness index (a calibration metric) is calculated based on the users heart rate [0512]. This calculation is performed by "a processor receiving this information" but the location of the

processor is not specified [0512]. The fitness index can be subsequently used to estimate heart rate (a proxy for activity intensity level) based on activity type and sensed kinematic data, circumventing the need to actually measure the heart rate [0517].

32. In view of their familiarity with 'cloud computing', the skilled person would realise that the server envisaged in paragraph [0202] could perform any calculation or data storage/retrieval step that can be done on a device itself. Therefore they would think to use a processor on the remote server to calculate the fitness index of paragraph [0512]. This would require heart rate data to be communicated to the server.

33. Therefore claims 1 and 9 do not appear to involve an inventive step over the disclosure of US2014/372064. Claims 17 and 18 appear obvious for analogous reasons. US2014/372064 discloses the additional features of dependent claims 2, 4-6, 10 and 12-14 so these do not contribute to an inventive step.

US2007/276200

34. US2007/276200 discloses a system including a performance monitor in the form of a heart rate monitor and a motion measuring unit or units mounted on the limbs of the user. The system provides an association unit that can associate a performance parameter based on heart rate with an activity determination based on the motion sensor. This calibration enables subsequent performance parameters to be determined without heart rate measurement [0064].

35. The system includes identifying what it refers to as the performance type, for example running or walking etc based on the activity information and or the movement of the user's limbs.

36. Hence like WO2015/087164, US2007/276200 has all the features of the claimed invention except for a clear disclosure that heart rate information is transmitted to a server for purposes of calibration. The only reference to 'server' is in [0039] and is made with reference to a "second communication unit 116 positioned in the server". This second communication unit 116 is referred elsewhere as part of a wrist worn central processing unit. There is reference to a calculation unit which undertakes calculations based on heart rate being part of portable device such as mobile phone however as noted there is no clear disclosure that heart rate information is transmitted to a server for purposes of calibration. However as noted above in respect of WO2015/087164, such a difference is not such that the claimed invention would not be obvious over US2007/276200.

Patentability: The Law

37. The examiner has also raised an objection under section 1(2) of the Patents Act 1977 that the invention is not patentable because it relates to a category of excluded matter. The relevant provisions of this section of the Act are shown below:

> 1(2) It is hereby declared that the following (amongst other things) are not inventions for the purpose of the Act, that is to say, anything which consists of...
>
> (c) …a program for a computer;
>
> 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.

38. As explained in the notice published by the IPO on the 8th December 2008[5], 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*[6].

39. The interpretation of section 1(2) has been considered by the Court of Appeal in *Symbian*[7]. *Symbian* arose under the computer program exclusion, but as with its previous decision in *Aerotel* 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* approach. The Court was quite clear (see paragraphs 8-15) that the structured four-step approach to the question in *Aerotel* was never intended to be a new departure in domestic law; that it remained bound by its previous decisions, particularly *Merrill Lynch*[8] 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.

40. 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,* 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.
> (4) If the third step has not covered it, check whether the actual or alleged contribution is actually technical.

Applying the Aerotel test

Step 1 – Properly construe the claim

41. As is evident from the discussion on inventive step, claims 1 and 9 present little difficulty in terms of construction. However, it is helpful just to re-emphasise how a couple of the phrases used have been construed. Claim 1 refers to the memory and the processing being “configured to” to do something. In the context of this application, this simply means that the memory is ‘programmed to’ store the

[5] http://www.ipo.gov.uk/pro-types/pro-patent/p-law/p-pn/p-pn-computer.htm
[6] *Aerotel Ltd v Telco Holdings Ltd and Macrossan’s Application* [2006] EWCA Civ 1371; [2007] RPC 7
[7] *Symbian Ltd v Comptroller-General of Patents*, [2009] RPC 1
[8] *Merrill Lynch's Appn*. [1989] RPC 561

metric; and the processing core is 'programmed to' perform the subsequent steps.

42. The term 'back-end' in the claims appears to require that the server is remote from the user.

Step 2 – Identify the actual contribution

43. Jacob LJ addressed this step in *Aerotel/Macrossan* where he noted:

> "43. The second step — identify the contribution — is said to be more problematical. How do you assess the contribution? Mr Birss submits the test is workable — it is an exercise in judgment 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."

Jacob LJ goes on to say that:

> "44. …at the application stage – …the Office must generally perforce accept what the inventor says is his contribution"

44. In their letter of 15th September 2021, the applicant suggested that the contribution of the present invention is the steps of method claim 9 recited in full:

- obtaining a user-specific calibration metric by causing the apparatus to participate in a calibration procedure, the calibration procedure including communicating heart rate data of the user with a back-end server;
- storing, in an apparatus, the user-specific calibration metric;
- determining an activity type identifier of an activity a user is engaged in;
- determining a user-specific intensity level of the activity while the user is not wearing a heart rate sensor, wherein determining the user-specific intensity level is based at least partly on the identifier of the activity type, the user-specific calibration metric and data obtained from a kinematic or speed sensor; and
- presenting the user-specific intensity level of the activity to the user.

45. The examiner, in their exam dated 3rd March 2021, identified the contribution as:

> A method of using kinematic sensors to determine a user's activity intensity level without monitoring their heart rate, comprising the steps of obtaining a user-specific calibration metric using a calibration procedure that includes communicating heart-rate data to a server, determining an activity type, and determining a user-specific activity metric from the calibration metric and kinematic data.

