Patents Act 1977 **Opinion Number** **07/22**

OPINION UNDER SECTION 74A

Patent	GB 2590988 B
Proprietor(s)	Prevayl Innovations Limited
Exclusive Licensee	
Requester	Prevayl Innovations Limited
Observer(s)	Mewburn Ellis LLP
Date Opinion issued	18 May 2022

The request

1. The Comptroller has been requested by Prevayl Innovations Limited ("the requester") to issue an opinion as to whether claims 1, 2, 5-7 and 20-22 of GB 2590988 B ("the Patent") are infringed by the MZ-Switch Heart Rate Monitor ("MZ-Switch") distributed by Myzone Holdings Limited and represented by Mewburn Ellis LLP ("the observer").

2. The request includes the following evidence describing the MZ-Switch:

   A1 – screenshot of https://buy.myzone.org/product/?code=MZ-Switch&lang=enGB

   A2 - MZ-Switch user manual

   A3 – External photos of the MZ-Switch obtained from https://fccid.io/OVJMZSW/External-Photos-5201836

   A4 – Internal photos of the MZ-Switch obtained from https://fccid.io/OVJMZSW/Internal-Photos-520827

3. Observations were received 15th March 2022 and observations in reply were received 29th March 2022.

The patent

4. The patent, GB 2590988 B, is titled "Electronics module for a wearable article". It was filed on 19th February 2020, published on 14th July 2021 and granted on 29th December 2021. The patent remains in force.

5. The patent relates to an electronics module for a wearable article. The patent

explains that wearable articles can be designed to interface with a wearer of the article, and to determine information such as the wearer's heart rate, rate of respiration, activity level, and body positioning. Such properties can be measured with a sensor assembly that includes a sensor for signal transduction and/or microprocessors for analysis. The articles include electrically conductive pathways to allow for signal transmission between an electronics module for processing and communication and sensing components of the article.

6. Figure 1 below shows an example system 10 comprises an electronics module 100, a garment 200, and a mobile device 300. The garment 200 is worn by a user 400. The electronics module 100 is removably coupled to the garment 200. The electronics module 100 is arranged to integrate with sensing components incorporated into the garment 200 so as to obtain signals from the sensing components. The sensing components comprise electrodes.

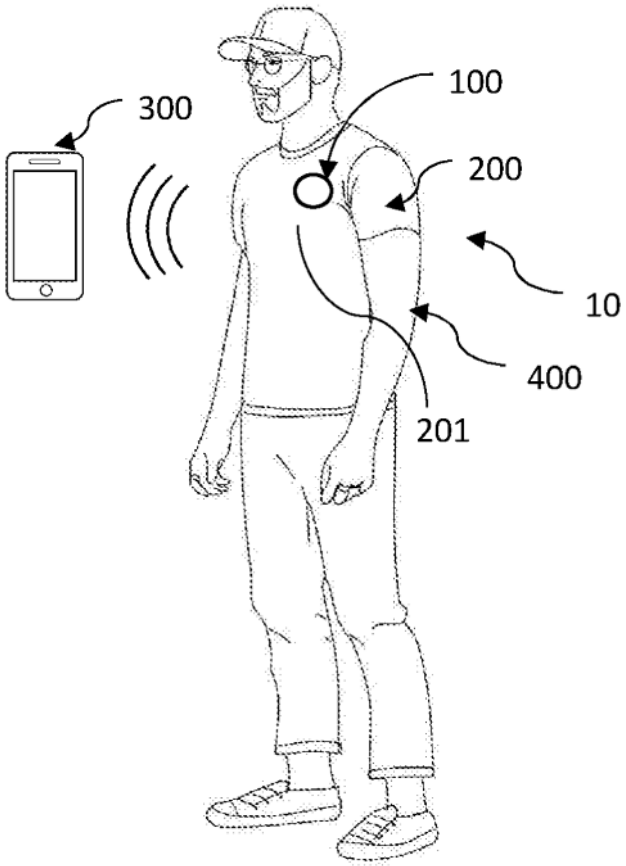

Fig. 1

7. Beneficially, the removable electronic module 100 may contain all of the components required for data transmission and processing such that the garment 200 only comprises the sensor components and communication pathways. In this way, manufacture of the garment 200 may be simplified. In addition, it may be easier to clean a garment 200 which has fewer electronic components attached thereto or incorporated therein. Furthermore, the removable electronic module 100 may be easier to maintain and/or troubleshoot than embedded electronics.

