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IN THE UNITED STATES DISTRICT COURT  
DISTRICT OF UTAH

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POLAR ELECTRO OY,  
Plaintiff,

v.

SUUNTO OY, AMER SPORTS WINTER &  
OUTDOOR d/b/a/ SUUNTO USA, and  
FIRSTBEAT TECHNOLOGIES OY,  
Defendants.

**MEMORANDUM DECISION  
AND ORDER**

Case No. 1:17-cv-0139 CW

Judge Clark Waddoups

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**INTRODUCTION**

U.S. Patent No. 6,537,227 (hereinafter, “the ‘227 Patent”) has been challenged through three re-examinations. Over that course, some claims were confirmed, others were cancelled, and new claims were added and found patentable. Now, Plaintiff Polar Electro Oy (“Polar”) moves for summary judgment on the grounds that the ‘227 Patent is valid and that Defendant Firstbeat Technologies Oy (“Firstbeat”) has infringed Polar’s patent. In turn, Firstbeat moves for summary judgment on the grounds that its Sports products do not infringe the ‘227 Patent; the ‘227 Patent is invalid because it pertains to a non-patentable subject area; and the patent has other statutory infirmities. Firstbeat offers expert testimony from Thomas Blackadar to support part of its assertions. Polar moves to exclude such testimony on the ground that Mr. Blackadar is not an expert. Polar offers its own experts to support its summary judgment motions and its assertion

that Mr. Blackadar’s opinions fail.

The parties submitted comprehensive briefing on the issues. Ultimately, however, the court reaches only one issue because the issue is dispositive. The court concludes the claims at issue under the ‘227 Patent are invalid because they comprise an abstract idea. Summary judgment is granted in favor of Firstbeat.

### **FACTUAL BACKGROUND**

1. Polar asserts Firstbeat has infringed Claims 5, 15, 21, and 43 of the ‘227 Patent.<sup>1</sup> *See* Polar’s Amended Final Infringement Claim Chart, at 3–50 (ECF No. 313-1).<sup>2</sup> Claim 5 is an independent methods claim and Claim 21 is an independent apparatus claim. Claims 15 and 43 depend from Claim 5.

2. According to the ‘227 Patent, “[t]he object of the invention is to provide an improved method and equipment implementing the method for assessing energy consumption during exercise.” ‘227 Patent, Col. 1, Lines 49–51 (ECF No. 205-1).

3. “For 200 hundred years, scientists have sought to measure energy expenditure.” Declaration of Dr. James A. Levine, M.D., PhD., ¶ 26 (ECF No. 456-3) (hereinafter “Levine Decl. II”).

4. “Sports and exercise increase the heart muscle mass and the capability of the system to supply oxygen to the body.” ‘227 Patent, Col. 1, Lines 23–25. In turn, “[t]he heart’s capability to pump oxygenated blood into the body improves, and consequently by one contraction, i.e. beat,

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<sup>1</sup> Polar asserted that Firstbeat also infringed Claim 18, but Polar subsequently filed an unopposed Notice of Withdrawal (ECF No. 485) of that claim, so Claim 18 is no longer at issue.

<sup>2</sup> When the court cites to a page in the record, the citation is to the ECF page numbering at the top of the page and not to page numbering elsewhere on the document.

the heart is able to pump a larger amount of blood in the body, whereby the beat rate can be lower than that of an unfit person.” *Id.* Col. 1, Lines 25–29. These principles govern a person’s energy consumption.

5. Prior art for heart rate monitors have assessed energy consumption “on the basis of the heart rate and the person’s weight, gender and age, for instance.” *Id.* Col. 1, Lines 37–39.

6. According to the ‘227 Patent’s specification, however, prior art did “not take into account that a fit person performs a larger amount of work at a given heart rate level than an unfit person, whereby the amount of energy consumed by the fit person is larger than that of the unfit person.” *Id.* Col. 1, Lines 42–45.

7. Polar’s expert Dr. James A. Levine, M.D., Ph.D. has opined that the ‘227 Patent “involves a determination/input of maximum heart rate and maximum oxygen consumption and uses this information to assess and determine energy expenditure.” Levine Decl. II, ¶ 2 (ECF No. 456-3). Dr. Levine asserts this is “an unusual approach” for “personalizing a heart rate monitor . . . to assess a person’s energy consumption during exercise.” *Id.* ¶¶ 2–3.

8. The “relationship between heart rate and energy expenditure” varies “from one person to the next,” resulting in “substantial inter-individual variance.” Declaration of James A. Levine, ¶ 4 (ECF No. 157) (hereinafter “Levine Decl. I”). Factors such as emotions and hormone levels may affect “[a] person’s heart rate,” and other factors such as age and illness may impact the relationship between a person’s heart rate and “volume of blood pumped per beat.” *Id.* ¶¶ 4.1, 4.3.

9. The inter-individual variance impedes the accuracy of heart rate monitors to estimate a person’s energy consumption. “[T]he precision of heart rate for predicting energy

consumption,” however, “can be improved by using individual calibration of the heart rate monitor for every person being measured.” Levine Decl. I, ¶ 7 (ECF No. 157).

10. Regression equations allow for such “individualization,” thereby increasing the accuracy of heart rate monitors to determine energy consumption. *Id.* ¶ 8. The individualization also has been referred to by Dr. Levine as the personalization phase. Levine Decl. II, ¶ 70 (ECF No. 456-3).

11. According to Dr. Levine, the ‘227 Patent contains a “unique method” for “defining an individual calibration curve for each user whereby maximum heart rate, resting heart rate and potentially intermediate values are used to define an individual calibration curve.” Levine Decl. I, ¶ 9 (ECF No. 157). The calibration curve is combined with “physiological variables,” thereby allowing energy consumption to be calculated by a portable device as the device receives “continuous heart rates values.” *Id.*

12. Assessment of a person’s energy consumption occurs during the “use” phase. At least two calculating parameters have to be present: “the heart rate parameter and the energy consumption reference value.” Second Reexamination Certificate, Col. 1, Lines 42–45 (ECF No. 205-7). The use phase also depends on “the maximum value of energy consumption and a lower value of energy consumption, wherein the person’s energy consumption is substantially linear dependent on the heart rate parameter between the maximum value of energy consumption and the lower value of energy consumption.” *Id.* Col. 1, Lines 46–52.

13. According to Dr. Levine, the ‘227 Patent advanced the technology. Levine Decl. I, ¶ 10 (ECF No. 157); Levine Decl. II, ¶ 67 (ECF No. 456-3). Both of Dr. Levine’s declarations focus on the personalization or individualization phase as being a technological advancement.

