Neutral Citation Number: [2019] EWHC 107 (Ch)

Case No: HP-2017-000068

IN THE HIGH COURT OF JUSTICE
BUSINESS AND PROPERTY COURTS OF ENGLAND AND WALES
PATENTS COURT (Ch)

7 Rolls Building
Fetter Lane, London
EC4A 1NL

Date: 29 January 2019

Before :

MR JUSTICE HENRY CARR

- -

Between:

GARMIN (EUROPE) LIMITED	**Claimant**
- and -	
KONINKLIJKE PHILIPS N.V.	**Defendant**
(a company existing under the laws of the Kingdom of the Netherlands)	
- and -	
GARMIN INTERNATIONAL, INC.	**Third Party**
(a company existing under the laws of Kansas)	

- -
- -

Hugo Cuddigan QC and Tom Alkin (instructed by **Powell Gilbert LLP**) for the **Claimant** and the **Third Party**
Brian Nicholson and Christopher Hall (instructed by **Bristows LLP**) for the **Defendant**

Hearing dates: 7, 10, 11, 17 and 18 December 2018

- -

Approved Judgment

I direct that pursuant to CPR PD 39A para 6.1 no official shorthand note shall be taken of this Judgment and that copies of this version as handed down may be treated as authentic.

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MR JUSTICE HENRY CARR

Contents

Mr Justice Henry Carr

Introduction

1. This case concerns GPS sports watches, also known as fitness trackers, and the use of such devices. Most readers of this judgment will be very familiar with such devices. Whether you love them, hate them, or are obsessed by them, they are difficult to avoid. There are several famous brands including Garmin. They are personal monitoring devices that enable users to obtain, amongst other things, real-time feedback whilst exercising. Users of such devices may not be "athletes" in any normal sense of the word, although the devices have been referred to by the parties as "athletic performance monitoring devices" ("APMDs").

2. On 20 October 2017 the Claimant, Garmin (Europe) Ltd, issued a claim for a declaration of invalidity and for an order for revocation against the Defendant ("Philips") in respect of EP(UK)1,076,806B1 entitled "Athlete's GPS-based performance monitor" ("the Patent"). The priority date of the Patent is 26 March 1998. Philips counterclaimed for infringement, and issued an additional infringement claim against Garmin International, Inc. Common design between the defendants to the counterclaim is admitted and I shall refer to them collectively as "Garmin". Once infringement was alleged, the parties treated Philips as the claimant, and its evidence was called first.

3. Although the subject matter of the Patent is technically simple, the parties raised multiple issues which have complicated the proceedings. In particular:

    i) When opening skeleton arguments were exchanged, Garmin was relying upon six prior art citations as separate starting points for obviousness; certain collocation attacks based on *Sabaf SPA v MFI Furniture Centres Ltd* [2005] RPC 10; an allegation of excluded subject matter; and an alleged insufficiency squeeze.

    ii) In response, Philips applied to make five different amendments. Two claim groups (referred to as claims 30A and 30B) were put forward by Philips. Philips accepted that claim 1 as granted is anticipated by certain of the cited prior art (although it maintained that the anticipation was "accidental") but denied that any of the prior art deprived any claim of inventive step. Claims 30A and 30B are a combination of claim 30 as granted, which is dependent on certain sub-claims. Philips also proposed three conditional amendments to claim 1, which, according to Philips, only require consideration if the granted claims are to be found invalid.

    iii) There was a major dispute between the parties as to the identity of the skilled person for the purposes of obviousness. Philips alleged that the invention changed the art by combining two previously unrelated fields of GPS and athletic performance monitors; and that defining the skilled person for the purposes of obviousness by reference to those fields involved impermissible hindsight; it relied upon the judgment of the Court of Appeal in *Schlumberger Holdings Ltd v Electromagnetic Geoservices AS* [2010] RPC 33.

iv) The allegation of infringement concerns 73 different Garmin products, which were addressed in Philips' evidence by reference to thirteen different functionalities.

4. By the start of the trial, and during the trial, the issues narrowed to some extent.

i) Garmin did not pursue various of its prior art citations, or only pursued certain prior art in the event that its collocation attack was successful.

ii) Garmin did not cross-examine in relation to the evidence of infringement and did not rely upon any evidence as to non-infringement.

iii) The dispute as to the identity of the skilled person evaporated, and Philips no longer advanced the submission that this was a *Schlumberger*-type invention. Indeed, Philips accepted that claim 1 of the Patent was not only anticipated by, but also obvious, in the light of one of the prior art citations (Schutz Y and Chambaz A, "*Could a satellite-based navigation system (GPS) be used to assess the physical activity of individuals on earth?"*, European Journal of Clinical Medicine (1997) 61, 338-339) ("Schutz"); see in particular Mr Nicholson's oral closing T4/442-443.

iv) Philips continued to advance all of its five proposed amendments, as the scope of any claim found to be valid may make a significant difference to the extent of infringement by the various Garmin products in issue. In particular, if claim 30A is valid, then all 73 Garmin products will infringe. Certain of the conditional amendments will substantially reduce the number of infringing products.

5. I make no criticism of the parties, or their advisers, for the various points which they have pursued. This case was extremely well prepared and presented by both sides. Cases change during the course of litigation, which may mean that issues once seen as important no longer matter. It is very easy for a judge hearing a trial, who has not followed the day to day progress of the case, to wonder why certain points have been advanced. Nonetheless, the stance originally adopted by the parties has influenced the contents of the expert reports and has led to criticisms of the expert evidence.

6. At the conclusion of the trial, the parties agreed a list of issues which remain in dispute. The structure of this judgment is based on that list of issues.

The witnesses

7. Each side relied upon the evidence of a single expert witness, and there were no witnesses of fact. The expert witnesses were Mr Jonathan Farringdon for Philips and Mr Thomas McKnight for Garmin. Both experts gave their evidence carefully. Their purpose was to assist and educate the court. Sensibly, neither counsel made any personal criticism of the experts. However, each side raised issues as to the approach which the experts had taken, and the extent to which the court could rely upon their evidence.

Mr Farringdon

8. Mr Farringdon's knowledge and experience of the relevant fields of expertise was challenged by Mr Hugo Cuddigan QC on behalf of Garmin. I shall summarise Mr Farringdon's experience as described in his written evidence, and then consider his cross-examination.

9. Mr Farringdon explained in his first report that he had worked as an inventor and research scientist for 29 years, with 21 years of commercial experience in the field of wearable health monitoring, and eight years of experience as an academic research scientist in the field of artificial intelligence. He has a degree in mathematical science with computer science and a Master's degree in knowledge-based systems. Between 1990 and 1997 he worked as an academic at UCL. He started his commercial research science career in 1997, joining Philips Research in Redhill UK.

10. He explained that there were three "wearables" teams working in concert at Philips Research, including a technology team which focused on wearable technology that would be feasible to bring to market in the next five years. He was project lead for this team from 1997 to 2001. This work included development of a wearable context detector using an accelerometer published in 1999, and certain fabric sensors measuring body position, also published in 1999. He explained that "application concepts" for these devices included sports training and fitness monitoring. During 1999 he said that he developed a GPS location alarm. This allowed users who had prescriptions to create an alarm for a group of locations corresponding to the locations of chemists, so that the device could provide an alert to users passing a chemist when they had a prescription.

11. Additionally, he said that he was technical project lead in collaboration with Philips Design and Levi's Europe for a consumer wearable developed between 1999 and 2000 and commercially available in the autumn of 2000. This was a consumer wearable with fashion, phone and music.

12. Between 2001 and 2013, he was director of informatics at BodyMedia, a Pittsburgh based start-up developing wearable sensors for health monitoring. In about 2005, this company became an FDA and EU regulated medical device company. He explained that his work with BodyMedia brought him into close collaboration with exercise physiologists. He was involved in developing sensors, and with the analysis of sensor signals, to interpret a user's activity, from sleeping and resting to walking, running, cycling and other exercises. At BodyMedia he was frequently involved in validation studies of devices for measuring activity and assessing health outcomes.

13. Mr Farringdon first applied for a patent at the UK Patent Office in 1994. He now has 26 granted patents at the USPTO and 5 granted patents internationally outside the USPTO. He has published more than 15 papers on the topics of machine learning, wearable sensors, and the combination of applying machine learning to wearable sensors.

14. Frequently, cross-examination of experts in patent cases concerning their knowledge and experience gets nowhere. In this case, Mr Cuddigan's cross examination was very effective. He established that:

    i) Mr Farringdon was first exposed to GPS at Philips when he joined in November 1997 but he did not collaborate with any external GPS people;

ii) he had never worked for or with a GPS company or on a GPS device in production;

iii) his knowledge of GPS came from discussions with wearables academics researching GPS, and not from persons in the GPS industry;

iv) his evidence about the response of GPS specialists to the prior art was based upon attributing the threads of electronic engineering and product design common to consumer products to GPS specialists;

v) by 1998 he had not worked on athletic monitoring and only worked on a general activity monitor after that date;

vi) he had no direct experience of the leading manufacturers of APMDs.

15. Mr Cuddigan did not suggest that Mr Farringdon was incompetent to give expert evidence, nor that his evidence was inadmissible. On the contrary, he relied upon parts of Mr Farringdon's evidence, which he contended were concessions as to substantive aspects of the case made during cross-examination. However, Mr Cuddigan submitted that the court should ignore all of Mr Farringdon's written evidence but give weight to his oral evidence where he accepted propositions that were put to him. That was because, in his oral evidence, he approached the task by reference to common threads of electronic engineering and product design.

16. Mr Brian Nicholson, on behalf of Philips, submitted that Garmin had to make a choice. If Mr Farringdon was not qualified to give expert evidence, then all of his evidence would have to be disregarded. Garmin could not simply adopt the parts that suited its case and ignore the remainder. I agree with this submission and my conclusions in relation to the status of Mr Farringdon's evidence are as follows. I do not consider that he was qualified to give evidence about the GPS industry at the priority date, as indeed he fairly accepted. Nor do I consider that he was qualified to give evidence about common general knowledge amongst APMD manufacturers at the priority date. Fortunately, the common general knowledge is now largely agreed, and the remaining disputes are of modest importance. More generally, I consider that Mr Farringdon is a highly skilled electronics engineer, with significant experience of wearables for health monitoring, and I found his evidence helpful. He also understood, and was able to explain, technical aspects of GPS.

17. Garmin submitted that Mr Farringdon's written evidence was further compromised by the fact that he selected the wrong team as a skilled addressee, a team who did not communicate with each other, and that his approach to the prior art was too constrained. Whilst the approach taken in Mr Farringdon's reports might have been consistent with Philips' case that this was an art-changing, *Schlumberger*-type invention, that case was no longer pursued.

18. This is a fair criticism of Mr Farringdon's reports, which I accept. However, the case has moved on since service of the expert reports. I have no doubt that Philips was right to accept that claim 1 of the Patent is obvious in the light of Schutz, and there was significant common ground between the experts as to the approach that would be taken by the skilled team to obvious developments of a GPS-based APMD in the light of Schutz.

Mr McKnight

19. Mr McKnight obtained an undergraduate Bachelor of Science degree in Electrical Engineering from the University of Maryland in 1985 and then joined the Applied Physics Laboratory (the "APL") at The Johns Hopkins University. He was involved in designing and developing equipment for GPS, with applications ranging from missile tracking to spacecraft navigation, as well as interplanetary navigation and communication systems. He also participated in, and later led efforts in, the development of high accuracy GPS monitoring stations for the U.S. Air Force. Whilst at the APL he also studied for a postgraduate Master of Science degree in electrical and computer engineering, which he obtained in 1989.

20. After obtaining his Masters degree, Mr McKnight moved to a part-time role at the APL and started his own independent consultancy firm, SensorStar. He moved into full-time consulting in 1997 and is currently CEO and President of SensorStar. SensorStar provides technical assistance and advice to companies to enable them to develop their research and development operations to keep pace with technological developments, or to leverage a broad base of newer technologies in new ways.

21. Mr McKnight had significant experience of the GPS industry, and development of GPS-based products, prior to the priority date. In 1993, Mr McKnight developed a GPS-based attitude receiver for a movie camera. In 1994 he was approached by Walt Disney Co. to develop a system for tracking amusement park guests using GPS. In 1995, he worked with Nike on a sports watch incorporating a GPS receiver for athletic monitoring. However, this sports watch was not commercialised, and the development was not published. In 1996, he worked on a GPS-based military personnel tracker. In the same year, he worked with Personal Electronic Devices, a company involved in making sensors for measuring physical activity, on a project using GPS to track human movement.

22. Mr McKnight also had significant experience, before the priority date, of working with leading APMD manufacturers. As part of his work with Nike, Mr McKnight worked with a variety of leading APMD manufacturers, including Cateye and Polar, and also with Trimble Navigation, which made GPS receivers. In 1997 he worked with ISA France on developing a watch which connected to a PED accelerometer.

23. Mr McKnight was well qualified to give evidence about the GPS industry at the priority date. He was also well qualified to give evidence about common general knowledge amongst APMD manufacturers at the priority date.

24. Mr Nicholson pointed out that Mr McKnight is an inventive man, who is the founder and CEO of a company at the forefront of solving significant technical challenges. He had experience in relation to research conducted in private by Nike and Trimble before the priority date. Mr Nicholson submitted, and I agree, that it is important for the court to ensure that Mr McKnight did not allow hindsight, or his personal knowledge of unpublished product developments, to colour his views.

25. Mr Nicholson submitted that in his expert reports, Mr McKnight did not consider obvious developments in the light of the prior art, without knowledge of the Patent. Rather, his approach to obviousness was based upon using the claims of the Patent to spotlight the necessary path. Whilst this might be justified if Garmin's collocation case

is accepted, on the basis that the claims contain a series of separate inventions to be assessed separately, if that case is not accepted, then Mr McKnight's approach is an exercise in hindsight. This criticism cannot be assessed in the abstract – it depends on the reasons put forward by Mr McKnight for his various conclusions. I will return to this question when considering the substantive issues in relation to inventive step.

26. Mr Cuddigan submitted that sections of Mr McKnight's evidence were unchallenged, and therefore must be accepted. I do not agree. Whilst individual paragraphs may not have been expressly referred to during cross-examination, the principal issues in dispute were fairly put to Mr McKnight, who carefully considered the questions and fully expressed his views.

Technical background

27. The parties did not provide a technical background, and the following section is a summary based on the expert reports. In my view, this information would have been common general knowledge to the skilled team, as defined below. There are three areas to consider at the priority date:

    i) GPS technology;

    ii) Existing athletic performance monitoring devices; and

    iii) The Internet and World Wide Web.

GPS technology

28. The Global Positioning System ("GPS") is a worldwide, satellite-based radio navigation system. GPS is owned and operated by the US government and was originally intended to be used as a navigation system for the US military. It has been available for civilian use since the 1980s, although its accuracy in this respect was intentionally limited by a scheme implemented by the US government, known as Selective Availability. By the priority date, Selective Availability could be effectively mitigated through the implementation and use of differential GPS. Selective Availability was turned off in May 2000.

29. GPS is made up of three segments: the space segment, the control segment and the user segment. The space segment consists of a constellation of 24 satellites which orbit the Earth along the same ground track twice a day. Where a user is outdoors and has a clear view of the sky, the GPS constellation provides the user with between five and eight satellites visible from any point on the Earth.

30. The control segment is responsible for the proper operation of GPS and consists of a network of monitor stations and ground antennae around the world. The network also includes a master control station located in Colorado, which processes the measurements received by the monitor stations to compute a number of parameters for each satellite, including precise orbital data and clock corrections. It then uploads this information to the satellites via the ground antennae.

31. The user segment consists of a variety of configurations including an antenna and a receiver-processor. It receives the satellite signals and uses these to determine its position in relation to geodetic latitude, longitude and elevation. Velocity can then be computed from change in position over time, amongst other methods.

32. At the priority date, GPS was used in both the commercial and consumer spheres, primarily for navigation purposes. GPS receiver devices were gradually reducing in size, and some portable GPS devices were available by the priority date, either as vehicle mounted or handheld units. There were a number of manufacturers of portable GPS devices, including Trimble, Lowrance, Garmin and Magellan.

33. Many of the portable GPS devices available at the priority date were suitable for outdoor enthusiasts, such as hikers, cyclists and recreational sailors.

Existing athletic performance monitoring devices

34. At the priority date, such devices were used by athletes, as well as their coaches/personal trainers, to monitor their performance and training. APMDS allow athletes to compare their performance to times recorded during previous exercise sessions, and to pre-set goals and to implement pace-based training plans, ultimately enabling them to train more efficiently and increase their performance. By the priority date, professional and recreational athletes (including runners, cyclists, hikers, walkers and skiers) were increasingly using more sophisticated electronic devices to help keep track of their performance, both when training indoors and outdoors.

35. Performance monitoring devices for outdoor activities included wristwatches with stopwatch functionality, heart rate monitors, pedometers, accelerometers and cycle computers. For indoor activities, they included treadmills, rowing machines and stationary bikes.

Sports watches

36. Sports watches were used by athletes to record time metrics, including lap times and splits, and also to set countdown timers (using audio alarms) for timed activities. By the priority date, most sports watches had internal memories for storing data (such as lap times), although the size of such memory varied between sports watches.

Heart rate monitors

37. Heart rate monitors ("HRMs") were used by athletes to maintain their heart rate at a certain intensity within a certain zone in order to train efficiently. The appropriate heart rate is specific to each person. By the priority date, it was well understood that it was beneficial to maintain heart rate at a certain intensity while training, and HRMs were widely used by athletes.

38. At the priority date, HRMs consisted of a chest strap and a screen component, usually in the form of a wristwatch. The chest strap would measure the athlete's heart rate and transmit it wirelessly to the screen component. HRMs available at the priority date provided the following functionality:

i. a regular real-time read-out of the user's heart rate, as obtained from the connected chest strap sensor;

ii. a memory for logging heart rate readings;

iii. the ability for the athlete to specify the target zone within which he/she wished to maintain his/her heart rate, and means for alerting the athlete if the heart rate was above or below the target zone (usually a combination of audio alerts and on-screen alerts), which would direct the athlete to either decrease or increase activity to move into the target zone; and

iv. normal watch functionality, including sports watch functionality discussed above.

39. Many of the higher-end HRMs available at the priority date also provided functionality for transferring logged heart rate readings to a personal computer for further storage and analysis. By the priority date, there were a number of manufacturers of HRMs, including Polar, Cardiosport, Idass, Hellcat and Sports Instruments.

Bicycle computers

40. Bicycle computers allow cyclists to monitor performance metrics such as speed and distance travelled while cycling, working in conjunction with magnets (or some other type of sensor) connected by wire to the bicycle computer and attached to the wheel of a bicycle. This enables the bicycle computer to register each revolution of the wheel.

41. After the circumference of the tyre is entered into the bicycle computer, the bicycle computer increments the odometer (which gives the distance travelled) by an amount equal to the circumference of the tyre each time a tyre revolution is registered.

42. By the priority date, there were a large number of bicycle computers available, many of which provided estimates of distances travelled between wheel revolutions; some also enabled the cyclist's cadence (number of crank revolutions per minute) to be registered using additional sensors on the crank (the bar on the bicycle connecting the pedals to the gears that turn the wheels).

Bicycle power meters

43. Power meters are devices which attach to or replace the crank of a bicycle to directly measure the force applied to it by the cyclist by pushing on the pedals. This allows a cyclist to measure power output while cycling, and to determine whether he or she is exerting energy in an efficient manner.