8. The electronics module 100, illustrated in figure 5 below, comprises an interface in the form of electrical contacts 121, 123 that extend through the outer layer of fabric material 103. The first electrical contact 121 conductively connects with a first terminal region 211 of the garment 200. The first terminal region 211 enables the electronics module 100 to conductively connect to sensing components of the garment 200 via first electrically conductive pathway 213 of the garment 200. The second electrical contact 123 conductively connects with a second terminal region 215 of the garment 200. The second terminal region 215 enables the electronics module 100 to conductively connect to sensing components of the garment 200 via second electrically conductive pathway 217 of the garment 200. The sensing components may be one or more electrodes. The electronics module 100 includes a sensor 105 arranged to monitor a property of the user. The sensor 105 may be, for example, a temperature sensor 105 arranged to monitor a core body temperature or skin-surface temperature of the user. The sensor 105 may be, for example, a humidity sensor 105 arranged to monitor a hydration or sweat level of the user. The material 103 includes a window aligned with the sensor such that the sensor has line of sight through the housing.

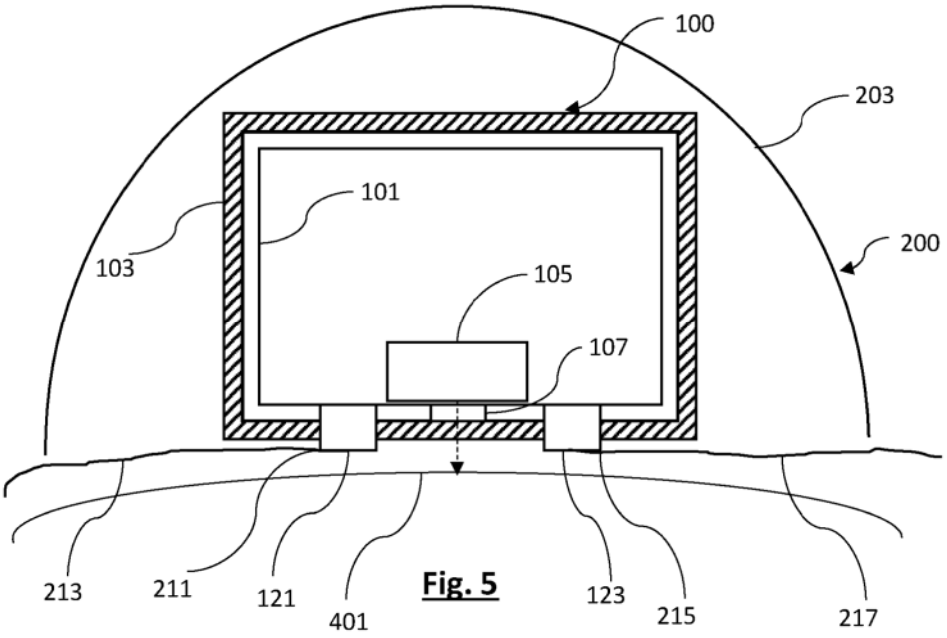

Fig. 5

9. The patent has 22 claims including a single independent claim 1. Claim 1, adopting the references used by the requester, reads:

1A A wearable assembly comprising:

1B a wearable article comprising conductive elements, the conductive elements comprising first and second terminal regions,

1C first and second conductive pathways, and first and second electrodes, the first terminal region is electrically connected to the first electrode by the first conductive pathway, the second terminal region is electrically connected to the second electrode by the second conductive pathway;

1D an electronics module arranged to be removably coupled to the wearable article, the electronics module comprising:

1E a housing comprising a top surface and a bottom surface;

1F a processor disposed within the housing;

1G a first electrical contact arranged to interface with the first terminal region of the wearable article, when the electronics module is coupled to the wearable article, so as to receive signals from the first electrode and provide the same to the processor, wherein the first electrical contact extends through the bottom surface of the housing;

1H a second electrical contact arranged to interface with the second terminal region of the wearable article, when the electronics module is coupled to the wearable article, so as to receive signals from the second electrode and provide the same to the processor, wherein the second electrical contact extends through the bottom surface of the housing; and

1I a sensor disposed within the housing proximate to the bottom surface, the sensor being arranged to monitor a property of a user wearing the electronics module through the housing;

1J wherein the housing comprises a window aligned with the sensor such that the sensor has line of sight through the housing.