14. The '227 Patent has a priority date of March 7, 2000. *See* '227 Patent, Foreign Application Priority Data, at 1 (ECF No. 205-1); First Reexam File History, at 41 (ECF No. 205-6) (stating “[t]he ‘227 patent claims priority to Finnish Application No. 000522, filed March 7, 2000”).

15. “In the Year 2000, the idea of using heart rate to predict[] oxygen or energy consumption had been published.” Levine Decl. I, ¶ 10 (ECF No. 157). Additionally, in that same year, “portable electronic devices for measuring heart rate in free-living people and the use of portable computers to analyze and store heart rate data had been published.” *Id.* Moreover, in the Year 2000, “[t]he concept of individual calibration of a physiological device had been published.” *Id.* ¶ 11. Thus, the ‘227 Patent’s alleged advancement goes to “the method used for individual calibration.” *See id.* (opining Polar’s method “was unique at the time”).

16. Dr. Levine asserts “the scientists behind the ‘227 Patent had the idea to individually calibrate the heart rate monitor for each person using it—personalization—and specifically how it should be calibrated.” Levine Decl. II, ¶ 37 (ECF No. 456-3). In particular, Dr. Levine reports that “The Personalized Heart Rate Monitor and Method in the ‘227 Patent looks at a person’s heart rate at maximum exertion to represent the maximum energy consumption, or what is also referred to as VO<sub>2</sub>max (the maximum amount of oxygen a person uses during exercise; this is also called maximal oxygen consumption or maximal oxygen uptake).” *Id.*

17. Dr. Levine further asserts, “VO<sub>2</sub>max is an important aspect of The Personalized Heart Rate Monitor and Method described in the ‘227 Patent.” Levine Decl. II, ¶ 38. Specifically, “[w]hen a person is at maximum physical performance, their heart rate is maximum, and their oxygen consumption is maximum, which is referred to as VO<sub>2</sub>max. When a person is at rest, the

heart rate is lowest, and their oxygen consumption is lowest.” *Id.*

18. Thus, according to Dr. Levine, the ‘227 Patent “exploit[s] the idea that a person’s maximum physical performance corresponds uniquely to the person’s maximum oxygen consumption, VO<sub>2</sub>max, and maximal heart rate,” which “was not an *obvious* approach to using heart rate to assess energy expenditure. In fact, it was an oddball approach.” Levine Decl. II, ¶ 40 (ECF No. 456-3) (emphasis added).

### **Claim at Time of Application**

19. When the application for the ‘227 Patent was filed, Claim 1 read as follows:

A method for assessing a person’s energy consumption during exercise, which method measures the person’s heart rate information during exercise,

provides an assessment of the person’s energy consumption by means of at least two calculating parameters, one of which is a heart rate parameter during exercise measured from the person’s heart rate information, wherein an energy consumption reference value is used as one calculating parameter,

the reference value being obtained by using one or more performance parameters describing the person’s physical performance.

‘227 Patent File History, at 94 (ECF No. 205-5) (line breaks inserted). The claim did not mention oxygen, and the concepts of VO<sub>2</sub>max, maximum heart rate, and maximum energy expenditure were not stated in the claim.

20. The Patent and Trademark Office (“PTO”) rejected the claim as being “anticipated by Richardson et al, U.S. Patent No. 5,976,083,” because Richardson “discloses a personal fitness monitoring device and method for assessing the fitness of an individual as the individual exercises.” *Id.* at 29. Moreover, the Richardson patent “discloses the computation of fitness by

computing the user's maximum heart rate, then a linear regression is fitted to the time series of heart rate and energy expenditure points. Using this regression, the value of energy expenditure associated with the user's maximum heart rate is computed." *Id.* at 29–30. Under Richardson, that "value [was] the user's estimated maximum aerobic energy expenditure, which is taken as the user's aerobic fitness value." *Id.* at 30.

21. Polar did not rebut the PTO's conclusions. '227 Patent File History, at 24 (ECF No. 205-5). Instead, Polar rewrote all the claims in its application. *Id.* at 17, 24. Claim 1 was changed to read as follows:

A method for assessing a person's energy consumption during exercise, the method comprising the steps of:

measuring the person's heart rate information during exercise, the heart rate information including a heart rate parameter;

obtaining an energy consumption reference value from one or more performance parameters that describe the person's physical performance with at least one of the performance parameters being oxygen uptake;

assessing the person's energy consumption by means of a plurality of calculating parameters including at least the heart rate parameter and the energy consumption reference value.

*Id.* at 17; '227 Patent, Col. 10, Lines 37–49 (ECF No. 205-1). The amended Claim 1 required oxygen uptake to be "one of the performance parameters used to obtain an energy consumption value." First Reexam File History, at 67 (ECF No. 205-6) (reviewing history of patent during initial prosecution). The amended Claim 1 did not require VO<sub>2</sub>max, maximum heart rate, or maximum energy expenditure.

22. The PTO accepted the changes and issued a Notice of Allowability. '227 Patent File History, at 16 (ECF No. 205-5). The '227 Patent issued on March 25, 2003. '227 Patent, at

1 (ECF No. 205-1).

### **First *Ex Parte* Reexamination**

23. About nine years later, Firstbeat requested an *ex parte* reexamination of the ‘227 Patent, which the PTO granted on or about October 25, 2012. First Reexam File History, at 64–66 (ECF No. 205-6). The reexam resulted in Claims 1 and 16 being cancelled; Claims 2–15 and 17–31 being amended; and Claims 32–42 being added. *Id.* at 6. The first Reexamination Certificate issued on June 4, 2013. *Id.* at 1.

24. Polar had to combine Claim 1 with dependent Claim 5, such that Claim 5 became the independent methods claim at issue in this case. Claim 5, following the first reexamination reads as follows, with bracketed language deleted from Claim 5 and italicized language added from Claim 1 to Claim 5:

A method [as claimed in claim 1] *for assessing a person’s energy consumption during exercise, the method comprising the steps of:*

*measuring the person’s heart rate information during exercise, the heart rate information including a heart rate parameter;*

*obtaining an energy consumption reference value from one or more performance parameters that describe the person’s physical performance with at least one of the performance parameters being oxygen uptake;*

*assessing the person’s energy consumption by means of a plurality of calculating parameters including at least the heart rate parameter and the energy consumption reference value, wherein the plurality of calculating parameters include at least a maximum value of energy consumption and a lower value of energy consumption, wherein the person’s energy consumption on the heart rate parameter is substantially linear dependent between the maximum value of energy consumption and the lower value of energy consumption.*

First Reexamination Certificate, Col. 1, Lines 36–55 (ECF No. 205-6).