44. At the priority date, power meters were relatively expensive, and were generally used by more serious cyclists.

Indoor bicycle trainers

45. At the priority date, cyclists also used indoor trainers, which are stationary devices that can be attached to a bicycle via its rear wheel. Such devices, also known as power trainers or turbo trainers, allow cyclists to exercise on their own bicycle indoors without moving. The rear wheel instead turns an attached flywheel or roller. The resistance of

the flywheel can be adjusted to simulate uphill or downhill cycling by requiring the cyclist to increase or decrease effort.

Pedometers

46. Pedometers are small, lightweight mechanical devices which record vertical accelerations of the body using a pendulum on a spring. They record the number of steps travelled, and when supplied with the user's average stride length and population-level data on energy output from human exercising, can also estimate distance travelled and calories expended.

47. Pedometers were in existence by the priority date. Commercially available models at the time would typically allow the user to input their stride length.

Accelerometers

48. Accelerometers are used to measure the level of activity of a user using a piezo-electric sensor to detect accelerations in one or more axes of movement. The acceleration data recorded by the device can be interpreted as a number of "counts" in a defined period of time, indicative of the intensity of physical activity. Accelerometers can be used to measure motion when the subject is either active or at rest.

49. At the priority date, accelerometers (also sometimes referred to as actometers) were relatively new, and had the advantage that a log of data could be retrieved from the device, providing information not just on overall intensity but also duration of exercise at a given intensity.

Entertainment devices for athletes

50. By the priority date, it was common for athletes, particularly runners, to listen to music or the radio while exercising, normally through a pair of headphones. The Sony Walkman was one of the best-known portable audio devices. It was released in 1979, and some of its advertisements were directed to use by athletes.

Athletic performance monitoring software

51. Performance monitoring devices that allowed for data to be transferred to a personal computer required interfaces to allow them to be connected to a personal computer. Many such performance monitoring devices had serial ports that allowed for a serial cable to be used to connect the device to a personal computer. Other devices had a wireless connection to an intermediate device, which could then be connected to a personal computer by way of a serial cable.

52. Software was available at the priority date to help athletes to monitor and analyse their athletic performance. Such software was advertised and reviewed in a number of athletic magazines.

The Internet and the World Wide Web

53. The Internet is an interconnected network of servers that host content and services accessible to users. One such service is the World Wide Web, which provides users with content in the form of web pages and has protocols allowing users to upload

content if allowed by a website. The World Wide Web allows users to upload information onto a common webpage that can be easily viewed, like a noticeboard.

54. At the priority date, everyday users were increasingly using the Internet. Connection to the Internet was often achieved by dial-up, and Internet websites were rudimentary in nature. Although still in its early days, the World Wide Web was increasing in popularity. The potential of the World Wide Web was widely appreciated, and many large companies were focused on leveraging it for their businesses.

The Patent

55. The Patent is entitled "Athlete's GPS-based performance monitor". As stated at [0001] it relates to:

> "… the application of Global Positioning System (GPS) technology for the personal performance monitoring of outdoor athletes, such as runners, bicyclists, hikers, walkers, skaters, skiers, and so forth, and providing the athlete with real-time performance feedback and optional long-term trend analysis."

The examples of "outdoor athletes" given in this paragraph make clear that an athlete, in the context of the Patent, includes individuals who may or may not be particularly athletic, such as hikers, walkers and cyclists.

56. At [0002] the Patent sets out the field to which it relates:

> "More specifically, the invention relates to a portable personal performance monitor for monitoring athletic performance when carried by an athlete as well as to the use of such a monitor in a feedback system providing regular updates on the athlete's performance."

57. At [0003], the Patent explains that outdoor sports such as running and bicycling are becoming increasingly popular, and that athletes need to be able to measure their performance and progress accurately in order to improve over time. Using runners as an example, the Patent states that measurement of performance:

> "… can presently only be done indoors on treadmills. Treadmills provide the runner with continuous read-outs of time, distance, speed, pace, inclination, calories burned, and so forth. Outdoors, the runner is limited to wristwatches with built-in stop watches, heart rate monitors, or pedometers."

58. The Patent acknowledges certain prior art at [0004] to [0007]. In particular, it refers to GPS devices, including hand held devices, which it says are "generally limited to navigation uses only", and which are not designed for use by outdoor athletes. According to [0008] of the Patent, such devices are not suited to use by outdoor athletes because they "do not include real-time athletic performance algorithms, audible presentation of information, a means for storing historical exercise session data, or a means for entertaining the athlete"; nor can they be carried around conveniently while exercising. In addition, according to the Patent, "the exclusively visual means of conveying information employed by current devices requires frequent visual

interaction, compromising the safety and concentration of the user, making them incompatible with exercise activities".

59. At [0009], the Patent states its general object:

> "To provide a solution to the need for a portable GPS unit that is small and light enough to be carried or worn by an outdoor athlete which incorporates real-time athletic performance algorithms for continuously monitoring the athlete's progress and reporting his/her progress periodically during the exercise session."

60. The specific objects of the invention are set out in the same paragraph:

> "To provide a device which is portable, rugged, weather resistant, and self-contained;
>
> To provide a device which continuously and accurately determines the position of an outdoor athlete anywhere in the world; and
>
> To provide a device which continuously and consistently provides accurate, real-time performance feedback such as elapsed time, elapsed distance, current and average speeds and paces, current climbing rate, and so forth, independent of its outdoor location in the world."

61. The invention relates to a product, namely a portable personal performance monitor for monitoring athletic performance when carried by an athlete; and to the use of such a portable personal performance monitor in a feedback system providing regular updates on the athlete's performance, with the feedback system comprising computer means that are external to the monitor.

62. The Patent states at [0010] that the device comprises:

> "a global positioning system GPS receiver for acquiring time-stamped geographic position data of the athlete, computing means for conversion of said position data into athletic performance feedback data and presentation means for presenting said feedback to the athlete."

63. Figures 1A and 1B provide the front and side views of the preferred embodiment of the monitor respectively:

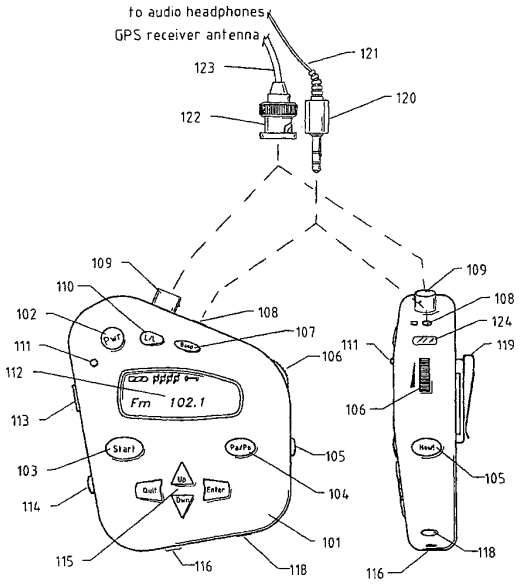

Fig. 1A Fig. 1B

64. Figure 3 shows "a runner wearing the GPS-based personal performance monitor and feedback device on her upper arm, together with a set of audio head-phones having a GPS receiver antenna mounted on top".

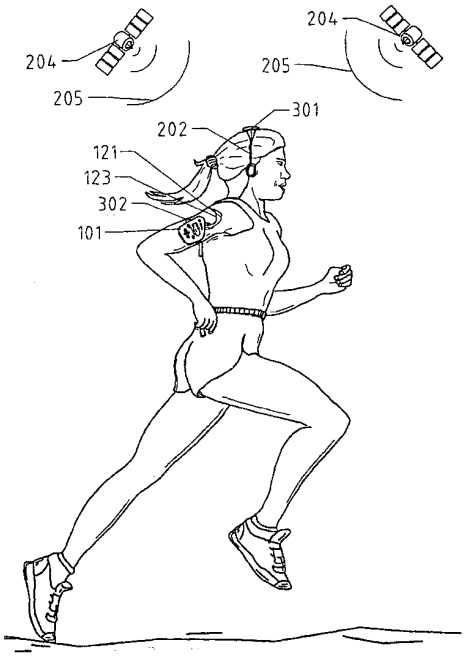

Fig. 3

65. Various input buttons are used to control the functionality of the monitor, which contains a visual display showing a range of information set out in [0018], including device options, GPS signal strength, and performance feedback data. The monitor is connected to a set of audio headphones, and could be combined with other audio entertainment systems (such as an audio cassette tape or audio CD player). The monitor also contains one or more data ports for connecting the monitor to an external computer.

66. Inside the monitor is a central processor unit, which is connected to a "GPS receiver module 604 such as those manufactured by SiRF Technology, Trimble Navigation Limited, and others", as well as to, amongst other things, an AM/FM/TV radio module, input controls and a barometric pressure sensor ([0030]) and optionally includes an external heart rate sensor and temperature sensor.

67. [0038] explains the setup of the device before exercising:

> "…Preference options include, by way of example, performance targets (e.g., total distance, exercise session time, and/or average speed or pace), frequency of feedback information cycles (e.g., continuous, time-related, distance-related, or none), type of feedback information (e.g., full or summarized), and personal data (e.g., gender, birth date, and body weight). Certain preference options may only need to be set once (such as gender and birth date) or occasionally (such as weight or other variable parameters), while other preference options may be adjusted each time the GPS-based personal performance monitor and feedback device is used. Alternatively, all device settings and user preferences may be set and/or adjusted using a personal computer and an optional software program."

68. The Patent states at [0041] that the GPS receiver:

> "receives GPS radio wave signals 205 which are emitted from existing GPS satellites 204 and received via the GPS receiving antenna 301. … The GPS receiver 604 has a built-in processing unit and memory for processing the GPS radio wave signals 205 to determine the latitude and longitude coordinates of the GPS antenna's current position, as well as determine its current speed and direction of travel."

69. The time-stamped position data output by the GPS receiver is used to compute athletic performance data. The Patent explains how such data is obtained at [0042]:

> "During the exercise session, the GPS receiver module 604 continuously determines the athlete's geographical position and stores it in the memory 608 along with other information such as the date and time that each position was acquired. From these positions and times, performance data such as elapsed distance, current and average speeds and paces, calories burned, miles remaining and time remaining are calculated. Based on this data, recommendations to increase or decrease level of effort to meet pre-set performance targets are then determined."

70. The Patent discloses at [0045] that the performance data is then provided to the user at pre-set intervals through a set of audio headphones by means of an audio module, during which time the volume of the radio music is temporarily reduced. The user can also press a button to immediately receive a current update of his/her performance or view the feedback data which is scrolled across the display while being announced via the audio headphones.

71. Additionally, [0046] states that if a user has downloaded a pre-determined course from his/her PC or an Internet website, the invention will announce and display course changes and directional indicators throughout the exercise session on an as-needed basis. A smart algorithm based on measured parameters including speed, pace and exercise type can optionally be used to determine if the user has temporarily suspended exercise, and temporarily pause monitoring until such exercise is resumed.

72. The Patent also discloses the use of the portable personal performance monitor in a feedback system providing regular updates on the athlete's performance, with the feedback system comprising computer means that are external to the monitor. The external computer can be a personal computer as shown in Figure 7:

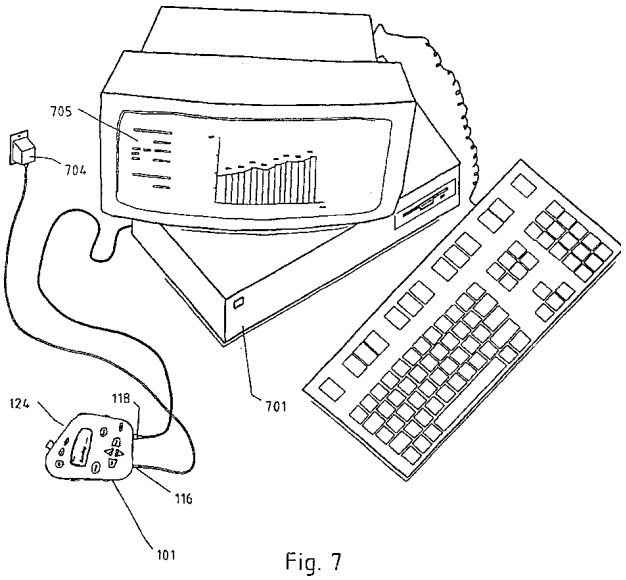

Fig. 7

73. The Patent explains at [0052] that the monitor can be connected to a personal computer using a serial-type connector or infrared-type port for "*long term historical exercise session data storage, performance trend analysis, and remote device configuration using customized software*".

74. [0053] states that the monitor can also be connected, using a standard telephone line, to a remote computer and modem bank. The remote computer is said to collect, store and compile performance data from participants around the planet. The performance data from participating athletes is then presented on an Internet website. This is illustrated in Figure 8:

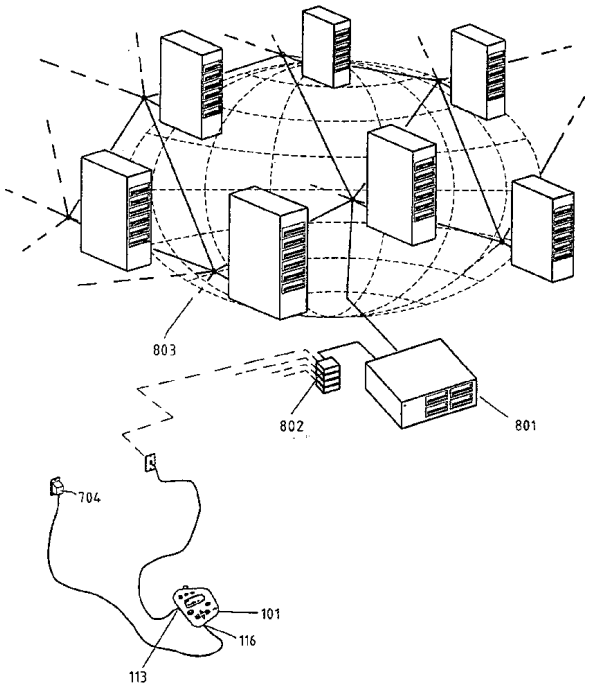

Fig. 8

75. [0054] discloses various uses for the Internet website, including the presentation of information about virtual competitions:

> "The inventors envision an Internet web site that would present information such as national and international performance averages for different age/gender groups, virtual competitions, prizes for the most miles run, best average pace, and other performance achievements, personal fitness recommendations, marathon training programs, and so forth. Prior to uploading information for the first time, each participant is assigned a member number by filling out a demographics profile form, either on-line or via mail. Each time the user uploads data, the device relays the user's member number to associate the data with the user."

76. [0055] discloses that a smart algorithm may be used to automatically verify that an exercise session has actually occurred.

> "A smart algorithm (applied the remote computer 801) based on measured parameters such as average speed and pace, exercise type, average sustained heart rate, elapsed distance and time, and so forth can be optionally used to automatically verify that an exercise session has actually occurred. Verified exercise activity is then used to qualify participants' specific exercise sessions in advertiser-sponsored programs such as product giveaways, earning frequent flier miles, and so forth. This technique may also be used to automatically qualify the results of virtual competitions."

77. [0056] and [0057] describe further features and uses of the Internet website envisaged, including selling advertising space on the Internet website ([0056]), and downloading geographically and demographically targeted messages to the monitor which are then played when the device is in use ([0056] and [0057]). Paragraph [0058] discloses that:

> "The device is initialized at the new destination and connected to the remote computer 801 via the modem 613. The remote computer 801 collects the most recent position information from the device and from the device and downloads messages pertaining to the travelling user's new geographic location."

78. Paragraph [0059] discloses use of the Internet site to locate other athletes with similar skills and interest to exercise with. It states that:

> "Users may also use the Internet web site to locate other athletes with similar skills and interest to exercise with. For example, a runner travelling to Seattle, WA from San Francisco, CA could log on to the Internet web site and search for individual runners or groups of runners in the Seattle area with similar skills and interest. An E-mail message can be sent to schedule a future exercise session together. Favourite local courses may also be posted and exchanged via the Internet web site to be optionally used in the GPS-based personal performance monitor and feedback device."

79. Figure 10 of the Patent illustrates configuration menus of the preferred embodiment, which show data stored for PC and internet usage. The main menus are designed as "exercise session type", "pre-set course", "performance targets", "information cycles", "user data" and "system set-up". Some of the main menus have sub-menus. A user can customize his/her exercise session as desired.

80. Figure 12 of the Patent shows the types of data stored for PC and Internet usage in a preferred embodiment. Data types include "Exercise Geographic Start Location (Latitude/ Longitude"; "Exercise Geographic End Location (Latitude/Longitude)"; "Total Elapsed Distance"; "Maximum Speed"; and "Key Course Waypoints"

81. The Patent summarises the benefits provided by the invention at [0060]:

> "the GPS-based performance monitor and feedback device of the present invention can be used to provide an outdoor athlete with continuous, consistent, and accurate real-time performance feedback, independent of his/her outdoor location in the world. The data presentation method of using an audio module eliminates the exclusive use of large, power- consuming, cumbersome, and visually distracting displays and leaves the athlete free to concentrate on his/ her exercise, safety, and surroundings. It even allows for safely obtaining performance feedback on poorly illuminated tracks and trails."

82. A number of additional advantages are also set out, including;

i. providing a motivational tool for the athlete to improve and fine-tune his/her outdoor performance,

ii. providing regularly updated recommendations to the athlete on how to best achieve his/her pre-set performance targets,

iii. providing the athlete with entertaining music during his/her exercise session,

iv. providing and storing summary data of the most recent exercise achievements, showing progress and trends,

v. uploading summary data of each exercise session to a personal computer for permanent storage in an electronic log and further analysis of the user's long-term progress and trends,

vi. providing a total health monitor when optional sensors such as a heart rate sensor or body temperature sensor are added,

vii. providing a direction indicator to guide the athlete through a course based on downloaded geographical waypoints,

viii. providing the means to upload summary data of each exercise session to an Internet website via a remote computer for comparing the performance of participants from around the globe,

ix. providing the means for athletes to locate other athletes with similar skills and interests,

x. providing the means for athletes to exchange favourable course waypoints via the Internet,

xi. providing the means to stage virtual competitions between participating athletes from around the world, and

xii. providing the means to verify that a legitimate exercise session has actually taken place.

83. Claim 1 of the Patent as granted is in the following terms:

> "a portable personal performance monitor for monitoring athletic performance when carried by an athlete, comprising a global positioning system GPS receiver for acquiring time-stamped geographical position data of the athlete, computing means for conversion of said position data into athletic performance feedback data and presentation means for presenting said feedback data to said athlete."

84. The Patent also contains a number of claims to use of a personal performance monitor as claimed in claim 1 for various specified purposes. I shall consider the claims in issue, including Philips' proposed amendments, when dealing with issues of construction which are in dispute in these proceedings.

The Skilled Addressee

Legal principles

85. There was no dispute as to the relevant legal principles:

i) A patent specification is addressed to those likely to have a real and practical interest in the subject matter of the invention (which includes making it as well as putting it into practice).

ii) The relevant person or persons must have skill in the art with which the invention described in the patent is concerned. As Aldous LJ stated in *Richardson Vicks Inc's Patent* [1997] RPC 888 at 895:

> "Each case will depend upon the description in the patent, but there is no basis in law or logic for including within the concept of "a person skilled in the art", somebody who is not a person directly involved in producing the product described in the patent or in carrying out the process of production."

iii) The skilled addressee has practical knowledge and experience of the field in which the invention is intended to be applied. He/she (hereafter "he") reads the specification with the common general knowledge of persons skilled in the relevant art, and reads it knowing that its purpose is to disclose and claim an invention.

iv) A patent may be addressed to a team of people with different skills. Each such addressee is unimaginative and has no inventive capacity.

v) Although the skilled person/team is a hypothetical construct, its composition and mind-set is founded in reality. As Jacob LJ said in *Schlumberger* at [42]:

> "… The combined skills (and mindsets) of real research teams in the art is what matters when one is constructing the notional research team to whom the invention must be obvious if the patent is to be found invalid on this ground."