10. The requester has requested I also consider whether the MZ-Switch infringes dependent claims 2, 5-7 and 20-22 which read:

2. A wearable assembly as claimed in claim 1, wherein the window is constructed from a transparent, translucent, or light-diffracting material.

5. A wearable assembly as claimed in any preceding claim, wherein the sensor comprises an optical sensor.

6. A wearable assembly as claimed in claim 5, wherein the optical sensor comprises a photoplethysmography, PPG, sensor.

7. A wearable assembly as claimed in any preceding claim, wherein the electronics module further comprises a light source disposed within the housing, the light source is arranged to emit light through the housing.

20. A wearable assembly as claimed in any preceding claim, wherein the electronics module further comprises a communicator arranged to communicate with an external device.

21. A wearable assembly as claimed in any preceding claim, wherein the first and second electrical contacts are spaced apart from one another.

22. A wearable assembly as claimed in claim 21, wherein the sensor is located between the first and second electrical contacts.

Claim construction

11. Before I can consider whether the patent could be infringed, I need to construe the claims of the patent – that is to say, I must interpret them in the light of the description and drawings as instructed by Section 125(1):

> *125(1) For the purposes of this Act an invention for a patent for which an application has been made or for which a patent has been granted shall, unless the context otherwise requires, be taken to be that specified in a claim of the specification of the application or patent, as the case may be, as interpreted by the description and any drawings contained in that specification, and the extent of the protection conferred by a patent or application for a patent shall be determined accordingly.*

12. In doing so I must interpret the claims in context through the eyes of the person skilled in the art. Ultimately the question is what the person skilled in the art would have understood the patentee to be using the language of the claims to mean. This approach has been confirmed in the recent decisions of the *High Court in Mylan v Yeda*[1] and the *Court of Appeal in Actavis v ICOS*[2].

13. I consider the person skilled in the art to be a designer and manufacturer of electronic modules for wearable articles.

14. The main point of contention in relation to claim construction appears to reside in the interpretation of the scope of the feature 1l relating to 'a sensor disposed within the housing proximate to the bottom surface, the sensor being arranged to monitor a property of a user wearing the electronics module through the housing'.

15. The observer contends the skilled person attempting to make technical sense of granted claim 1, would interpret feature 1l as requiring the sensor to be arranged to monitor a property of a user when the user is wearing the wearable article, and when the electronics module is coupled to the wearable article. The observer argues that this is the only technically sensible interpretation of the requirement of feature 1l and that interpreting the feature such that the sensor is arranged to monitor a property of a user when the user is wearing the electronics module, but not when the electronics module is coupled to the wearable article, is illogical and does not make technical sense.

16. The requester considers construing feature 1l in this limited way is to not interpret the claim as a whole as required under the general principles of claim interpretation. The requester explains that the claim defines how the electronics module can be coupled to the wearable article but may also be removed from the wearable article and coupled to other wearable articles or used independently of the wearable article. The requester argues that the claim does not require the sensor to be arranged to monitor a property of a user when the user is wearing the wearable article, and when the electronics module is coupled to the wearable article.

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[1] Generics UK Ltd (t/a Mylan) v Yeda Research and Development Co. Ltd & Anor [2017] EWHC 2629 (Pat)

[2] Actavis Group & Ors v ICOS Corp & Eli Lilly & Co. [2017] EWCA Civ 1671

17. I agree with the requester on this point. I am unable to identify anything in the Patent that would justify deviating from a normal interpretation of the language used in the claim. The claim sets out that the electronics module is removably coupled to the wearable article (feature 1D) and that the first and second electrical contacts are arranged to interface with the first and second terminal regions of the wearable article respectively, when the electronics module is coupled to the wearable article (features 1G and 1H). The claim further defines the sensor as arranged to monitor a property of a user when the user is wearing the electronics module (feature 1I). However, the claim does not define the sensor as necessarily monitoring a property of a user when the user is wearing the electronics module **and** when the electronics module is coupled to the wearable article. I agree with the requester that the claim defines how the electronics module can be coupled to the wearable article but may also be removed from the wearable article and used independently of the wearable article.