25. The amended Claim 5 did not require VO<sub>2</sub>max or maximum heart rate, but as of June 4, 2013, the independent claim required maximum energy expenditure, which previously was only a dependent claim limitation.

26. The PTO granted the first request for a reexamination, in part, due to Lubell et al., U.S. Patent No. 4,566,461, issued on January 28, 1986. The Lubell “invention relates to health and fitness monitors.” Lubell Patent, Col. 1, Lines 4–5. Lubell reported, “[r]ecently, the capacity of the subject’s cardiovascular system to bring oxygen to the body tissues has been determined to be perhaps the most meaningful index of aerobic fitness,” which “fitness index is commonly referred to as the maximal oxygen uptake, or VO<sub>2max</sub>.” *Id.* Col. 1, Lines 42–45, 48–49.

27. Lubell reported the “fitness index VO<sub>2max</sub> is higher,” generally, “the greater the level of fitness is for a given individual.” Lubell Patent, Col. 1, Lines 49–51. Additionally, “[a]s a general proposition, this fitness index declines with age, and, for the same fitness level, is slightly lower for women than for men.” *Id.* Col. 1, Lines 58–60. Lubell also reported, “[t]he application of maximal oxygen uptake VO<sub>2max</sub> as an index of fitness, is discussed, e.g., in Astrand and others . . . in the Journal of Physiology, November 1963.” *Id.* Col. 1, Lines 61–64.

28. Lubell improved on prior art that “require[d] manual entry of resting heart rate, minimum exercise heart rate, maximum exercise heart rate, and a previously-calculated fitness index or maximal oxygen [sic] uptake level VO<sub>2max</sub>,” by changing a device’s programming to “measur[e] the subject’s fitness automatically.” Lubell Patent, Col. 2, Lines 26–34. Its objective was to “automatically calculate an appropriate fitness parameter (e.g., maximal oxygen uptake level or VO<sub>2max</sub>) by automatically pacing the subject through a straightforward training protocol” that was portable. *Id.* Col. 2, Lines 48–51, 62–64.

29. The Lubell patent also is relevant to the issue here because the data entry for the heart rate monitor was based on “selected data peculiar to the subject, . . . and also displaying one or more fitness parameters calculated on the basis of the entered selected data and the detected heart beats of the subject.” Lubell Patent, Col. 3, Lines 3–7. The fitness parameters had to “include at least the maximal oxygen uptake  $VO_{2max}$  as a fitness index,” *id.*, Col. 3, Lines 19–21, which Lubell taught how to implement. *Id.* Col. 3, Lines 23–57.

30. Lubell’s protocol “continuously measures the heart rate” until the subject reaches maximal heart rate, whereupon  $VO_{2max}$  is determined and “displayed as the calculated fitness index.” Lubell Patent, Col. 3, Lines 41–56. That calculated fitness is then “used to monitor the aerobic training of the subject.” *Id.* Col. 3, Lines 56–57.

31. Lubell noted that “the correlation between actual  $VO_{2max}$  values and the values calculated using data from the submaximal exercise stress tolerance test is extremely good,” which correlation was depicted on a table. Lubell Patent, Col. 9, Lines 42–56. Lubell further noted “[a] well-established linear relationship exists between the percent of  $VO_{2max}$  required for a given workload, and the heart rate achieved at that [workload].” *Id.* Col. 10, Lines 8–11.

32. In Lubell’s method claim, a person’s heartbeat is detected, “selected data peculiar to the said subject” is inputted pertaining to physiological parameters, and “ $VO_{2max}$  is calculated as a fitness index,” based in part on the time it takes for the subject’s heart rate to reach maximum level. *Id.* Col. 16, Lines 19–52.

33. The PTO concluded that Lubell teaches:

[A] health fitness monitor for monitoring aerobic exercise training. The monitor automatically calculates a fitness parameter for a subject by monitoring heart rate during an exercise stress test protocol. At the point of maximum heart rate, the subject’s maximal

oxygen uptake capacity is calculated and is displayed as a fitness parameter. During exercise, the submaximal oxygen uptake is calculated at regular intervals using the individual's heart rate and this parameter can be used to calculate caloric consumption . . . during training for the particular subject . . . Hence Lubell measures heart rate during exercise, obtains an energy consumption reference value that comprises oxygen uptake, and assesses the person's energy consumption value by calculating calorie expenditure in accordance with Claim 1.

First Reexam File History, at 53 (ECF No. 205-6).

34. The PTO further concluded that Lubell “discloses the plurality of calculating parameters include at least one of: a maximum heart rate corresponding to the person's maximum performance . . . ; a lower heart rate lower than the maximum heart rate . . . ; and an intermediate heart rate which is between the maximum heart rate and the lower heart rate . . . . First Reexam File History, at 54 (noting teachings of the Lubell Patent, but addressing Claim 11 of the ‘227 Patent as it existed during the first reexamination).

35. As to energy consumption, however, Firstbeat admitted and the PTO concurred that Lubell did “not explicitly disclose” the following:

the plurality of calculating parameters include a lower value of energy consumption; and

wherein the person's energy consumption on the heart rate parameter is substantially linear dependent between the maximum value of energy consumption and the lower value of energy consumption.

First Reexam File History, at 60, 122.

36. The limitations in Paragraph 35 above pertain to the “use” phase of Claim 5 and not to the “personalization” phase of that Claim. According to Dr. Levine, the inventive concept that advanced the technology pertains to “an oddball approach to *personalizing* a heart rate

monitor, specifically to assess a person's energy consumption during exercise.” Levine Decl. II, ¶ 2 (ECF No. 456-3) (emphasis added).

### **Second *Ex Parte* Reexamination**

37. On January 29, 2014, Firstbeat filed a second request for *ex parte* reexamination, which the PTO granted on or about March 18, 2014. Third Reexam File History, at 152 (ECF No. 205-8). The PTO concluded on or about June 13, 2014, that Claims 5, 15, and 21 were unpatentable over prior art. *Id.*

38. During the second reexamination, Jimenez et al., U.S. Patent No. 4,367,752, issued on January 11, 1983, was considered along with three other references. According to the PTO, “Jimenez disclose[d] all the claimed method steps of independent claim 5 and structure of claim 21 to assess a person's energy consumption during exercise.” Second Reexam File History, at 50, 83 (ECF No. 205-7); Third Reexam File History, at 155 (ECF No. 205-8).