The skilled person for the purposes of obviousness

86. Garmin submitted that the person skilled in the art is an individual or team with responsibility for designing, developing and manufacturing a portable device for monitoring the performance of an athlete and associated athletic training software. Philips initially contended for a team comprising persons skilled in GPS; wearables; and exercise physiology. Mr Farringdon took the view that those working in GPS were concerned with navigation and did not appreciate that GPS could be used for other purposes, and in particular for athletic performance monitoring. Therefore, the rest of the team did not communicate with the GPS specialist. This is no longer in issue, as it is no longer contended by Philips that the Patent is art-changing.

87. The Patent identifies at [0003], by reference to the example of runners, certain products on which its invention seeks to improve, namely treadmills, wrist watches with built in stop watches, HRMs and pedometers. Such devices were made and sold by APMD

manufacturers, and the manufacture and sale of APMDs was a well-established field at the priority date. In my judgment, the Patent is primarily addressed to those practically involved in manufacturing APMDs. The skilled team would require the expertise to make the device, and would be able to call on, if required, a GPS specialist and a sport exercise physiologist. The APMD manufacturer would be unlikely to know about technical aspects of GPS, but he would know who to ask.

88. Philips contended that the characterisation of a notional APMD manufacturer was too broad. It covered different fields such as HRMs and indoor bicycles in respect of which, according to Philips, there were only exceptionally limited examples of any overlap. I reject this submission. Mr Farringdon accepted during cross-examination that it was conventional for prominent APMD companies to make more than one type of athletic monitoring product. Furthermore, leading APMD companies such as Cateye and Polar made hybrid products, for example a bike computer with an HRM and sports watch functionality; see trial bundle X3.

Common general knowledge

Legal principles

89. The relevant legal principles were set out by Arnold J in *KCI Licensing v Smith and Nephew* [2010] EWHC 1487 (Pat); [2010] FSR 31 at [105]–[115], which passage was approved by the Court of Appeal at [2010] EWCA Civ 1260; [2011] FSR 8 at [6]. For the purposes of this judgment, certain principles are important to emphasise.

90. The meaning of "common general knowledge" is accurately set out in *Terrell on the Law of Patents* (18th Edition) at [8-56] – [8-69]. It is part of the mental equipment necessary for competency in the art or science concerned, such that every worker in the art may be expected to have it as part of his technical equipment. The authors explain that common general knowledge permeates everything that is required of the skilled person; in reading and understanding the patent, in understanding and reacting to the cited prior art and in considering any technical problem which arises. For the court to take into account information as common general knowledge, the relevant knowledge must be commonly and generally known. It is not enough to establish that the relevant knowledge is public.

91. The distinction between "public knowledge" and "common general knowledge" was considered by Sachs LJ in *General Tire & Rubber Co v. Firestone Tyre & Rubber Co Ltd* [1972] RPC 457 at 482:

> "The common general knowledge imputed to such an addressee must, of course, be carefully distinguished from what in patent law is regarded as public knowledge. This distinction is well explained in *Halsbury's Laws of England, ….* As regards patent specifications it is the somewhat artificial (see per Lord Reid in the *Technograph* case [1971] FSR 188 at 193) concept of patent law that each and every specification, of the last 50 years, however unlikely to be looked at and in whatever language written, is part of the relevant public knowledge if it is resting anywhere in the shelves of the Patent Office. On the other hand, common general knowledge is a different concept derived from

> a common sense approach to the practical question of what would in fact be known to an appropriately skilled addressee – the sort of man, good at his job, that could be found in real life."

92. It follows that published information that may be found as a result of a search may not be common general knowledge. This was considered by Aldous LJ in *Beloit Technologies Inc. and Another v Valmet Paper Machinery Inc. and Another* [1997] RPC 489 at 494:

> "It has never been easy to differentiate between common general knowledge and that which is known by some. It has become particularly difficult with the modern ability to circulate and retrieve information. Employees of some companies, with the use of libraries and patent departments, will become aware of information soon after it is published in a whole variety of documents; whereas others, without such advantages, may never do so until that information is accepted generally and put into practice. The notional skilled addressee is the ordinary man who may not have the advantages that some employees of large companies may have. The information in a patent specification is addressed to such a man and must contain sufficient details for him to understand and apply the invention. It will only lack an inventive step if it is obvious to such a man.
>
> It follows that evidence that a fact is known or even well-known to a witness does not establish that that fact forms part of the common general knowledge. Neither does it follow that it will form part of the common general knowledge if it is recorded in a document."

93. Entire textbooks of information may be common general knowledge, but the skilled person needs a reason to refer to specific common general knowledge when addressing a specific problem. The authors of *Terrell* state, correctly, at [8-64] that "… a potentially very large stock of information may be part of the common general knowledge. However, whether it would be sought or applied in any given circumstance is a separate question."

94. This principle was considered by Jacob LJ in *Generics v. Daiichi* [2009] RPC 23 at 25:

> "Of course material readily and widely to hand can be and may be part of the common general knowledge of the skilled person – stuff he is taken to know in his head and which he will bring to bear on reading or learning of a particular piece of prior art. But there will be other material readily to hand which he will not carry in his head but which he will know he can find *if he needs to do so* (my emphasis). The whole passage is about material which the skilled man would refer to as 'as a matter of course'. It by no means follows that the material should be taken to be known to the skilled man if he has no particular reason for referring to it."

95. There is also a distinction between common general knowledge and information which it is obvious to acquire. In *Generics v. Daiichi*, Jacob LJ approved of the passage at first instance where Kitchin J (as he then was) made this distinction:

> "It seems to me that a subtle but potentially significant point of principle emerges from these passages. I can readily accept that, faced with a disclosure which forms part of the state of the art, it may be obvious for the skilled person to seek to acquire further information before he embarks on the problem to which the patent provides a solution. But that does not make all such information part of the common general knowledge. The distinction is a fine one but it may be important. If information is part of the common general knowledge then it forms part of the stock of knowledge which will inform and guide the skilled person's approach to the problem from the outset. It may, for example, affect the steps it will be obvious for him to take, including the nature and extent of any literature search."

96. Accordingly, even if it is not common general knowledge, there may be information which it is obvious for the skilled person to obtain when faced with the problem to which the patent is addressed, and which he would be motivated to obtain. Such information can, of course, be taken into account when assessing inventive step, as explained by Arnold J in *KCI Licensing v. Smith & Nephew* at [112]:

> "It follows that, even if information is neither disclosed by a specific item of prior art nor common general knowledge, it may nevertheless be taken into account as part of a case of obviousness if it is proved that the skilled person faced with the problem to which the patent is addressed would acquire that information as a matter of routine. For example, if the problem is how to formulate a particular pharmaceutical substance for administration to patients, then it may be shown that the skilled formulator would as a matter of routine start by ascertaining certain physical and chemical properties of that substance (e.g. its aqueous solubility) from the literature or by routine testing. If so, it is legitimate to take that information into account when assessing the obviousness of a particular formulation. But that is because it is obvious for the skilled person to obtain the information, not because it is common general knowledge."

Summary of common general knowledge

97. At [170] of his first report, Mr McKnight summarised what he considered to be the "key propositions" that were common general knowledge to the person skilled in the art at the priority date. These were as follows:

i) Athletes used electronic devices to track their performance, both when training indoors and outdoors;

ii) Examples of athletic performance monitoring devices that were used when training outdoors included sports watches, heart rate monitors, bicycle computers, bicycle power meters, pedometers and portable GPS devices;

iii) Examples of athletic performance monitoring devices that were used when training indoors included treadmills, stationary exercise bicycles, indoor rowing machines and indoor trainers for use with bicycles;

iv) Athletic performance monitoring devices were used both to provide real-time feedback to athletes during an activity and also for post-activity performance analysis;

v) Real-time feedback was provided by the displays of such devices, and many devices also used audible alerts to provide feedback;

vi) Athletes used multiple devices simultaneously, such as heart rate monitors, bicycle computers and cycling power meters;

vii) There were many performance monitoring devices and equipment that incorporated multiple sensors or allowed for additional sensors to be connected to them;

viii) Many of the athletic performance monitoring devices provided information to athletes for specific periods during an activity, such as lap times;

ix) Many of the athletic performance monitoring devices allowed the athletes to set performance targets (such as heart rate training zones) and the devices gave feedback to the athletes as to whether they were meeting such pre-set targets;

x) Many of the athletic performance monitoring devices and equipment could be connected to a personal computer to allow performance data to be downloaded from the device to the computer;

xi) Software was available that allowed users to further analyze data downloaded from compatible performance monitoring devices and recommend training plans to the user;

xii) The Internet was being used by athletes to share results of races and was the easiest way to provide an electronic notice board that could display sports scores, comparisons and the like;

xiii) Performance monitoring devices and equipment were available that allowed users to compete against each other over the Internet;

xiv) Portable GPS devices were available and used by athletes such as cyclists and hikers, which provided users with information including their current and average speed, distance elapsed and time elapsed;

xv) GPS receivers could be used to determine the location (including altitude) and velocity of a GPS device anywhere in the world;

xvi) Current-generation GPS receivers would be replaced by much smaller, lighter, cheaper versions with much longer battery life spans in the near future; and

xvii) Many athletes listened to music while exercising, for example using portable audio devices such as a Sony Walkman, normally through headphones.

98. This, in my view, is a useful general summary, which I accept. More detail is provided in the technical background section (supra).

Common general knowledge and information that would be found on a routine search

99. Before turning to the areas of dispute in relation to common general knowledge, I note that Mr McKnight's reports do not deal separately with common general knowledge on the one hand, and the additional information that the skilled person would obtain from a routine search on the other.

100. At [57] in his first report, Mr McKnight explained, and I accept, that before starting the process of developing a new product, anyone developing athletic performance monitoring devices would as a matter of routine carry out a detailed analysis into products available on the market, including products that had only very recently been launched. He then gave evidence as to common general knowledge by reference to extracts presented to him from a search of magazines and other publications conducted by Garmin's solicitors, Powell Gilbert, at Mr McKnight's suggestion. As one might expect from a highly skilled team of lawyers, this was a very thorough search, and covered sources of which Mr McKnight fairly accepted at [55] of his first report that he was not previously aware.

101. Garmin's case is that all of the information identified by Mr McKnight as common general knowledge was very well known, and that articles and advertisements exhibited to his first report were merely illustrative examples. However, I formed the view that Mr McKnight, on some occasions, understandably found it difficult to differentiate between information that could properly be characterised by the court as common general knowledge, and information that would be found on a routine search of competitor products.

Common general knowledge – issues in dispute

i) UltraCOACH and its variants

102. There is a dispute as to whether athletics performance training software relied upon by Garmin known as UltraCOACH (with variants known as UltraCOACH HRM and UltraCOACH VR) was common general knowledge at the priority date. Philips accepted that the APMD manufacturer would know of the existence of athletic performance training software. However, it denied that UltraCOACH, in all its variants, was common general knowledge. On this issue, whilst in this case the distinction may not matter, I agree with Philips. Mr McKnight exhibited to his evidence a reference to UltraCOACH in a review, published shortly before the priority date and he accepted that it was not heavily advertised. The UltraCOACH HRM and VR variants were known and advertised at the priority date, but only from the UltraCOACH website.

103. Nonetheless Philips accepted that if an APMD manufacturer was motivated to start to develop new software to go with a new APMD, UltraCOACH, in all its variants, would have been found as part of a routine search, from its website.

ii) *Automatic uploading of cycle computer data to computer software*

104. Philips disputed that automatic uploading of cycle computer data to computer software was common general knowledge. In this regard, Garmin relied on the Polar Xtrainer Plus, a state of the art product at the priority date which was advertised in the October 1997 issue of Cycling Plus. Mr McKnight explained during cross-examination (T2/319/8-12) that Polar was the leading manufacturer of HRMs at the priority date. The Xtrainer Plus was said by Polar to "combine the best features of an HRM with a cycle computer." The October 1997 advertisement listed a number of advantages of the Xtrainer Plus, including that it "downloads training information to a PC with Polar Interface Plus. Analyses heart rate, speed, cadence and altitude information with Polar Training Advisor Software."

105. Philips claimed that automatic uploading of data from a cycle computer was limited to HRM data. I disagree. The Polar Training Advisor Software enabled uploading of HRM data but was not so limited. It also enabled automatic uploading of training data which included speed and cadence, as expressly stated in the 1997 advertisement. In my view, the Polar Xtrainer Plus enabled automatic uploading of cycle computer data to computer software.

106. There is no doubt, and the experts were agreed, that the Xtrainer Plus would be found on a routine search by an APMD manufacturer of competitor products, if the manufacturer was not already aware of the product. However, in my view, APMD manufacturers would already have been aware at the priority date of the features of a state of the art product from the leading HRM manufacturer. It was their business to keep abreast of latest developments from their competitors. I note that Philips accepted at [51] of its closing that the APMD manufacturer would know of the existence of athletic performance training software and "may even know some of the detail of well-known software such as Polar's Training Advisor". The acknowledgement that the Training Advisor software was well-known is significant. I am satisfied that the feature of automatic uploading of cycle computer data to computer software was common general knowledge at the priority date.

107. Garmin also relied upon a combined heart rate monitor, cycle computer and stopwatch marketed by Cateye and known as the CC-3D. It was advertised on Cateye's website in February 1998. Its data was downloadable to a PC or a Mac. The advertisement stated that: "With an infrared download unit, the CC-3D will transfer rides and workouts to software for review and analysis. The software will act as a state-of-the-art training diary". It also stated that "Heart rate, speed and cadence are captured in 5 second, 15 second or 60 second intervals and stored in memory for either computer download or manual replay."

108. As to the CC-3D, it was not advertised or reviewed in the exhibits to Mr McKnight's reports. It was first included in Garmin's cross-examination bundle which was exchanged shortly before the trial. Its features were not common general knowledge, but the software would have been found on a routine search, if the skilled person was motivated to look for it.

iii) Use of GPS for athletic performance monitors

109. Garmin submitted that it was clear that the idea of using GPS for athletic performance monitors was common general knowledge to the skilled person at the priority date. Philips disagreed. Whether this dispute is relevant is very doubtful since the idea was obvious from Schutz. Nonetheless I shall decide the issue. Garmin's case was supported by the evidence of Mr McKnight who said at [165] of his first report, in a section concerning common general knowledge, that the skilled person would have known that GPS had the potential for use in devices for monitoring athletic performance and so would have sought to acquire further information about GPS when developing a device for monitoring athletic performance. However, this was not supported by the results of the searches annexed to his reports.

110. Garmin relied upon the use of GPS in the Americas Cup 1995, where it was reported in yachting magazines (not exhibited to Mr McKnight's reports) that Trimble GPS helped competitors to measure their boat speed during tactical manoeuvres. Garmin argued that competitive sailors were athletes and that GPS was being used to monitor their performance. I do not accept this argument. The use of GPS in the Americas Cup 1995 was for the purpose of monitoring the performance of the boat rather than of the athletes.

111. Garmin also relied upon an article in the Los Angeles Times published in April 1997. The article is entitled "Just Think of it as a Big Eye in the Sky… Watching". It concerns the potential of GPS and discusses possible future applications. In that article, the editor of GPS World magazine, Glenn Gibbons, is recorded as saying:

> "GPS by itself is sort of like electricity by itself… Until you have created a tool and integrated it with information and other technologies it doesn't do much for you."

112. The article continues that "seeing potential requires vision", which is apparently possessed by Charles Trimble, who is interviewed in the article. The article contains the following passage:

> "In the future, Trimble says, GPS will further expand its uses. It will help marathon runners keep a steady pace. If you want a 6.4 minute per mile clip, he says, a wrist receiver will beep if you deviate. If you are training for a marathon, you will be able to measure changes in your heart rate based on the degree of incline."

113. Garmin suggested that this supported Mr McKnight's evidence. Mr Trimble was prepared to disclose the idea of an APMD using GPS, with pre-set performance targets, without any concerns to confidentiality. If the idea was inventive, Mr Trimble would have sought patent protection for it. Furthermore, the APMD manufacturer must be deemed to know at least as much as a reader of the Los Angeles Times.

114. Whilst initially I found this argument appealing, on reflection, I do not consider that this establishes that the use of GPS for APMDs was common general knowledge at the priority date. It was not suggested that the article itself was common general knowledge, which it plainly was not. The fact that Mr Trimble, who was intimately involved in

future applications for GPS, was willing to disclose the idea does not show that it was part of the common general knowledge of APMD manufacturers at the priority date. Nonetheless, it does emphasise why Philips was correct to abandon its case that the invention of claim 1 of the Patent was an art-changing invention. The idea had already been disclosed in the LA Times nearly a year before the priority date.

115. I fully accept that Mr McKnight was personally well aware of the potential use of GPS in APMDs. He was a GPS specialist who was approached in 1995 by Nike's Director of Advanced Technology Exploration because of his GPS experience. Nike were interested in developing a sports watch incorporating a GPS receiver to measure a runner's pace and distance. As part of that project, he immersed himself in the potential application of GPS for athletic performance monitors and spoke to a variety of potential suppliers and manufacturers, as described at [32] of his first report. However, the work that he did with Nike prior to the priority date, and the discussions that he had were not public. In my view, his experience, which would not have been shared by the person skilled in the art, influenced his belief, which was sincerely held, that such an idea was common general knowledge.

iv) Products beyond the scope of Mr McKnight's literature search e.g the Sanyo Sportable

116. This issue primarily arises in relation to audio entertainment and may be resolved by reference to a product known as the Sanyo Sportable. Two versions of this product appear to have been marketed before the priority date, the SPT-1000 and SPT-1500. It is not in dispute that it had been known for years before the priority date that athletes liked to listen to music when exercising, and this is reflected in the summary of common general knowledge given above. Bespoke devices, such as the Sony Walkman, were designed for such purposes. In the various APMDs that Mr McKnight considered in his evidence, there was only one example of a device having built in audio entertainment with volume dimming. This was the Sanyo Sportable, which was shown in the 1991 edition of Popular Science and the 1993 edition of Popular Electronics. These were not amongst the publications that Mr McKnight asked Powell Gilbert to search.

117. Philips contended that the features of this product were not common general knowledge at the priority date. I did not understand Garmin to contend otherwise, but in any event, there is no evidence to establish that this product was being sold at the priority date. Its features were not common general knowledge, and I do not accept that the product would have been found on a routine search of competitor APMDs conducted in 1998. I do not consider that such a routine search would include back issues of the magazines in which this product was found.

118. Garmin relied upon [107] of Mr McKnight's first report where he said:

> "The Sanyo Sportable is an example of a pedometer integrated with an entertainment system for use by joggers or walkers while exercising. It had a built-in cassette player and FM radio, a pedometer capable of computing distance and calorie counting, programmable audio tones to alert the user to meet distance targets, and a stopwatch. Reviews of the SPT-1000 and the SPT-1500 can be seen on pages 3 and 6 of **Exhibit TRM-13**, which contains extracts from the August 1991 issue of Popular Science

> and the August 1993 issue of Popular Electronics magazines. The Skilled Person may not have been aware of these particular devices, but would have been aware of the main features of these products since they had been well established by the Priority Date."