18. Therefore, I construe feature 1I to define, within its scope, the sensor being arranged to monitor a property of a user when the user is wearing the electronics module, but not when the electronics module is coupled to the wearable article.

19. There is no contention over how the remainder of claim 1 or the dependent claims ought to be construed and I find the language of the claims plain, presenting no further issues regarding construction.

Infringement - the law

20. Section 60 Patents Act 1977 governs what constitutes infringement of a patent:

> *(1) Subject to the provision of this section, a person infringes a patent for an invention if, but only if, while the patent is in force, he does any of the following things in the United Kingdom in relation to the invention without the consent of the proprietor of the patent, that is to say –*
>
> > *(a) where the invention is a product, he makes, disposes of, offers to dispose of, uses or imports the product or keeps it whether for disposal or otherwise;*
> >
> > *(b) where the invention is a process, he uses the process or he offers it for use in the United Kingdom when he knows, or it is obvious to a reasonable person in the circumstances, that its use there without the consent of the proprietor would be an infringement of the patent;*
> >
> > *(c) where the invention is a process, he disposes of, offers to dispose of, uses or imports any product obtained directly by means of that process or keeps any such product whether for disposal or otherwise.*
>
> *(2) Subject to the following provisions of this section, a person (other than the proprietor of the patent) also infringes a patent for an invention if while the patent is in force and without the consent of the proprietor, he supplies or offers to supply in the United Kingdom a person other than a licensee or other person entitled to work the invention with any of the means, relating to*

an essential element of the invention, for putting the invention into effect when he knows, or it is obvious to a reasonable person in the circumstances, that those means are suitable for putting, and are intended to put, the invention into effect in the United Kingdom.

21. The request has made no indication that indirect infringement under 60(2) is to be considered.

22. In *Actavis v Eli Lilly*[3], Lord Neuberger states that the problem of infringement is best approached by addressing two issues, each of which is to be considered through the eyes of the notional addressee of the patent in suit, i.e. the person skilled in the relevant art. Those issues are:

> *(i) does the variant infringe any of the claims as a matter of normal interpretation; and, if not,*
>
> *(ii) does the variant nonetheless infringe because it varies from the invention in a way or ways which is or are immaterial?*

23. If the answer is “yes” to either question, there is infringement; otherwise there is not.

24. The second issue to be addressed is whether the variant provided by the product varies in a way that is immaterial. The court in *Actavis* provided a reformulation of the three questions in *Improver* [4] to provide guidelines or helpful assistance in connection with this second issue. These reformulated questions are:

> *(i) Notwithstanding that it is not within the literal meaning of the relevant claim(s) of the patent, does the variant achieve substantially the same result in substantially the same way as the invention, i.e. the inventive concept revealed by the patent?*
>
> *(ii) Would it be obvious to the person skilled in the art, reading the patent at the priority date, but knowing that the variant achieves substantially the same result as the invention, that it does so in substantially the same way as the invention?*
>
> *(iii) Would such a reader of the patent have concluded that the patentee nonetheless intended that strict compliance with the literal meaning of the relevant claims(s) of the patent was an essential requirement of the invention?*

25. To establish infringement in a case where there is not literal infringement, a patentee would have to establish that the answer to the first two questions was "yes" and that the answer to the third question was "no".

26. The first step in determining if there is any infringement under section 60(1) is to consider whether the MZ-Switch falls within the scope of the claims of the patent.

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[3] Actavis UK Limited and Others v Eli Lilly and Company [2017] UKSC 48
[4] Improver [1990] FSR 181

MZ-Switch

27. The MZ-Switch assembly is an exercise tracker kit which can be used in monitor heart rate via a user's chest, arm or wrist. It includes an MZ-Switch sensor module, chest strap, wrist strap and arm strap (as shown in the illustration below). The MZ-Switch sensor module can be interchangeably used with each of these straps.

