

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.;
SAMSUNG ELECTRONICS AMERICA, INC.,
Petitioner

v.

OURA HEALTH OY,
Patent Owner.

Case No. IPR2024-01080
U.S. Patent No. 10,842,429

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 10,842,429**

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LIST OF EXHIBITS¹

Ex. No.	Description
Ex-1001	U.S. Patent No. 10,842,429 (“the ’429 Patent”)
Ex-1002	Declaration of Dr. Andrew Wolfe
Ex-1003	Curriculum Vitae of Dr. Andrew Wolfe
Ex-1004	Prosecution History of U.S. Patent No. 10,842,429
Ex-1005	U.S. Patent Publication No. 2015/0250396 to Ahmed (“Ahmed”)
Ex-1006	U.S. Patent Publication No. 2015/0119732 to Wisbey (“Wisbey”)
Ex-1007	U.S. Patent Publication No. 2011/0201902 to Shiga (“Shiga”)
Ex-1008	INTENTIONALLY LEFT BLANK
Ex-1009	INTENTIONALLY LEFT BLANK
Ex-1010	INTENTIONALLY LEFT BLANK
Ex-1011	INTENTIONALLY LEFT BLANK
Ex-1012	INTENTIONALLY LEFT BLANK
Ex-1013	INTENTIONALLY LEFT BLANK
Ex-1014	INTENTIONALLY LEFT BLANK
Ex-1015	INTENTIONALLY LEFT BLANK
Ex-1016	INTENTIONALLY LEFT BLANK
Ex-1017	INTENTIONALLY LEFT BLANK

¹ Four-digit pin citations that begin with 0 are to the branded numbers added by Samsung in the bottom right corner of the exhibits. All other pin citations are to original page, column, paragraph, or line numbers.

Ex. No.	Description
Ex-1018	INTENTIONALLY LEFT BLANK
Ex-1019	INTENTIONALLY LEFT BLANK
Ex-1020	Claim Mapping Table
Ex-1021	Claim Construction Order, <i>Oura Health Oy v. Circular SAS</i> , No. 22-cv-00478-ADA (W.D. Tex. Feb. 2, 2024)
Ex-1022	Joint Claim Construction Statement, <i>Oura Health Oy v. Circular SAS</i> , No. 22-cv-00478-ADA (W.D. Tex. Jan. 16, 2024)
Ex-1023	Daniel Siewiorek, <i>Wearable Computing: Retrospectives on the first decade</i> , GetMobile: Mobile Computing and Communications, Vol. 21, Issue 1, 5-10 (Carla Schlatter Ellis ed., Mar. 2017)
Ex-1024	David M. Ewalt, <i>Getting Fitbit</i> , Forbes (June 11, 2010), https://www.forbes.com/2010/06/11/fitbit-tracker-pedometer-lifestyle-health-lifetracking.html (last visited June, 25, 2024)
Ex-1025	Brian Santo, <i>The Consumer Electronics Hall of Fame: Fitbit</i> , IEEE Spectrum (Nov. 7, 2019), https://spectrum.ieee.org/the-consumer-electronics-hall-of-fame-fitbit (last visited June 25, 2024)
Ex-1026	Garmin Forerunner 920XT Owner’s Manual (2014)
Ex-1027	<i>Consumer Reports</i> (Dec. 2014)
Ex-1028	U.S. Patent No. 8,764,651 to Tran (“Tran”)
Ex-1029	U.S. Patent No. 9,582,034 to Von Badinski (“Von Badinski”)
Ex-1030	Kate Hartman, <i>Make: Wearable Electronics</i> 77, 113-143 (Maker Media, Inc., 2014) (citing Chapters 5 & 7)
Ex-1031	U.S. Patent No. 8,157,731 to Teller (“Teller ’731”)
Ex-1032	U.S. Patent No. 9,165,117 to Teller (“Teller ’117”)

I. INTRODUCTION

Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc. (collectively, “Petitioner”) request *inter partes* review (“IPR”) of Claims 1-6 of U.S. Patent No. 10,842,429 (“the ’429 Patent”) (Ex-1001), currently assigned to Oura Health Oy (“PO”).

II. MANDATORY NOTICES UNDER 37 C.F.R. §42.8

Real Parties-in-Interest: Petitioner identifies the following real parties-in-interest: Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.

Related Matters: PO has asserted the ’429 Patent against Ultrahuman Healthcare Pvt., Ltd. and Ultrahuman Healthcare Ltd. in *Oura Health Oy et al. v. Ultrahuman Healthcare Pvt. Ltd., et al.*, No. 2:23-cv-396 (E.D. Tex.); PO has also asserted the ’429 Patent against Circular SAS in *Oura Health Oy v. Circular SAS*, No. 6:22-cv-478 (W.D. Tex.) (“*Circular* litigation”); PO has filed an ITC investigation for alleged infringement of the ’429 Patent against Ultrahuman Healthcare Pvt. Ltd., Ultrahuman Healthcare SP LLC, Ultrahuman Healthcare Ltd., Guangdong Jiu Zhi Technology, RingConn LLC, and Circular SAS in *In the Matter of Certain Smart Wearable Devices, Systems, and Components Thereof*, Inv. No. 337-TA-1398 (ITC).

Petitioner has filed a suit against PO seeking a declaratory judgment of noninfringement of the ’429 Patent: *Samsung Electronics Corporation, Ltd. et al. v.*

Ōura Health Oy et al., No. 3:24-cv-03245 (N.D. Cal. filed May 30, 2024). There are no invalidity claims and therefore no overlap with this petition.

For the Board’s convenience, Petitioner also notes that Petitioner is challenging the following patents owned by PO, all directed to wearable electronic devices—U.S. Patent Nos. 11,868,178, 11,868,179, 11,599,147, 9,582,034, 10,893,833, 10,139,859, 11,874,701, 11,874,702, and 10,281,953.

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III. FEE AUTHORIZATION

The PTO is authorized to charge any fees due during this proceeding to Deposit Account No. LA500639.

IV. GROUNDS FOR STANDING

Petitioner certifies that the '429 Patent is available for review, and Petitioner is not barred or estopped from requesting review.

V. PRECISE RELIEF REQUESTED

Petitioner requests review and cancellation of Claims 1-6 as unpatentable based on the following grounds, supported by a declaration from Dr. Andrew Wolfe. Ex-1002 ¶¶1-40, 47-67; Ex-1003.

Ground	Summary
1-2	Claims 1-6 are obvious over Ahmed (Ex-1005) alone or Ahmed in view of Shiga (Ex-1007).
3	Claims 1-6 are obvious over Wisbey (Ex-1006) in view of Shiga.
4	Claims 1-6 are obvious over Wisbey in view of Ahmed.

VI. THE CHALLENGED PATENT

The challenged claims are directed to a method for determining a user's readiness by processing and analyzing data related to the user's biological signals and physical activities, and using that data to calculate the user's "readiness score." Ex-1001, 1:6-9. The '429 Patent teaches that a "readiness score is an estimated readiness of the user to perform well at a given day," which "summarizes both physical and mental prerequisites for a good day" and "covers the effects of earlier physical activity, previous night's sleep, and body responses measured lately." Ex-1001, 4:43-48.

Many of the steps of independent Claim 1's method are depicted in the flowchart of Figure 13 below. Ex-1001, Fig. 13.

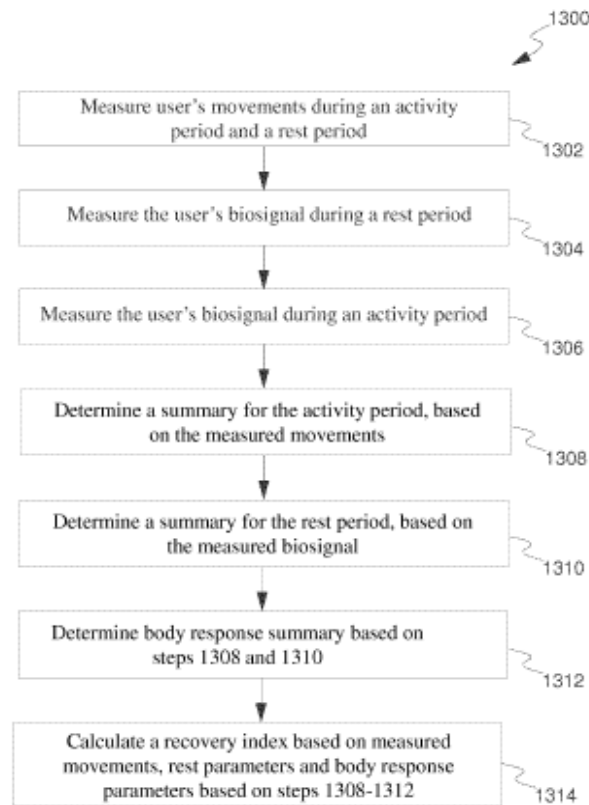
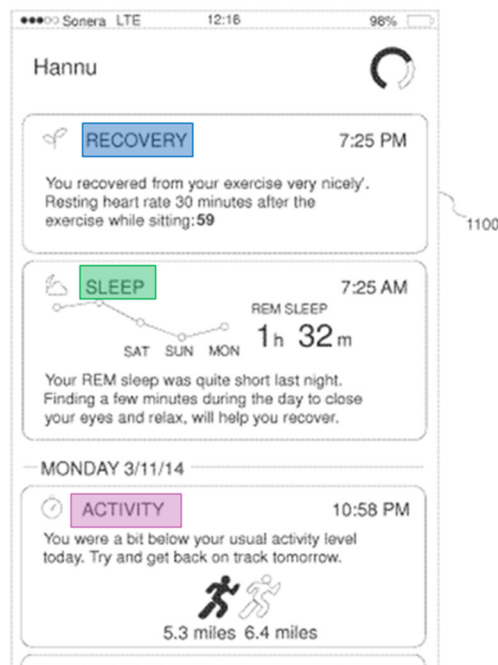


FIG. 13

The claimed method collects data regarding the user's movements (step 1302); measures the user's biosignal during the rest period (step 1304); determines a rest summary for the rest period based on the biosignal (step 1310); determines an activity summary for the activity period based on the user's movements from both the present and a previous activity period (step 1308); determines a body response summary based on the rest summary and activity summary (step 1312); and calculates a "readiness score" based on the present and a previous body response summary, which indicates the user's readiness level (step 1314). Ex-1001, Cl. 1, Fig. 13. The claimed method further requires "showing" (i.e., displaying) elements

contributing to the user's readiness score and instructions relating to physical and mental activity for improving the readiness score using a user interface of the mobile communication device. Ex-1001, Cl. 1. Figure 11 below depicts an exemplary user interface for displaying recovery (blue), sleep (green), and activity (purple) elements and instructions to the user. Ex-1001, Fig. 11.²



The '429 Patent recognizes that methods for “calculat[ing] biological signals” and “monitor[ing] physical activities” of a user were well-known. *Id.*, 1:29-31. Yet the patent alleges that the claimed method is somehow inventive because it provides information relating to the user's recovery “from mental or physical loads,” “a

² Throughout, emphasis and annotations are added unless otherwise specified.

readiness score” that considers historical data, and “suggestions or recommendations that may help the [user] to efficiently recover from such” loads “to increase the readiness score.” *Id.*, 1:31-42. As explained below, all of these concepts were known and thus the ’429 Patent claims are obvious in view of the prior art. Ex-1002 ¶¶41-44.

VII. PROSECUTION HISTORY OF THE ’429 PATENT

The ’429 Patent was filed August 17, 2017, as the U.S. national stage application of International Patent Application PCT/FI2016/050113 filed February 23, 2016. Ex-1001. The ’429 Patent claims priority to three provisional applications, 62/121,425 filed February 26, 2015, 62/205,114 filed August 14, 2015, and 62/260,760 filed November 30, 2015. Ex-1001.

This Petition presents arguments not considered during prosecution. *See* Ex-1004. The prior art combinations in this Petition were not before the PTO during prosecution, as discussed in Section XII. Ex-1004; Ex-1002 ¶¶45-46.

VIII. LEVEL OF ORDINARY SKILL IN THE ART

A person of ordinary skill in the art at the relevant time (“POSITA”) would have had at least a four-year degree in electrical engineering, biomedical engineering, or related field of study, or equivalent experience, and at least two years’ experience in academia or industry studying or developing sensor system design, signal processing, decision algorithms, and user interfaces. A higher level

of education or skill might make up for less experience, and vice versa. Ex-1002 ¶¶32-36.

IX. PRIORITY DATE

For purposes of this proceeding only, Petitioner applies the earliest alleged priority date of the '429 Patent: February 26, 2015.³ Accordingly, AIA 35 U.S.C. §102 applies.

X. CLAIM CONSTRUCTION

Petitioner interprets the claims according to *Phillips*. 37 C.F.R. §42.100(b). To resolve this Petition, Petitioner does not believe that any term requires express construction.⁴ CTPG, 44; Ex-1002 ¶76. To the extent that terms were construed or agreed upon by the parties in the *Circular* litigation against an unrelated party,⁵ as

³ Petitioner respectfully reserves the right to challenge the priority date in other proceedings.

⁴ There is a pending declaratory judgment action between PO and Petitioner. There are no invalidity claims and therefore no overlap with this petition. Should the circumstances regarding validity change, Petitioner will respectfully request leave to brief any discretionary denial issues, to the extent raised. Moreover Petitioner respectfully reserves all rights to raise claim construction and other arguments in district court and will request leave to submit the district court's claim construction as soon as it becomes available. Additionally, should PO raise express or implied claim construction arguments in its Preliminary Response, Petitioner will respectfully seek a Preliminary Reply to respond. CTPG, 44-45 (permitting petitioner to respond to claim construction raised by PO).

⁵ Petitioner has adopted these constructions only for purposes of this Petition and reserves the right to propose and/or adopt any construction in any pending litigation.

set forth below, Petitioner applies these constructions for purposes of this Petition. Ex-1002 ¶¶77-78.

A. “obtaining the user’s movements” (Claim 1)

In the *Circular* litigation, the parties agreed this claim term should be given the following construction: “collecting data regarding the user’s movements.” Ex-1022, 4; Ex-1021, 1. Petitioner applies this construction for purposes of this Petition. The prior art invalidates the challenged claims under this construction.

B. “instruction related to physical activity and mental activity for improving the readiness score” (Claim 1)

In the *Circular* litigation, the parties agreed this claim term should be given the following construction: “instructions related to at least one physical activity and at least one mental activity for improving the readiness score.” Ex-1022, 4; Ex-1021, 1. Petitioner applies this construction for purposes of this Petition. The prior art invalidates the challenged claims under this construction.