46. This is a case where a search has been performed and as discussed above a number of relevant prior art documents have been cited. From these it is clear that the actual hardware used in the invention here is entirely conventional. The applicant does not suggest otherwise. The identification above of the differences between the invention and the prior art might suggest that the contribution lies in where some of the analysis is undertaken ie that the heart data is communicated to the server during the calibration step. But it is important to put that difference in the context of the overall claimed invention hence the contribution can be summarised as:

> In a method of using kinematic sensors to determine a user's activity intensity level without monitoring their heart rate, comprising the steps of obtaining a user-specific calibration metric and determining an activity type, and determining a user-specific activity metric from the calibration metric and kinematic data, the calibration procedure includes communicating heart-rate data to a server.

Steps 3 and 4 – Ask whether it falls solely within the excluded matter and check whether the actual or alleged contribution is actually technical

47. I will consider steps 3 and 4 together.

48. Lewison J (as he then was) set out five signposts *AT&T/CVON*[9] that he considered to be helpful when considering whether a computer program makes a technical contribution. In *HTC*[10] the signposts were reformulated slightly in light of the decision in *Gemstar*[11]. 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 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.

49. It is important to stress that these signposts are just that. They are not barriers or hurdles that need to be individually or collectively overcome by the applicant. They are rather a non-exhaustive list of some of the factors that can indicate in some cases especially where a computer program is involved whether a particular contribution may be technical.

50. In their letter of 15th September 2021, the applicant discusses signpost i:

> "the technical effect of the presently claimed invention outside the wearable device [is] that the user does not have to wear the heart rate sensor in order to obtain a user-specific intensity level of the activity in which they are engaged, despite the user-specific intensity level being indirectly based on heart rate data of the user, wherein the user-specific intensity level tells us something about how the intensity of activity affects this particular user."

51. It is, as seen from the prior art here, known for activity monitors to indicate activity intensity levels based indirectly on heart rate without using heart rate sensors, so this aspect on its own does not appear to provide the necessary technical contribution.

---

[9] AT&T Knowledge Venture/CVON Innovations v Comptroller General of Patents [2009] EWHC 343 (Pat); [2009] FSR 19
[10] HTC v Apple [2013] EWCA Civ 451
[11] Gemstar-TV Guide International Inc v Virgin Media Ltd [2009] EWHC 3068 (Pat); [2010] RPC 10

52. The applicant also suggests that the invention provides information about how the intensity of activities affects the particular user for example whether it is dangerously straining. Again, that is not a clear feature of the claimed invention. Further this is again a feature known in the art. WO2015/087164 discusses the provision of alarms extensively in paragraphs [0064]—[0075].

53. The applicant also highlights the provision of useful data to the user as indicating a contribution outside of the computer. I accept that taking real life information from sensors and presenting information to the user are things that happen outside the computer. However, these sensors, their signals and the display of the output are entirely conventional. They do not provide a technical contribution.

54. The applicant also refers to signpost v) noting that:

> the presently claimed invention overcomes the technical problem of providing more precise calibration of user-specific calibration metrics and thus an improved calibration procedure including communicating heart rate data of the user with a back-end server and providing information characterizing the technical state of the system.

55. It is however not clear to me how the invention in issue provides a more precise calibration over the prior art. The transmission of heart rate data to the server does not appear to provide this greater precision over say calibration performed on the wearable device itself. Hence, I am not persuaded that the invention here does solve any technical problem. I should add that the applicant suggests that the claimed invention is technical in nature for the similar reasons as a thermometer is technical or a blood oxygen meter is technical. I fully accept that these are indeed technical pieces of apparatus as indeed is the device in issue here. But then again so is a computer but that is not enough on its own for a computer implemented invention to be patentable. What matters is whether the contribution provided by the invention is technical. A thermometer that differs from a standard thermometer only in the colour of the markings is unlikely to be patentable.

56. The applicant has not commented on signpost ii-iv and I need to say nothing further than none seem to point to any technical contribution here.

57. Taking a step back and looking at the invention as a whole, I am satisfied that the contribution as I have identified it, does not provide a technical contribution. The transmission of the heart beat data to the server is merely a programming choice. Hence, I am satisfied that claims 1 and 9 are excluded as a program for a computer.

58. Dependent claims 2-8 and 10-16 and 18 do not appear to materially affect the above analysis. While they would add features to the contribution, such features would not extend the contribution beyond a computer program as such.

59. I make one final observation in response to the applicant's argument that two similar applications, GB1615994.9 and GB1615992.3 have recently been granted by the IPO. Whilst it is clearly important that applicant's receive consistency from the IPO, those applications are not in issue before me and hence I will make no further comment other than to note that each application needs to be considered on its merits.

Decision

60. I find that the invention defined in claims 1-18 of GB1615991.5 is not inventive over either of WO2015/087164, US2014/372064 and US2007/276200.

61. I also find that claims 1-18 to be excluded under Section 1(2) as a program for a computer.

62. I can see nothing in the specification that could be reasonably expected to form the basis of a valid claim. I therefore refuse this application under section 18(3).

Appeal

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

Phil Thorpe
Deputy Director, acting for the Comptroller