119. This evidence, rightly, does not suggest that the skilled person would have been aware of the devices identified by this search. Philips is correct to note that whilst characterised as "an example" of a pedometer integrated with an entertainment system for use while exercising, the Sanyo Sportable is the only example of any such device, and it appears to have taken a search of wide scope, stretching back years before the priority date, to identify it.

Conclusion

120. In relation to the disputed issues concerning common general knowledge at the priority date, I conclude that:

i) UltraCOACH, in all its variants, was not common general knowledge, but would have been found as part of a routine search if the skilled person was motivated to conduct such a search.

ii) Automatic uploading of cycle computer data to computer software was common general knowledge at the priority date. In any event, this feature would have been found as part of a routine search if the skilled person was motivated to conduct such a search.

iii) The idea of using GPS for athletic performance monitors was not common general knowledge. However, this idea was obvious from certain of the cited prior art.

iv) Products beyond the scope of Mr McKnight's literature search, such as the Sanyo Sportable, were not common general knowledge at the priority date. The Sanyo Sportable would not have been found as part of a routine search at the priority date.

The claims of the Patent

121. The following claims are in issue:

i) claim 30 as dependent on claims 1, 24, 26 and 27 ("Claim 30A");

ii) the proposed amendments to claim 1, referred to as Conditional Amendments 1, 2 and 3 ("Claim CA1, CA2 and CA3"); and

iii) claim 30 as dependent on claims 1, 24, 26, 27 and 29, and Conditional Amendment 3 ("Claim 30B").

122. The form of those claims, with multiple dependencies, is very difficult to follow. However, Philips provided comprehensible versions of the relevant claims, which I shall use for the purposes of this judgment.

Claim 30A

Claim 30A		**Reference to granted claims**
a	Use of a portable personal performance monitor for monitoring athletic performance when carried by an athlete, said portable personal performance monitor comprising	Claim 1/24
b	a global positioning system GPS receiver (604) for acquiring time-stamped geographical position data of the athlete,	Claim 1
c	computing means (802) for conversion of said position data into athletic performance feedback data and	Claim 1
d	presentation means (202, 605, 606) for presenting said feedback data to said athlete,	Claim 1
e	wherein said use of said portable personal performance monitor is in a feedback system providing regular updates on said athlete's performance, said system comprising computer means (701) external with respect to said portable monitor (601),	Claim 24
f	wherein said feedback system comprises means for verifying actual exercise activity,	Claim 26
g	and an Internet website adapted to receive athletic performance feedback data from two or more athletes and display comparison data representing relative performance of said athletes,	Claim 27
h	and wherein said Internet website is adapted to facilitate virtual athletic competitions.	Claim 30

Claim CA1

Claim 30A with first conditional amendment		**Reference to granted claims**
a	Use of a portable personal performance monitor for monitoring athletic performance when carried by an athlete, said portable personal performance monitor comprising	Claim 1/24
b	a global positioning system GPS receiver (604) for acquiring time-stamped geographical position data of the athlete,	Claim 1
c	computing means (802) for conversion of said position data into athletic performance feedback data <u>and</u>	Claim 1
d	<u>determination, based on said athletic performance feedback data, of recommendations to increase or decrease level of effort to meet pre-set performance targets,</u> and	CA1

e	presentation means (202, 605, 606) for presenting said feedback data and said recommendations to said athlete,	CA1
f	wherein said use of said portable personal performance monitor is in a feedback system providing regular updates on said athlete's performance, said system comprising computer means (701) external with respect to said portable monitor (601),	Claim 24
g	wherein said feedback system comprises means for verifying actual exercise activity,	Claim 26
h	and an Internet website adapted to receive athletic performance feedback data from two or more athletes and display comparison data representing relative performance of said athletes,	Claim 27
i	and wherein said Internet website is adapted to facilitate virtual athletic competitions.	Claim 30

Claim CA2

Claim 30A with second conditional amendment		**Reference to granted claims**
a	Use of a portable personal performance monitor for monitoring athletic performance when carried by an athlete, said portable personal performance monitor comprising	Claim 1/24
b	a global positioning system GPS receiver (604) for acquiring time-stamped geographical position data of the athlete,	Claim 1
c	computing means (802) for conversion of said position data into athletic performance feedback data and	Claim 1
d	presentation means (202, 605, 606) for presenting said feedback data to said athlete,	Claim 1
e	wherein said presentation means comprises means for providing audio presentation of real-time performance information	CA2
f	and wherein said portable personal performance monitor further comprises an audio entertainment system for providing said athlete with music during his/her exercise session, which is reduced in volume during said audio presentation of real-time performance information,	CA2
g	wherein said use of said portable personal performance monitor is in a feedback system providing regular updates on said athlete's performance, said system comprising computer means (701) external with respect to said portable monitor (601),	Claim 24
h	wherein said feedback system comprises means for verifying actual exercise activity,	Claim 26

i	and an Internet website adapted to receive athletic performance feedback data from two or more athletes and display comparison data representing relative performance of said athletes,	Claim 27
j	and wherein said Internet website is adapted to facilitate virtual athletic competitions.	Claim 30

Claim CA3

Claim 30A with third conditional amendment		**Reference to granted claims**
a	Use of a portable personal performance monitor for monitoring athletic performance when carried by an athlete, said portable personal performance monitor comprising	Claim 1/24
b	a global positioning system GPS receiver (604) for acquiring time-stamped geographical position data of the athlete,	Claim 1
c	computing means (802) for conversion of said position data into athletic performance feedback data and	Claim 1
d	determination, based on said athletic performance feedback data, of recommendations to increase or decrease level of effort to meet pre-set performance targets, and	CA1
e	presentation means (202, 605, 606) for presenting said feedback data and said recommendations to said athlete,	CA1
f	wherein said presentation means comprises means for providing audio presentation of real-time performance information	CA2
g	and wherein said portable personal performance monitor further comprises an audio entertainment system for providing said athlete with music during his/her exercise session, which is reduced in volume during said audio presentation of real-time performance information,	CA2
h	wherein said use of said portable personal performance monitor is in a feedback system providing regular updates on said athlete's performance, said system comprising computer means (701) external with respect to said portable monitor (601),	Claim 24
i	wherein said feedback system comprises means for verifying actual exercise activity,	Claim 26
j	and an Internet website adapted to receive athletic performance feedback data from two or more athletes and display comparison data representing relative performance of said athletes,	Claim 27

k	and wherein said Internet website is adapted to facilitate virtual athletic competitions.	Claim 30

Claim 30B

Claim 30B with third conditional amendment		**Reference to granted claims**
a	Use of a portable personal performance monitor for monitoring athletic performance when carried by an athlete, said portable personal performance monitor comprising	Claim 1/24
b	a global positioning system GPS receiver (604) for acquiring time-stamped geographical position data of the athlete,	Claim 1
c	computing means (802) for conversion of said position data into athletic performance feedback data and	Claim 1
d	determination, based on said athletic performance feedback data, of recommendations to increase or decrease level of effort to meet pre-set performance targets, and	CA1
e	presentation means (202, 605, 606) for presenting said feedback data and said recommendations to said athlete,	CA1
f	wherein said presentation means comprises means for providing audio presentation of real-time performance information	CA2
g	and wherein said portable personal performance monitor further comprises an audio entertainment system for providing said athlete with music during his/her exercise session, which is reduced in volume during said audio presentation of real-time performance information,	CA2
h	wherein said use of said portable personal performance monitor is in a feedback system providing regular updates on said athlete's performance, said system comprising computer means (701) external with respect to said portable monitor (601),	Claim 24
i	wherein said feedback system comprises means for verifying actual exercise activity,	Claim 26
j	and an Internet website adapted to receive athletic performance feedback data from two or more athletes and display comparison data representing relative performance of said athletes,	Claim 27
k	and wherein said Internet website is adapted to display customized individual training advice,	Claim 29
l	and is adapted to facilitate virtual athletic competitions.	Claim 30

Construction – legal principles

123. The parties were agreed that the correct approach to claim construction, which is purposive, is set out at [18] and [19] of the judgment of Floyd LJ *in Saab Seaeye Limited v Atlas Elektronik GmbH* [2017] EWCA Civ 2175. The parties also agreed that no issues arise as to equivalents in the present case. Therefore, the further principles explained in *Actavis UK Ltd v Eli Lilly & C*o [2017] RPC 21 and *Icescape Limited v Ice-World International BV & Ors* [2018] EWCA Civ 2219 are not relevant.

124. Floyd LJ applied the summary of the approach to claim construction provided by Jacob LJ in *Virgin Atlantic v Premium Aircraft* [2010] RPC 8 at [5]. Ignoring equivalents, the principles are as follows:

> "(i) The first overarching principle is that contained in Article 69 of the European Patent Convention.
>
> (ii) Article 69 says that the extent of protection is determined by the claims. It goes on to say that the description and drawings shall be used to interpret the claims. In short the claims are to be construed in context.
>
> (iii) It follows that the claims are to be construed purposively – the inventor's purpose being ascertained from the description and drawings.
>
> (iv) It further follows that the claims must not be construed as if they stood alone – the drawings and description only being used to resolve any ambiguity. Purpose is vital to the construction of claims.
>
> (v) When ascertaining the inventor's purpose, it must be remembered that he may have several purposes depending on the level of generality of his invention. Typically, for instance, an inventor may have one, generally more than one, specific embodiment as well as a generalised concept. But there is no presumption that the patentee necessarily intended the widest possible meaning consistent with his purpose be given to the words that he used: purpose and meaning are different.
>
> (vi) Thus purpose is not the be-all and end-all. One is still at the end of the day concerned with the meaning of the language used. Hence the other extreme of the Protocol – a mere guideline – is also ruled out by Article 69 itself. It is the terms of the claims which delineate the patentee's territory.
>
> (vii) It follows that if the patentee has included what is obviously a deliberate limitation in his claims, it must have a meaning. One cannot disregard obviously intentional elements.

> (viii) It also follows that where a patentee has used a word or phrase which, acontextually, might have a particular meaning (narrow or wide) it does not necessarily have that meaning in context.
>
> …
>
> (x) On the other hand purposive construction can lead to the conclusion that a technically trivial or minor difference between an element of a claim and the corresponding element of the alleged infringement nonetheless falls within the meaning of the element when read purposively. …
>
> (xi) Finally purposive construction leads one to eschew the kind of meticulous verbal analysis which lawyers are too often tempted by their training to indulge."

"For"

125. Before turning to disputes as to construction I shall consider the meaning of the word "for", used in various places in the claim in issue in the present case. Normally, in a patent claim, where a device is required to be "for" a particular function, it means "suitable for" that function, and no more. If there are no physical requirements in the claim associated with that function, a device will infringe or anticipate when not performing that function, even if the intended function of the device is entirely different; *per* Floyd LJ in *Qualcomm v Nokia* [2008] EWHC 329; [2014] 6 WLUK 654. However, if a device requires some alteration or adaptation to perform the claimed function, then it is not "suitable for" that function. This was explained by Birss J in *Philips v Nintendo* [2014] EWHC 1959 at [104]:

> "The fact that a general purpose computer can be programmed to become a virtual body modelling apparatus does not mean that a general purpose computer is a virtual body modelling apparatus nor is it an apparatus suitable for virtual body modelling. It is not. If the right software was installed in the computer but the computer was switched off then that might well be apparatus suitable for virtual body modelling but that is a different point."

Construction – disputed issues

Claim 30A

Athletic performance feedback data (claim 1 as granted) and its subsequent use in claim 30A

126. It has proved very difficult to identify and understand Garmin's case on this issue. The issue in dispute, as I understood it at the outset of the trial, was whether "athletic performance feedback data" is required to be based on GPS position data, or whether it can be based on speed/distance data from any prior art cycle computer.

127. Claim 1 requires "a global positioning receiver for acquiring time-stamped geographical position data of the athlete and computing means for conversion of said position data into athletic performance feedback data". The use of the word "said", in my judgment, makes it clear the athletic performance data must have been derived from the geographical position data of the athlete that has been acquired by the receiver. The use of GPS-derived data is continued throughout the claim chain by the phrase "the use of a personal performance monitor as recited in claim 1" and continued use of the term "athletic performance feedback data" in the later claims.

128. This is illustrated by the following example. Claim 27, which is ultimately dependent on claim 1, requires an Internet website that is adapted to receive athletic performance feedback data from two or more athletes. Garmin, in its Opening Skeleton at [115] submitted that:

> "the website could equally be used to display athletic performance data harvested from a different monitoring device such as a bicycle computer, heart rate monitor, pedometer or accelerometer. There is no technical link from the information presented on the website to the device of claim 1."

129. Mr Nicholson argued that Garmin's submission was plainly wrong, and I agree. Athletic performance data is an antecedent term introduced in Claim 1 and Claim 1 requires that athletic performance feedback data is obtained by conversion of said position data. The antecedent to "said position data" is time-stamped geographical position data of the athlete that was acquired from a GPS receiver. Therefore, the athletic performance feedback data in Claim 27 (and Claims 29 and 30) must have been derived by conversion of position data from a GPS receiver. It cannot have come from a known bicycle computer, HRM, pedometer or accelerometer as Garmin suggested. GPS-derived data is a requirement of all of the claims.

130. During his closing speech, Mr Cuddigan accepted that Philips' construction, as set out above, was correct. He maintained that his submission had been misunderstood, and that the real issue was whether Claim 30A required use of precise geographical position data acquired by the device of Claim 1 in the performance feedback provided to the athlete. As I understood his submission, he contended that although the GPS data included geographic position, the athletic performance feedback data did not. The claim required feedback for no more than data concerning elapsed time, speed and distance.

131. Mr Cuddigan referred to paragraphs [0009] and [0042] of the Patent which do not mention geographic position as a part of the performance feedback provided to the athlete, but do refer to elapsed time, elapsed distance, current and average speeds and current climbing rate. He also referred to paragraph [0060] which describes how the device "can be used to provide an outdoor athlete with continuous, consistent, and accurate real-time performance feedback". The bullet points list a series of advantageous functions of the device, including that it "provides and stores summary data of the most recent exercise achievements"; has "the means to upload summary data of each exercise session" to a personal computer; and has "the means to upload summary data of each exercise session" to a website. He submitted that the word "summary" was being used to indicate that the data that is taken off the portable device and sent to the external computer and website is less detailed than the raw GPS data harvested by the device. Although the GPS data included geographical position, the

athletic performance feedback data did not. Mr Cuddigan also suggested that this point was conceded by Philips during its closing.

132. I do not accept this submission. GPS data includes speed and elapsed distance and time. It also plainly includes geographic position, as indicated by its name. There is no feature of the claim which indicates that athletic performance data, derived by conversion of geographic position data, is intended to exclude geographic position data, which would be a surprising limitation. Nor is it supported by a purposive construction of the claims. Garmin's case requires the skilled person to conclude that, in spite of acquiring geographic position data, the patentee has decided not to use it as a part of the athletic performance data fed back to the athlete. No technical reason was advanced for such an exclusion, which would not make sense. If it were right, then no explanation was offered as to why the patentee was bothering to acquire GPS data, as existing devices, such as a cycle computer, could already provide feedback of speed, elapsed distance and time, and an object of the invention is to provide an improvement over such devices.

133. Additionally, I do not accept that Garmin's construction is supported by consideration of the description and figures of the Patent. [0059] of the Patent discloses that athletes may share a course to be followed via the website and use GPS data when following the course. This is illustrated in Figure 10 of the Patent which provides the option to download a pre-set course from a PC. Having downloaded such a pre-set course, Figure 12 is a preferred embodiment which is a diagram depicting the data stored for PC and internet usage. It provides the option for athletes to upload to the device the exercise geographic start location and end location (latitude and longitude) and key course way points. Uploading this geographic position data is one option for enabling geographic position data to be fed back to the athlete for use as a navigation aid, so that he/she is guided through the course.

134. Amongst the advantages of the invention summarised at paragraph [0060] of the Patent is that the invention "provides a direction indicator to guide the athlete through a course based on downloaded geographical waypoints". This is a disclosure of a general concept and is not limited to a preferred embodiment. It would be apparent to the skilled person from this disclosure that when following a pre-set course, geographic position data should be fed back to the athlete for its usual purpose, as a navigation aid, so that he/she is guided through the course.

135. The word "summary" in paragraph [0060] means a summary of additional advantages of the invention. It is plainly not being used to indicate that the data that is taken off the portable device and sent to the external computer and website is less detailed than the raw GPS data harvested by the device.

136. As to the alleged concession by Philips, Mr Cuddigan relied upon paragraphs [60] – [70] of Philips' written closing. As I understood those paragraphs, Philips argued that, even though non-GPS derived data could be entered into the system, that was irrelevant, since it is a requirement of the claim that the athletic performance feedback data in Claim 27 must have been derived by conversion of position data from a GPS receiver. If it is not so derived, then it is outside the scope of the claim. That is not a concession. In any event, during his oral closing, Mr Nicholson plainly did not concede that Garmin's construction was correct. On the contrary, once Mr Cuddigan had explained the point, Mr Nicholson put arguments to the contrary in his reply speech, and it was not suggested by Mr Cuddigan, at that stage, that his case was being mischaracterised.

137. On this issue of construction (insofar as it was pursued by Garmin) I believe that Philips is correct, and I reject Garmin's case.

138. After this judgment had been sent in draft to the parties and typing errors and other obvious corrections had been submitted, I received a letter from Counsel for Garmin, which asserted that Garmin's submission on this issue of construction had still not been understood. Counsel did not suggest that any further corrections were necessary to the judgment, but indicated that, in case this matter proceeds further, they felt it appropriate to give me the opportunity to see whether any revisions were desirable. The letter stated that it had never been Garmin's case that "athletic performance data" was to be interpreted to *exclude* GPS position data. Instead, it was Garmin's case that athletic performance data did not have to *include* GPS position data, and feedback might be limited to speed and distance.

139. In *In Re L (Children) (Preliminary Finding: Power to Reverse)* [2013] UKSC 8; [2013] 1 WLR 634 SC, the Supreme Court confirmed that, in giving judgment, a judge has jurisdiction to change his or her mind until the order carrying the judgment into effect is drawn up and perfected, and held that the exercise of the power is not restricted to exceptional circumstances. Relevant considerations include a plain mistake by the court; the failure of the parties to draw the judge's attention to a plainly relevant fact or point of law; the discovery of new facts after judgment was given; whether any party has acted upon the judgment his detriment (especially where this would be expected), but a carefully considered change of mind can be sufficient.

140. It is the duty of Counsel to draw the attention of the Court to, for example, a plain mistake on the face of the judgment. On the other hand, there is a temptation to continue to argue the case on receipt of the draft judgment. This temptation is inevitable in commercially important cases, but it needs to be resisted.

141. Since no correction is suggested to the judgment, and the issue was already dealt in some detail in the draft judgment, I am unclear as to the basis for sending this letter, to which Philips chose not to reply. However, since the letter has been sent, I shall add the following very brief observation. It is mandatory that athletic performance feedback data is based at least in part on GPS position data. There is no dispute that GPS data includes speed and distance data. Philips accepted that the claim does not limit how simple the athletic performance feedback data might be. It could just be speed and distance data in a particular implementation.

142. However, there does not appear to be any nexus between Garmin's latest attempt to clarify its submission, and the objection of collocation, to which this issue is supposed to relate. Claim 30A is a process claim. It relates to use of a personal performance monitor in a feedback system to present various types of feedback data to the athlete. The process uses an integrated system. It is one invention – see paragraphs [185] – [188] below. The fact that athletic performance data could just be speed and distance data does not mean that the claim is directed to more than one invention.