XI. BRIEF DESCRIPTION OF THE APPLIED PRIOR ART

A. Ahmed (Ex-1005)

Ahmed (U.S. Patent Publication No. 2015/0250396) was filed March 5, 2013, and published September 10, 2015. Ahmed qualifies as prior art under 35 U.S.C. §102(a)(2). Petitioner is unaware of any facts supporting an exception under §102(b). Ex-1002 ¶¶68-70.

Ahmed teaches a method for determining a “user’s recovery after physical exertion or daily stress given sleep” by analyzing data related to the user’s biological signals during physical and sleep activities and using that data to calculate the user’s “recovery score.” Ex-1005 ¶47. Specifically, Ahmed determines a “sleep score,” which summarizes the user’s “sleep efficiency” and “sleep duration” based on “a combination of physiological parameters,” such as the user’s heart rate during sleep. Ex-1005 ¶166. Ahmed further teaches determining an “intensity score,” which is calculated based on the user’s heart rate reserve (HRR) (Ex-1005 ¶144), and provides a summary of “the cardiovascular intensities experienced by the user during a portion of a day, during the entire day or during any desired period of time (e.g., during a week or month).” Ex-1005 ¶142. Ahmed’s feedback panel, depicted below in Figure 15A, presents a qualitative summary to the user regarding the user’s sleep (green) and physical (purple) activities. Ex-1005, Fig. 15A.

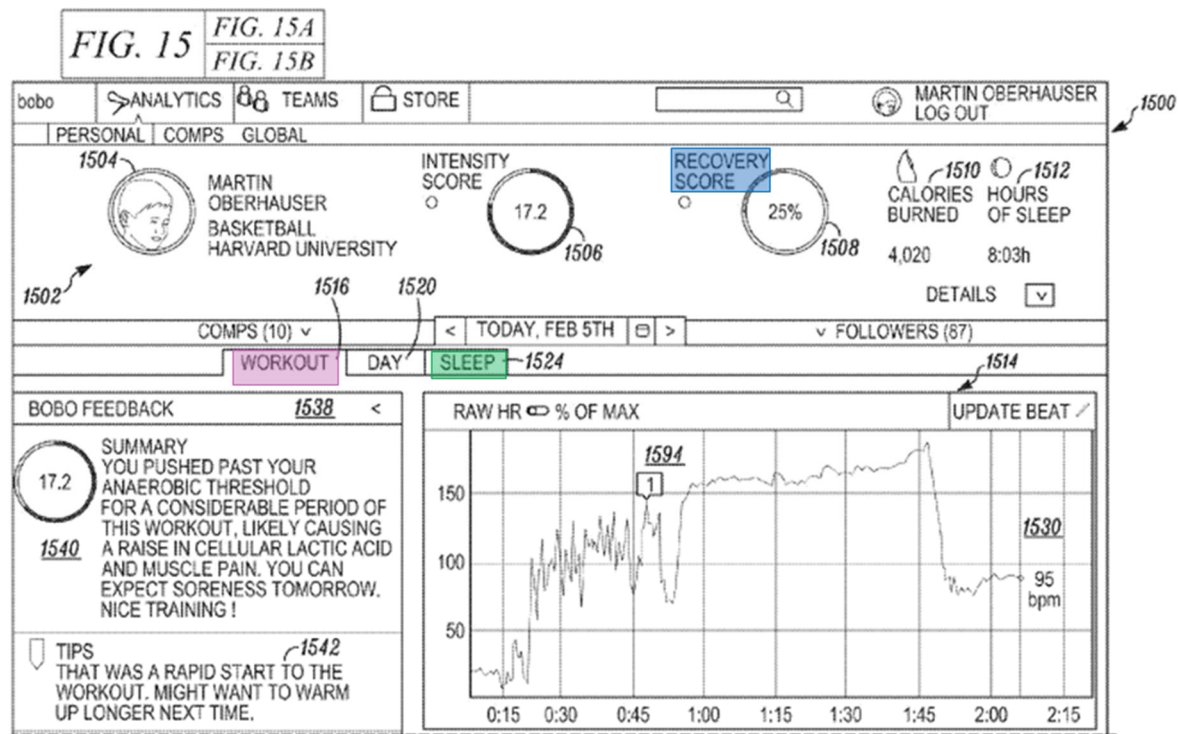


FIG. 15A

Ahmed further teaches a recovery score, which indicates the “level of recovery of a user’s body and health after a period of physical exertion.” Ex-1005 ¶¶160-161. The recovery score indicates the user’s readiness level by, for example, helping the user understand “how exercise-ready he/she is each day” and “how he/she arrived at the exercise-readiness score each day.” Ex-1005 ¶161. Ahmed’s exemplary user interface, depicted in Figures 14A-14C below, shows elements contributing to the recovery score, such as heart rate variability (HRV), resting heart rate (RHR), sleep quality, and recent physical and psychological strain. Ex-1005 ¶172, Figs. 14A-14C. It also gives instructions to the user for improving the score, such as the user “may need rest” or “is well prepared for intense activity.” *Id.*

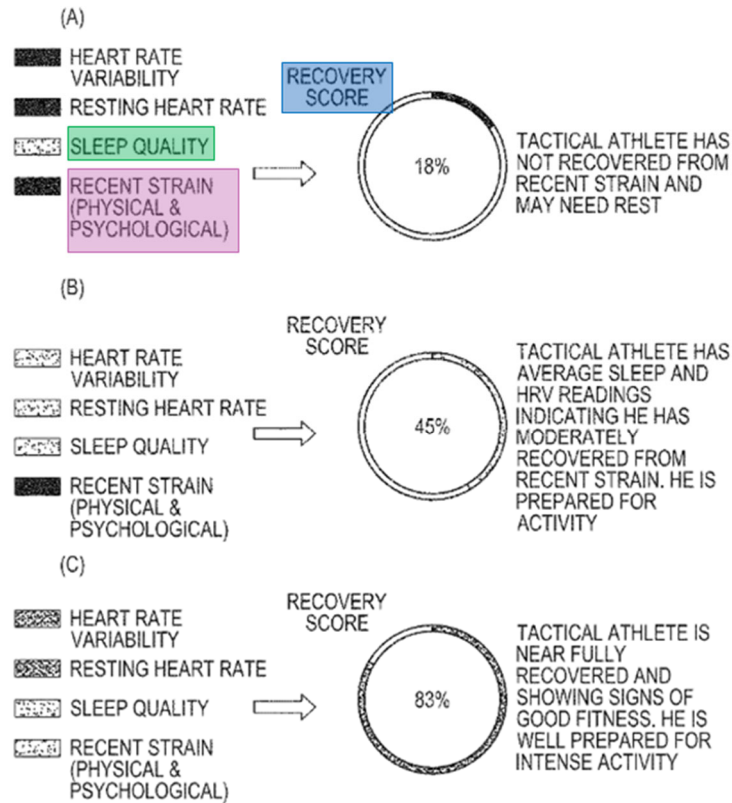


FIG. 14

B. Wisbey (Ex-1006)

Wisbey (U.S. Patent Publication No. 2015/0119732) was filed December 20, 2013, and published April 30, 2015. Wisbey qualifies as prior art under 35 U.S.C. §102(a)(2). Petitioner is unaware of any facts supporting an exception under §102(b). Ex-1002 ¶¶71-73.

Wisbey teaches a method for “providing a recovery status” to a user based on an “interpreted recovery score” (Ex-1006 ¶12), which is a measurement that “accurately reflects the user’s physical condition and performance capabilities.” Ex-1006 ¶57. Wisbey teaches that logic circuits detect “the amount of physical activity

and the amount of sleep a user experienced over the last 48 hours” and combine that metric with the user’s HRV to calculate a fatigue level, which indicates “the user’s physical condition and aptitude for further physical activity that day.” Ex-1006 ¶¶39, 91 (the user’s physical activity is also summarized using a “metabolic activity score”). The fatigue level may be based “on the amount of sleep that is measured for the previous night, the duration and type of user activity, and the intensity of the activity determined for a previous time period (e.g., exercise activity level in the last twenty-four hours).” Ex-1006 ¶102. Wisbey further teaches determining an “interpreted recovery score,” which is “based on a user’s personalized fatigue levels, as recorded over time.” Ex-1006 ¶57.

Figure 10D below depicts an archive table that may be part of the user’s “dynamic recovery profile,” which shows the parameters contributing to the user’s interpreted recovery score. Ex-1006 ¶107, Fig. 10D. Wisbey also teaches that the dynamic recovery profile includes instructions for improving the recovery score.

Date	MAS	Avg. UAI	Sleep Time (hours)	Fatigue Level
1 Nov. 2013	2,500	7	6	HIGH
2 Nov. 2013	2,000	5	8	NORMAL
3 Nov. 2013	1,500	3	9	LOW

For example, if “the user has a mean fatigue level of 7 following a day when sleep to MAS ratio is 6 to 2,000” and the system has determined that “the user typically achieves a below average MAS on days when the fatigue level is 7 or higher,” then “the dynamic recovery profile may indicate that the user should get more sleep, or should strive for a lower MAS, to avoid becoming overly fatigued.” Ex-1006 ¶109.

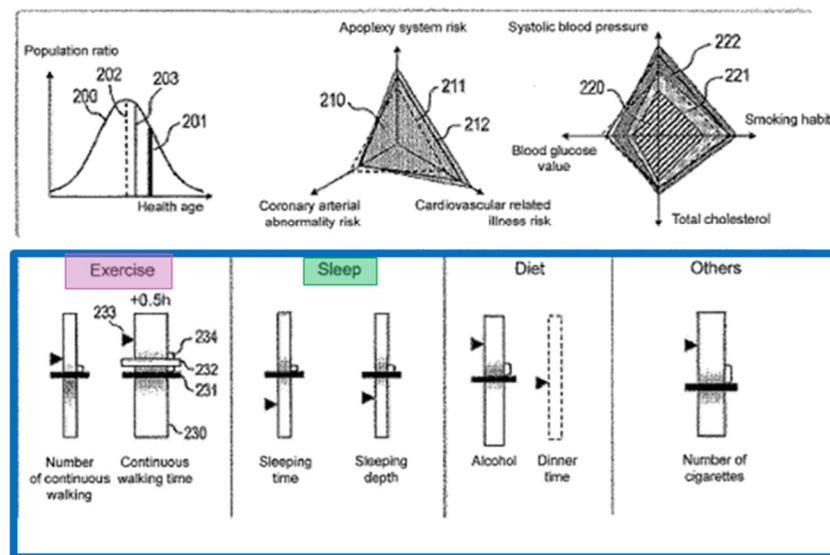
C. Shiga (Ex-1007)

Shiga (U.S. Patent Publication No. 2011/0201902) was filed April 21, 2011 and published August 18, 2011. Shiga qualifies as prior art under 35 U.S.C. §102(a)(1). Petitioner is unaware of any facts supporting an exception under §102(b). Ex-1002 ¶¶74-75.

Shiga teaches a “health condition determining device” that accumulates measured data relating to certain physiological indexes of the user and determines an “improvable factor” to present “along with the evaluation of the health condition” to the user. Ex-1007, Abstract. Shiga teaches determining a “lifestyle index” for the user, which is a numerical value generated by combining an “exercise related index” and a “sleep related index” relating to the “daily body activity and lifestyle habit[s]” of the user. Ex-1007 ¶50. Shiga uses the user’s past and present lifestyle indices to determine an “improvable factor” for the user, which is an action or habit that the user can take to improve the user’s health. Ex-1007 ¶119. Shiga further teaches a user interface that shows elements contributing to the “improvable factor”

and instructions relating to physical and mental activities for improving it. For example, the “lower level of the screen” in Figure 7 below gives an example of the “improvable factor” (blue), which shows the user their present exercise (purple) and sleep (green) progress compared to past exercise and sleep progress and the average user’s values for the same. Ex-1007 ¶¶118-120, Fig. 7.

Fig. 7



XII. THE BOARD SHOULD NOT EXERCISE ITS DISCRETION UNDER §325(D) TO DENY HEARING THESE INVALIDITY ISSUES FOR THE FIRST TIME IN THIS PETITION

In considering its discretion under §325(d), “the Board uses the following two-part framework: (1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and (2) if either condition of first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred

in a manner material to the patentability of challenged claims.” *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential).

Here, the first *Advanced Bionics* prong is not met. Two of the references relied upon in this petition (Ahmed and Shiga) were not cited or discussed by the Examiner. While the Wisbey reference was cited substantively in rejections by the Examiner, this is not sufficient to satisfy the first *Advanced Bionics* prong because Wisbey is used in combination with Shiga (in Ground 3) and Ahmed (in Ground 4), both not of record. *See Godbersen-Smith Constr. Co. d/b/a Gomaco Corp. v. Guntert & Zimmerman Const. Div., Inc.*, IPR2021-00050, Paper 24 at 19-21 (PTAB May 7, 2021) (where “neither [the combination references] nor similar prior art was before the examiner ... the prosecution history does not include any overlapping arguments directed to this prior art”); *K/S HIMPP v. Bragi GmbH*, IPR2023-01205, Paper 8 at 20 (PTAB March 19, 2024) (“Although one reference ... was previously presented to the Office, in each asserted ground, Petitioner relies on either Hain or Hain in combination with Sørensen. Because neither of those references was before the office, Patent Owner has not satisfied the first prong of the *Advanced Bionics* test.”).

Petitioner notes that a different reference authored by Ahmed (U.S. Pat. Pub. 2014/0073486 (“Ahmed-486”)) was of record during prosecution. But even if

Ahmed is cumulative to Ahmed-486, this would not be sufficient to satisfy the first *Advanced Bionics* prong for at least Ground 2. In that ground Ahmed is used in combination with Shiga (not of record). Thus, for the same reasons given above, the Ahmed-Shiga ground does not satisfy *Advanced Bionics*. *Id.*

Moreover, under the second prong, which need not be reached, it was a material error for the Examiner not to have considered the disclosures of Ahmed-486 to the extent they are similar to those of Ahmed, as applied here. That is because Ahmed-486, cited on an IDS with seven other references (Ex-1004, 79), clearly does teach the “user interface” limitation of the claims (Ex-1005, Figs. 14A-14C). Yet the Examiner allowed the claims to issue after Applicant added that limitation to overcome the Examiner’s Wisbey rejections. Ex-1004, 329-338, 363-372, 375-383, 390-396, 410-417. In other words, the file history indicates that Wisbey met all limitations except the “user interface.” Applicants did not seriously dispute this fact. Instead, Applicants added the “user interface” limitation hoping to distinguish Wisbey. After that amendment, the Examiner did not make a further rejection. But a “user interface” is obvious in view of other prior art that the Examiner failed to meaningfully consider. Because the record is silent as to the Examiner’s understanding of Ahmed-486’s teachings, the Examiner must have overlooked it (assuming the Examiner understood the other limitations of Claims 1-6 as being

taught by the prior art).⁶ *See K/S HIMPP*, Paper 8 at 20-21. In view of the foregoing, the Board should not exercise its discretion under §325(d) to deny institution.