39. The ‘227 Patent, however, survived invalidity because “[e]ach of the independent claims” was amended to require further limitations. Second Reexam File History, at 7 (ECF No. 205-7). Claim 5, following the second reexamination reads as follows, with bracketed language deleted from Claim 5 and the italicized language added to survive invalidity:

A method for assessing a person's energy consumption during exercise, the method comprising [the steps of]:

measuring the person's heart rate information during exercise, the heart rate information including a heart rate parameter;

obtaining an energy consumption reference value from one or more performance parameters that describe the person's physical performance with at least one of the performance parameters being *a maximal oxygen uptake, the energy consumption reference value being a maximum value of energy consumption associated with the person, the maximum value of energy consumption representing a*

*value of energy consumption that is associated with the person and corresponds to a maximum heart rate associated with the person;*

assessing the person's energy consumption by means of a plurality of calculating parameters including at least the heart rate parameter and the energy consumption reference value, wherein the plurality of calculating parameters include at least [a] *the* maximum value of energy consumption and a lower value of energy consumption, wherein the person's energy consumption *is substantially linear dependent* on the heart rate parameter [is substantially linear dependent] between the maximum value of energy consumption and the lower value of energy consumption.

Second Reexamination Certificate, Col. 1, Lines 26–53 (ECF No. 205-7).

40. The second Reexamination Certificate issued on October 2, 2014, approximately fourteen and a half years after the '227 Patent's priority date of March 7, 2000. *Id.* at 1; '227 Patent, at 1 (ECF No. 205-1) (stating "Foreign Application Priority Data"). Through the amendment, VO<sub>2</sub>max and maximum heart rate became limitations for the first time, and it is the language from the second reexamination that Dr. Levine relies upon for his declarations.

41. During the second reexamination, Claim 43 was added, which depends from Claim 5. Second Reexamination Certificate, Col. 4, Lines 5–7 (ECF No. 205-7).

42. During a third ex parte reexamination, Claims 5, 15, 21, and 43 were confirmed, with no further modifications. Third Reexam File History, at 5 (ECF No. 205-8).

### **Statements about Maximum Oxygen Uptake in Prior Art**

43. As stated above, Firstbeat proffered Lubell, Jimenez, and other publications when challenging the '227 Patent on novelty and obviousness grounds before the PTO.

44. Jimenez disclosed that one object of that invention was "to provide a portable apparatus which can be worn" during exercise that measured heart rate, distance, speed, "and, upon completion of 12 minutes of maximum activity, his fitness based on maximum oxygen uptake."

Jimenez Patent, Col. 5, Lines 23–31.

45. Jimenez further stated, “there is a roughly linear relationship between oxygen uptake and heart rate during exercise for a particular subject,” and noted that “[t]he roughly linear relationship has a slope that changes with the physical fitness of the subject.” *Id.* Col. 20, Lines 45–49.” Similar to the ‘227 Patent, Jimenez stated physical fitness mattered “because a physically fit person is able to transport the same amount of oxygen at a lower heart rate than an unfit person.” *Id.* Col. 20, Lines 49–51. “The hypothesis for the caloric consumption equations employed in the [Jimenez] invention relie[d] upon” these “known phenomena.” *Id.* Col. 20, Lines 42–44.

46. Another prior art cited by Firstbeat was Maruo et al., U.S. Patent No. 5,853,351, issued on December 29, 1998. Figure 2 of Maruo is similar to Figure 1 of the ‘227 Patent to show a linear relationship between heart rate and aerobic capacity, including when maximum heart rate and maximum aerobic capacity is reached. *Cf.* ‘227 Patent, Figure 1 (ECF No. 205-1) (charting energy consumption and heart rate) *with* Maruo Patent, Figure 2 (charting aerobic capacity and heart rate).

47. Maruo included regression formulas that represented “[t]he maximum heart rate,” and stated, “[t]o be exact, the maximum heart rate is defined as a heart rate corresponding to a maximal oxygen uptake ( $VO_{2max}$ ) taken in the body per 1 kg of the body weight and per 1 minute.” Maruo Patent, Col. 1, Line 40–51.

48. Maruo further provided a formula showing how maximum oxygen uptake could be converted to maximum aerobic capacity. *See id.* Col. 3, Lines 36–44; Col. 10, Lines 30–33.

49. Maruo defined “maximum aerobic capacity . . . as maximum workload corresponding to a maximum heart rate ( $HR_{max}$ ) of the individual user.” *Id.* Col. 2, Line 67 to Col.

3, Lines 1–2; *see also id.* Col. 13, Lines 65–67 to Col. 14, Line 1.

50. Firstbeat further cited to the work done by Kenneth H. Cooper that was published in the *Journal of the American Medical Association*, Vol 203, No 3, at 135–38 (Jan. 15, 1968) entitled *A Means of Assessing Maximal Oxygen Intake* (hereinafter “*Cooper*”). *Cooper* reported that oxygen consumption is “the most objective method by which one can determine the physical fitness of an individual as reflected by his cardiovascular system.” *Cooper*, at 2 (ECF No. 438-25).

51. *Cooper* developed a 12-minute field test, at submaximal exertion, to evaluate whether the field test could be substituted in place of determining VO<sub>2</sub>max in a laboratory. *See id.* at 3–4 (ECF No. 438-25) (describing test and validating procedures). After testing 115 subjects both in a laboratory and in the field, *Cooper* demonstrated the field test could “provide a good assessment of maximal oxygen consumption,” with some variability based on the motivation of the test subject. *Id.* at 4. Moreover, the publication reported that *Cooper* found a linear “correlation between *maximal* oxygen consumption and [the] 12-minute walk-run performance in normal males.” *Id.* at 3 (emphasis added).

52. Those who were able to travel the greatest distance in the 12-minute test also were those with the highest VO<sub>2</sub>max. *Cooper*, Correlation Graph, at 3 (ECF No. 438-25). Additionally, *Cooper* included two tables to show how distance traveled by a subject during the 12-minute test predicted maximum oxygen consumption and that person’s fitness level. *Cooper*, Table 1 - Predicted Maximal Oxygen Consumption on the Basis of 12-Minute Performance, at 4 (ECF No. 438-25); *Cooper*, Table 2 – Levels of Cardiovascular Fitness Based on 12-Minute Performance and Maximal Oxygen Consumption, at 4 (ECF No. 438-25). Thus, the test provided an “indicator

of cardiovascular fitness.” *Id.* at 2.

### **Dependent Claims 15 and 43 and Independent Claim 21 of the ‘227 Patent**

53. To the method in Claim 5, Claim 15 adds that when measuring the heart rate, it is measured with a heart rate monitor and includes the step of “displaying the assessment on the display of the heart rate monitor.” First Reexamination Certificate, Col. 2, Lines 17–23 (ECF No. 205-6).

54. Claim 43 provides “[a] method as claimed in claim 5, wherein the plurality of calculating parameters includes the maximum heart rate associated with the person.” Second Reexamination Certificate, Col. 4, Lines 5–7 (ECF No. 205-7).