28. As explained by the observer a key feature of the MZ-Switch product is that it is configured to switch between two independent modes:

    (a) Photoplethysmography ('PPG') mode; and

    (b) Electrocardiography ('ECG') mode.

    The control circuitry of the MZ-Switch sensor module is configured to switch between the two modes. The PPG and ECG measurements cannot be taken at the same time. PPG measurements are taken when the MZ-Switch sensor module is located on the wrist or arm strap worn by the user. The PPG sensor is activated by an on/off switch. Separately, ECG measurements are taken when the MZ-Switch sensor module is located on the chest strap.

29. In the PPG mode of the MZ-Switch sensor module, the module is attached to the wrist or arm strap by way of frame 52 as shown in figure 1 below. In this mode, the PPG sensor located on the back of the MZ-Switch sensor module is in contact with the user's skin. There is no electrical connection between the wrist or arm strap and the electrical contacts of the MZ-Switch sensor module, and there is no electrical skin contacts or electrodes on the wrist or arm strap.

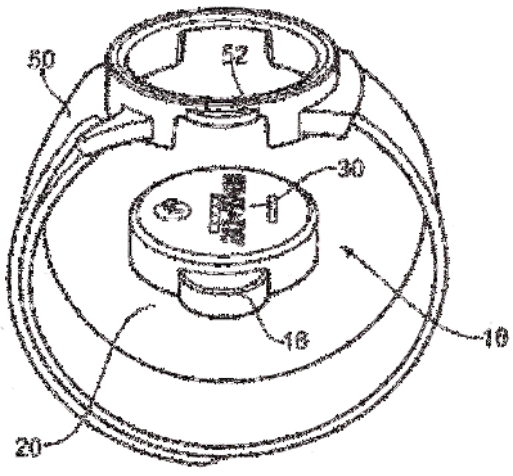


Figure 1 – MZ-Switch PPG mode

30. In the ECG mode of the MZ-Switch sensor module, the module is attached to the chest strap (shown below). In the ECG mode, there is an electrical connection between terminal pins on the back of the MZ-Switch sensor module and fasteners 62 of the chest strap. The fasteners are in electrical connection with external skin contacts 64 on the chest strap, which act as ECG electrodes.