XIII. DETAILED EXPLANATION OF THE UNPATENTABILITY GROUNDS

A. Grounds 1-2: Claims 1-6 are obvious over Ahmed alone or Ahmed in view of Shiga.

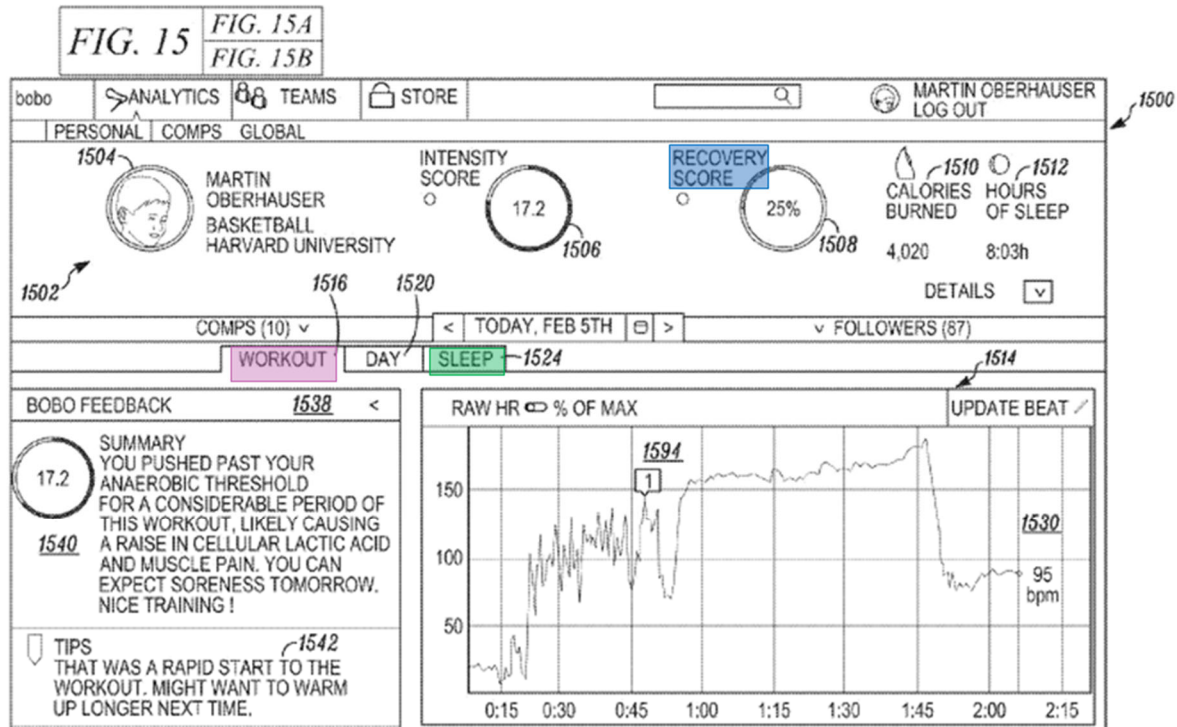
1. A POSITA would have been motivated to combine Ahmed’s teachings with Shiga’s teachings and would have had a reasonable expectation of success.

A POSITA would have been motivated to combine the teachings of Ahmed and Shiga and would have had a reasonable expectation of success in doing so because each relates to the same well-known technologies. Ex-1002 ¶¶79-81. Both are directed to physiological monitoring devices that collect biometric data from the user relating to the user’s sleep and physical activity and use that data to evaluate the user’s health state and provide recommendations for improving it. *See, e.g.*, Ex-1005, Abstract, ¶4, Figs. 14-18; Ex-1007, Abstract, Fig. 7.

Ahmed teaches a feedback panel, shown in Figure 15A below, that presents a summary of the user’s sleep and workout activity to the user (i.e., a body response

⁶ Although only a proposed rule, under the April 19, 2024 Notice of Proposed Rulemaking on discretionary denials, §325(d) is not applied to references not “meaningfully considered,” which is defined as situations “where the Office has evaluated the art or arguments and articulated its consideration of the art or arguments in the record of the application....” 89 Fed. Reg. 28693, 28700 (Apr. 19, 2024).

summary). Ex-1005, Fig. 15A. For example, Ahmed’s feedback panel “present[s] the intensity score along with a qualitative summary 1540 of the score indicating, for example, whether the user pushed past his anaerobic threshold for a considerable period of exercise.” Ex-1005 ¶182. The panel also presents, for example, a summary of “the number of hours of sleep 1512 obtained by the user the previous night.” Ex-1005 ¶179.



Ahmed calculates a recovery (i.e., readiness) score, taking into account the user’s sleep and physical activity summaries, to determine the user’s “readiness for physical and psychological exertion.” Ex-1005 ¶¶70, 160-161. Shiga teaches a “lifestyle index” (i.e., body response summary), which is a numerical value

generated by combining an “exercise related index” and a “sleep related index.” Ex-1007 ¶50. Shiga uses the user’s past and present lifestyle indices to determine an “improvable factor” (i.e., readiness score), which is an action the user can take to improve the user’s health. Ex-1007 ¶119.

To the extent it is determined that the claimed “body response summary” must be a discrete data point that is calculated by the system before calculating the claimed “readiness score,” it would have been obvious to a POSITA that Ahmed’s algorithm does this because it uses the combined sleep score and intensity score data (i.e., body response summary) to calculate the recovery score. Ex-1002 ¶82. For example, Ahmed’s Figures 15-18 show examples of the qualitative body response summaries that are presented to the user by words and narratives, which summarize the user’s sleep and workout activity. Ex-1005, Figs. 15-18.

A POSITA interested in additional implementation details for a “body response summary” would have understood that another way a summary could be communicated to a user would be using a discrete data point such as a numerical value, as Shiga teaches with its “lifestyle index,” to capture the same information. Ex-1002 ¶83; Ex-1007 ¶50. A POSITA would have been motivated to implement Shiga’s teachings to create a body response summary in the form of a numerical value with Ahmed’s system because this would have been a simple, efficient, tangible, and user-friendly alternative to presenting a summary of combined rest and

activity information to the user by narratives and words. Ex-1002 ¶83; *see DyStar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1368 (Fed. Cir. 2006) (making things stronger, cheaper, lighter, smaller, more durable, or more efficient are universal motivators to combine/modify prior art).

A user can easily tell from looking at a numerical value whether the user's combined sleep and fitness summary (body response summary) for the day has improved or worsened since the previous reading. Ahmed already uses a numerical value to communicate its recovery, sleep, and intensity scores to the user. Ex-1005 ¶70. And both Ahmed and Shiga provide recommendations to the user for improving their respective scores or indexes using narratives. Ex-1005 ¶167; Ex-1007 ¶¶118-120. Therefore, a POSITA would have understood that providing the body response summary in the form of a numerical value before providing the narrative recommendation would improve the system. Ex-1002 ¶84. Thus, design incentives and consumer preferences would have motivated a POSITA to apply the teachings of Shiga to Ahmed. *Id.*

A POSITA would have had a reasonable expectation of success in combining Ahmed and Shiga. Ex-1002 ¶85. Ahmed and Shiga are analogous prior art as they both involve physiological monitoring devices that measure the same parameters (such as the user's heart rate), during the same activities (for example, sleep and exercise activities), and with the same goal—to provide recommendations to the user

for improving the user's health condition and fitness state. *See, e.g.*, Ex-1005, Abstract, ¶¶4, 70, Figs. 14-18; Ex-1007, Abstract, ¶55, Fig. 7. Moreover, a POSITA would have understood that Ahmed and Shiga's devices are similar such that they are programmable using standard processors and are interchangeable regardless of whether they use narratives or numerical values to communicate information to the user. Ex-1002 ¶85. A POSITA would have understood, therefore, that these references disclose interrelated teachings based on routine technologies that would have been amenable to various well-understood and predictable combinations to provide more features and enhance user interest. *Id.*

2. Independent Claim 1

a. Element 1[pre]: A method for assessing readiness of a user, the method comprising:

Ahmed alone teaches⁷ the preamble, to the extent it is limiting. Ex-1002 ¶¶86-87.

Ahmed teaches a method for computing a "recovery" score, which is an assessment of the user's readiness to exercise, from data obtained by a wearable device. Ex-1005 ¶¶4-5. Ahmed teaches computer-executable instructions, which

⁷ Petitioner uses the term "teaches" to include both express teachings and those fairly suggested to a person of ordinary skill in the art. *In re Baird*, 16 F.3d 380, 383 (Fed. Cir. 1994); *In re Keller*, 642 F.2d 413, 425 (CCPA, 1981) ("The test for obviousness is...what the combined teachings of the references would have suggested to those of ordinary skill in the art." (citations omitted)).

“enable automatic interpretation of one or more physiological parameters to assess ... the user’s recovery after physical exertion or daily stress given sleep and other forms of rest (embodied in a recovery score).” Ex-1005 ¶47. The recovery score presents “an accurate indication” of the readiness level of the user’s “body and health after a period of physical exertion.” Ex-1005 ¶160.

b. Element 1[a]: obtaining the user’s movements;

Ahmed alone teaches Element 1[a]. Ex-1002 ¶¶88-90. As discussed in Section X.A, Petitioner interprets “obtaining the user’s movements” to mean “collecting data regarding the user’s movements.” Ex-1022, 4; Ex-1021, 1.

Ahmed teaches collecting data regarding the user’s movements via accelerometers and gyroscopes. For example, Ahmed teaches that the wearable device records physiological parameters including, for example, motion, using “accelerometers and/or gyroscope[s].” Ex-1005 ¶70. Ahmed teaches that its device includes “one or more sensors for activity measurement” such as “one or more multi-axes accelerometers and/or gyroscope[s] to provide a measurement of activity.” Ex-1005 ¶77.

c. Element 1[b]: using the obtained user’s movements to determine a nature of the period, wherein the nature of the period is selected from an activity period and a rest period;

Ahmed alone teaches Element 1[b]. Ex-1002 ¶¶91-92.

Ahmed uses the data collected regarding the user's movements, among other information, to determine whether the user is in an active, rest, or sleep state.⁸ Ahmed teaches a processing module that processes "the motion data to determine a motion status of the user which indicates the level of motion of the user," for example, light motion (e.g., walking), exercise, no motion or rest, and sleep. Ex-1005 ¶126. For example, Ahmed may determine that the user is asleep based on "movement input, skin temperature and heart rate" that correlate to a user sleeping. Ex-1005 ¶135. "[P]eriods of no movement or small bursts of movement (such as shifting in bed), lower skin temperature (although it is not a dramatic drop from normal), drastic GSR changes, and heart rate that is below the typical [RHR] when the user is awake" are common indicators that correlate to a user being asleep. Ex-1005 ¶135. Because these variables depend on each user's physiology, Ahmed teaches a "machine learning algorithm" that is "trained with user-specific input" to assess when the user is awake or asleep. *Id.*

d. Element 1[c]: measuring at least one biosignal of the user during the rest period;

Ahmed alone teaches Element 1[c]. Ex-1002 ¶¶93-95.

⁸ The '429 Patent defines "rest period" as "primarily relat[ing] to a sleep period of the user in a day," but also "includ[ing the] time period when the user is sitting or lying down to relax." Ex-1001, 5:23-26. Thus, a POSITA would have understood that Ahmed's teachings regarding sleep and rest periods both meet the claimed "rest period" and related "rest summary" limitation discussed below. Ex-1002 n.6.

Ahmed teaches measuring the user's biosignals while the user sleeps, including heart rate and skin conductivity. Ahmed teaches that continuous data is collected by the "physiological measurement system regarding the user's heart rate, skin conductivity, ambient temperature and accelerometer/gyroscope data throughout the user's sleep." Ex-1005 ¶166.

e. Element 1[d]: determining a rest summary for the rest period, based on the measured at least one biosignal and at least one biosignal of a previous rest period;

Ahmed alone teaches Element 1[d]. Ex-1002 ¶¶96-98.

Ahmed teaches determining a "sleep score" (i.e., rest summary) for the user's sleep period, which is based on the user's most recent and past sleep biometric data. Ahmed's "sleep score" measures and indicates "sleep efficiency (how good the user's sleep was) and sleep duration (if the user had sufficient sleep)" based on "a combination of physiological parameters, personal habits and daily stress/strain (intensity) inputs." Ex-1005 ¶166. Ahmed teaches that "[t]he *actual data* measuring the time spent in various stages of sleep may be *combined with the wearer's recent daily history* and a longer-term data set describing the wearer's personal habits *to assess the level of sleep sufficiency achieved by the user.*" *Id.*; see also *id.* ¶188 (sleep panel 1522 includes "information on health parameters of the user during sleep including," e.g., "overlaid graph 1573 of heart rate and movement during sleep, statistics 1574" on certain sleep parameters, and "sleep duration graph 1578"). The

sleep score therefore “model[s] sleep quality in the context of sleep duration and history” and “consider[s] each sleep period in the context of biologically-determined sleep needs, pattern-determined sleep needs and historically-determined sleep debt.”

Ex-1005 ¶166. As explained in the previous section, the continuous data that is collected by the physiological measurement system includes “the user’s heart rate, skin conductivity, ambient temperature and accelerometer/gyroscope data throughout the user’s sleep.” Ex-1005 ¶166.

f. Element 1[e]: determining an activity summary for the activity period, based on the obtained movements of an activity period and obtained movements of at least one previous activity period;

Ahmed alone teaches Element 1[e]. Ex-1002 ¶¶99-100.