A feedback system providing regular updates on said athlete's performance, said system comprising computer means external with respect to said portable monitor (claim 24 as granted)

143. The dispute about this feature of the claim involves three sub-issues:

i) Is the external computer required to provide the provision of regular updates to athletes?

ii) What does "regular" mean?

iii) Is a regular update satisfied by training advice that is independent of the athlete's performance?

Is the external computer required to provide the provision of regular updates to athletes?

144. Garmin submitted that the regular updates of claim 24 are not required to be provided by the external computer means but may be in-session updates provided by the device of claim 1. It accepted that the specification teaches the use of the external computer to collect data (i.e. athletic performance feedback data) stored during exercise sessions on the portable device and that it also discloses use of the computer to provide some feedback in the form of long term analysis. However, it argued that there was no disclosure of anything like a regular update provided by the external computer.

145. Garmin submitted that the only regular feedback information that is discussed in the description is provided by the portable device itself. In particular, it referred to paragraph [0060], which as noted above sets out a series of advantages of "the GPS-based personal performance monitor and feedback device". Garmin argued that this is the portable device of claim 1 in isolation. Thus Figure 7 is described as "a perspective view of a personal computer connected to the GPS-based personal performance monitor and feedback device". The second bullet point advantage is "provides the athlete with regularly updated recommendations on how to best achieve his/her pre-set performance targets;" That is provided by the portable device, and not the computer. The targets are themselves explained in paragraph [0042], and the associated recommendations are provided by the device during an exercise session.

146. In response, Philips noted that Claim 24 has expressly added the external computer system to the claim. It would be an unusual construction for the 'use' claim to introduce the use of the device in a wider feedback system involving an external computer, but to then construe the only functional limitation in the claim, i.e. the feedback system providing regular updates on the athlete's performance, as having nothing to do with the feedback system. On Garmin's construction, the feedback system is in the underlying device i.e. the personal performance monitor that was the subject of the earlier device claims and already had presentation means for feedback.

147. Philips further submitted that Garmin was selective in its citations from the specification. Garmin referred to certain parts of the specification that relate to the provision of updates to the user from the personal performance monitor, but overlooked the teaching, such as can be seen in Fig. 7, of an external computer being used to provide trend analysis over multiple exercise sessions. Philips referred to the following passages in the specification:

> [0015] … Fig 7. Is a perspective view of a personal computer connected to the GPS-based personal performance monitor and feedback device, displaying a software program for performing long-term historical exercise session data storage, athletic

> performance trend analysis, and remote configuration of the device. (repeated at [0031]).
>
> [0032] A number of historical exercise session performance data sets (as described below and shown in Fig. 12) can be uploaded to the remote computer 801. The remote computer 801 is connected to the Internet 803. The uploaded data sets are collected, stored and compiled for presentation on an Internet website, which compares performances of athletes in a variety of ways.

148. In my judgment, Philips is correct on this issue, and I accept its submissions. This feature is claimed in the context of introducing the wider "feedback system" comprising both the portable personal performance monitor and the external computer. The role of the external computer, as taught in the specification as a whole, is to collect GPS data stored during exercise sessions on an athlete's portable personal performance monitor and to provide feedback in relation to it.

149. Of course, the device of claim 1 has its own feedback means which provides the athlete with regularly updated recommendations during an exercise session on how to best achieve his/her pre-set performance targets. That is described in the specification. But claim 24 is not concerned with recommendations provided by the device itself. Claim 24 is a use claim which requires use of the device of claim 1 in a feedback system "providing regular updates on said athlete's performance comprising computer means external with respect to said portable monitor". The external computer means is present to provide the regular updates – that is its function in the feedback system claimed in this claim.

150. In the context of claim 24, "regular updates" are explained by [0015] and [0031]. In addition to long-term historical exercise session data storage, they include athletic performance trend analysis, and remote configuration of the device. As disclosed at [0032], where the remote computer is connected to the Internet, the uploaded data sets are collected, stored and compiled for presentation on an Internet website, which compares performances of athletes in a variety of ways. These are regular updates to the athlete, within the meaning of claim 24. They are provided by the external computer in the system of claim 24, and not by the device of claim 1.

What does "regular" mean?

151. As to the second issue concerning the meaning of "regular", Garmin contended that paragraph [0045] explains the way the device itself provides regular updates to the user. This is done in conjunction with an explanation as to how such regular updates are interrupted in response to a demand for an immediate current update:

> "[0045] At pre-set intervals, the information is provided to the athlete through the set of audio headphones 202 by means of the audio module 606, during which time the volume of the radio music is temporarily reduced. In addition, by pressing the "Now!" button 105 (Fig. 1B), the pre-set feedback cycle preference is temporarily overridden, the athlete is immediately

> provided with a current update of his/her performance, and the pre-set feedback cycle preference is resumed."

152. Garmin submitted that the "pre-set intervals" of the "pre-set feedback cycle" comprise regular updates. "Regular updates" are the updates provided by the device to the athlete at pre-set intervals during exercise sessions. It also suggested that Philips' construction was absurd in that a device that was used sporadically, even when the use sessions resulted in entries for a virtual athletic competition, would always be outside the claim.

153. I have already rejected Garmin's submission that the regular updates required by claim 24 are provided by the device of claim 1. They are provided by the external computer in the system of claim 24. As to "regular" this simply means as regularly as athletes choose to update stored activity to the wider feedback system.

Is a regular update satisfied by training advice that is independent of the athlete's performance?

154. As to the third issue, I am not sure that it was pursued by Garmin. It was raised in paragraph [347] of Mr McKnight's report but not referred to by Garmin in its closing in relation to claim 24. In my view, since claim 24 refers to regular updates "*on said athlete's performance*", training advice which is provided independently of the athlete's performance does not fall within the claim.

Said feedback system comprises means for verifying actual exercise activity (claim 26 as granted)

155. Garmin contended that the means for verifying actual exercise activity do not have to be automatic and the "means" required by the claim are satisfied by a human being who witnesses and verifies the relevant activity. Philips disputed this, contending that the Patent teaches an electronic device with electronic connections in an electronic system. It does not teach any manual process.

156. Mr Cuddigan pointed out that the only disclosure relating to verification in the Patent is at [0055] (cited above). This discloses that a smart algorithm applied to the remote computer can be optionally used to automatically verify that an exercise session has actually occurred. It also states that verified exercise activity is then used to qualify participants' specific exercise sessions in advertiser-sponsored programs such as product giveaways, earning frequent flier miles, and so forth. It concludes that this technique may also be used to automatically qualify the results of virtual competitions.

157. Garmin asserted that none of these options are to be found in the claim, which does not refer, for example, to advertiser sponsored programs. The claim does not specify smart algorithms; it only requires means that are suitable for verifying actual exercise activity. Nor does the claim require that the verification should be automatic. The Patentee was plainly aware of that option as it is expressly referred to in [0055]. But it chose not to limit its claim in this way. Garmin claimed that the approach of the Patent was to advance a narrow conceptual disclosure (a smart algorithm) and then claim the whole territory of verification.

158. Furthermore, Garmin pointed out that claim 24 states that the system *comprises* external computer means. It follows that the feedback system does not exclude human

involvement; it merely *includes* a computer and means that are suitable for verifying actual exercise activity. The computer must be included but claim 26 does not require that it carries out the step of verification, even in part. The only requirement is that means are provided that are suitable for verifying actual exercise activity. The "means" could present athletic performance feedback data to a human, who could then decide whether the data is genuine exercise activity. Any human verification step is therefore within the claim.

159. Philips responded that there is no teaching whatsoever of any manual verification to be found anywhere in the Patent. [0055], cited above, expressly refers to automatic verification. This is consistent with the entire disclosure of the Patent. Figures 7 and 8 illustrate the use of electrical interfaces and modems to upload data to the various external processing means. This is further described at [0021], [0022], [0032] and [0052] – [0053]. This disclosure is consistent, and the Patent teaches an electronic device with electronic connections in an electronic system. It does not teach that the verification process could be manual.

160. Philips challenged Garmin's claim that because the relevant feedback system which undertakes the work is introduced as "comprising*"* the "computing means external with respect to the portable monitor", it follows as a matter of construction that other means, i.e. human means, can be applied. Whilst "comprising" does not exclude further "means" being part of the system, it would be a nonsense effectively to write out of the claim the means that are provided to do the requisite job and replace them with a human – leaving the external computer simply sitting there with nothing to do. "Comprising" is an appropriate word to have used in the claim, as "consisting" would lead to non-infringement as soon as anything else was added to the "system" of the claim.

161. In my judgment, Philips is correct in its construction, for the reasons that it gave, to which I add the following: I have to consider what the skilled addressee would understand that the patentee intended the language of the claim to mean, objectively construed by reference to the context and background. As noted in *Virgin*, there is no presumption that the patentee necessarily intended that the widest possible meaning consistent with his purpose be given to the words that he used. Furthermore, purposive construction leads one to eschew the kind of meticulous verbal analysis in which lawyers are too often tempted by their training to indulge.

162. As to context, the entirety of the disclosure of the Patent is concerned with an electronic device in an electronic system. The "use" claims are process claims where the functions are achieved, automatically, and without human intervention. As to background, the skilled person would apply his technical understanding and common general knowledge to the teaching of the Patent. As Jacob LJ memorably observed in *Technip France SA's Patent* [2004] RPC 46 at [7] – [10] the skilled person, "if real, would be very boring – a nerd". That is because he is deemed to have read all of the prior art and yet be entirely unimaginative. However, he is not an idiot. Jacob LJ noted that; "He does, on the other hand, have a very good background technical knowledge". Having regard to disclosure of the Patent, the advantages of an automated system, including automatic verification in a GPS system would be clear. No skilled person would conclude that the word "means" in a claim to a system, was intended to include human beings.

163. As to the teaching of the Patent, both experts plainly understood that it was concerned with automatic verification. Neither expert suggested that human verification had even crossed their minds. Mr Farringdon dealt with this in his first report at [333] and made no reference to manual verification. He said:

> "333. The desirability of verifying actual exercise (claim 26) arises from the nature of GPS, since the GPS data recorded by the device of claim 1 may or may not be related to the athlete engaging in exercise. The Patent contemplates using GPS data (average speed and pace), together with other measures, in a smart algorithm to verify actual exercise in the data (para 55). I consider that GPS position could also be used in an algorithm, for example, to determine that an athlete is travelling on a ski lift rather than skiing downhill."

164. As this passage makes clear, from a technical perspective, the Patentee is intending to refer to automatic verification. Mr Farringdon maintained this explanation during cross-examination at T2/180/2 -181/23.

165. Mr McKnight was cross-examined about the insights that, according to Philips, the skilled person would learn from the Patent. He did not suggest any human input. For example, he was asked about verification at T3/339/20 - 340/2. He made no reference to manual verification:

> "Q. "Seventh, the uploaded GPS activity data from a plurality of athletes is of such a nature that it can be algorithmically verified for authenticity."
>
> A. Yes, again with the caveat that they would typically think about it as uploaded data from -- the plurality of sensors would be able to do that, but specifically GPS could be verified, yes."

166. In my judgment, the skilled person, on reading the specification, would understand that the Patentee did not intend to include manual verification within the scope of claim 26. Use of "means" within a "system" avoids the disadvantages and uncertainties of human involvement, which is a positive benefit of the use of GPS data.

Adapted to receive athletic performance data (claim 27 as granted)

167. This dispute is very similar to the verification issue. Garmin alleged that this requirement is satisfied by human entry of data. If this is correct, then where a human being reads data from the device of claim 1 and types it into the external computer of claim 24 or the Internet website of claim 27, that manual process would fall within the claims. Philips denied this on the basis that the Patent teaches an electronic device with electronic connections in an electronic system. It does not teach any manual process.

168. For the reasons given above, I accept Philips' case on this issue. This possibility might occur to a lawyer, but not to a person skilled in the art. It is not supported by a purposive construction of the claims, read in the light of the description and drawings. There is no suggestion of manual extraction and re-entry of data anywhere in the Patent. On the contrary, Figures 7 and 8 explain the use of electrical interfaces and modems to upload

the data to the various external processing means. This is further explained at [0021], [0022], [0032], [0052] and [0053]. Furthermore, [0054] discloses that:

> [0054] The inventors envision an Internet web site that would present information such as national and international performance averages for different age/gender groups, virtual competitions, prizes for the most miles run, best average pace, and other performance achievements, personal fitness recommendations, marathon training programs, and so forth. Prior to uploading information for the first time, each participant is assigned a member number by filling out a demographics profile form, either on-line or via mail. Each time the user uploads data, the device relays the user's member number to associate the data with the user.

169. Paragraph [0054] accordingly teaches that despite the manual step of member number assignment at the outset, it is expressly "the device" that provides the member number as part of the upload process. In my judgment, the skilled person would not consider that the language chosen by the patentee was intended to include within the claimed "system" a human being who manually extracts and re-enters the athletic performance feedback data.

Display of "comparison data" representing relative performance of said athletes (claim 27 as granted) and role of the Internet Website (claims 27, 29 and 30 as granted)

170. Garmin contended that the comparison data of claim 27 is not required to be processed by the Internet website itself. I agree. Philips accepted that in the claims of the Patent, it is the computer that is responsible for the relevant data processing, generation and presentation. A website cannot do this itself. At [0054], the Patent discloses generation of comparison data, which is carried out by the computer of the Internet website, not by the website itself. The same is true in respect of claims 29 and 30 as granted. The Internet website displays the information processed by the computer – it does not process or generate that information.

Use as recited in any of claims 27 to 29, characterised in that said Internet website is adapted to facilitate virtual competitions (claim 30 as granted)

171. The issue is whether this requirement of the claim is satisfied by a website which merely displays information. Garmin contended that an Internet website is adapted to facilitate virtual competitions if it invites competitors to participate in a virtual competition and publishes the results. Garmin submitted that there is no disclosure in the Patent of the website doing anything more than displaying information. There is no disclosure of comparisons being made, virtual or otherwise.

172. Philips disputed this and contended that the website must do more. It must make a meaningful comparison between athletes' performance. It submitted that:

i) as to "*comparison data representing relative performance*": the concept is that the uploaded athletic performance data of multiple athletes is used to generate comparison data. The nature and extent of the comparison and of the consequential data is unspecified, but the important point is that the wider feedback and Internet system is configured to enable such comparison to be made, between athletes that need not even be known to each other, exist in the

same geographic vicinity, or exercise at the same time, provided that a meaningful comparison can be effected.

ii) as to "virtual competitions": this is enabled by the wider feedback and Internet system. They are fairly considered 'competitions' because data verification ensures that the athletes can 'compete' on comparable terms, and 'virtual' because the parameters of the competition neither require nor take into account any 'real-world' competition. To facilitate such virtual competitions, the Internet website must be able to make a meaningful comparison between the underlying GPS data recording the athletic activity of each athlete uploaded from their portable personal performance monitor.

173. An advantage of the invention generally disclosed at [0014] is that the claimed personal performance monitor "includes an internal modem for transmitting exercise results to an Internet website where such data is also collected from other participating athletes". [0052] – [0053] of the Patent provide two options for uploading from the personal performance monitor and [0054] explains the function of the website.

> "[0052] The athlete may optionally connect the GPS-based personal performance monitor and feedback device to the personal computer 701 using the serial-type port 118 or the infrared-type port 124 for long term historical exercise session data storage, performance trend analysis, and remote device configuration using customized software.
>
> [0053] The athlete may also optionally use the modem 613, connected to the CPU 602, to transmit data from the GPS-based personal performance monitor and feedback device to a remote computer 801 and modem bank 802 via a standard telephone line. This remote computer 801 collects, stores and compiles athletic performance data from participants around the planet. An Internet web site is then used to present performance data from participating athletes.
>
> [0054] The inventors envision an Internet web site that would present information such as national and international performance averages for different age/gender groups, virtual competitions, prizes for the most miles run, best average pace, and other performance achievements, personal fitness recommendations, marathon training programs, and so forth."

174. In my view, the claimed feedback system is required to make a meaningful comparison between the uploaded athletic performance data of multiple athletes. That is how it is adapted to facilitate virtual competitions. The comparison is made by the computer. The results of the comparison are then presented on the Internet website. An Internet website is not "adapted to facilitate virtual competitions" within the meaning of claim 30 if the system of which it forms part can do no more than invite competitors to participate in a virtual competition and publish the results, without comparing their performances.

Claim 30B

"said internet website is adapted to display customised individual training advice" (claim 29 as granted)

175. The issue between the parties is whether "*customised individual training advice*" is satisfied by fitness recommendations. This, according to Garmin, includes user customised training advice, inserted by individual athletes. It contended that the customised individual training advice does not require anything more than the personal fitness recommendations, marathon training programs and so forth, disclosed in [0054] of the Patent. There was no requirement for automation as between submission of performance feedback data by the athlete and provision of training advice by the system. There was no requirement for a link between training advice and the performance feedback data. According to Garmin, this feature is satisfied by the provision of a range of pre-existing advice suitable for different individuals.

176. Philips argued that the claim is dependent upon claim 27 and requires the use of the athletic performance feedback data received by the Internet website in claim 27. The claim expressly requires that the Internet website is adapted to display customised individual training advice. The language of the claim, together with the overall teaching of the Patent, provides no warrant to extend this to cover the mere presentation of static training advice that a user self-customises.

177. In my view, Philips is correct on this issue, for the reasons that it gave. Claim 29 is dependent on claim 27 and the training advice is dependent on the athletic performance feedback data. It is customised, not customisable.

Claim CA2

> *"and wherein said portable personal performance monitor further comprises an audio entertainment system for providing said athlete with music during his/her exercise session, which is reduced in volume during said audio presentation of real-time performance information"*

178. In opening, Garmin's case was that all that is required by this proposed amendment is a conventional audio entertainment system with a conventional volume control, connected to the APMD, which is manually reduced in volume by the user while the performance information is announced. There is no requirement for any automation. That cannot be right, as was made clear during the cross-examination of Mr McKnight. It gives rise to the problem that the user would receive real-time performance information before being able to reduce the volume of the music. Therefore, the volume of the music would not be reduced in time. In closing, Garmin modified its case. It submitted that the conditional amendment is satisfied by a speaker or buzzer of some kind, to alert the user to real-time performance information, and a standard music player with a volume control that can be manually adjusted by the user.

179. I do not accept this submission. The skilled person would understand that this feature is concerned with automatic volume reduction, rather than manual reduction by the user. Amongst the advantages of the invention set out at [0061] is that the personal performance monitor "*provides the athlete with entertaining music during his/her exercise session, which is reduced in volume during performance feedback cycles*." That language is contained in the claim and does not contemplate user intervention. Similarly [0045] discloses that: *"[a]t pre-set intervals, the information is provided to the athlete through the set of audio headphones 202 by means of the audio module 606, during which time the volume of the radio music is temporarily reduced.*" There is no suggestion of manual adjustment of volume control by the user.

180. Furthermore, [0060] discloses that:

> "The data presentation method of using an audio module eliminates the exclusive use of large, power-consuming, cumbersome, and visually distracting displays and leaves the athlete free to concentrate on his/her exercise, safety and surroundings. It even allows for safely obtaining performance feedback on poorly illuminated tracks and trails."

Therefore, an advantage of the invention is to leave the athlete free to concentrate on his/her exercise, safety and surroundings. This is consistent with the disclosure at [0008] which makes clear that frequent (visual) interaction with existing devices compromises the safety and concentration of the user. An advantage of the invention is to avoid such compromise. That advantage will not be realised if the athlete is fiddling with the volume control in response to a buzzer during exercise.