55. Independent Claim 21 is an apparatus that implements the method of Claim 5. It contains “a measuring means for measuring a person’s heart rate,” and “a calculating unit for calculating an assessment of the person’s energy consumption during exercise,” along with “a presenting means for presenting the formed assessment of the person’s energy consumption.” Second Reexamination Certificate, Col. 2, Lines 24–26, 40–41 (ECF No. 205-7). Much of the remaining language is the same as Claim 5. Claim 21 reads as follows, with bracketed language deleted from Claim 21 and the italicized language added to survive invalidity:

A heart rate measuring arrangement comprising:

a measuring means for measuring a person’s heart rate;

a calculating unit for calculating an assessment of the person’s energy consumption during exercise from a plurality of calculating parameters, the plurality of calculating parameters including the heart rate and an energy consumption reference value, the energy consumption reference value being obtained from one or more performance parameters that describe the person’s physical performance with at least one of the performance parameters being *a maximal oxygen uptake, the energy consumption reference value*



*being a maximum value of energy consumption associated with the person, the maximum value of energy consumption representing a value of energy consumption that is associated with the person and corresponds to a maximum heart rate associated with the person;*  
and

a presenting means for presenting the formed assessment of the person's energy consumption, wherein the plurality of calculating parameters include at least [a] *the maximum value of energy consumption and a lower value of energy consumption, wherein the person's energy consumption is substantially linear dependent on the heart rate parameter [is substantially linear dependent] between the maximum value of energy consumption and the lower value of energy consumption.*

Second Reexamination Certificate, Col. 2, Lines 23–48 (ECF No. 205-7).

## ANALYSIS

### I. '227 PATENT CLAIMS AT ISSUE

As discussed above, the '227 Patent has gone through three *ex parte* reexaminations. An “*ex parte* reexamination is a curative proceeding meant to correct or eliminate erroneously granted patents.” *Fresenius USA, Inc. v. Baxter Intern., Inc.*, 721 F.3d 1330, 1338 (Fed. Cir. 2013) (citations omitted). This means “[t]he reexamination statute [has] authorized the PTO to reconsider patents of doubtful validity, and to cancel defectively examined and therefore erroneously granted patents.” *Id.* (quotations, citations, and alteration omitted). If a claim is invalid, it is cancelled under the reexamination statute. *Id.* at 1339. “Even if the claim is amended during reexamination to render the claim valid, no suit can be maintained for the period prior to the validating amendment,” and enforcement is limited to the “reissued claims.” *Id.*

Although this decision pertains to section 101, the above is still applicable to inform that only the latest amended versions of Claims 5, 15, and 21 are applicable when determining if they

contain an inventive concept. For Claim 15, the applicable version is that stated in the first Reexamination Certificate issued on June 4, 2013. For Claims 5 and 21, the applicable versions are those stated in the second Reexamination Certificate issued on October 2, 2014. Claim 43 also was added at that time.

## II. STANDARD OF REVIEW

By statute, a patent is “presumed valid,” and “[e]ach claim of a patent (whether in independent, dependent, or multiple dependent form) shall be presumed valid independently of the validity of other claims; dependent or multiple dependent claims shall be presumed valid even though dependent upon an invalid claim.” 35 U.S.C. § 282(a). “This presumption reflects the fact that the Patent and Trademark Office has already examined whether the patent satisfies the prerequisites for issuance of a patent, including § 101.” *Cellspin Soft, Inc. v. Fitbit, Inc.*, 927 F.3d 1306, 1319 (Fed. Cir. 2019) (quotations and citation omitted). Congress also has placed “[t]he burden of establishing invalidity of a patent or any claim thereof . . . on the party asserting such invalidity.” 35 U.S.C. § 282(a). Moreover, in *Microsoft Corp. v. i4i Limited Partnership*, 564 U.S. 91, 95 (2011), the United States Supreme Court held that “the party asserting such invalidity,” must prove the “invalidity defense . . . by clear and convincing evidence.”

Because Firstbeat is challenging the validity of Polar’s ‘227 Patent, Firstbeat bears the burden of proving the claims at issue are invalid by clear and convincing evidence. The ‘227 Patent has fifty claims. *See* Third Reexamination Certificate, Col. 1, Lines 15–18 (ECF No. 205-8). Only four of the claims are at issue in this case. Since each claim in a patent is presumed valid independent of the validity of other claims, Firstbeat’s obligation extends only to those claims at issue and not to proving the ‘227 Patent is invalid as a whole.

### III. SECTION 101 CHALLENGE

Firstbeat asserts the '227 Patent claims at issue are invalid because they claim an abstract idea and fail to contain an inventive concept. “Section 101 of title 35 defines patent-eligible subject matter.” *Intell. Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1312 (Fed. Cir. 2016). The statute states, “[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.” 35 U.S.C. § 101. Although the subject area is broad, “[f]or over 150 years, the Supreme Court has recognized an implicit exception to these broad categories encompassing laws of nature, natural phenomena, and abstract ideas, which are not patentable.” *Intell. Ventures I LLC*, 838 F.3d at 1312 (quotations, citations, and alterations omitted). To do otherwise would preempt or impede innovation rather than promote it. *Alice Corp. Pty. Ltd., v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014) (quotations and citations omitted); *see also Bilski v. Kappos*, 561 U.S. 593, 602 (2010) (stating “[t]he concepts covered by these exceptions are part of the storehouse of knowledge of all men . . . free to all men and reserved exclusively to none”) (quotations and citation omitted) (alteration in original)).

The exception to patentability is easily stated, but application is not. The Federal Circuit “as well as the Supreme Court, has long grappled with the exception that laws of nature, natural phenomena, and abstract ideas are not patentable.” *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1334 (Fed. Cir. 2016) (quotations, citations, and alteration omitted). In the cases of *Mayo* and *Alice*, the United States Supreme Court provided ““a framework for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts.”” *Alice Corp. Pty. Ltd., v. CLS Bank Int’l*, 573 U.S. at 217; *see*

also *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66 (2012). The framework is a two-step process.

**A. *Alice* Step One**

i. Patent Ineligible Subject Matter

Under the *Alice* “step one, a court must determine whether the claims at issue are directed to one of those patent-ineligible concepts.” *Intell. Ventures I LLC*, 838 F.3d at 1313 (quotations and citation omitted). “Phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work.” *Genetic Techs. Ltd. v. Merial L.L.C.*, 818 F.3d 1369, 1374 (Fed. Cir. 2016) (quoting *Gottschalk*, 409 U.S. at 67). “Groundbreaking, innovative, or even brilliant discovery does not by itself satisfy the § 101 inquiry.” *Id.* (quotations and citation omitted).