As explained for Element 1[a], Ahmed obtains the user’s movements using accelerometers and gyroscopes. Ex-1005 ¶77. Ahmed further teaches determining an “intensity score” (i.e., activity summary) for the user’s activity period, which is based on the user’s most recent activity biometric data. Ahmed’s intensity score “may be determined in real-time or after a workout routine or for an entire day.” Ex-1005 ¶140. The intensity score, which is calculated based on the user’s heart rate reserve (HRR) (Ex-1005 ¶144), “provides an accurate indication of the cardiovascular intensities experienced by the user during a portion of a day, during the entire day or during any desired period of time (e.g., during a week or month).”

Ex-1005 ¶142; *see also id.* ¶181 (workout panel 1514 presents “quantitative information on the user’s health and exercise routines,” including, e.g., “graph 1530 of the user’s continuous heart rate during the exercise, statistics 1532” on certain exercise parameters, and “graph 1536 of the intensity scores over a period of time (e.g., seven days)”), Fig. 15. The intensity score is adapted and customized for the user’s “unique physiological properties” and also considers, for example, the user’s gender, age, RHR, anaerobic threshold, and maximum heart rate. Ex-1005 ¶142. If the intensity score is determined based on an exercise routine period and beyond, it indicates “the cardiovascular intensities experienced by the user during the routine and also the activities the user performed after the routine (e.g., resting on the couch, active day of shopping) that may affect their recovery or exercise readiness.” Ex-1005 ¶142.

Ahmed also teaches tracking past intensity scores, using the user’s past activity biometric data to both calibrate measurements and provide a summary with feedback to the user, and using past activity biometric data in the weighting scheme that is used to determine the intensity score. For example, Ahmed teaches that the user’s intensity score values may be displayed to the user along with quantitative or qualitative information such as, for example, “how difficult an exercise routine was *in the context of the user’s training*” and “whether the exercise regimen of the user should be automatically adjusted (e.g., made easier *if the intensity scores are*

consistently high)." Ex-1005 ¶152. Moreover, as shown in Figure 10 below, Ahmed teaches that one of the steps in generating the intensity score is the weighting of heart rate reserve (HRR) values (step 1004). Ex-1005, Fig. 10.

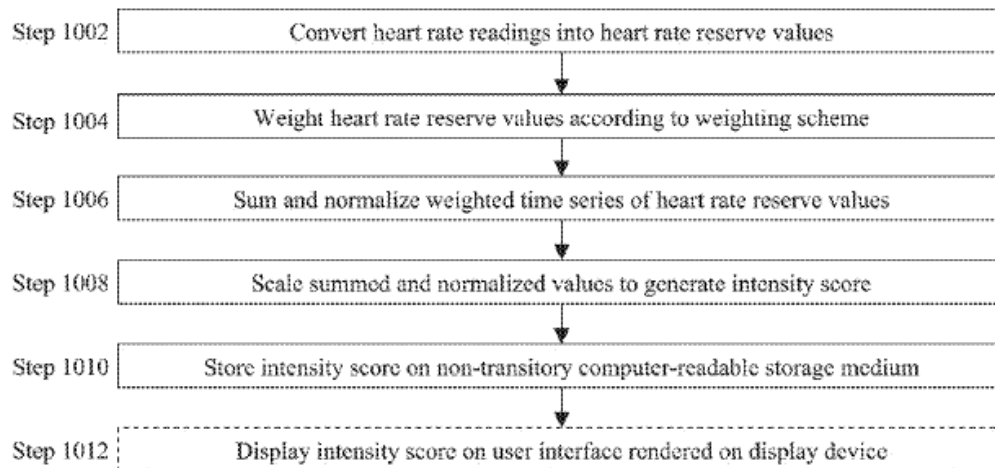


FIG. 10

Ahmed teaches that in an exemplary weighting scheme, “the HRR time series is weighted iteratively *based on the intensity scores determined thus far* (e.g., the intensity score accrued thus far) and the path taken by the HRR values to get to the present intensity score” such that the “*path may be detected automatically based on the historical HRR values*.” Ex-1005 ¶156. A POSITA would thus have understood that Ahmed’s intensity score is “based on the obtained movements of an activity period and obtained movements of at least one previous activity period.” Ex-1002 ¶¶101-104.

g. Element 1[f]: determining a body response summary based on the rest summary and the activity summary;

Ahmed alone or in view of Shiga (“Ahmed-Shiga”) teaches Element 1[f].
Ex-1002 ¶¶105-107.

The ’429 Patent does not define a “body response summary” other than to state that it is determined based on the rest summary and the activity summary and used to calculate the readiness score. *See, e.g.*, Ex-1001, Fig. 13 (step 1312: “Determine body response summary based on steps 1308 [summary for the activity period] and 1310 [summary for the rest period]”; step 1314: “Calculate a recovery index based on measured movements, rest parameters and body response parameters based on steps 1308-1312”). The ’429 Patent states that a body response summary can be determined “for day to night, or activity period to rest period.” Ex-1001, 23:26-28. And it gives examples of “body response parameters” including, for example, “training impact vs. heart rate recovery speed, daily physical activity parameter vs. amount of deep sleep or lowest heart rate of the night,” and “changes in body signal as a response from rest to stand-up at rise time.” Ex-1001, 23:28-33.

If the “body response summary” is simply the combination of past and present biosignal measurements during the user’s sleep and activity periods that is used to generate the readiness score (discussed in Element 1[g]), Ahmed meets this limitation. Ahmed teaches that the recovery score (i.e., readiness score) takes into

account similar body response parameters as the '429 Patent including, for example, the user's HRV, RHR, sleep quality, "recent physiological strain (indicated, in one example, by the intensity score of the user)," and "the sleep score combined with performance readiness measures (such as, morning heart rate and morning [HRV])." Ex-1005 ¶161.

Moreover, as shown in Figure 15 below, Ahmed's feedback panel presents a body response summary to the user, which includes both an activity summary (purple) and a rest summary (green). Ex-1005, Fig. 15A; Ex-1002 ¶108.

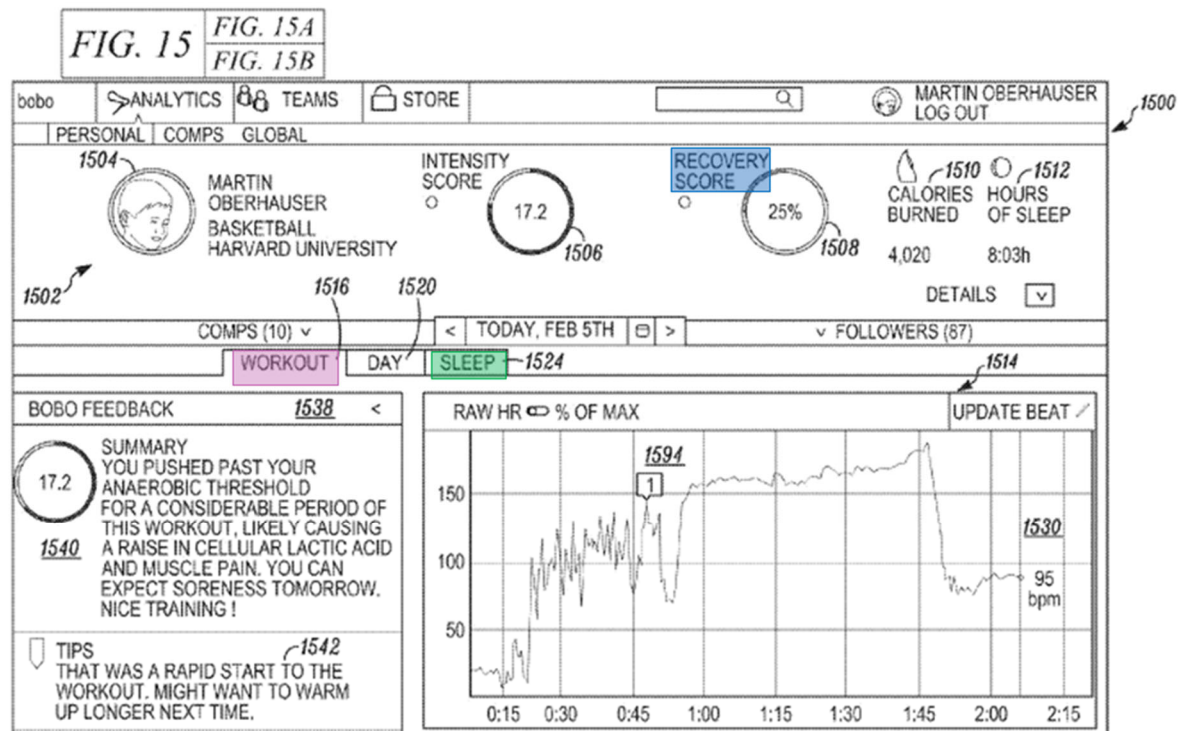


FIG. 15A

Ahmed's panel "present[s] the intensity score along with a qualitative summary 1540 of the score indicating, for example, whether the user pushed past his anaerobic

threshold for a considerable period of the exercise, whether the exercise is likely to cause muscle pain and soreness, and the like.” Ex-1005 ¶182. The panel also presents, for example, “the number of hours of sleep 1512 obtained by the user the previous night.” Ex-1005 ¶179. Ahmed further teaches that the user interface may “include panels for presenting information on the user’s workouts—a workout panel 1514 accessible using tab 1516 ... and sleep-a sleep panel 1522 accessible using tab 1524.” Ex-1005 ¶180. A POSITA would thus have understood that Ahmed teaches the claimed body response summary. Ex-1002 ¶109.

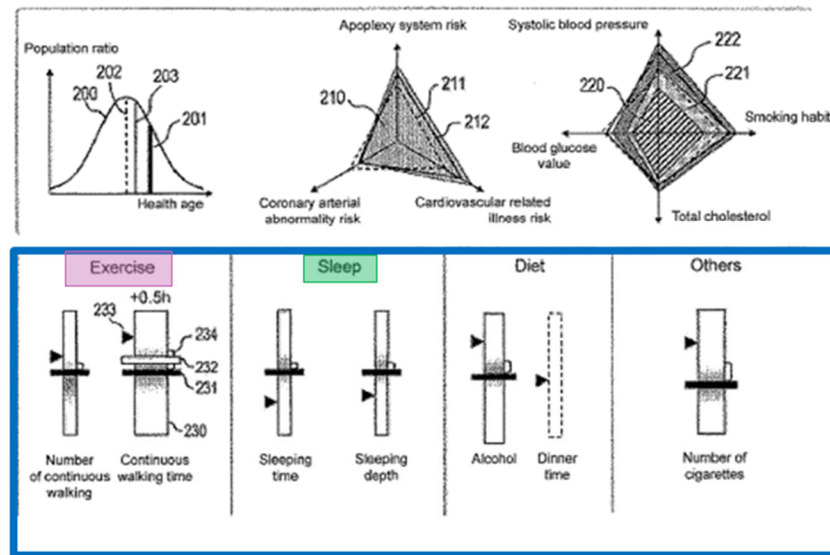
To the extent that the body response summary must be a discrete data point that is determined by the system before the claimed “readiness score” is calculated, it would have been obvious to a POSITA that Ahmed teaches this limitation because its algorithm uses the combined rest summary (i.e., sleep score) and the activity summary (i.e., intensity score) data (i.e., the claimed body response summary) to calculate the readiness (i.e., recovery) score. Ex-1002 ¶110.

Ground 2: This limitation is also taught by Shiga. Shiga teaches a “lifestyle index” (i.e., body response summary), which is a value generated by combining an “exercise related index” and a “sleep related index.” Ex-1007 ¶50. Shiga’s “lifestyle index” is defined as “the criterion indicating the daily body activity and lifestyle habit (exercise, sleep, diet, etc.) *and the numerical value thereof.*” Ex-1007 ¶50. It includes the exercise related index, which takes into account the user’s body activity

amount and exercise intensity including, e.g., “intermittent walking time per unit time, continuous walking time, number of continuous walking, regularity of walking pattern, etc.”; and the sleep related index, which is a measure of the user’s sleep, e.g., “sleeping time, number of times of roll-over, number of times of breathing, etc.” Ex-1007 ¶¶50, 55.

Shiga uses the user’s past and present lifestyle indices (i.e., body response summaries) to determine an “improvable factor,” similar to the claimed “readiness score,” which is an action or habit the user can take to improve the user’s health. Ex-1007 ¶119. It would have been obvious to a POSITA to implement Shiga’s teachings to combine a rest summary (i.e., sleep related index shown in lower level of Figure 7) and an activity summary (i.e., exercise related index shown in lower level of Figure 7) to generate a numerical summary value. Ex-1007, Fig. 7. The combined data (i.e., lifestyle index or body response summary) could then be used to improve Ahmed to determine the overall health and readiness of the user in Ahmed, in the same manner that Shiga uses this data to determine Shiga’s “improvable factor.” Ex-1002 ¶¶111-114.

Fig. 7



A POSITA would have been motivated to combine Ahmed’s teachings with Shiga’s teachings and had a reasonable expectation of success in doing so, for the same reasons discussed in Section XIII.A.1.

- h. Element 1[g]: calculating a readiness score based on the body response summary and a previous body response summary, whereby the readiness score indicates a level of readiness of the user; and**

Ahmed alone or Ahmed-Shiga teaches Element 1[g]. Ex-1002 ¶¶115-118.

The ’429 Patent does not expressly define the term “level” but defines “readiness” as “a return to the normal state of mental and physical strength (or energy level) after the mental and physical load.” Ex-1001, 10:5-7. Thus, for example, “*the readiness score may be good or high (such as about 90%),* if the

heart rate, [HRV] and stress level of the user have returned to the normal state after the exercise.” Ex-1001, 10:11-14.

Ahmed teaches calculating a recovery (i.e., readiness) score, which “provides an accurate indication of the level of recovery of a user’s body and health after a period of physical exertion.” Ex-1005 ¶160. The “recovery score” is adapted and customized for the user’s “unique physiological properties.” Ex-1005 ¶161. It is a weighted combination of, for example, the user’s RHR, HRV, “sleep quality indicated by a sleep score” (i.e., rest summary), and “recent physiological strain (indicated, in one example, by the intensity score [i.e., activity summary] of the user).” Ex-1005 ¶161.

Ahmed teaches that its “analytics system may consider the magnitude of the differences between 7-day moving averages and 3-day moving averages of” the user’s HRV “readings for a given day.” Ex-1005 ¶163. And “[t]he recovery score algorithm may take into account RHR along with history of past intensity and recovery scores.” Ex-1005 ¶164. Ahmed’s recovery score indicates a level of readiness of the user by, for example, helping the user understand “how exercise-ready he/she is each day” and “how he/she arrived at the exercise-readiness score each day.” Ex-1005 ¶161.