Conclusion

181. Garmin raised numerous points of construction, in relation to claims that are relatively straightforward. Generally, I have decided these issues in favour of Philips. There is, I believe, a reason for this. Having decided not to contest infringement, Garmin has adopted the widest possible meaning that the words of the claims are capable of bearing, in each case having regard to its grounds of invalidity. Purposive construction requires the Patent to be interpreted objectively, and without regard to, or knowledge of, grounds of invalidity. Garmin's approach does not provide fair protection to the patentee, nor reasonable certainty for the public.

Collocation

Legal principles

182. Section 14(5) of the Patents Act 1977 provides that the "claim or claims shall – […] (d) relate to one invention or to a group of inventions which are so linked as to form a single inventive concept". Similarly, Article 82 EPC 2000 provides that: "The European patent application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept". The question of collocation arises where a claim or claims do not relate to only one invention and are not so linked as to form a single inventive concept.

183. The issue of collocation was considered by the House of Lords in *Sabaf SPA v. MFI Furniture Centres Ltd* [2005] R.P.C. 10. Lord Hoffmann said at [24] – [26]:

> "24. …there is no law of collocation in the sense of a qualification of, or gloss upon, or exception to, the test for obviousness stated in s.3 of the Act. But before you can apply s.3 and ask whether the invention involves an inventive step, you first have to decide what the invention is. In particular, you have to decide whether you are dealing with one invention or two or more inventions. Two inventions do not become one invention because they are included in the same hardware. A compact motor car may contain many inventions, each operating

> independently of each other but all designed to contribute to the overall goal of having a compact car. That does not make the car a single invention.
>
> 25. Section 14(5)(d) of the Act provides (following art.82 of the EPC) that a claim shall "relate to one invention or to a group of inventions which are so linked as to form a single inventive concept". Although this is a procedural requirement with which an application must comply, it does suggest that the references in the Act to an "invention" (as in s.3) are to the expression of a single inventive concept and not to a collocation of separate inventions.
>
> 26. The EPO guidelines say that "the invention claimed must normally be considered as a whole". But equally, one must not try to consider as a whole what are in fact two separate inventions. What the Guidelines do is to state the principle upon which you decide whether you are dealing with a single invention or not. If the two integers interact upon each other, if there is synergy between them, they constitute a single invention having a combined effect and one applies s.3 to the idea of combining them. If each integer "performs its own proper function independently of any of the others", then each is for the purposes of s.3 a separate invention and it has to be applied to each one separately. That, in my opinion, is what Laddie J. meant by the law of collocation."

184. Where a claim is to a collocation, it is enough to show that the individual features of the claim are obvious to prove that the aggregation of features does not involve an inventive step; see the EPO Guidelines Part G, Chapter VII:

> "7. Combination vs. juxtaposition or aggregation
>
> The invention claimed must normally be considered as a whole. When a claim consists of a "combination of features", it is not correct to argue that the separate features of the combination taken by themselves are known or obvious and that "therefore" the whole subject-matter claimed is obvious. *However, where the claim is merely an "aggregation or juxtaposition of features" and not a true combination, it is enough to show that the individual features are obvious to prove that the aggregation of features does not involve an inventive step* (see G-VII, 5.2, last paragraph). A set of technical features is regarded as a combination of features if the functional interaction between the features achieves a combined technical effect which is different from, e.g. greater than, the sum of the technical effects of the individual features. In other words, the interactions of the individual features must produce a synergistic effect. If no such synergistic effect exists, there is no more than a mere aggregation of features (see T 389/86, and T 204/06)." (emphasis added)

Claims 30/A/B split from C1/CA1/CA2/CA3

185. Garmin submitted that claims 30 A and B consisted of or covered at least two inventions that were mere collocations, namely the device of Claim 1/CA1/CA2/CA3 and the feedback system of claim 30A/B. At [103] of its Closing Submissions, Garmin stated that: "If the system of claim 30 is satisfied by the use of feedback data relating to speed and distance alone, it must follow that the device of claim 1 and the analysis environment of claims 30A and 30B are collocations."

186. I reject this submission, for the reasons given at [126] – [142] above. Philips is correct in its submission that the claims in issue constitute a combination of features in respect of a complete system, behaving as a single system, in which there is synergy between the claim to the portable performance monitor and the claims that make use of it. The functional interaction between the features achieves a combined technical effect greater than the sum of the technical effects of the individual features. Whilst the portable personal performance monitor can be used independently of the wider feedback system, the wider feedback system cannot be used independently of the portable personal performance monitor. The overall system is a new system that did not exist previously, and which is able to use GPS-based data e.g to facilitate virtual competitions by outdoor athletes. This is not a case where each integer performs its own function independently of the others. I reject the collocation argument.

CA2 split from C1/CA1

187. Garmin submitted that there is a mere collocation between the additional features of claim CA2, added to those of claim 1 and/or claim CA1. It argued that the behaviour of the system of claim CA2 was entirely sequential and there was no synergistic effect. Data was gathered by the personal performance monitor, calculations were carried out, and the results were announced back to the athlete. There was a flow of information in one direction only and the features of the device were agnostic about the data source.

188. I do not except that submission. It is based on the premise that the claim is to an audio entertainment system and a personal performance monitor where the system and monitor perform their functions independently of each other. This ignores the solution that the Patent has provided to the technical problem of how to enable the athlete to simultaneously listen to music from an audio entertainment system and to be provided with aural feedback on his/her performance. The solution is to introduce aural feedback to the personal performance monitor in a manner that enables the aural signal to be combined with the music, by automatically reducing the music volume when the device presents aural real-time performance information. Therefore, the personal performance monitor and audio entertainment system do not perform their functions independently of each other.

189. In my view, the combination of conditional amendment 2 with claim 1 or CA1 provides an integrated system, which cannot be divided into separate parts. This was illustrated during the cross-examination of Mr McKnight, by reference to a diagram at CXX13. This compares the system arrangement of a conventional music player, a conventional aural-output performance monitoring device (typified by an HRM) and a system of a combined aural-output performance monitoring device and music player. The latter was a single integrated system with a switching mechanism/mixer which ensured that the music volume would lower to enable the athlete to hear real-time performance

information. There is no division in the system which means that the music player and personal performance monitor behave separately, and in a conventional manner. It is not a mere collocation.

The Schutz/Higham/GPS II+ prior art

Schutz

190. Schutz is a paper by A Schutz and A Chambaz, of the Institute of Physiology at the University of Lausanne in Switzerland, entitled "*Could a satellite-based navigation system (GPS) be used to assess the physical activity of individuals on earth?*", published in 1997 in the European Journal of Clinical Nutrition EJCN 1997 vol 51 pp338-339.

191. The subject matter of the paper is evident from the abstract. The authors tested whether GPS was useful to assess velocity in walking, running and cycling. They concluded that, at least in respect of running and cycling, the GPS technique appeared very promising for speed assessment:

> "**Objectives:** To test whether the Global Positioning System (GPS) could be potentially useful to assess the velocity of walking and running in humans.
>
> **Subject: A** young man was equipped with a GPS receptor while walking running and cycling at various velocity on an athletic track. The speed of displacement assessed by GPS, was compared to that directly measured by chronometry (76 tests).
>
> **Results:** In walking and running conditions (from 2-20 km/h) as well as cycling conditions (from 20-40 km/h), there was a significant relationship between the speed assessed by GPS and that actually measured *(r*=0.99, $P < 0.0001$) with little bias in the prediction of velocity. The overall error of prediction (s.d. of difference) averaged f 0.8 km/h.
>
> Conclusion: The GPS technique appears very promising for speed assessment although the relative accuracy at walking speed is still insufficient for research purposes. It may be improved by using differential GPS measurement."

192. Schutz describes the use of a commercially-available portable GPS device (a Garmin GPS 45) for monitoring general human physical activity levels. The GPS device was used to monitor the speed of a recreational athlete while walking and running around an athletics track, the accuracy of which was assessed by comparing the GPS device readout to the lap times measured by a "chronometer" (i.e. a conventional stopwatch). The authors observed that the speed estimates calculated by GPS and by the stopwatch were closely aligned and concluded that GPS technology could be a useful monitoring method for general human physical activity levels.

193. Under the heading "Materials and methods" the authors explain that:

> "All measurements took place on an athletic track situated at 375 m above sea level. The speed of walking and running of the subject was directly determined by a Swiss certified chronometer. The purpose was to compare the velocity of walking and running at various speeds (as assessed by chronometry) with that obtained by the GPS. The subject was a young man of 25 y (AC) who was involved in non-competitive running. His body weight was 75 kg, his height 180 cm and his relative body fat 12%. In order to assure an almost constant rate of walking and running at each speed, the subject was wearing a portable metronome to time the cadence."

194. It is explained that 19 different speeds of walking and 22 different speeds of running were tested at a velocity ranging from 2±20 km/h as well as 35 speeds of cycling (below 40 km/h). The velocity of walking and running instantaneously displayed on GPS was recorded and averaged over 1 minute and compared to that measured by chronometry.

195. The "Results" section describes the statistical analysis (principally linear regression) that was carried out on the data, which are also plotted in their raw form as Figure 1. The correlation coefficient between the GPS speed and the speed measured by the chronometer is reported to be "high ($r=0.99$, $P < 0.001$)". The authors note, however, that the correlation is tighter at the mid-range of speeds tested, with a greater spread of points (and hence standard deviation of the error) at lower and higher speeds. It is stated that "the uncertainty of speed estimate (expressed as the s.d. of the error) was 1.1 km/h for walking, 0.7 km/h for running and 0.8 km/h for cycling".

196. In the "Discussion" section, the authors summarise the potential advantages and disadvantages of using the GPS system for monitoring general physical activity levels. As to advantages, the authors state that:

> "The potential advantages of the utilization of the GPS system are: (1) portable, (light and small size); (2) non-invasive non-obtrusive free-living measurements; (3) continuous measurement with 'on line' data obtained on a miniature screen, hence feedback values for the subject; (4) free access to the GPSs satellites in any part of the world, at no financial cost (in 1997); (5) reasonable cost of GPS receiver; (6) data could be stored and subsequently retrieved if required; (7) the technique can be used to independently validate measurements of velocity of walking and running by other techniques (such as by accelerometry)."

197. As to disadvantages, the authors state that:

> "The major disadvantages are: (1) Only activities involving outside displacements of the body, such as walking and running can be assessed; (2) failure to measure displacements when the access to the sky is obstructed by tall buildings or terrain; (3) static activities cannot be measured; (4) depends upon the continuous access to at least three satellites simultaneously (for 2D assessment)."

198. Finally, the authors refer to the US Department of Defence's then-current policy of "selective availability", in which the precision of the GPS satellite network was deliberately downgraded to preserve the highest levels of precision for military applications. The authors state that "the data obtained in [their] preliminary study could be substantially improved without such 'dithering' of the clocks".

Higham

199. Higham is an article published in the June 1997 issue of the consumer magazine "*Adventure Cyclist*". It is entitled "Touring with a Magic Compass: Is the Global Positioning System in your future?"

200. The article discusses the use of portable GPS devices by cyclists, in particular touring or off-road cyclists. It describes how commercially-available portable GPS devices can be used by cyclists to assist with navigation, as well as to provide information on metrics such as speed and distance travelled (which were traditionally provided by bicycle computers).

201. A section of the article entitled "A Quick Summary of GPS" provides an introduction into GPS and portable GPS devices. There is an image on page 20 of a Trimble Scout GPS, with the caption "Some GPS units can be mounted on your handlebars for ease of use".

202. A section entitled "Yeah, So Now What Happens?" discusses the use of such portable GPS receivers by cyclists. The author notes that "your GPS receiver not only knows where you are right now, but it also knows where you were a few moments ago, so it can tell you your speed, distance and direction of travel". The information provided by the portable GPS receivers is discussed further on page 22, where the author states:

> "When I tour, my GPS unit takes a prominent position on my handlebars, where most people would have some type of cyclometer (which I have dispensed with). That way I can keep an eye on the usual things like speed and distance covered, as well as hearing, ETA and deviation from the intended path.
>
> And for those of you who have struggled to find the exact diameter of your front wheel so you can calibrate your cyclometer, take heart. If you use the GPS unit as your source of information for speed and distance travelled, you'll be glad to know it's way more accurate than your old cyclometer, or your car speedometer, for that matter, and no calibration is necessary. Of course, all this high-tech information comes at a cost, and one of those is batteries. I keep mine freshly charged by using a solar-powered charger situated on top of my panniers."

203. The author also discusses how the GPS device can be used to assist with navigation. He explains that it is possible to store an intended route in memory, and to use the GPS device to determine if the cyclist is following the intended path or, if not, whether he/she needs to bear left or right to return to the path. The devices also provide an estimated time of arrival (ETA) at the intended destination, as well as "an electronic trail of bread crumbs" (i.e. a fairly rudimentary map showing the route that has been followed).

204. The final section, entitled "Back to Earth and On Two Wheels", together with the breakout box on page 23 entitled "Using Way-Points", discusses further how to input "way-points" into portable GPS devices and how this may develop in the future. The breakout box explains further what "way-points" are and how they are used to create routes. The author states: "A way-point is simply a location along your route, say an intersection where you need to turn left, stored in memory. When you reach the way-point, the GPS receiver will then prompt you to turn left". It is then discussed how such information is displayed to users in devices manufactured by Trimble and Garmin. In the body of the article the author explains that "way-points" can be entered manually into the devices to create a route to be followed. However, the author notes: "A whole industry is falling all over themselves to be the first to offer digitized maps. Give it about a year, and you'll be able to download all the way-points for your personally customized route off of the Web, right into your GPS unit."

GPS II+

205. The GPS II+ Device is a portable GPS unit. It is described on page (i) of the GPS II+ Manual as "the smallest, easiest-to-use GPS navigator for outdoor use". The GPS II+ Manual states that the device can be used in a vehicle, on a bike, or for handheld outdoor use "such as hunting or hiking". The GPS II+ Device was supplied with a wrist strap and a velcro mount, and optional accessories included a vehicle mounting bracket, an automotive dash bracket and a bicycle bracket. The box containing the device also states, "Helps you get the most out of your activity" and lists the following activities: backpacking, fishing, hunting, off-roading, RV touring, bicycling, motorcycling, snowmobiling and vacationing.

206. The GPS II+ Device is described in the GPS II+ Manual as a "GPS navigator" and it contains a number of features to assist users with navigating to a specific location or along a route. Garmin drew attention to pages in the manual which indicate that that it is possible to use the GPS II+ Device without entering specific locations (or waypoints). It contended that the manual disclosed that once the device has locked onto a sufficient number of satellites, it can simply be carried by the user (or attached to a bicycle) when walking, running, cycling or otherwise engaged in an outdoor activity. It submitted that the GPS II+ Device provides real-time information on at least its position and speed, and several other metrics depending on how it is configured. It drew attention to pages 26-27 of the GPS II+ Manual. These pages describe the "Position" page. It is stated on page 26: "This page shows you where you are, what direction you're heading, and how fast you're going, and it's most useful when you are traveling without an active destination waypoint."

207. I do not accept that the manual gives any indication of use of the device other than for navigation. In the light of the cross-examination of Mr McKnight, I reached the conclusion that the manual describes two ways of using the GPSII+ device, both of which are for the standard purpose of navigation:

i) the GPS II+ Device as described in the manual could be used to navigate to a known destination or along a route. The destination or route could be programmed into the GPS II+ Device as a waypoint (or in the case of a route, an ordered series of waypoints).

ii) Alternatively, the GPS II+ Device as described in the manual could be used to follow written directions to a destination without entering a destination waypoint.

Anticipation of claim 1 as granted by Schutz/Higham/GPSII+

208. Philips accepted that GPS II+, Higham, and Schutz all disclose a product falling within the scope of claim 1 of the Patent as granted, which is very broadly drafted, and accordingly anticipate that claim. Claim 1 is a product claim for a "portable personal performance monitor for monitoring athletic performance…for conversion of…position data into athletic performance feedback data...". The claim is anticipated because "for" in this context is to be construed as "suitable for" and "athletic performance feedback data" is so broadly described in the specification as to include instantaneous speed alone.

209. However, Philips contended in its written closing submissions that the anticipation was "accidental". It argued that each prior art citation discloses only a conventional GPS unit: GPS II+ is such a unit; Higham refers to several similar units; Schutz refers to the use of the Garmin 45. In respect of GPSII+, I agree. In my view it is the weakest of the prior art citations. In respect of Schutz and Higham, I disagree. Those citations disclose and recommend the use of a GPS unit to monitor the speed of recreational athletes whilst exercising. The idea of developing a GPS-based APMD would have been obvious to the skilled person from both Schutz and Higham. Schutz is the better citation, as it is not confined to cycling, and certain features of the claims are obvious in the context of running, but not in the context of cycling. Since Philips now accept that the idea of developing a GPS-based APMD would have been obvious to the skilled person at the priority date in the light of Schutz, assertions of accidental anticipation cannot improve its case on obviousness.

Anticipation of claim CA2 by Dotan

210. Philips accepted that if the combination of claim 1 and conditional amendment 2 as claimed in claim CA2 was a mere collocation, then claim CA2 was anticipated by US Patent 5,314,389 ("Dotan"). Since I have rejected the collocation argument, Dotan does not anticipate claim CA2.

Conventional obviousness over Schutz/Higham/GPSII+

Philips' approach

211. Philips submitted that the Patent is based on a number of fundamental technical realisations or "insights", which collectively combine to produce a new type of training tool that can improve motivation, training effectiveness, and, over time, overall performance and health of the athlete. It presented a list of nine insights, which it sought to identify in various passages in the Patent. Garmin contended that this language was not contained in the Patent, and Philips was attempting to rewrite its disclosure with hindsight knowledge of the alleged infringements, and of features which have proved successful in practice.

212. On this issue, I agree with Garmin. The disclosure of the Patent says what it says, and it is impermissible to expand or rephrase it. If the Patent already discloses the insights

that Philips have identified, then there is no point in paraphrasing its language. If it does not disclose those insights, then they cannot now be introduced.

213. Philips identified fourteen steps which it contended that the skilled team would be required to take to arrive at the features of the claims in issue. It contended that this step-wise approach to obviousness was a classic exercise in hindsight; see for example, *Mills & Rockley (Electronics) Ltd v Technograph Printed Circuits Ltd* [1971] FSR 188 at 193 per Lord Diplock. I shall bear in mind that once one knows of the invention, it is possible to set out a combination of steps by which inventor might have arrived at the invention, starting from the prior art. Such steps, in isolation, may not be inventive, but as Lord Diplock pointed out, such a reconstruction may be unrealistic and may ignore the inventive ingenuity in selecting the particular combination of steps which the inventor perceived would lead to the final result. However, it is also the case that a patentee may identify numerous steps in response to an allegation of obviousness, and those steps may themselves be artificial, or obvious, both alone and in combination,

214. Philips also submitted that, even if all else was obvious, key features such as virtual competitions and audio entertainment with dimming were clearly inventive.

Garmin's approach

215. Garmin's approach (ignoring, at this stage, issues of collocation and excluded subject matter) had the virtue of simplicity. It submitted that each feature of the claims in issue was known to the person skilled in the art from the common general knowledge, or would have been found on a routine search, which the skilled team would have performed when developing a GPS-based APMD. In summary, it argued that once the person skilled in the art had the idea of a GPS-based APMD (which was obvious) it would have been routine to consider introducing any of the claimed features, which were common general knowledge, and of which several examples would readily be found on a routine search of commercially available products, as shown by the evidence of Mr McKnight. No invention resided in the idea of improving such a device with additional features known to be used in APMD, individually or collectively, and/or obvious desiderata.