As to what constitutes an “abstract idea,” the Supreme Court has not “delimited the precise contours of [the] category.” *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat. Ass’n*, 776 F.3d 1343, 1347 (Fed. Cir. 2014) (quotations, citation, and alteration omitted). What is known is that “fundamental practices long prevalent are abstract ideas.” *Intell. Ventures I LLC*, 838 F.3d at 1314 (quotations, citation, and alteration omitted). Mental processes are considered abstract for the following reasons:

[m]ethods which can be performed entirely in the human mind are unpatentable not because there is anything wrong with claiming mental method steps as part of a process containing non-mental steps, but rather because computational methods which can be performed *entirely* in the human mind are the types of methods that embody the basic tools of scientific and technological work that are free to all men and reserved exclusively to none.

*Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1146 (Fed. Cir. 2016) (emphasis in original) (quoting *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)) (other citation omitted). Mental processes do not have to be done exclusively with one’s mind. It is permissible for a “pencil and paper” to be involved where the method is performed by hand. *See id.* at 1147. If basic tools are applied when working with pencil and paper it does not change a concept from being abstract. *See Int’l Business Machines Corp. v. Zillow Group Inc.*, 50 F.4th 1371, 1377 (Fed. Cir. 2022) (listing a map, knife or scissors, and transparent overlay as part of tools allowing one to perform an abstract method by hand).

“The first stage of the *Alice* inquiry” also “looks at the focus of the claims,” or “their character as a whole.” *SAP Am., Inc. v. InvestPic, LLC*, 898 F.3d 1161, 1167 (Fed. Cir. 2018) (quotations and citations omitted). In this case, Polar contends the ‘227 Patent involves “personalizing the energy consumption estimation by developing and then using a special energy consumption reference value based on a user’s fitness, and specifically the user’s maximal oxygen uptake ( $VO_{2max}$ ).” Polar’s Opp’n to S. Jdmt. Mot., at 24 (ECF No. 458). With the stated purpose of the patent in mind, the court now addresses Firstbeat’s contention that the claims at issue fall under the abstract idea category.

ii. Claim 5 Is an Abstract Idea

In *SAP America, Inc.*, 898 F.3d at 1165, 1167, the Court addressed the focus of the patent at issue, where it involved a plurality of items from which an analysis was performed. The Court stated the focus was “on selecting certain information, analyzing it using mathematical techniques, and reporting or displaying the results of the analysis.” *Id.* at 1167. The Court concluded it was “all abstract.” *Id.* It noted that “[i]nformation as such is an intangible, hence abstract, and

collecting information, including when limited to particular content (which does not change its character as information), is within the realm of abstract ideas.” *Id.* (quotations, citation, and alteration omitted). Likewise, “analyzing information by mathematical algorithms, without more,” also is abstract. *Id.* (quotations, citations, and alteration omitted).

Here, the first element of Claim 5 requires measuring a person’s heart rate information during exercise and including a heart rate parameter. Neither the claim nor the specification limit how “measuring” is to occur or what the heart rate parameter must be. Measuring and including a heart rate parameter can be accomplished simply by taking someone’s pulse while they are walking in place and counting the beats per minute while looking at the second hand on a watch. The focus of the first element is on gathering information.

The second element of Claim 5 involves obtaining an energy consumption reference value from one or more performance parameters, with at least one of the performance parameters being maximal oxygen uptake, otherwise known as VO<sub>2</sub>max. Although the ‘227 Patent allows for multiple performance parameters, Claim 5 requires no more than VO<sub>2</sub>max. VO<sub>2</sub>max is a fundamental concept when assessing energy consumption and has been utilized for decades to determine fitness.<sup>3</sup> Consequently, formulas and tables exist where one can obtain a person’s estimated VO<sub>2</sub>max. *See e.g.*, Maruo Patent, Col. 10, Lines 20–23 (predicting “maximum oxygen

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<sup>3</sup> Firstbeat has referenced an article by Howley et al., *Criteria for Maximal Oxygen Uptake: Review and Commentary*, *Medicine and Science in Sports and Exercise*, at 1292–1301 (1995). The article states that “[m]aximal aerobic power (VO<sub>2</sub>max) is one of the most common measurements made in exercise physiology laboratories. It is generally accepted as the best measure of the functional limit of the cardiovascular system . . . and is commonly interpreted as an index of cardiorespiratory fitness.” *Id.* at 1292. The article further states, “because VO<sub>2</sub>max describes such a basic physiological characteristic, it has become a common descriptive variable much like height, weight, and age.” *Id.* (emphasis added).

uptake” based on certain variables); *Cooper*, at 4 (ECF No. 438-25) (providing tables for predicted maximum oxygen uptake and fitness). Neither the claim nor the specification preclude one from simply utilizing formulas and tables to obtain the required information.<sup>4</sup> Consequently, this part of the second element merely pertains to gathering or collecting information.

Besides “obtaining” an energy consumption reference value from VO<sub>2</sub>max, the remainder of second element states, “the energy consumption reference value being a maximum value of energy consumption associated with the person, the maximum value of energy consumption representing a value of energy consumption that is associated with the person and corresponds to a maximum heart rate associated with the person.” Second Reexamination Certificate, Col. 1, Lines 36–41 (ECF No. 205-7). Thus, the energy consumption reference value is defined as the maximum value of energy consumption associated with a person and corresponds to that person’s maximum heart rate. Dr. Levine attested that “[w]hen a person is at maximum physical performance, their heart rate is maximum, and their oxygen consumption is maximum.” Levine Decl. II, ¶ 38 (ECF No. 456-3).

Applying that to the second element, the energy consumption reference value reflects a known correlation, namely, when a person is at VO<sub>2</sub>max (the required performance parameter), that person’s heart rate is at maximum, that person’s physical performance is a maximum, and thus, that person’s energy consumption is at maximum. *Id.* ¶¶ 37–38; *see also* ‘227 Patent, Col. 3, Lines 24–30 (ECF No. 205-1) (remarking that “known physiological formulae” make it

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<sup>4</sup> During Claim Construction, the court concluded the term “maximal oxygen uptake” should not include “the limitations of ‘measured’ and ‘breathing gases.’” *Polar Electro Oy v. Suunto Oy*, No. 1:17-CV-0139, 2019 WL 6791353, at \*5, 8 (D. Utah Dec. 12, 2019). Instead, the court construed the term to mean “An objectively determined maximum oxygen consumption associated with a person during the person’s physical performance at maximum heart rate.”