A POSITA would have understood that Ahmed’s recovery (i.e., readiness) score is calculated by combining a variety of past and present biometric data,

including, for example, a “history of past and present intensity and recovery scores.” Ex-1002 ¶119. Moreover, Ahmed teaches that the recovery (i.e., readiness) score takes into account similar body response parameters as the ’429 Patent. Ex-1005 ¶161. Thus, as discussed for Element 1[f], if the “body response summary” is simply the combination of past and present biosignal measurements during the user’s sleep and activity periods that is used to generate the readiness score, a POSITA would have understood that Ahmed teaches “calculating a readiness score based on the body response summary and a previous body response summary.” Ex-1002 ¶119.

To the extent that the past and present body response summaries must be discrete data points that are determined by the system before the claimed “readiness score” is calculated, it would have been obvious to a POSITA that Ahmed teaches this limitation because its algorithm uses the combined past and present rest summary (i.e., sleep score) and past and present activity summary (i.e., intensity score) to calculate the readiness (i.e., recovery) score. Ex-1002 ¶120.

Ground 2: This limitation is also taught by Shiga. Shiga uses the user’s past and present lifestyle indices (i.e., body response summaries) to determine an “improvable factor,” similar to the claimed “readiness score,” which is an action or habit that the user can take to improve the user’s health. Ex-1007 ¶119. It would have been obvious to a POSITA to implement Shiga’s teachings to combine past and present body response summaries and use the combined data to determine the overall

health and readiness of the user in Ahmed, in the same manner that Shiga uses it to determine Shiga's "improvable factor." Ex-1002 ¶¶121-123.

A POSITA would have been motivated to combine Ahmed's teachings with Shiga's teachings and had a reasonable expectation of success in doing so, for the same reasons discussed in Section XIII.A.1.

- i. **Element 1[h]: using a user interface of the mobile communication device⁹ to show elements contributing to the readiness score and instructions related to physical activity and mental activity for improving the readiness score.**

Ahmed alone teaches Element 1[h]. Ex-1002 ¶¶124-125. As discussed in Section X.B., Petitioner interprets "instructions related to physical activity and mental activity for improving the readiness score" to mean "instructions related to at least one physical activity and at least one mental activity for improving the readiness score." Ex-1022, 4; Ex-1021, 1.

Ahmed teaches "using a user interface of the mobile communication device to show elements contributing to the readiness score." Ahmed teaches that "data collected by a wearable system may be transmitted via a mobile communication

⁹ The term "***the*** mobile communication device" in Claim 1 appears to lack antecedent basis. Petitioner reserves the right to argue indefiniteness for the term "user interface of ***the*** mobile communication device" in other proceedings. The prior art describes this term as it is described in the '429 Patent, so it is met by the prior art regardless of how it is interpreted.

device application to a cloud-based data storage, from which data may be downloaded for display and analysis on a website.” Ex-1005 ¶49; *see also id.* ¶175 (“Exemplary systems have the ability to stream the physiological information wirelessly, directly or through a mobile device application, to an online website”). Ahmed further teaches that “the website may be displayed using a mobile website or a mobile application.” Ex-1005 ¶50. Ahmed’s Figures 14A-14C, shown below, depict the “recovery score graphic component with exemplary recovery scores and qualitative information corresponding to the recovery scores” that are shown on the user interface of the mobile communication device. Ex-1005 ¶172, Figs. 14A-14C. The user interface shows elements contributing to the recovery (i.e., readiness) score including, for example, HRV, RHR, sleep quality, and recent strain (physical and psychological). *Id.*

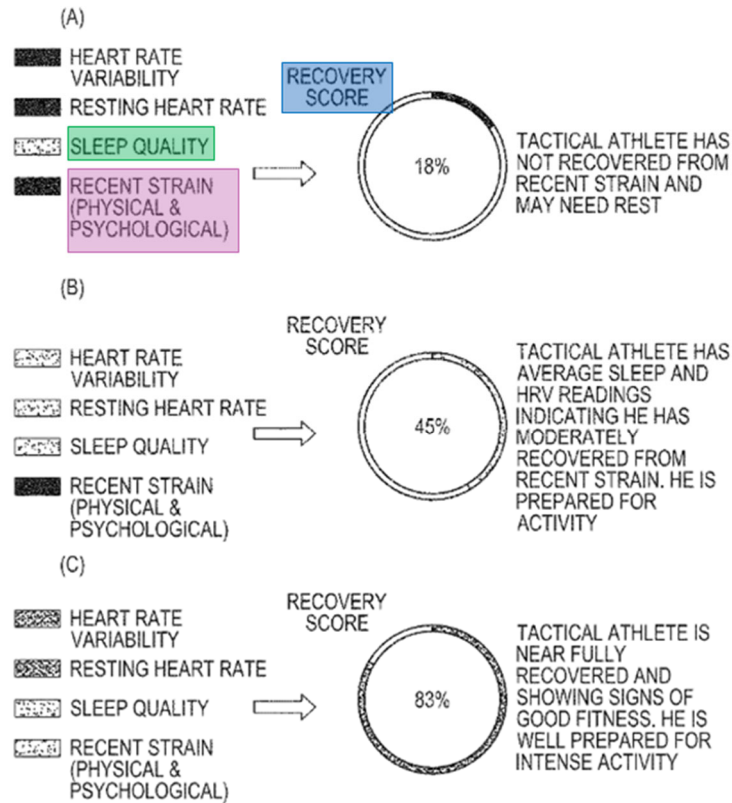


FIG. 14

Ahmed's user interface shows instructions related to at least one physical activity for improving the readiness score. Ahmed teaches that the recovery score is displayed with other qualitative or quantitative information regarding the user including, for example, "whether the user has recovered sufficiently, what level of activity the user is prepared to perform, whether the user is prepared to perform an exercise routine [of] a particular desired intensity, whether the user should rest and the duration of recommended rest, whether the exercise regimen of the user should be automatically adjusted (e.g., made easier if the recovery score is low), and the like." Ex-1005 ¶167, Figs. 14A-14C ("tactical athlete has not recovered from recent

strain and may need rest”; “tactical athlete has average sleep and HRV readings indicating he has moderately recovered from recent strain” and “is prepared for activity”; “tactical athlete is near fully recovered and showing signs of good fitness” and “is well prepared for intense activity”). Moreover, Ahmed teaches that the “analytics system may automatically generate, store and display an exercise regimen customized based on the recovery scores of the user alone or in combination with the intensity scores.” Ex-1005 ¶167; *see also id.* ¶¶170, 172-173.

Ahmed’s user interface also shows instructions related to at least one mental activity for improving the readiness score. For example, Ahmed teaches that the “recovery score may take into account perceived psychological strain experienced by the user” either from user input or by automatically “detecting changes in sympathetic activation based on one or more parameters including, but not limited to, [HRV], heart rate, galvanic skin response, and the like.” Ex-1005 ¶162; *see also id.* ¶73 (the device may “include a user input component for enabling additional contextual data, e.g., emotional (e.g., the user’s feelings), perceived intensity, and the like”).

Ahmed further teaches that the feedback panel may display qualitative information regarding, for example, whether “the user was stressed at a certain point in the day (e.g., if there was a high level of sweat with little activity).” Ex-1005 ¶186. For example, Figure 17B below shows the user interface displaying “at 230pm

you had high levels of sweat although little movement” and “this appears to be a stressful movement in your day.” Ex-1005, Figs. 15A, 17B, 18B, ¶¶181 (feedback panel 1538 presents “tips 1542 on adjusting the exercise routine”), 189 (feedback panel 1580 presents “tips 1584 on adjusting sleep”). A POSITA would have understood that this meets the claim requirement that instructions be displayed “related to at least one mental activity for improving the readiness score” because informing the user that a stressful movement was detected during the day that contributed to a low recovery score implicitly instructs the user that reducing psychological strain could improve the score. Ex-1002 ¶¶126-129.

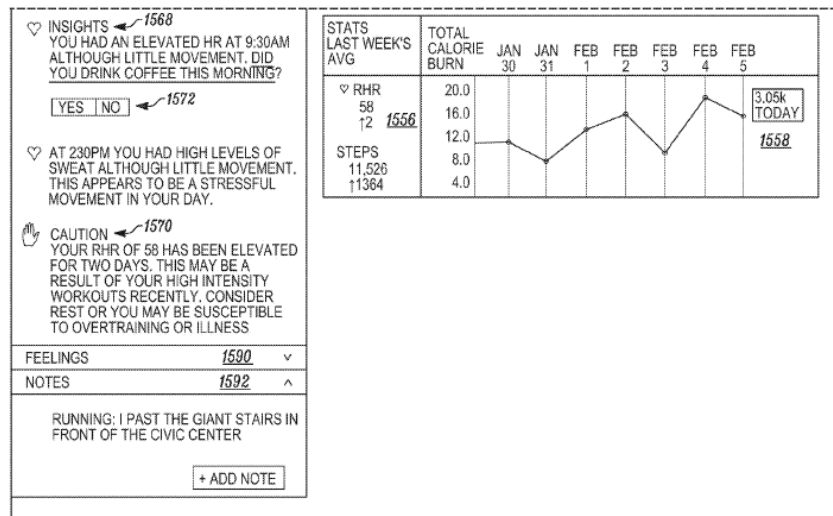
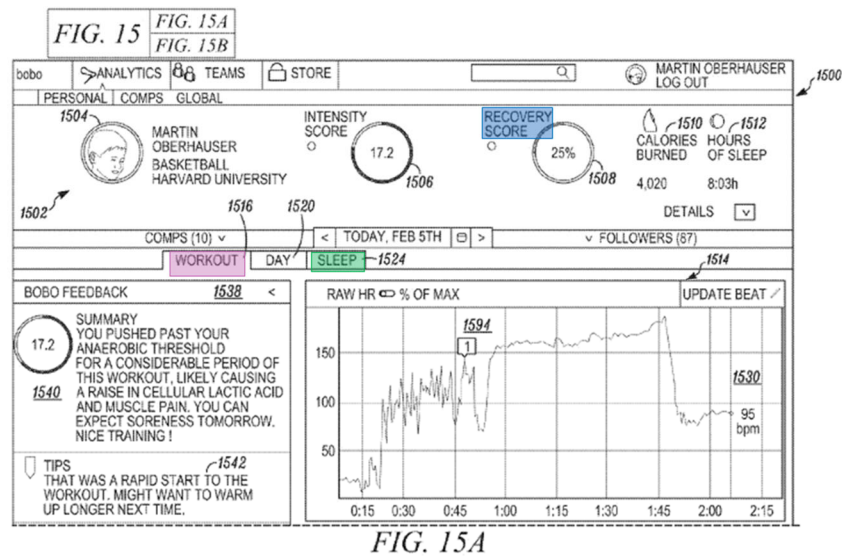


FIG. 17B



3. Dependent Claims 2-6

- a. **Claim 2:** A method according to claim 1, wherein obtaining the user's movements is performed by measuring the user's movements or by retrieving the user's movement data from a separate device.

Ahmed alone or Ahmed-Shiga teaches Claim 2. Ex-1002 ¶¶130-131.

Ahmed obtains the user's movements by measuring the user's movements using a wearable device, such as a bracelet. Ex-1005 ¶65 (“[T]he wearable system may include components configured to provide various functions such as data collection and streaming functions of the bracelet.”). For example, Ahmed's wearable device includes “one or more sensors for activity measurement” such as “one or more multi-axes accelerometers and/or gyroscope to provide a measurement of activity.” Ex-1005 ¶77.

- b. Claim 3: A method according to claim 1, further comprising measuring at least one biosignal during the activity period.**

Ahmed alone or Ahmed-Shiga teaches Claim 3. Ex-1002 ¶¶132-133.

Ahmed teaches measuring at least one biosignal during the activity period, including as part of determining an intensity score (i.e., activity summary). Ahmed teaches that “the intensity score is calculated based on the user’s heart rate reserve (HRR) as detected continuously throughout the desired time period.” Ex-1005 ¶143; *see also id.* ¶¶70, 144 (“continuous heart rate readings are converted to HRR values”).

- c. Claim 4: A method according to claim 1, wherein the at least one biosignal is selected from the group consisting of an electrocardiogram, a photoplethysmogram, an electromyogram, an electrooculogram, a heart rate, a heart rate variability, a body temperature, a resting heart rate, an average heart rate and signals related to breathing.**

Ahmed alone or Ahmed-Shiga teaches Claim 4. Ex-1002 ¶¶134-136.

Ahmed teaches measuring at least the user’s heart rate and body temperature during sleep when generating a sleep score (i.e., rest summary). Ex-1005 ¶166 (“[T]he analytics system generates a sleep score using continuous data collected by an exemplary physiological measurement system regarding the *user’s heart rate*, skin conductivity, *ambient temperature* and accelerometer/gyroscope data *throughout the user’s sleep*.”).

- d. Claim 5: A method according to claim 1, wherein determining the rest summary comprises at least one of determining a sleep factor, determining a sleep balance, determining lowest body temperature during rest and determining a resting heart rate.**

Ahmed alone or Ahmed-Shiga teaches Claim 5. Ex-1002 ¶¶137-138.

Ahmed teaches determining at least the user's lowest body temperature during rest as part of the sleep score (i.e., rest summary). Ahmed states that its "sensors may be used to recognize sleep based on a temperature drop." Ex-1005 ¶78. Moreover, Ahmed teaches that the user's "body temperature, in conjunction with heart rate monitoring and motion, may be used to interpret whether a user is sleeping or just resting, as body temperature drops significantly when an individual is about to fall asleep[]." Ex-1005 ¶78; *see also id.* ¶166 (using the user's ambient temperature throughout the user's sleep in generating the sleep score).

- e. Claim 6: A method according to claim 1, further comprising providing the user with appropriate instructions, related to at least one of physical activity, mental activity and rest, for improving the user's readiness score.**

Ahmed alone or Ahmed-Shiga teaches Claim 6. Ex-1002 ¶¶139-140.

As explained for Element 1[h], Ahmed teaches displaying on a user interface elements contributing to the recovery (i.e., readiness) score and instructions related to at least one of physical activity, mental activity, and rest for improving the readiness score. For example, Ahmed teaches that the system may "automatically

generate or adjust an exercise routine or regimen based on the user's actual recovery scores (e.g., *to recommend lighter exercise for days during which the user has not recovered sufficiently*).” Ex-1005 ¶173; *see also id.*, Figs. 15A, 17B, 18B, ¶¶181, 189.