Claim 30A – inventive step

Performance monitor/GPS receiver/GPS feedback data (Claim 1 as granted)

216. Claim 30A incorporates the features of claim 1 as granted. Philips approached this issue on the premise that the obviousness attack based on the individual prior art citations was virtually identical. In his expert reports, Mr McKnight had focused on GPSII+, and had considered that the same reasoning applied to the other prior art. During his cross-examination, Mr McKnight confirmed his view that the claims were obvious over GPSII+. This was based on the view that the skilled team would decide to use GPS when cycling. On that basis, Philips addressed the issue of inventive step in the light of GPSII+, by asking whether it would have been obvious to substitute that navigation device into an existing cycle computer to replace the speed and distance sensors.

217. Philips contended that a series of steps must be taken for the skilled team to appreciate the idea of a GPS-based APMD which converted GPS data into athletic performance feedback data, starting from GPSII+. It argued that: first, the skilled person would have

to extract from the disclosure of GPSII+ the fact that position data can be converted into athletic performance feedback data; second the skilled person would have to appreciate that the GPS receiver can be used as a portable performance monitor for monitoring athletic performance; third, the skilled person would have to realise that a GPS sensor could be substituted into an existing cycle computer to replace the speed and distance sensors; and fourth, the skilled person would have to decide which bicycle computer to use as the appropriate framework, and whether to choose a cycle computer with data upload functionality.

218. In my judgment, the problem with Philips' approach is that the case has moved on since Mr McKnight's reports were prepared. Philips has selected the weakest prior art citation to address when considering inventive step. The forensic attractions of this approach are clear, but since Philips has accepted that claim 1 as granted is obvious in the light of Schutz (a conclusion that I would have reached in any event) that is the starting point for the obviousness attack.

219. The skilled team is deemed to have read Schutz. Schutz would be read carefully and with interest, and its significance would, in my view, have been apparent; *Asahi Medical Co Limited v Macopharma* (UK) Limited [2002] EWCA Civ 466 at [21]; *Inhale v Quadrant* [2002] RPC 21 at [47]. Schutz discloses use of a GPS device to monitor, amongst other things, the speed of a runner during outdoor exercise. The advantages set out in Schutz, from the perspective of an APMD manufacturer, are very clear and outweigh any disadvantages. In the light of Schutz, it was obvious at the priority date to develop a GPS-based APMD which converted GPS data into athletic performance feedback data.

Connection to an external computer so as to provide regular updates on performance (claim 24 as granted)

220. Claim 30A incorporates the features of claim 24 as granted. Philips suggested that several steps would have to be taken for the skilled person to design a new GPS-based APMD in such a way that it could connect to an external computer to provide regular updates on performance. Again, it relied upon the position taken in Mr McKnight's written evidence, where he had asked whether it would be obvious to the skilled person to use GPSII+ in conjunction with athletic performance monitoring software.

221. Philips accepted that it would have been an obvious step to manually enter GPS cycle computer data into a coaching program, such as PC Coach, but argued that any automatic download of data would not have been obvious. This argument proceeded on the basis that: the starting point for obviousness was GPSII+; there was nothing in that prior art to suggest to the skilled person that the device should be used with any third-party software; in relation to APMDs, automatic uploading of data was known only in the context of HRMs; and cycle computers did not automatically upload speed and distance data to third-party software.

222. I do not accept this argument for the following reasons. First, as with Philips' case in respect of claim 1 as granted, it begins from the wrong starting point. The most relevant prior art is Schutz. Schutz clearly discloses use of a GPS device to monitor the speed of a runner during outdoor exercise. Mr McKnight explained that there were several known third-party providers of automated software, such as PC Coach and UltraCOACH, which uploaded performance data to an external computer and provided

regular updates on performance. That was clearly the case in relation to HRMs, as used by runners, and I accept Mr McKnight's evidence that the application of this existing technique in the context of a GPS-based APMD for, amongst other activities, running was obvious.

223. Secondly, I have rejected Philips' submission that automatic uploading of speed and distance data to third-party software was known only in the context of HRMs and that cycle computers did not automatically upload speed and distance data to third-party software. I have concluded that it was common general knowledge to upload such data from cycle computers. I accept Mr McKnight's evidence that use of such a feature in the context of a GPS-based APMD was obvious, even if the starting point was a cycle computer.

224. Thirdly, I do not accept that the skilled team would rigidly differentiate between cycle computers on the one hand and HRMs on the other. When considering the attributes of the skilled team, I noted that many companies had produced combination devices with multiple functions, including combination HRMs and cycle computers. Knowledge of features commonly used in such devices cannot be compartmentalised.

225. Fourthly, it is plainly not inventive to emulate the features of an existing APMD in a new GPS-based APMD. Polar's Xtrainer Plus uploaded HRM and cycle computer data to an external computer to provide regular updates on performance. This was common general knowledge. Cateye's CCD-3 APMD included the same functionality and would have been found on a routine search at the priority date, which the skilled team would have undertaken.

Means for verifying actual exercise activity (claim 26 as granted); an Internet website adapted to receive athletic performance feedback data from two or more athletes and display comparison data representing relative performance of said athlete (claim 27 as granted); and wherein said Internet website is adapted to facilitate virtual athletic competitions (claim 30 as granted)

226. These features of claim 30A are inter-related and it is appropriate to consider them together. Garmin submitted that once the person skilled in the art has had the idea of a GPS-based APMD (which I have found was obvious at the priority date) then it was no more than the application of common general knowledge to provide for virtual competitions displayed via an Internet website with verification of actual exercise activity. The use of the Internet for sports applications was well known. Performance monitoring devices and equipment were available which allowed users to compete against each other over the Internet, and once a decision had been made to include virtual competition functionality it was plainly obvious to include automatic verification of that activity.

227. Philips contended that the context in which virtual competitions were known was different. The software packages relied upon by Mr McKnight had only been used on indoor stationary bikes. It would have required insight to consider the use of virtual competitions for outdoor exercise, where it had not previously been used. Automatic verification was a further step which was not obvious. Indeed, unless the skilled person had thought of virtual competitions against other athletes, automatic verification was pointless. Furthermore, the existing software packages would have required alteration, which itself was not obvious. In particular, software packages used human witnessed

verification rather than automatic verification, and certain of the software did not use an internet website to display comparison data.

Discussion

228. In his first report, Mr McKnight gave several examples of software for monitoring the performance of multiple athletes, and he explained that this feature was well-known. The known performance monitoring software for multiple athletes included Polar Training Advisor, various versions of PC Coach, UltraCOACH and CycleOps eTrainer. He also noted that the skilled person would know from his or her common general knowledge that the Internet allowed for effective worldwide dispersal of information. He said that it was an obvious solution to the problem of making results from different athletes widely and quickly available and was already widely used for that purpose. He also noted that UltraCOACH VR allowed for the display of performance data from multiple athletes on a website and that this software package would have been discovered by the skilled person at the outset of any development project.

229. As to virtual competitions between multiple athletes, the evidence focused on CycleOps eTrainer and UltraCoach VR, both of which would have been found on a routine search of commercially available products at the priority date. The experts agreed that the skilled team, when developing a GPS-based APMD, would have conducted such a search.

230. CycleOps was an indoor cycling system that converted an ordinary road bike into a stationary bike. The 'eTrainer' version was reviewed in 'Bicycling' magazine in January/February 1998, which was exhibited to Mr McKnight's first report. The review article said:

> "The eTrainer costs $1099 and with it you get constant monitoring of heart rate, power output, speed and cadence. The system analyses your workouts and suggests training plans. It's internet connectable so you can hammer with friends in distant cities. And to guarantee that you never escape that killer hill, even in the winter, you can record the route of your favourite rides and download them into the eTrainer for fun. CycleOps has also teamed up with Lance Armstrong so soon you will be able to record Armstrong's favourite 25-mile loop and race him. Or at least try."

231. Mr Farringdon was cross-examined about the CycleOps eTrainer system and accepted that it provided customised individual training plans, was adapted to receive athletic performance data from two or more athletes, display comparison data relating to those athletes, and facilitated virtual competitions via the Internet. He also accepted that, from the review article, the idea of virtual competitions would have been known to APMD manufacturers, and he did not appear to consider it inventive to display the results on an Internet website; T1/139/14 – 140/1:

> "Q. It would not make any difference, would it? If you have had the idea to do this virtual competition, whether it is using the display on your device or an internet website, there is no material difference, is there, Mr. Farringdon?

> A. I think once you have the internet piece down, you could choose the next, the other means over which you use the internet.
>
> Q. The idea really is the virtual competitions, is it not?
>
> A. That seems to be the feature that is prominent.
>
> Q. After this, this is going to be an idea that is known to Polar and Cardiosport and all the other heart rate monitor companies?
>
> A. Yes."

232. Mr Farringdon was also cross-examined about UltraCOACH. UltraCOACH was a multisport athletic training software program for athletes of all levels. It contained a training log for multiple sports, including swimming, running and cycling, that allowed training data to be inserted and analysed, and proposed workouts for the athlete. The standard edition of the software allowed users to insert workout data into a training log, including HRM data, body weight, calories and blood pressure; to produce future workouts from the software based on the previous workout data provided; and to analyse workout data using graphs and summary reports.

233. In addition to the UltraCOACH Standard Edition there were a number of other editions of the software available, including UltraCOACH HRM and UltraCOACH VR. UltraCOACH HRM incorporated all the features of the UltraCOACH Standard Edition, but also including the additional feature of allowing direct download of HRM data from HRM monitors, including the Polar Xtrainer Plus.

234. UltraCOACH VR incorporated all the features of UltraCOACH HRM, but also included the ability to connect cycle trainers, treadmills, stair steppers and rowing machines via a serial port to a computer and allowed live data to be downloaded from the fitness machine to the computer. This was promoted as allowing an individual to "train alone, against yourself (using a previous workout), with a friend or in a group, at a fitness centre (individually or networked) or on the Internet or at a website*"*.

235. UltraCOACH VR would have been found on a routine search, which the skilled person would have been motivated to perform when developing a GPS-based APMD. This software package disclosed the idea of an Internet website adapted to receive athletic performance feedback data from two or more athletes and display comparison data representing relative performance of the athletes, and an Internet website adapted to facilitate virtual athletic competitions.

236. In the light of the expert evidence, I conclude that the idea of an Internet website adapted to receive athletic performance feedback data from two or more athletes and display comparison data representing relative performance of the athletes, and an Internet website adapted to facilitate virtual athletic competitions, was known at the priority date.

237. In my view, the Patent is an "ideas" patent. At [297] – [317] of his first report, Mr Farringdon identified its inventive contribution exclusively in the proposed functionality of the device and associated system. In relation to virtual competitions, how the functionality is to be achieved is left to the skilled team and is not explained in

the Patent. Garmin acknowledged that there is no difficulty in principle in an ideas patent, if the other requirements for patentability are satisfied. An ideas patent is where the invention lies in having the ideas or concepts prescribed in the claims, rather than in any perceived difficulty of implementation once one had had those ideas; *Rovi Guides, Inc v Virgin Media Limited* [2015] EWCA Civ 781 per Floyd LJ at [18]. However, if the invention resides in an idea, and not the manner of its implementation, then if the idea is known or obvious, it cannot be patented. Whether such an idea should be implemented is a commercial decision and does not require technical innovation.

238. Even though I have concluded that the idea of virtual competitions etc. was known at the priority date, it remains necessary to consider whether it would have been obvious to use that idea in the context of a GPS-based APMD. Mr Nicholson powerfully submitted that such use was unprecedented. CycleOps eTrainer and UltraCOACH VR were used in conjunction with *indoor* training equipment, the whole point of which is to bring the outdoor environment, indoors. Cycle computers were not compatible with UltraCOACH VR. GPS is an outdoor technology. Thus, the skilled person would not be motivated to make a GPS-based APMD, which can only be used outdoors, compatible with software packaging for use with indoor equipment.

239. Whilst initially I found this argument attractive, on reflection, I do not accept that considering such a known solution for outdoor activity, in the context of a GPS-based APMD would have required any invention. Nor would the provision of means for verifying actual exercise activity. On the contrary, as the skilled person would have appreciated, the nature and technical characteristics of GPS data made it obvious to use for virtual competitions and verification of actual exercise activity. This, in my view, is supported not only by the evidence of Mr McKnight, but also by the evidence of Mr Farringdon at [333] – [334] of his first report.

240. As to virtual competitions, Mr Farringdon explained that utilising GPS position data from multiple GPS devices allows comparisons to be made over the same route and facilitates a virtual competition in which athletes can compete over the same route at different times. As to automatic verification, Mr Farringdon explained that the desirability of verifying actual exercise arises from the nature of GPS, since the GPS data recorded by the APMD may or may not be related to the athlete engaging in exercise. Therefore, in the context of a virtual competition, it is obvious in my view to use GPS data, and in particular average speed and pace to verify that the athlete has in fact engaged in the exercise. I accept the evidence of Mr McKnight that, in this context, there is no invention in automating what was previously done manually.

241. In my view, once the skilled person had embarked upon development of a GPS-based APMD, these aspects of GPS would be apparent. The idea was already known. No invention was required to use that known idea in the context of a GPS-based APMD.

242. I have also considered whether this conclusion is refuted by secondary evidence. Philips relied upon the fact that when Garmin introduced its first GPS-based APMD, it did not include any virtual competition facility. Furthermore, Garmin's advertising suggested that the use of a GPS-based APMD was of itself inspirational, and Garmin applied for a patent in respect of that feature.

243. I did not find this evidence of assistance. The prior art, and in particular Schutz, which rendered the use of a GPS-based APMD obvious, was only published shortly before the

priority date. There is no evidence that Garmin was aware of this prior art. I do not know of the history of development of Garmin's device. It was not an issue that was pleaded by Philips. There was no evidence of fact from either side about this development, which was largely pursued through the cross-examination of Mr McKnight, who had no personal knowledge of the issue. Nor was there evidence as to the accuracy of Garmin's advertising. There was no evidence as to why Garmin did not include a virtual competition facility in its first GPS-based APMD. Given that it was a known idea, there are many possible explanations. One explanation is that Garmin did not wish to introduce too many features at one time, or in one version. Another is that it did not like the idea. Since there was no obligation on Garmin to give evidence about nor disclosure in relation to its development I do not consider that this argument assists Philips' case.

Conclusion

244. For the reasons set out above, I conclude that claim 30A was obvious at the priority date and is invalid.

Claim CA1 – inventive step

Recommendations to increase or decrease levels of effort to meet pre-set performance targets

245. Claim CA1 adds a conditional amendment to claim 30A. There are two linked aspects to the conditional amendment, namely pre-set performance targets and recommendations.

246. As to pre-set performance targets, Mr McKnight explained that existing portable athletic performance monitors had long included functionality which enabled athletes to keep track of their pace and similar performance metrics. In particular, heart rate monitors could indicate whether the wearer's heart rate was above or below a target zone, enabling the wearer to stay consistently within that zone. He considered that it would have been obvious, in the light of this common general knowledge, to use pre-set targets in a GPS-based APMD. During cross-examination, he explained his reasoning at T3/400-401:

> "MR. NICHOLSON: As I understand it, your logic is that the sort of pre-set targets the patent is considering are technically equivalent to the target zones in a heart rate monitor?
>
> A. "Technically equivalent", I do not know that they use those words, but my reasoning is they are all feeding back data to a user in order to inform him whether his effort needs to be increased or decreased; whether that is to run faster or increase your heart. That sort of thing suggests target zones in all cases where someone is aiming to hit a specific level of effort and they need to either increase it or decrease it, it is letting it know you are in the zone."

247. Philips argued that such a feature was not obvious for cycle computers (contrary to a suggestion made at [290] of Mr McKnight's first report). In particular, there were safety

reasons, as a result of which speed and pace targets would not be appropriate for cyclists. This explained why, although heart rate zones had been a feature of HRM devices for several years before the priority date, speed, pace and distance targets had never been used in a cycle computer. Therefore, in the context of an obviousness attack based upon using GPSII+ as a cycle computer, inventiveness would be required to incorporate pre-set targets in a GPS-based APMD.

248. I agree that it was not obvious to incorporate this feature into a cycle computer. However, Schutz is clearly not exclusively cycle based. For runners, incorporation of pre-set targets was obvious, and I accept Mr McKnight's evidence on this issue.

249. As to effort recommendations, as noted in the summary of common general knowledge (supra), by the priority date, many APMDs allowed athletes to set performance monitoring targets and the devices gave feedback to the athletes as to whether they were meeting such pre-set targets. Numerous examples of HRMs with this feature were exhibited to Mr McKnight's first report. Such feedback constituted recommendations to increase or decrease levels of effort and this was very well-known in HRMs. I accept that such recommendations would not be obvious to include in a cycle computer and might be a safety risk. However, that was not the case for runners, who were a major target market for HRM manufacturers.

250. Philips pointed out that the recommendations have to be determined by reference to athletic performance feedback data, itself derived from GPS position data. That is correct, but in my view, such recommendations are merely the application of a well-known feature in the context of development of a GPS-based APMD. Mr McKnight was of the view that, given their use in HRMs, the utility of effort recommendations to enable runners using a GPS-based APMD to maintain pace was obvious, and I agree.

251. For the reasons set out above, I conclude that claim CA1, as proposed to be amended, was obvious at the priority date, and is invalid.

Claim CA2 – inventive step

252. Claim CA2 adds two conditional amendments to claim 1 as granted, namely means for providing audio presentation of real time performance information; and an audio entertainment system for providing the athlete with music during his/her exercise session, which is reduced in volume during the audio presentation of real-time performance information.

Means for providing audio presentation of real time performance information

253. As noted in the summary of common general knowledge (supra), at the priority date, many devices used audible alerts to provide feedback. Mr Farringdon accepted that use of audio alerts was standard for HRMs. An '*audio pacer signal for targets'* was a feature of at least one of Casio's sport watches. Philips submitted that audio feedback was not an obvious feature for cycle computers and had not been incorporated into such devices. I agree, but as Mr McKnight explained, and I accept, the applicability of audio feedback to runners using a GPS-based APMD was obvious.

An audio entertainment system for providing said athlete with music during his/her exercise session, which is reduced in volume during said audio presentation of real-time performance information

254. Philips divided the features of claim CA2 into three separate steps, each of which would require a separate realisation on behalf of the skilled person. In my view, this is artificial. Audio entertainment and volume reduction ("dimming") together form an integrated feature, and it makes sense to consider their inventiveness together.

255. First, Garmin argued that the claims required no more than the connection of a radio to the device of Schutz or Higham with manual adjustment of the volume control. This, it contended, was obvious in the light of widespread use of the Sony Walkman during exercise. Whilst I accept, as did Mr Nicholson, that the claim does not require the audio entertainment to be in the same casing as the portable performance monitor, I have rejected a construction of the claim that includes manual adjustment of volume control. Therefore, I reject this argument.

256. Secondly, and alternatively, Garmin submitted that the skilled person would have known that it was common at the priority date for people who exercise to listen to a portable music player. The skilled addressee would also be aware of existing athletic performance monitors that delivered performance feedback in the form of audio alerts. If a commercial decision were taken to produce an athletic performance monitor which delivered audio feedback and incorporated a music player, the problem of a potential conflict between the two audio outputs would be immediately apparent. The solution would also be immediately apparent, namely automatically to lower the volume of the music during audio feedback.