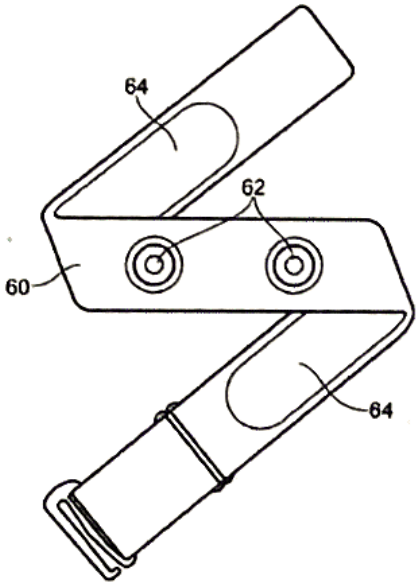
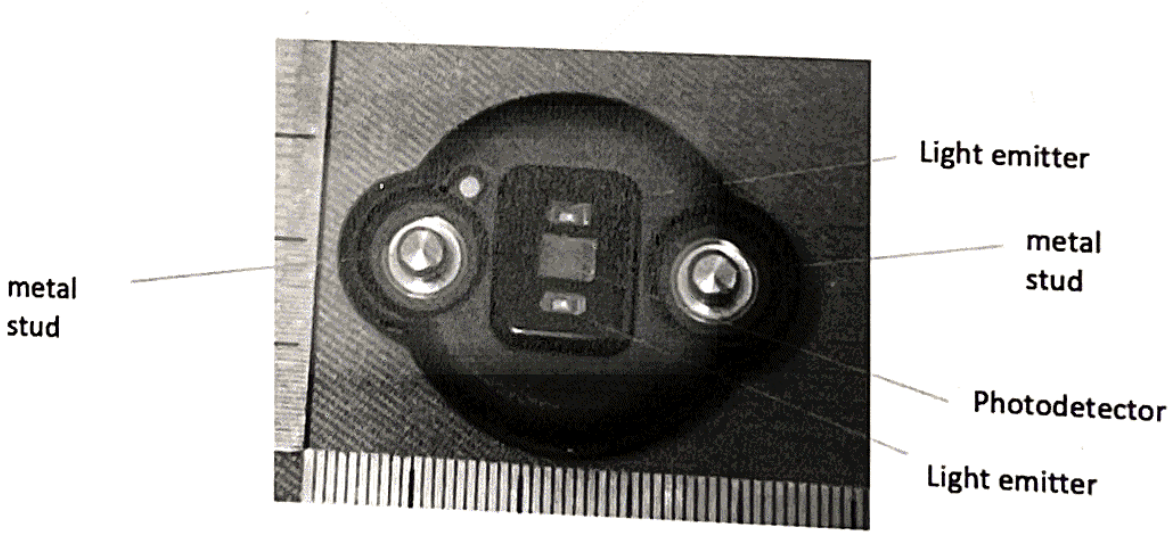
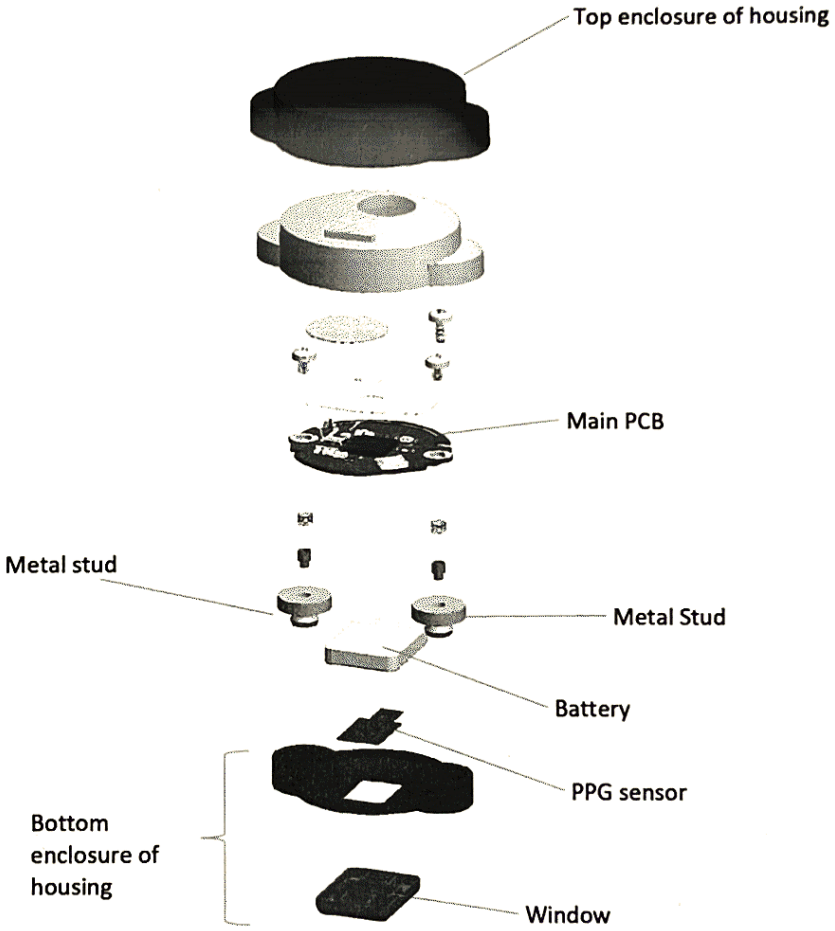


Figure 2 – ECG Mode

31. In the ECG mode, the PPG sensor on the back of the MZ-Switch sensor module is not in operation, and there is no optical pathway between the PPG sensor and the skin of the user. The chest strap does not include an optical window and the PPG sensor simply rests against the chest strap in an inactive state.



32. An exploded view of the MZ-Switch sensor module as provided by the requester is reproduced below. The module includes a processor disposed on the main PCB; metal studs for connection with the fasteners 62 of the chest strap; a PPG sensor; and an optically transparent window aligned with the PPG sensor.