B. Ground 3: Claim 1-6 are obvious over Wisbey in view of Shiga.

1. A POSITA would have been motivated to combine Wisbey's teachings with Shiga's teachings and would have had a reasonable expectation of success.

A POSITA would have been motivated to combine the teachings of Wisbey and Shiga and would have had a reasonable expectation of success in doing so because each relates to the same well-known technologies. Ex-1002 ¶¶141-143. Both are directed to physiological monitoring devices that collect biometric data from the user relating to the user's sleep activity and physical activity and use that data to evaluate the user's health state and provide recommendations for improving it. *See, e.g.*, Ex-1006, Abstract, ¶¶39, 57; Ex-1007, Abstract, Fig. 7.

Wisbey displays elements contributing to the interpreted recovery (i.e., readiness) score. For example, Wisbey teaches archive table 1020 (shown below), which may be part of the user's dynamic recovery profile and shows parameters contributing to the interpreted recovery score such as metabolic activity score (MAS) 1024, “sleep time 1028, and fatigue level 1030.” Ex-1006 ¶107, Fig. 10D. Wisbey further teaches that the dynamic recovery profile includes instructions

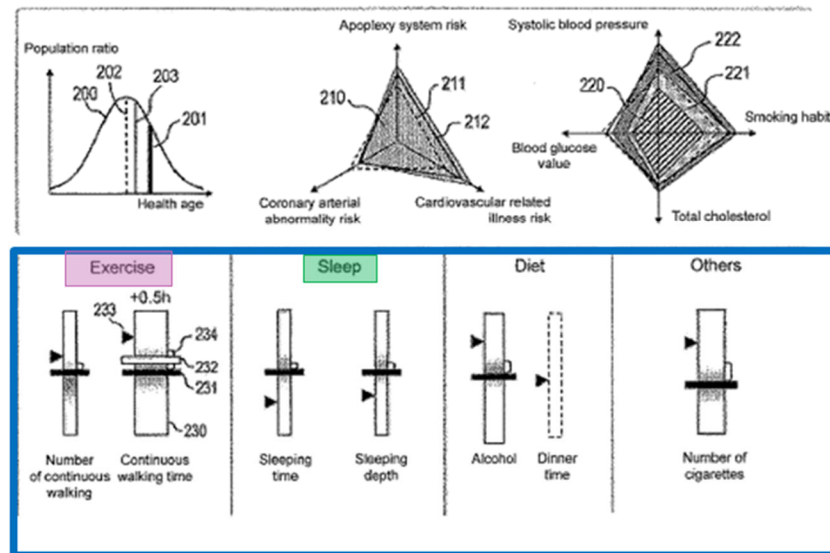
related to at least one physical activity and at least one mental activity for improving the recovery score. For example, Wisbey teaches that “the dynamic recovery profile may indicate that the user should get more sleep, or should strive for a lower MAS, to avoid becoming overly fatigued.” Ex-1006 ¶109.

Diagram illustrating a table structure with labels 1020, 1022, 1024, 1026, 1028, and 1030 pointing to various parts of the table structure.

Date	MAS	Avg. UAI	Sleep Time (hours)	Fatigue Level
1 Nov. 2013	2,500	7	6	HIGH
2 Nov. 2013	2,000	5	8	NORMAL
3 Nov. 2013	1,500	3	9	LOW

Shiga teaches a *user interface of the mobile communication device* for showing elements contributing to Shiga’s “improvable factor” and instructions relating to physical and mental activities for improving it. Shiga’s Figure 7 shows an exemplary user interface. On the “lower level of the screen,” the interface gives an example of the “improvable factor” by showing the user their present exercise and sleep progress compared to past exercise and sleep progress. The interface also shows the average user’s values for the same, and implicit instructions for improving the “improvable factor” using bars and triangles on the display. Ex-1007 ¶¶97, 118-120, Fig. 7.

Fig. 7



A POSITA would have been motivated to implement Shiga's user interface teachings for displaying elements contributing to the readiness score and instructions for improving it to enhance Wisbey's system because this was a well-known and user-friendly way to present information to the user. Ex-1002 ¶144. Wisbey does not explicitly teach that the elements contributing to the recovery score and the instructions for improving it are shown *on a user interface of the mobile communication device*. But it would have been obvious to a POSITA to do so based on Wisbey's teachings that the user interacts with a user interface to input information relating to the user's lifestyle and physical activity types. See, e.g., Ex-1006 ¶¶59-60, 84-85, 124 ("the past interpreted recovery score is *displayed on a*

graph (e.g., a line or bar graph) as a function of time (e.g., comparing against other past interpreted recovery scores from past measuring periods)’’); Ex-1002 ¶144.

A POSITA would thus have been motivated to display all related recovery score information on a user interface of the user’s mobile communication device, as taught by Shiga. Ex-1002 ¶145. In the Wisbey-Shiga combination, the dynamic recovery profile, which shows the elements contributing to the recovery score and the instructions on physical and mental activities that can improve the score, would have been displayed on the user interface. Ex-1002 ¶¶145-146.

A POSITA would have had a reasonable expectation of success in combining Wisbey and Shiga. Ex-1002 ¶147. Wisbey and Shiga are analogous prior art as they both involve physiological monitoring devices that measure the same biological markers (such as the user’s heart rate), during the same activities (for example, sleep and exercise activities), and with the same goal—to provide recommendations to the user for improving the user’s health condition and/or fitness state. *See, e.g.*, Ex-1006, Abstract, ¶¶39, 57; Ex-1007, Abstract, ¶55, Fig. 7. Moreover, a POSITA would have understood that Wisbey and Shiga’s devices are similar such that they are programmable using standard processors and are interchangeable regardless of how they display information to the user. Ex-1002 ¶147. A POSITA would have understood, therefore, that these references disclose interrelated teachings based on

routine technologies that would have been amenable to various well-understood and predictable combinations to provide more features and enhance user interest. *Id.*

2. Independent Claim 1

a. Element 1[pre]: A method for assessing readiness of a user, the method comprising:

Wisbey in view of Shiga (“Wisbey-Shiga”) teaches the preamble, to the extent it is limiting. Ex-1002 ¶¶148-149.

Wisbey teaches a method for “providing a recovery status” to a user based on an “interpreted recovery score” (Ex-1006 ¶12), which is a measurement that “accurately reflects the user’s physical condition and performance capabilities.” Ex-1006 ¶57. Figure 10A shows Wisbey’s exemplary “method 1000 for providing an interpreted recovery score.” Ex-1006 ¶57, Fig. 10A. The interpreted recovery score “take[s] into account not only the user’s current fatigue level, but also the relationship between current and past fatigue levels,” based on data obtained from a wearable device (e.g., worn on the user’s wrist or finger). Ex-1006 ¶57.

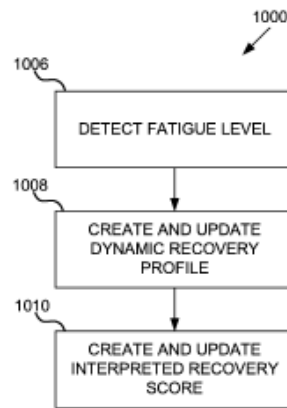


Fig. 10A

b. Element 1[a]: obtaining the user's movements;

Wisbey-Shiga teaches Element 1[a]. Ex-1002 ¶¶150-152. As discussed in Section X.A, Petitioner interprets “obtaining the user’s movements” to mean “collecting data regarding the user’s movements.” Ex-1022, 4; Ex-1021, 1.

Wisbey teaches collecting data regarding the user’s movements using accelerometers and gyroscopes. For example, Wisbey teaches that “the movement of the user’s leg in x, y, and z directions may be monitored (e.g., by an accelerometer or gyroscope).” Ex-1006 ¶72. Moreover, Wisbey teaches monitoring the user’s movement using sensors attached to the user’s body such as “a gyroscope or accelerometer to detect movement, and a heart-rate sensor, each of which may be embedded in a wristband that a user can wear on the user’s wrist or ankle, such as wristband 100.” Ex-1006 ¶78.

- c. **Element 1[b]: using the obtained user's movements to determine a nature of the period, wherein the nature of the period is selected from an activity period and a rest period;**

Wisbey-Shiga teaches Element 1[b]. Ex-1002 ¶¶153-154.

Wisbey uses the data collected regarding the user's movements, among other information, to determine whether the user is in an active, rest, or sleep state. *See* Ex-1001, 5:23-26 ("rest period" and "rest summary" include both sleep and rest). Wisbey teaches determining "the user activity type and the user activity intensity by using sensors configured to be attached to the user's body." Ex-1006 ¶90. Wisbey determines the activity type from a "set of reference activity types," with each type being "associated with a reference activity type pattern." Ex-1006 ¶79. Examples of reference activity types "include typical activities, such as **running**, walking, **sleeping**, swimming, bicycling, skiing, surfing, **resting**, working." Ex-1006 ¶67. Wisbey then determines based on, for example, a pattern, pattern frequency, and temperature "that there is an 80% chance the user activity type is running, a 15% chance the user activity type is walking, and a 5% chance the user activity is dancing." Ex-1006 ¶85; *see also id.* ¶39 (logic circuits "detect and store metrics such as the amount of physical activity, sleep, or rest over a recent period of time, or the amount of time without physical activity over a recent period of time").

d. Element 1[c]: measuring at least one biosignal of the user during the rest period;

Wisbey-Shiga teaches Element 1[c]. Ex-1002 ¶¶155-158.

Wisbey teaches measuring the user's biosignals, including the user's heart rate and HRV. For example, Wisbey teaches logic circuits that "receive and process a plurality of electric signals" from the wrist and finger biosensors including, for example, "electro-cardio signals from a heart" detected by a heart rate sensor or oximeter, which "may be used to calculate and store a [HRV] value." Ex-1006 ¶¶38, 45. The logic circuits "detect and store metrics" such as the amount of sleep, rest, or physical activity "over a recent period of time, or the amount of time without physical activity over a recent period of time" and "combine those metrics with the user's HRV." Ex-1006 ¶¶38-39; *see also id.* ¶40 (pulse oximeter may detect blood oxygen saturation levels, which may be used to calculate the user's HRV).

Wisbey teaches that the user's biosignals are measured while the user sleeps. For example, Wisbey teaches that "if the user slept poorly, but for some reason this *lack of sleep* is not captured in the fatigue level measurement (e.g., *if the HRV is consistent rather than sporadic*), the interpreted recovery score may be adjusted to account for the user's lack of sleep." Ex-1006 ¶111.

e. Element 1[d]: determining a rest summary for the rest period, based on the measured at least one biosignal and at least one biosignal of a previous rest period;

Wisbey-Shiga teaches Element 1[d]. Ex-1002 ¶159.

The '429 Patent teaches that a rest summary includes “one or more of the following: bedtime, rise time, total sleep duration, sleep disturbances, hypnogram, lowest hear[t] rate, average heart rate, biosignal amplitude variation, [HRV], restlessness etc.” Ex-1001, 23:20-25. Thus, a POSITA would have understood that the claimed “rest summary” would at least include one or more of these factors. Ex-1002 ¶160.

Wisbey’s logic circuits “detect and store metrics” such as the amount of sleep or rest (i.e., total sleep duration) the user experienced “over a recent period of time.” Ex-1006 ¶39. Specifically, the logic circuits detect “the amount of sleep a user experienced over the last 48 hours” and combine that metric with the user’s HRV and amount of physical activity to calculate a fatigue level (i.e., the claimed body response summary, discussed for Element 1[f]). Ex-1006 ¶39. The fatigue level is also “based on the amount of sleep that is measured for the previous night.” Ex-1006 ¶102. As discussed in the previous section, Wisbey teaches that the user’s biosignals are measured during sleep. For example, “if the user slept poorly, but for some reason this *lack of sleep* is not captured in the fatigue level measurement (e.g., *if the HRV is consistent rather than sporadic*), the interpreted recovery score may be adjusted to account for the user’s lack of sleep.” Ex-1006 ¶111. A POSITA would thus have understood that Wisbey determines a sleep (i.e., rest) summary for

the user's sleep period, which is based on the user's most recent sleep biometric data (previous night) and past sleep biometric data (last 48 hours). Ex-1002 ¶¶161-162.

f. Element 1[e]: determining an activity summary for the activity period, based on the obtained movements of an activity period and obtained movements of at least one previous activity period;

Wisbey-Shiga teaches Element 1[e]. Ex-1002 ¶¶163-164.

As explained for Element 1[a], Wisbey obtains the user's movements using accelerometers and gyroscopes. Ex-1005 ¶72. Wisbey further teaches determining an "metabolic activity score" (i.e., activity summary) for the user's activity period. Wisbey's metabolic activity score, which may be "represented as a numerical value," is created and updated by "multiplying the metabolic loading by the duration of the user activity type at a particular user activity intensity." Ex-1006 ¶91.

Wisbey's "metabolic activity score" is based on the user's past and present activity biometric data. Wisbey's logic circuits "detect and store metrics" such as the amount of physical activity the user experienced "*over a recent period of time.*" Ex-1006 ¶39; *see also id.* ¶51 ("movement monitoring module" monitors the user's "movement to create a metabolic activity score"). Moreover, the logic circuits detect "the amount of physical activity ... a user experienced *over the last 48 hours*" and combine that metric with the user's HRV and amount of physical activity to calculate a fatigue level (i.e., the claimed body response summary, discussed for Element

1[f]). Ex-1006 ¶39. Wisbey teaches that “the metabolic activity score may be updated by *continually supplementing* the metabolic activity score *as new activities are undertaken* by the user” such that the “score continually increases as the user participates in more and more activities.” Ex-1006 ¶91. Moreover, Wisbey teaches that “the metabolic activity score is created and *updated as an aggregate of period activity scores*, and the metabolic activity score may represent a running sum total of the period activity scores.” Ex-1006 ¶93; *see also id.* ¶98 (“the activity score may be continually updated over the period of one week, or one month”). Wisbey also teaches an archive, which “includes *historical* information about the movement and the *metabolic activity score*.” Ex-1006 ¶53. A POSITA would thus have understood that Wisbey’s metabolic activity score is “based on the obtained movements of an activity period and obtained movements of at least one previous activity period.” Ex-1002 ¶¶165-167.

g. Element 1[f]: determining a body response summary based on the rest summary and the activity summary;

Wisbey-Shiga teaches Element 1[f]. Ex-1002 ¶¶168-170.