257. This submission requires an assessment of the expert evidence in relation to this feature. Garmin relied upon the evidence of Mr McKnight at [293] - [297] of his first report and [72] – [81] of his second report. He explained, and I accept, that it was very common at the priority date for people who exercised to listen to a portable music player whilst exercising. He also explained that the skilled person would have been aware that products were available in which a personal athletic performance monitor was combined with a music player in a single unit. He gave two examples. First, the Sony Sports Walkman with built-in stopwatch and lap timer. There was no suggestion that this Sony Walkman included any volume dimming feature, nor any audio performance feedback. Secondly, he referred to Sanyo's Sportable pedometer with cassette player and FM radio which included volume dimming. I have considered this above. The Sanyo Sportable was not common general knowledge at the priority date. The most recent advert for this device was dated August 1993, several years before the priority date, and it would not, in my view, have been found on a routine search in 1998. It was not pleaded as an obviousness citation. Mr McKnight gave no other examples.

258. Based on the two examples referred to above, Mr McKnight suggested that if a commercial decision were taken to produce a device which combined a music player with a personal athletic performance monitor and to maintain such an audio feedback feature it would have been obvious to the skilled person that the only realistic way would be to have both the music and the audio feedback in place with the same set of headphones. This meant that audio hardware such as amplification circuits and headphones could be used for both functions. The skilled person would understand that there would on occasion be conflict between the two audio sources and that the exercise

alert would be occasional and higher priority. Accordingly, he reasoned that the simplest solution, and possibly the only realistic solution to the conflict, would be to provide for the music signal to be cut or reduced in volume during the provision of audio alert information. If the music was reduced to a non-zero level, the only addition needed to make this work would be a mixer which allowed the two sound sources to be combined at levels which could be controlled.

259. I do not accept this evidence, for the following reasons. First, in the absence of any common general knowledge of such a system or any commercialised example of such a system which would be found on a routine search at the priority date this struck me as classic *ex post facto* step by step analysis; c.f. *Technograph* (supra). So did the cross-examination of Mr Farringdon on this issue, which followed the same approach. In contrast to the virtual competition feature, which was a known idea at the priority date which would have been discovered by a routine search at the priority date, the audio entertainment/dimming feature would not have been discovered by the skilled team at the priority date.

260. Secondly, rather than considering obvious developments in the light of the prior art, without knowledge of the Patent, Mr McKnight, having read the Patent, thought of logical steps to explain how the claimed features could have been arrived at, starting from GPSII+. Whilst in several instances he was able to explain and justify his approach, based on common general knowledge and commercialised examples, in this case he was not. His cross-examination revealed his approach at T3/366-368; see for example the following:

> "Q. As I understand what you have done, you have taken the patent, you have taken the prior art, you have worked out what the differences are between them and then said, "Does it involve a technical invention to get from what I see in GPS II+ to the claims of the patent"'
>
> A. I believe that is correct.
>
> Q. That is precisely what you do then. You proceed to explain a route of thinking that would take your skilled person from GPSII+ to the claims, at each stage trying to ask yourself whether anything clever is involved; would that be fair?
>
> A. Yes, going from one step to the next. I am just reading to make sure that that is a fair assessment, but it appears to be."

261. Thirdly, In Mr Farringdon's second report, he stated at [127] that it would require "blue sky thinking" at the priority date to conceive of a lifestyle device integrating location, athletic performance and audio entertainment. He noted that none of the prior art was concerned with integrating audio entertainment or enhancing the user interface of the device by providing performance feedback, let alone interaction between the two features. He expressed the view that even if Mr McKnight was correct on the scope and detail of the common general knowledge he did not think that the common general knowledge would give rise to the idea either. I agree with Mr Farringdon's characterisation of the combined audio entertainment and dimming feature as "blue sky thinking".

262. In the light of the expert evidence, I conclude that the combined audio entertainment and dimming feature was not obvious at the priority date. This conclusion is, in my view, corroborated by secondary evidence. Mr McKnight endeavoured to explain, why, if this feature was obvious, it had not been implemented before. His evidence was it was very common by the priority date for athletes (particularly runners) to listen to the music or the radio while exercising, normally through a pair of headphones. The Sony Walkman was one of the most well-known portable audio devices. He exhibited a number of examples from the 1980s onwards of various versions of the Sony Walkman which were branded sports. Also, he referred to devices which provided audio feedback to athletes and in particular audio alarms which alerted the user when his/her heart rate was too high or too low. Therefore, the apparent conflict between music and audio feedback existed well before the priority date.

263. Mr McKnight offered two explanations as to why this apparent conflict was not resolved before the priority date. First, he suggested that the introduction of this feature was delayed by concerns over size and battery power consumption which it was anticipated at the priority date would rapidly reduce. I do not accept this explanation. It did not stand up to cross-examination. At T3/349/9 to 351/9, Mr Nicholson demonstrated that there would have been no difficulty in 1998 in making the belt-worn size Walkman unit specifically disclosed in the Patent, incorporating audio entertainment, with a battery life which was sufficient for normal athletes. Secondly, Mr McKnight suggested during his cross-examination that the Sony Walkman devices were no longer popular by the priority date. I do not accept that evidence, which is not supported by Mr McKnight's written reports and exhibits.

264. Secondary evidence must be kept firmly in its place, as emphasised by the Court of Appeal in *Molnlycke v Procter & Gamble* [1994] RPC 49 at 112. It is no more than an aid to assessment of the primary evidence. However, in an appropriate case, secondary evidence may provide a useful cross-check against hindsight. In *Schlumberger* (supra) Jacob LJ explained the relevance of secondary evidence at [77]:

> "It generally only comes into play when one is considering the question "if it was obvious, why was it not done before?" That question itself can have many answers showing it was nothing to do with the invention, for instance that the prior art said to make the invention obvious was only published shortly before the date of the patent, or that the practical implementation of the patent required other technical developments. But once all other reasons have been discounted and the problem is shown to have been long-standing and solved by the invention, secondary evidence can and often does, play an important role. If a useful development was, in hindsight, seemingly obvious for years and the apparently straightforward technical step from the prior art simply was not taken, then there is likely to have been an invention."

265. In the present case, the prior art relied upon does not deprive the audio entertainment and dimming feature of inventive step. There is no adequate explanation as to why, if the solution was obvious, it was not generally implemented in APMDs well before the priority date.

Conclusion

266. For the reasons set out above, I conclude that claim CA2, as proposed to be amended, was not obvious at the priority date, and is valid.

Claim CA3 – inventive step

267. Claim CA3 combines conditional amendments 1 and 2. It includes both effort recommendations to meet pre-set performance targets and audio-entertainment/ dimming. In my view, it adds nothing inventive to claim CA2.

Claim 30B – inventive step

268. Claim 30B is the narrowest claim, which combines conditional amendments 1 and 2 with the virtual competition feature. In my view, this combination adds nothing inventive to claim CA2. In addition, claim 30B incorporates claim 29 as granted. I have concluded that this feature adds nothing inventive to claim CA2, for the following reasons:

Customised individual training advice on the Internet website (feature P claim 29)

269. Mr McKnight explained at [339] of his first report that customised individual training advice was provided by each of PC Coach, UltraCOACH and Polar Training Adviser. A good example is Polar Training Adviser, used in conjunction with Polar Xtrainer Plus. The Polar XTrainer Plus was not just a cycle computer. It was also advertised for runners, as illustrated in a photograph contained in Mr McKnight's first expert report.

270. A fuller description of the 'Polar Training Advisor' software appeared on Polar's website, which included the following:

> "The application offers analysis, comparison and tracking of training progress for a number of individuals or teams by integrating a graphical analyses tool with an easy to use, flexible training log, sports diary and planner… The Polar Training Advisor Software will give the user training guidelines based on [the user's] existing fitness levels and training goals… the more information the software has to work on, the more reliable the training guidelines. These guidelines are particularly useful for novice and intermediate athletes as well as fitness enthusiasts"

271. The "training guidelines" are customised individual training advice. Mr Farringdon accepted at T1/129-30 that this described analysis software that was adapted to receive athletic performance from two or more athletes, display performance data for two or more athletes which can be directly compared, and is adapted to display customised training advice. He further accepted that Polar's competitors would be aware of these features from the website.

272. In my view, there was nothing inventive in this feature of the claim at the priority date, whether alone, or in combination with the other features of the claim. I accept Mr McKnight's evidence that this was an obvious feature for the skilled person to include, in the light of those software packages, when developing a GPS-based APMD.

Conclusions in relation to inventive step

273. In summary:

i) Claim 30A corresponds to granted claims 1, 24, 26, 27 and 30. For the reasons set out above, I conclude that this claim was obvious at the priority date.

ii) Claim CA1 adds the feature of recommendations to increase or decrease levels of effort. I have found that this additional feature was obvious at the priority date. I conclude that claim CA1 was obvious at the priority date.

iii) Claim CA2 adds the feature of an audio entertainment system for providing the athlete with music during his/her exercise session, which is reduced in volume during the audio presentation of real-time performance information. I have found that this additional feature was inventive at the priority date. I conclude that claim CA2 was not obvious at the priority date.

iv) Claim CA3 combines the features of Conditional Amendments 1 and 2 with claim 30A. This claim adds nothing that is inventive to claim CA2. It was not obvious at the priority date, for the same reason that claim CA2 was not obvious.

v) Claim 30B is the narrowest claim, which adds nothing that is inventive to claim CA2. It was not obvious at the priority date, for the same reason that claim CA2 was not obvious.

Obviousness of claims 30A/B on an 'MFI' basis over Concept II

274. Concept II is a compilation of pages from the website of Concept II, Inc. – www.concept2.com – a company that manufactured the indoor rowing machine

branded "Concept II". It was relied upon by Garmin in the event that the collocation attack was successful against claims 30A or 30B. In that event, Garmin contended that those claims were obvious in the light of Concept II. Since I have rejected the collocation attack against those claims, this contention must also be rejected.

Excluded subject matter - presentation of information

Legal principles

275. Section 1(2) of the Patents Act 1977 lists subject matter that is excluded from patentability "as such".

> "(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—
>
> […]
>
> (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."

276. The Court of Appeal in *Aerotel Ltd v Telco Holdings Ltd and others* [2006] EWCA Civ 1371 at [40] set out a four stage test to be applied when considering excluded subject matter, namely to:

i) properly construe the claim;

ii) identify the actual contribution;

iii) ask whether it falls solely within the excluded subject matter; and

iv) check whether the actual or alleged contribution is actually technical in nature.

277. Step (iii) relates to the "as such" qualification. Cases subsequent to *Aerotel* have placed particular emphasis on the requirement that the actual contribution must be technical; see *Symbian Ltd v Comptroller General of Patents, Designs and Trade Marks* [2009] EWCA Civ 1066, at [11]. The principle was summarised by Kitchin LJ (as he then was) in *HTC Europe v Apple* [2013] EWCA Civ 451, at [44]. He said:

> "For the reasons given in *Symbian*, I believe we must continue to consider whether the invention made a technical contribution to the known art, with the rider that novel or inventive purely excluded subject matter does not count as a technical contribution. Further, in addressing that issue I believe it remains appropriate (though not strictly necessary) to follow the four stage structured approach adopted in *Aerotel*."

278. In relation to the presentation of information, a new technical feature in the manner that information is generated or presented may be sufficient to avoid excluded subject matter as such. In *Gemstar-TV Guide International Inc v Virgin Media Ltd*, [2009] EWHC 3068 at [56] and [57], Mann J considered the EPO Guidelines current at the time of his decision. The Guidelines included the following:

> "If, however, the presentation of information, as distinct from the information content, has new technical features, there could be patentable subject-matter in the information carrier or in the process or apparatus for presenting the information"

279. Mann J referred to this passage in the Guidelines and said:

> "If the presentation of information has some technical features over and above the information and its delivery, then it might be patentable. So the contrast is between the content or its mere delivery, on the one hand, and that material plus some additional technical aspect of its delivery, on the other. That approach is consistent with the law on computer programs, discussed above.
>
> […]
>
> So what achieves patentability is some real world technical achievement outside the information itself."

280. The authors of *Terrell on Patents* consider the exclusion of presentation of information as such at [2-123] – [2-124]. They submit that the EPO Guidelines for Examination current at the time of the 18th Edition of Terrell (November 2015) G-II 3.7 support the view that there is no reason why a novel and inventive method of presenting information should be excluded from patentability, provided that the information content itself is not claimed. That conclusion is supported, in my view, by consideration of the current EPO Guidelines – the key point is to ensure that the claimed feature is not in substance a claim to information content.

281. A practical application of these principles is illustrated by the judgment of Arnold J in *HTC Corp v Yozmot* [2010] EWHC 786 (Pat); [2010] 4 WLUK 254. The case concerned a customised call message on a mobile phone which allowed music or a spoken message to be assigned and played for a particular caller. Arnold J held that this involved a "technical solution" to the problem of identifying unknown callers and therefore had technical character. The fact that the invention involved the presentation of audible information did not mean that its contribution lay solely in that area. He said at [170]:

> "HTC contend that the claimed invention falls within the exclusion from patentability contained in section 1(2)(d) of the Patents Act 1977 in respect of "the presentation of information". Since I have decided that claims 1, 5 and 6 are invalid for lack of novelty and obviousness, this objection is only relevant to claim 7. HTC says that the contribution made by the claimed invention is no more than the presentation of information in an audible way. Accordingly, HTC contends that this is not a

> technical contribution, but one which falls solely within excluded subject matter. In support of this argument, HTC relies upon the decision of Mann J in *Gemstar-TV Guide International Inc v Virgin Media Ltd* [2009] EWHC 3068 (Pat) at [52]-[60]. I do not accept this argument. While the invention of claim 7 involves the audible presentation of information, in my judgment the contribution made by the invention does not lie solely in that area, but on the contrary has a technical character. The invention provides a technical solution to the problem of identifying unlisted or unknown callers."

282. Mr Cuddigan added further submissions to the somewhat prosaic analysis that I have so far provided. First, he pointed out, correctly, that the court must look at the substance of the matter, rather than merely the form of the claims. Secondly, he pointed to the current EPO Guidelines (November 2018 Ch 2.18 (3.7) and cited the following passage, to which I have added paragraph numbers:

> "During the assessment of inventive step, features related to the presentation of information are analysed to determine if, in the context of the invention, they contribute to producing a technical effect serving a technical purpose. If not, they make no technical contribution and cannot support the presence of an inventive step (G-VII,5.4)… [paragraph 1]
>
> A feature defining a presentation of information produces a technical effect if it credibly assists the user in performing a technical task by means of a continued and/or guided human-machine interaction process (T336/14 and T1802/13)… [paragraph 2]
>
> Non-technical information such as the state of a casino game, a business process or an abstract simulation model is exclusively aimed at the user for his subjective evaluation or non-technical decision-making. It is not directly linked to a technical task. Therefore, such information does not qualify as an internal state prevailing in a technical system [paragraph 3]"

283. Paragraph 1 applies essentially the same test as the UK authorities which I have considered. If features related to the presentation of information produce a technical effect serving a technical purpose then the contribution made by the invention may not lie solely in the presentation of information.

284. Mr Cuddigan argued that paragraph 2, and the two decisions of the Technical Board of Appeal referred to therein, established a general principle that a feature defining presentation of information must assist the user in performing a technical task by means of a continued or guided human-machine interaction process. That is a useful test applied by EPO examiners to ensure consistency of decision making. It is useful if one is focusing solely on a feature of the claim which relates to presentation of information. It cannot, in my judgment, be regarded as a test of general application to process or apparatus claims, which may provide technical solutions to technical problems, where the end result is presentation of information. The actual contribution of the invention

must be looked at in its entirety to see whether it provides a technical solution to a technical problem.

285. Mr Cuddigan also relied upon paragraph 3, and its reference to casino games, to draw analogies to the present case. I did not find such analogies of assistance. In relation to the exclusion of presentation of information as such, each case turns on its own facts, as is illustrated by reference to decisions of the TechnicaI Boards of Appeal. Attempts to formulate further tests merely distract from the essential question, which is whether the actual contribution is technical.

Application to the facts – claim CA2

286. In the light of my conclusions in respect of inventive step, the actual contribution of the invention is to be found in claim CA2. It is the feature of audio entertainment and volume dimming during presentation of real time performance information, i.e. "an audio entertainment system for providing said athlete with music during his/her exercise session, which is reduced in volume during said audio presentation of real-time performance information".

287. Mr Cuddigan contended that this contribution was presentation of information as such, and therefore excluded subject matter, for the following reasons. First, he relied upon his construction of this feature of the claim i.e. that the claim included a standard speaker and a music player with variable volume, which would be manually adjusted by the user. He contended that the addition of such standard equipment did not provide any technical contribution and in substance, was merely apparatus wrapped up in the claim. As I have rejected this construction, I also reject this submission.

288. Secondly, he contended that, even if he was wrong on construction, the essential feature of the claim was to turn down the volume, which is the audio equivalent of filtering out visual information and as such is a purely presentational feature. He argued that the content does not relate to the operational state of the device, gives no interaction with the device and is provided for a non-technical purpose. The only effect produced is an athlete who is simultaneously entertained and informed about his own performance, which is not technical a technical feature.

289. Thirdly, he argued that the manner of presentation does not assist the user in performing a technical task by means of a continued or guided human machine interaction process. The use of sound was merely one well-known way in which information can be communicated to a human being. Accordingly, the contribution of claim CA2 resided in non-technical, excluded subject matter.

290. Interesting as I found these arguments, I do not accept them. The combined feature of audio entertainment and volume dimming during presentation of real time performance information is technical. As I have explained, Garmin's submission ignores the technical solution that the Patent has provided to the technical problem of how to enable the athlete to simultaneously listen to music from an audio entertainment system and to be provided with aural feedback on his/her performance. The solution is to introduce aural feedback to the personal performance monitor in a manner that enables the aural signal to be combined with the music, by automatically reducing the music volume when the device presents aural real-time performance information.

291. The skilled person would understand that the system disclosed and claimed in the patent was a single integrated system with a switching mechanism which ensured that the music volume would lower to enable the athlete to hear real-time performance information. Both experts agreed that, having read the Patent, the skilled person would implement such a system by use of a mixer or switching mechanism to ensure that the music volume would lower to enable the athlete to hear real-time performance information. That is a substantive technical contribution, and not presentation of information as such.

Presentation of information – other claims

292. For the sake of completeness, I should add that, if I am wrong about inventive step, and the actual contribution lies in other features of the claims, then I would have rejected Garmin's case based on excluded subject matter. Garmin's argument depended on its case on construction, which I have rejected.

293. Whilst there is no doubt that information is presented on the website, that is the end product of the operation of the feedback system, and cannot be viewed in isolation. I accept that the portable personal performance monitor can be used independently of the wider feedback system, but the wider feedback system cannot be used independently of the portable personal performance monitor. In the feedback system it is the external/remote computer that is required to provide regular updates, to verify actual exercise activity, and to generate comparison data representing the relative performance of athletes. As a result of such verification and comparison, the feedback system is adapted to facilitate virtual competition. In my judgment, the overall system is a new system that did not exist previously, and which is able to use GPS-based data e.g to facilitate virtual competitions by outdoor athletes. Its contribution is technical, and not confined to presentation of information as such.

Conclusion

294. The Patent discloses and claims a very important concept, namely a GPS-based athletic performance monitoring device. I can understand why Philips initially asserted that this was an art changing invention. That concept may be said to have given rise to a new industry. However, it was obvious at the priority date in the light of the published prior art.

295. The Patent also discloses and claims a number of other concepts. I have decided that many of them would have been obvious to the skilled person at the priority date, when developing a GPS-based APMD. However, the concept claimed by conditional amendment 2 was, in my judgment, inventive at the priority date and I shall allow that amendment to be made. Claim CA2 is infringed, although, as I understand the position explained by Mr Nicholson, only by a small proportion of the 73 products the subject of the claim for infringement.