“possible to calculate the energy consumption reference value corresponding to the maximum value of the performance parameter”). Accordingly, the limitations added during the second reexamination appear duplicative of the requirement to obtain an energy consumption reference value from VO<sub>2</sub>max, where nothing is added because when one factor is at maximum, so are the other factors as a product of nature. Moreover, while the units of measurements may change through known formulas, their character remains as information.

Specifying that the maximum energy consumption and maximum heart rate must be associated with a person also does not remove the claim from being abstract. Again, these units of measurement are interchangeable with VO<sub>2</sub>max. Obtaining VO<sub>2</sub>max from a formula or table that reports VO<sub>2</sub>max based on gender or age, *see* Lubell Patent, Col. 1, Lines 50–60 (reporting VO<sub>2</sub>max levels based on fitness, and stating “[a]s a general proposition, this fitness index [of VO<sub>2</sub>max] declines with age, and, for the same fitness level, is slightly lower for women than for men”), or distance traveled by a person in a 12-minute field test, can satisfy the requirement that it be “associated with a person.” Neither Claim 5 nor the specification states that being “associated with a person” requires something other than obtaining the VO<sub>2</sub>max from a generalized table or known formulas or obtaining maximum heart rate from a known formula. Consequently, the latter part of the second element also pertains to gathering or collecting information.

The third element of Claim 5 involves assessing a persons’ energy consumption using at least the heart rate parameter and the energy consumption reference value. Additionally, there needs to be a substantial linear relation between the heart rate parameter and the maximum and lower values of energy consumption. Firstbeat contends the third element can be performed with a pencil and paper, and nothing within the element requires use of a computer. The court agrees.



In *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1149 (Fed. Cir. 2016), the case involved claims that did “not call for any form of computer implementation of the claimed methods.” Instead, the claims were “so broad as to read on an individual performing the claimed steps mentally or with pencil and paper.” *Id.* The same is true here. Nothing in the third element of Claim 5, or in any of the other elements, requires use of a computer. With the exception of using a watch to help determine a person’s heartrate, the steps can be performed mentally or with pencil and paper using known formulas and relationships.

iii. *CardioNet*

Polar asserts that Claim 5 cannot be reduced simply to measuring, obtaining, and assessing because the ‘227 Patent asserts it provides an improved method for determining a person’s energy consumption. Polar cites to *CardioNet, LLC v. InfoBionic, Inc.*, 955 F.3d 1358 (Fed. Cir. 2020) for support. *CardioNet* involved cardiac monitoring technology “for detecting and distinguishing atrial fibrillation and atrial flutter from other various forms of cardiac arrhythmia.” *Id.* at 1362. The patent uses known R-waves, along with some known correlations. *Id.* at 1362–63. Nevertheless, the Federal Circuit concluded the patent was directed to allowable subject matter.

In doing so, the Federal Circuit recognized that “at some level all inventions embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas.” *Id.* at 1367 (quotations, citations, and alterations omitted). The *CardioNet* patent did not just claim an improvement, however. Through testing, it showed “a positive predictivity in excess of 96%” based on the method used. *Id.* at 1366. When looking at the claims, the Federal Circuit concluded the claims were “directed to technological improvements.” *Id.* at 1369. The claims did not “merely computerize pre-existing techniques.” *Id.* at 1370. Instead, the claims “achieve[d]

speedier, more accurate, and clinically significant detection of two specific medical conditions out of a host of possible heart conditions.” *Id.* Accordingly, the Court rejected the district court’s finding that “doctors long used the claimed diagnostic processes,” and that the processes could be performed “mentally or manually.” *Id.* at 1370–71. The Court therefore concluded its analysis at *Alice* step one and did not reach *Alice* step two because the patent was not directed to an abstract idea. *Id.* at 1371.

In this case, Polar and its expert assert Claim 5’s personalization phase develops an individualized calibration curve to better predict a person’s energy consumption based on that person’s fitness level. Yet, unlike the method in *CardioNet*, the elements of Claim 5 do not require use of a computer to implement, and there were no tests or studies to show how the method in Claim 5 improved the prediction of a person’s energy consumption. Because the method in Claim 5 can be reduced to collecting information about a heart rate, obtaining an energy consumption reference value from known formulae or tables, and applying that individualized calibration through a pencil and paper, the court concludes this case is distinguishable from *CardioNet* and that Claim 5 is directed to an abstract idea.

## **B. Alice Step Two**

At *Alice* step two, a court “must examine the elements of the claim to determine whether it contains an inventive concept sufficient to transform the claimed abstract idea or law of nature into a patent-eligible application.” *Genetic Techs. Ltd.*, 818 F.3d at 1376 (quotations, citations, and alteration omitted). “The question is whether the claims do significantly more than simply describe a natural relation.” *Id.* (quotations, citation, and alterations omitted). Under *Alice*, “a claim directed to” an unpatentable subject area cannot survive based “on the novelty of” the

concept; “instead, the application must provide something inventive, beyond mere well-understood, routine, conventional activity.” *Id.* (quotations and citations omitted). Whether something is well-understood or routine is a question of fact, and it “goes beyond what was simply known in the prior art.” *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1368–69 (Fed. Cir. 2018). The court now turns to Dr. Levine’s declarations to determine if an issue of fact exists.

i. Dr. Levine’s Declarations

Polar’s expert Dr. Levine declared that he could not “find a single scientific publication that uses VO<sub>2</sub>max to determine free-living energy expenditure,” and “VO<sub>2</sub>max was not used to personalize a heart rate monitor before the ‘227 Patent.” Levine Decl. II, ¶ 50 (ECF No. 456-3). Dr. Levine further declared, “[i]nterestingly, this Court substantiated my research.” *Id.* ¶ 51. He then quoted a passage from a prior decision of this court to support his declaration. *Id.* Given that the ‘227 Patent survived the second reexamination by adding VO<sub>2</sub>max as a claim limitation, one would expect that VO<sub>2</sub>max was not expressly stated in prior art to calibrate a heart rate monitor. The passage that Dr. Levine quoted, however, is a statement made by the PTO, not this court. *See Polar Electro Oy v. Suunto Oy*, No. 1:17-CV-0139, 2019 WL 6791353, at \*6 (D. Utah Dec. 12, 2019). Consequently, this court did not “substantiate” Dr. Levine’s research, nor has this court engaged in a section 102 or 103 analysis.

Second, Dr. Levine further declared the ‘227 Patent involves an “oddball” approach to determining energy expenditure, which was not well-understood or routine when invented. Levine Decl. II, ¶¶ 52–53 (ECF No. 456-3). According to Dr. Levine, “[t]he claimed invention takes a value for VO<sub>2</sub>max and works backwards from there and does not depend upon the source of the VO<sub>2</sub>max. It is used in this weird way.” *Id.* ¶ 52. Notably, however, the court is not doing a

novelty or obviousness analysis. An invention can be novel or “oddball” and still be unpatentable. *SAP Am., Inc.*, 898 F.3d at 1163 (finding a patent abstract after it survived reexamination). Instead, the court’s section 101 analysis focuses on whether Claim 5 supports an advancement in technology to transform an abstract idea into an inventive concept.