Wisbey teaches determining a “fatigue level” (i.e., body response summary), which is based on the sleep summary and metabolic activity score. Wisbey’s logic circuits “detect and store metrics” such as the amount of rest, sleep, or physical activity “over a recent period of time” and use the user’s HRV, or HRV in

combination with those metrics, to determine a fatigue level. Ex-1006 ¶39. For example, the logic circuits detect the amount of sleep and physical activity “a user experienced over the last 48 hours, combine those metrics with the user’s HRV, and calculate a fatigue level of between 1 and 10,” which indicates “the user’s physical condition and aptitude for further physical activity that day.” Ex-1006 ¶39. The fatigue level is based, for example, “on the amount of sleep that is measured for the previous night, the duration and type of user activity, and the intensity of the activity determined for a previous time period (e.g., exercise activity level in the last twenty-four hours).” Ex-1006 ¶102. Wisbey further teaches an archive, which includes, for example, “information about past user activity types, past user activity intensities, and past fatigue levels, as well as the *relationships between* each of these (e.g., if *fatigue levels* are particularly high after a certain user activity type or after a user achieve a particular *metabolic activity score*).” Ex-1006 ¶104; *see also id.* ¶53 (“archive includes historical information about the fatigue level,” including “historical information about the movement and the metabolic activity score”).

- h. Element 1[g]: calculating a readiness score based on the body response summary and a previous body response summary, whereby the readiness score indicates a level of readiness of the user; and**

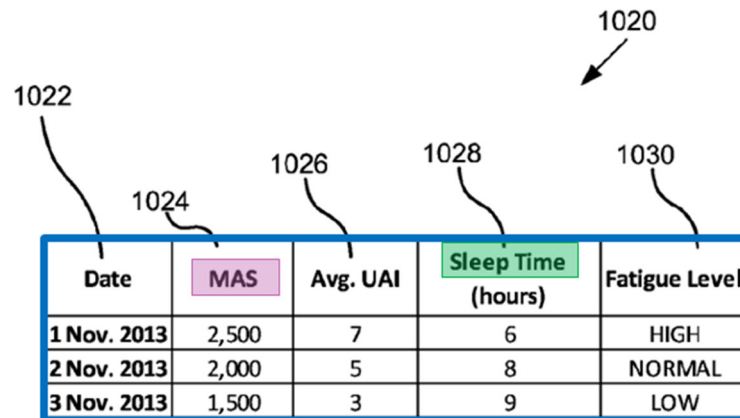
Wisbey-Shiga teaches Element 1[g]. Ex-1002 ¶¶171-173.

Wisbey teaches calculating an “interpreted recovery score” (i.e., readiness score), which is based on past and present “fatigue levels” (i.e., body response summaries) and indicates the readiness level of the user. Specifically, Wisbey teaches that the interpreted recovery score is “based on a user’s personalized fatigue levels, as recorded over time” and therefore considers “not only the user’s current fatigue level, but also the relationship between current and past fatigue levels to create” a score “that accurately reflects the user’s physical condition and performance capabilities.” Ex-1006 ¶57. Wisbey’s method takes into account current and past fatigue levels by “creating and updating a dynamic recovery profile based on an archive,” which includes “historical information about the fatigue level.” Ex-1006 ¶104. Because the interpreted recovery score “is based on both the fatigue level detected and on actual, historical results (as incorporated into the dynamic recovery profile),” Wisbey teaches that it is able to “provide[] higher resolution and additional perspective into the user’s current performance state” and “capacity for activity.” Ex-1006 ¶¶110-111; *see also id.* ¶¶110 (“The interpreted recovery score may be, for example, a number selected from a range of numbers.”), 122 (the interpreted recovery score itself may be further compared to past interpreted recovery scores “to inform the user’s current activity”).

- i. **Element 1[h]: using a user interface of the mobile communication device to show elements contributing to the readiness score and instructions related to physical activity and mental activity for improving the readiness score.**

Wisbey-Shiga teaches Element 1[h]. Ex-1002 ¶¶174-175.

Wisbey teaches showing elements contributing to the interpreted recovery score (i.e., readiness score). For example, Figure 10D shows an archive table 1020 that may be part of the user's dynamic recovery profile, which includes the parameters that contribute to the interpreted recovery score, for example, "date 1022, [metabolic activity score] MAS 1024, average [user activity intensity] UAI 1026, sleep time 1028, and fatigue level 1030." Ex-1006 ¶107.



Date	MAS	Avg. UAI	Sleep Time (hours)	Fatigue Level
1 Nov. 2013	2,500	7	6	HIGH
2 Nov. 2013	2,000	5	8	NORMAL
3 Nov. 2013	1,500	3	9	LOW

Wisbey further teaches that the dynamic recovery profile includes instructions related to at least one physical activity and at least one mental activity for improving the recovery score. For example, Wisbey teaches that if "the user has a mean fatigue level of 7 following a day when sleep to MAS ratio is 6 to 2,000" and the system has

determined that “the user typically achieves a below average MAS on days when the fatigue level is 7 or higher,” then “the dynamic recovery profile may indicate that ***the user should get more sleep, or should strive for a lower MAS***, to avoid becoming overly fatigued.” Ex-1006 ¶109; *see also id.* ¶¶9 (“a recovery recommendation module” may “provide[] an activity recommendation based on the interpreted recovery score”), 121. A POSITA would have understood that the instruction for the user to “get more sleep” is a mental activity and the instruction to strive for a lower metabolic activity score is a physical activity. Ex-1002 ¶176. A POSITA would also have understood that the instructions provided by Wisbey are examples and that an instruction related to another mental activity such as stress could instead be given as an obvious matter of design choice, given that Wisbey teaches considering factors including “stress-related activities such as work and driving in traffic” in determining the fatigue level. Ex-1002 ¶176; Ex-1006 ¶102.

Wisbey does not explicitly teach that the elements contributing to the recovery score and the instructions for improving it are shown ***on a user interface of the mobile communication device*** but it would have been obvious to a POSITA to do so based on Wisbey’s teachings that the user interacts with a user interface. Ex-1002 ¶177. For example, Wisbey teaches that “[t]he user may provide the user information by, for example, a user interface of computing device 708, or of electronic capsule 200.” Ex-1006 ¶59; *see also id.* ¶60 (“apparatus 702 may prompt

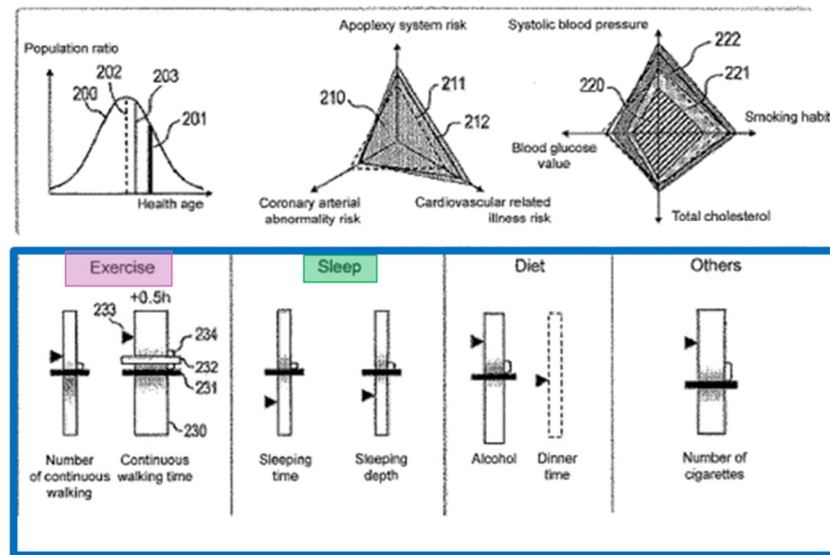
the user for information about the user's lifestyle (e.g., via a user interface)'), 67 ("user defines a user-defined activity by programming computing device 708 (e.g., by an interface on electronic capsule 200) with information about the user-defined activity, such as pattern of movement, frequency of pattern, and intensity of movement"), 84, ("user interface is provided such that the user can confirm whether a displayed user activity type is correct, or select the user activity type from a group of activity types"), 85 ("Via a user interface, a list of these possible user activities may be provided such that the user may select the activity type the user is performing."). Moreover, Wisbey teaches that "the past interpreted recovery score is *displayed* on a graph (e.g., a line or bar graph) as a function of time (e.g., comparing against other past interpreted recovery scores from past measuring periods)." Ex-1006 ¶124. A POSITA would have understood that the dynamic recovery profile, which shows the elements contributing to the recovery score and the instructions on physical and mental activities that can improve the score, would also have been displayed on a user interface because this would have been the most efficient and user-friendly way to communicate such information to the user. Ex-1002 ¶¶177-179.

This limitation is also taught by Shiga. As described above, Shiga uses the user's past and present lifestyle indices (i.e., body response summaries) to determine an "improvable factor," similar to the claimed "readiness score," which is an action

or habit that the user can take to improve the user's health. Ex-1007 ¶119. One of Shiga's goals is to give the user "specific guideline[s] such as what actions" the user can "take to maintain his/her condition ... or to improve his/her condition." Ex-1007 ¶5. Shiga proposes a "technology for presenting to the user a specific improvement action that is effective in improving the health condition of the user," "visualizing how the improvement in body activity and lifestyle habit in daily life influences the [user's] comprehensive health condition," and "assisting the setting of an appropriate improvement target that can be realized at a reasonable level for the user." Ex-1007 ¶13. To that end, Shiga teaches a user interface of the mobile communication device for showing elements contributing to Shiga's "improvable factor" and instructions relating to physical and mental activities for improving it.

Shiga's Figure 7 shows an exemplary user interface display. Ex-1007 ¶97, Fig. 7. Shiga teaches that the "lower level of the screen" gives an example of the "improvable factor" by showing the user their present exercise and sleep progress compared to past exercise and sleep progress and the average user's values for the same. Ex-1007 ¶¶118-120. For example, the exercise category of the lifestyle index shows "number of continuous walking" and "continuous walking time"; the sleep category shows "sleeping time" and "sleeping depth"; the diet category shows "alcohol ingestion frequency"; and the "other" category shows the number of cigarettes smoked by the user. Ex-1007 ¶118.

Fig. 7



In the example of Figure 7, the individual improvable factor bar is displayed. The components of bar 230 will be described using the “continuous walking time” example. Shiga teaches that “[t]he vertical axis of the bar 230 represents the value of the lifestyle index, where the value becomes more satisfactory towards the upper side”; “[t]he color (shading) of the bar 230 shows the variation in the value of the lifestyle index for a certain period (e.g., few weeks) in the past”; “[t]he width of the bar 230 represents the intensity of the influence the respective improvable factor has on the biomarker (problematic index)”; “black line 231 arranged overlapping the bar 230 shows the immediate measurement value (may be the latest measurement value or average of a plurality of immediate measurement values)”; “white line 232 on the black line 231 shows the improvement target set by the user”; “numerical value

‘+0.5h’ displayed at the upper part of the bar 230 shows the value of the improvement target”; “black triangle 233 arranged on the left side of the bar 230 represents the average value in a group of the same age and the same gender as the user”; and “[a] second bar 234 arranged on the right side of the bar 230 shows the range that can be set for the improvement target (movable range of the line 232).”

Ex-1007 ¶¶119-120. A POSITA would have understood that the information provided with bar 230 in Figure 7 relating to exercise, sleep, diet, and other categories implicitly instructs the user on how to improve the user’s improvable factor. Ex-1002 ¶180. A POSITA would have thus understood that Shiga teaches a user interface on the mobile communication device that shows elements contributing to the readiness score (i.e., improvable factor) and instructions relating to physical activity (e.g., exercise) and mental activity (e.g., sleep and smoking habit) to improve it. Ex-1007 ¶¶59 (teaching user I/F (interface) control unit 103, communication connector 104), 61 (teaching wireless communication); Ex-1002 ¶¶180-182.

A POSITA would have been motivated to combine Wisbey’s teachings with Shiga’s teachings and had a reasonable expectation of success in doing so, for the same reasons discussed in Section XIII.B.1.

3. Dependent Claims 2-6

- a. Claim 2: A method according to claim 1, wherein obtaining the user's movements is performed by measuring the user's movements or by retrieving the user's movement data from a separate device.**

Wisbey-Shiga teaches Claim 2. Ex-1002 ¶¶183-184.

Wisbey obtains the user's movements by measuring the user's movements using a wearable device, such as a wrist biosensor or a finger biosensor. Ex-1006 ¶¶38, 45. Specifically, Wisbey teaches monitoring the user's movement using sensors attached to the user's body such as "a gyroscope or accelerometer to detect movement, and a heart-rate sensor, each of which may be embedded in a wristband that a user can wear on the user's wrist or ankle, such as wristband 100." Ex-1006 ¶129. For example, Wisbey monitors "movement of the user's leg ... (e.g., by an accelerometer or gyroscope)." Ex-1006 ¶72.

- b. Claim 3: A method according to claim 1, further comprising measuring at least one biosignal during the activity period.**

Wisbey-Shiga teaches Claim 3. Ex-1002 ¶¶185-186.

Wisbey teaches measuring at least one biosignal during the activity period. For example, Wisbey teaches that its logic circuits "receive and process a plurality of electric signals" from the wrist and finger biosensors including, for example, "electro-cardio signals from a heart" detected by a heart rate sensor or oximeter, which "may be used to calculate and store a [HRV] value." Ex-1006 ¶¶38, 45.

Wisbey further teaches that “the user’s heart rate, and other indicators (e.g., breathing rate) may be monitored to determine how hard the user is working during the activity.” Ex-1006 ¶89.

- c. **Claim 4: A method according to claim 1, wherein the at least one biosignal is selected from the group consisting of an electrocardiogram, a photoplethysmogram, an electromyogram, an electrooculogram, a heart rate, a heart rate variability, a body temperature, a resting heart rate, an average heart rate and signals related to breathing.**

Wisbey-Shiga teaches Claim 4. Ex-1002 ¶¶187-189.

Wisbey teaches measuring at least the user’s heart rate when the user is sleeping. For example, Wisbey teaches logic circuits that “receive and process a plurality of electric signals” from the wrist and finger biosensors including, for example, “electro-cardio signals from a heart” detected by a heart rate sensor or oximeter, which “may be used to calculate and store a [HRV] value.” Ex-1006 ¶¶38, 45. Wisbey further teaches that “if the user slept poorly, but for some reason this *lack of sleep* is not captured in the fatigue level measurement (e.g., *if the HRV is consistent rather than sporadic*), the interpreted recovery score may be adjusted to account for the user’s lack of sleep.” Ex-1006 ¶111.