Does the MZ-Switch infringe the Patent as a matter of normal interpretation?

33. The observer argues that claim 1 is directed to a “wearable assembly” which includes both a “wearable article” and also an “electronics module” and that the claim clearly requires that the wearable article comprises conductive elements. Therefore, the PPG mode of the MZ-Switch assembly does not infringe since the wrist or the arm straps of the MZ-Switch assembly do not include any conductive elements. I agree with the observer on this point.

34. I will now consider the ECG mode of the MZ-Switch to see whether the MZ-Switch assembly falls within the scope of claim 1.

35. I consider it to be clear that the chest strap has all of the features of the wearable article of claim 1 i.e. features 1B and 1C. The chest strap has fasteners 62 (first and second terminal regions) in electrical connection (via first and second conductive pathways) with external skin contacts 64 (first and second electrodes).

36. I consider it also clear that the MZ-Switch sensor module includes all of features 1C-1H of the electronics module of claim 1. The requester or the observer have not provided any argument to dispute this. As discussed above the argument appears to hinge on the interpretation of the scope of feature 1I in claim 1.

37. The requester alleges the MZ-Switch assembly directly infringes claim 1 the patent as the PPG sensor assembly includes a photodetector that measures light reflected from a skin surface of the user. The photodetector is thus arranged to monitor a property of a user wearing the electronics module through the housing. Furthermore, the housing includes an optically transparent window which provides the sensor with a line of sight through the housing as required by feature 1J. Therefore, the requester contends that the MZ-Switch assembly has all of the features of claim 1 and thus infringes the patent.

38. The observer contests that when the MZ-Switch sensor module is used with the chest strap, the chest strap is positioned between the MZ-Switch sensor module and the user. The chest strap is not provided with an opening or window and as a result the PPG sensor does not have line of sight with the user and thus the PPG sensor cannot monitor a property of a user wearing the electronics module through the housing. The observer argues that the MZ-Switch sensor assembly when removably coupled to the chest strap does not include features 1I and 1H as required by claim 1.

39. As discussed above I am in agreement with the requester in relation to the interpretation of the scope of feature 1I. There is no requirement in claim 1 for the electronics module to be coupled to the wearable article when the sensor is monitoring a property of a user wearing the electronics module. The fact that the PPG sensor is redundant when the MZ-Switch sensor module is used with the chest strap does not mean it falls outside the scope of claim 1.

40. The MZ-Switch sensor module has a sensor (PPG sensor) disposed within the housing proximate to the bottom surface, the sensor being arranged to monitor a property of a user wearing the electronics module through the housing (i.e. in the PPG mode when used with the wrist or arm straps). Furthermore, MZ-Switch sensor module housing comprises a window aligned with the sensor such that the sensor has line of sight through the housing (i.e. the optically transparent window). The fact that the line of sight outside the housing is blocked by the chest strap does not mean feature 1H is not satisfied. It is my opinion that the MZ-Switch assembly falls within the scope of claim 1 of the patent. Therefore, the importation, disposal and/or manufacture thereof in the UK would constitute infringement under section 60(1).

41. As the answer to the first *Actavis* question is ‘yes’, it is not necessary for me to consider the second *Actavis* question. The MZ-Switch in my opinion directly infringes claim 1 of the patent.

42. The requester has also provided argument that the MZ-Switch infringes dependent claims 2, 5-7 and 20-22. The observer has provided no counter-argument other than the MZ-Switch does not fall within the scope of these claims by virtue of their dependency upon claim 1. On the basis of the material before me I am of the opinion that the MZ-Switch does include the features of dependent claims 2, 5-7 and 20-22. Hence those claims would also be infringed by the importation, disposal and/or manufacture thereof in the UK of the MZ-Switch.

Opinion

43. It is my opinion that the MZ-Switch falls within the scope of claims 1-2, 5-7 and 20-22 of the Patent as a matter of normal interpretation. Accordingly, it is my opinion that the MZ-Switch infringes GB 2590988 B under Section 60(1)(a) of the Act.

Marc Collins
Examiner

NOTE

This opinion is not based on the outcome of fully litigated proceedings. Rather, it is based on whatever material the persons requesting the opinion and filing observations have chosen to put before the Office.