- d. **Claim 5: A method according to claim 1, wherein determining the rest summary comprises at least one of determining a sleep factor, determining a sleep balance, determining lowest body temperature during rest and determining a resting heart rate.**

Wisbey-Shiga teaches Claim 5. Ex-1002 ¶¶190-191.

Wisbey teaches that determining the rest summary includes at least determining a sleep balance. The '429 Patent defines “sleep balance” at least as “sleep debt.” Ex-1001, 12:1 (“Sleep balance (sleep debt)”), 11:24-26 (“sleep debt (i.e., if the user did not sleep enough, the difference between the user’s optimal amount of sleep and the amount of sleep the previous night or nights”)). Wisbey’s logic circuits detect “the amount of sleep a user experienced over the last 48 hours.” Ex-1006 ¶39. Wisbey teaches that the user’s dynamic recovery profile “may reflect information indicating that the user typically has a very high fatigue level *when the user gets less than six hours of sleep.*” Ex-1006 ¶105. Wisbey further teaches calculating analytics such as the mean ratio of sleep to the metabolic activity score. Ex-1006 ¶108. Wisbey uses these analytics to make recommendations to the user, including regarding the user’s sleep debt. For example, if “the user has a mean fatigue level of 7 following a day when sleep to MAS ratio is 6 to 2,000,” the user’s “dynamic recovery profile may indicate that *the user should get more sleep.*” Ex-1006 ¶109. The user’s “lack of sleep information” is “available via archived activity type detection and movement monitoring.” Ex-1006 ¶111.

- e. **Claim 6: A method according to claim 1, further comprising providing the user with appropriate instructions, related to at least one of physical activity, mental activity and rest, for improving the user's readiness score.**

Wisbey-Shiga teaches Claim 6. Ex-1002 ¶¶192-193.

As explained for Element 1[h], the Wisbey-Shiga combination teaches displaying on a user interface elements contributing to the readiness score and instructions related to at least one of physical activity, mental activity, and rest for improving the readiness score. For example, Wisbey teaches that “the dynamic recovery profile may indicate that *the user should get more sleep, or should strive for a lower MAS*, to avoid becoming overly fatigued.” Ex-1006 ¶109; *see also id.* ¶¶9 (“in one embodiment, ... a recovery recommendation module ... provides an activity recommendation based on the interpreted recovery score”), 102, 121.

C. Ground 4: Claims 1-6 are obvious over Wisbey in view of Ahmed.

- 1. **A POSITA would have been motivated to combine Wisbey's teachings with Ahmed's teachings and would have had a reasonable expectation of success.**

A POSITA would have been motivated to combine the teachings of Wisbey and Ahmed and would have had a reasonable expectation of success in doing so because each relates to the same well-known technologies. Ex-1002 ¶¶194-196. Both are directed to physiological monitoring devices that collect biometric data from the user relating to the user's sleep activity and physical activity and use that

data to evaluate the user's health state and provide recommendations for improving it. *See, e.g.*, Ex-1006, Abstract, ¶¶39, 57; Ex-1005, Abstract, ¶4, Figs. 14-18.

As explained in Section XIII.B.1, Wisbey teaches showing elements contributing to the interpreted recovery score and providing instructions related to at least one physical activity and at least one mental activity for improving the recovery score. Ex-1006 ¶¶107, 109, Fig. 10D.

Date	MAS	Avg. UAI	Sleep Time (hours)	Fatigue Level
1 Nov. 2013	2,500	7	6	HIGH
2 Nov. 2013	2,000	5	8	NORMAL
3 Nov. 2013	1,500	3	9	LOW

Ahmed teaches a *user interface of the mobile communication device* for showing elements contributing to Ahmed's recovery score and instructions for improving it. For example, Ahmed's Figures 14A-14C, shown below, depict the "recovery score graphic component" of the user interface, which includes "qualitative information corresponding to the recovery scores" such as "sleep quality" and "recent strain (physical and psychological)" elements and an instruction that the "tactical athlete has not recovered from recent strain and may need rest." Ex-1005 ¶¶167, 170, 172-173, Figs. 14A-14C; *see also id.* Figs. 15A, 17B ("this appears to be a stressful

movement in your day”), 18B (“Consider rest,” “Get a good night’s sleep tonight!”), ¶¶181 (feedback panel 1538 presents “tips 1542 on adjusting the exercise routine”), 189 (feedback panel 1580 presents “tips 1584 on adjusting sleep”).

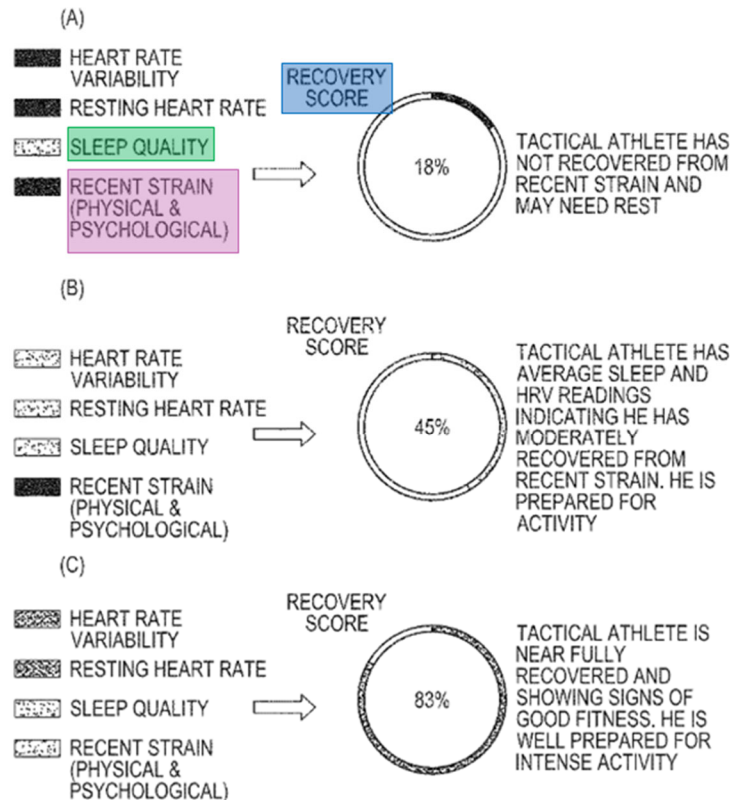


FIG. 14

A POSITA would have been motivated to implement Ahmed’s user interface teachings for displaying elements contributing to the readiness score and instructions for improving it, with Wisbey’s system, for the same reasons described in Ground 3 (Section XIII.B.1), namely because this was a well-known and user-friendly way to present information to the user. Ex-1002 ¶197. Wisbey does not explicitly teach

that the elements contributing to the recovery score and the instructions for improving it are shown *on a user interface of the mobile communication device* but it would have been obvious to a POSITA to do so based on Wisbey's teachings that the user interacts with a user interface to input information relating to the user's lifestyle and physical activity types. *See, e.g.*, Ex-1006 ¶¶59-60, 84-85, 124; Ex-1002 ¶197. A POSITA would thus have been motivated to display all related recovery score information on a user interface of the user's mobile communication device, as taught by Ahmed. *Id.* In the Wisbey-Ahmed combination, the dynamic recovery profile, which shows the elements contributing to the recovery score and the instructions on physical and mental activities that can improve the score, would have been displayed on the user interface. *Id.*

A POSITA would have had a reasonable expectation of success in combining Wisbey and Ahmed. Ex-1002 ¶¶198-199. Wisbey and Ahmed are analogous prior art as they both involve physiological monitoring devices that measure the same biological markers (such as the user's heart rate), during the same activities (for example, sleep and exercise activities), and with the same goal—to provide recommendations to the user for improving the user's health condition and/or fitness state. *See, e.g.*, Ex-1006, Abstract, ¶¶39, 57; Ex-1005, Abstract, ¶¶4, 70, Figs. 14-18. Moreover, a POSITA would have understood that Wisbey and Ahmed's devices are similar such that they are programmable using standard processors and are

interchangeable regardless of how they display information to the user. Ex-1002 ¶199. A POSITA would have understood, therefore, that these references disclose interrelated teachings based on routine technologies that would have been amenable to various well-understood and predictable combinations to provide more features and enhance user interest. *Id.*

2. Independent Claim 1

a. Element 1[pre]: A method for assessing readiness of a user, the method comprising:

Wisbey in view of Ahmed (“Wisbey-Ahmed”) teaches the preamble, to the extent it is limiting, for the same reasons described in Section XIII.B.2.a. Ex-1002 ¶200.

b. Element 1[a]: obtaining the user's movements;

Wisbey-Ahmed teaches Element 1[a], for the same reasons described in Section XIII.B.2.b. Ex-1002 ¶201.

c. Element 1[b]: using the obtained user's movements to determine a nature of the period, wherein the nature of the period is selected from an activity period and a rest period;

Wisbey-Ahmed teaches Element 1[b], for the same reasons described in Section XIII.B.2.c. Ex-1002 ¶202.

- d. Element 1[c]: measuring at least one biosignal of the user during the rest period;**

Wisbey-Ahmed teaches Element 1[c], for the same reasons described in Section XIII.B.2.d. Ex-1002 ¶203.

- e. Element 1[d]: determining a rest summary for the rest period, based on the measured at least one biosignal and at least one biosignal of a previous rest period;**

Wisbey-Ahmed teaches Element 1[d], for the same reasons described in Section XIII.B.2.e. Ex-1002 ¶204.

- f. Element 1[e]: determining an activity summary for the activity period, based on the obtained movements of an activity period and obtained movements of at least one previous activity period;**

Wisbey-Ahmed teaches Element 1[e], for the same reasons described in Section XIII.B.2.f. Ex-1002 ¶205.

- g. Element 1[f]: determining a body response summary based on the rest summary and the activity summary;**

Wisbey-Ahmed teaches Element 1[f], for the same reasons described in Section XIII.B.2.g. Ex-1002 ¶206.

- h. Element 1[g]: calculating a readiness score based on the body response summary and a previous body response summary, whereby the readiness score indicates a level of readiness of the user; and**

Wisbey-Ahmed teaches Element 1[g], for the same reasons described in Section XIII.B.2.h. Ex-1002 ¶207.

- i. **Element 1[h]: using a user interface of the mobile communication device to show elements contributing to the readiness score and instructions related to physical activity and mental activity for improving the readiness score.**

Wisbey-Ahmed teaches Element 1[h]. Ex-1002 ¶208.

As discussed in Section XIII.B.2.i, while not explicitly disclosed by Wisbey, it would have been obvious to a POSITA that Wisbey's dynamic recovery profile, which shows elements contributing to the recovery score and instructions on physical and mental activities that can improve the score, would have been shown on Wisbey's user interface that is already used to display other information to the user, because this would have been the most user-friendly and efficient way to communicate the recovery score information to the user. Ex-1002 ¶¶209-212.

Ahmed also teaches this limitation for the same reasons described in Section XIII.A.2.i.

A POSITA would have been motivated to combine Wisbey's teachings with Ahmed's teachings and had a reasonable expectation of success in doing so, for the same reasons discussed in Section XIII.C.1.

3. Dependent Claims 2-6

- a. Claim 2: A method according to claim 1, wherein obtaining the user's movements is performed by measuring the user's movements or by retrieving the user's movement data from a separate device.**

Wisbey-Ahmed teaches Claim 2, for the same reasons described in Section XIII.B.3.a. Ex-1002 ¶213.

- b. Claim 3: A method according to claim 1, further comprising measuring at least one biosignal during the activity period.**

Wisbey-Ahmed teaches Claim 3, for the same reasons described in Section XIII.B.3.b. Ex-1002 ¶214.

- c. Claim 4: A method according to claim 1, wherein the at least one biosignal is selected from the group consisting of an electrocardiogram, a photoplethysmogram, an electromyogram, an electrooculogram, a heart rate, a heart rate variability, a body temperature, a resting heart rate, an average heart rate and signals related to breathing.**

Wisbey-Ahmed teaches Claim 4, for the same reasons described in Section XIII.B.3.c. Ex-1002 ¶215.

- d. Claim 5: A method according to claim 1, wherein determining the rest summary comprises at least one of determining a sleep factor, determining a sleep balance, determining lowest body temperature during rest and determining a resting heart rate.**

Wisbey-Ahmed teaches Claim 5, for the same reasons described in Section XIII.B.3.d. Ex-1002 ¶216.

This claim is also taught by Ahmed, for the same reasons described in Section XIII.A.3.d. Ex-1002 ¶¶217-218.

A POSITA would have been motivated to combine Wisbey's teachings with Ahmed's teachings and had a reasonable expectation of success in doing so, for the same reasons discussed in Section XIII.C.1.

- e. **Claim 6: A method according to claim 1, further comprising providing the user with appropriate instructions, related to at least one of physical activity, mental activity and rest, for improving the user's readiness score.**

Wisbey-Ahmed teaches Claim 6. Ex-1002 ¶¶219-224.

As explained for Element 1[h], the Wisbey-Ahmed combination teaches displaying on a user interface elements contributing to the readiness score and instructions related to at least one of physical activity, mental activity, and rest for improving the readiness score. Moreover, Wisbey teaches Claim 6 for the same reasons described in Section XIII.B.3.e.

XIV. THE BOARD SHOULD NOT USE ITS DISCRETION TO DENY INSTITUTION UNDER *FINTIV*.

The Board should decline to exercise its discretion to deny institution under 35 U.S.C. §314(a) because while there is a pending declaratory judgment action between PO and Petitioner, there are no invalidity claims and therefore no overlap with this petition. Should the circumstances regarding validity change, Petitioner

will respectfully request leave to brief any discretionary denial issues, to the extent raised.

XV. CONCLUSION

Petitioner requests institution of IPR for Claims 1-6 of the '429 Patent based on each of the grounds in this Petition.

Respectfully Submitted,

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CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. §42.24(d), Petitioner certifies that this petition includes 13,973 words, as measured by Microsoft Word, exclusive of the table of contents, mandatory notices under §42.8, certificates of service, word count, and exhibits.

CERTIFICATE OF SERVICE (37 C.F.R. §42.6(e)(1))

The undersigned hereby certifies that the above document was served on June 28, 2024, by filing this document through the Patent Trial and Appeal Board P-TACTS System, as well as delivering a copy via express mail upon the following attorneys of record for the Patent Owner:

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