Dr. Levine provides significant detail about the challenges of determining energy expenditure and how the field of technology seeks more accurate measurements outside of a laboratory. When addressing the inventive concept of the ‘227 Patent, however, Dr. Levine paints with a wide brush of generality. One of his most specific statements is the one quoted above where “the claimed invention takes a value for VO<sub>2</sub>max and works backwards from there and does not depend upon the source of the VO<sub>2</sub>max.” Levine Decl. II, ¶ 52 (ECF No. 456-3). Dr. Levine does not explain why this concept advanced technology to predict energy consumption *more accurately*, particularly when individual calibration of heart rate monitors was already known.

The specification for the ‘227 Patent states prior art had a disadvantage because their methods did “not take into account that a fit person performs a larger amount of work at a given heart rate level than an unfit person.” ‘227 Patent, Col. 1, Lines 41–46 (ECF No. 205-1). Yet, Lubell took into account that the fitness index of VO<sub>2</sub>max is higher the greater the level of a person’s fitness, and the patent utilized maximum heart rate and maximum oxygen uptake to calculate a fitness parameter. Lubell Patent, Col. 1, Lines 49–51, 61–64. Jimenez also took into account that “a physically fit person is able to transport the same amount of oxygen at a lower heart rate than an unfit person,” and utilized such “known phenomena” when developing the patent’s caloric consumption equations. Jimenez Patent, Col. 20, Lines 42–44, 49–51. Thus, while

the '227 Patent's specification stated prior art did not take into account a person's fitness, the prior art offered by Firstbeat tells a different story.

Additionally, it is important to note the relationship between maximum oxygen uptake, maximum heart rate, and maximum energy expenditure. As stated in Maruo, "the maximum heart rate is defined as a heart rate corresponding to a maximal oxygen uptake ( $VO_{2max}$ )," with known conversion formulas. Maruo Patent, Col. 1, Lines 40–51. Dr. Levine further reported that "when a person is at maximum physical performance, their heart rate is maximum, and their oxygen consumption is maximum, which is referred to as  $VO_{2max}$ ." Levine Decl. II, ¶ 38 (ECF No. 456-3). Consequently, when the PTO concluded that Richardson used maximum heart rate to determine the value of the user's estimated maximum aerobic energy expenditure, one could interchange maximum heart rate with  $VO_{2max}$ . This calls into question what technological advancement the '227 Patent made when  $VO_{2max}$  can be interchanged, and when it has not only been a prominent factor in prior art, but consists of a basic physiological characteristic that is a common descriptive variable when determining fitness.

If the '227 Patent were the technological advancement Polar contends it to be, one would expect Dr. Levine to declare in detail why it is inventive and more accurate in determining energy consumption. In other words, one would expect detail similar to what Dr. Levine provided when discussing the background of energy expenditure. He did not do so. Instead, he largely quoted language from the specification that is repetitive of the language in Claim 5, without connecting how the quotations showed a technological advancement. He also quoted means for obtaining maximum oxygen uptake that are not required by Claim 5, such as by obtaining  $VO_{2max}$  via breathing gases or neural networks. *Id.* ¶ 61.

This is similar to the expert statements in *Move, Inc. v. Real Estate Alliance Ltd.*, 721 F. App'x 950 (Fed. Cir. 2018). In that case, the Federal Circuit concluded the claims were directed to abstract ideas, and it therefore proceeded to an *Alice* step two analysis. *Id.* at 955–56. The Court reviewed “the individual claim limitations [and] their ordered combination,” and a declaration from the patentee’s expert. *Id.* at 957. The expert’s declaration stated the following:

It was considered neither routine nor conventional in the mid-1980s for a computer-displayed map to be able to zoom to display a higher level of detail in the sense of displaying information that wasn’t present at the lower level of detail at all, and this zooming step cannot be performed by a human.

*Id.* The Court noted that the expert failed to provide additional rationale beyond the conclusory statements. *Id.* Consequently, the bald assertions did “not satisfy the inventive concept requirement.” *Id.* The Court further stated “[w]here the claim language does not provide any specific showing of what is inventive about the limitation in question or about the technology used to generate and process it,” the Court has “concluded that the claims do not satisfy *Alice*’s second step.” *Id.* (quotations, citations, and alteration omitted).

Based on the above, the court concludes Dr. Levine’s declarations fail to show why the ‘227 Patent is a technological advancement so as to transform abstract ideas into an inventive concept.

ii. Polar’s Ordered Combination Contention

Polar contends that when the relevant claim elements are analyzed as a combination, they “satisfy step two of the *Alice* analysis.” Mem. in Opp’n to S. Jdmt., at 43 (ECF No. 458). According to Polar, “[t]his particular solution leads to a personalized and a more accurate assessment of energy consumption that depends upon the unconventional ordered steps of

obtaining an energy consumption reference value prior to assessing the person's energy consumption using the person's measured heart rate." *Id.*

In *SAP America, Inc. v. InvestPic, LLC*, 898 F.3d 1161, 1163–64 (Fed. Cir. 2018), the patent was directed at improving financial forecasting so risk and rewards could be better assessed. “[T]he patent propose[d] a technique that utilizes resampled statistical methods for the analysis of financial data.” *Id.* at 1164 (quotations and citation omitted). Although it contained limitations on the particular methods used, the Federal Circuit concluded “those features simply provide further narrowing of what are still mathematical operations. They add nothing outside of the abstract realm.” *Id.* at 1169.

Here, the ‘227 Patent collects information about a person's heart rate information and then, like *SAP America*, it uses known correlations and formulas to carry out the elements. Individual calibration of heart rate monitors was already known in 2000. Measuring a person's heart rate through any mechanism, setting a heart rate parameter without limitation on what it must be, and then obtaining an energy consumption reference value from the VO<sub>2</sub>max performance parameter without limiting how VO<sub>2</sub>max is obtained, show steps that read broadly. VO<sub>2</sub>max does not have to be obtained through breathing gases, like other prior art. It does not have to be obtained by the particular subject performing a fitness test correlated to maximum oxygen consumption. It simply can be obtained from a formula or table. Accordingly, it is not apparent why the ‘227 Patent provides a more accurate calibration curve, thereby advancing the technology.

The ‘227 Patent was not valid at the time it issued, and it has been in search of an inventive concept since that time. Because Claim 5's ordered combination fails to show an inventive concept sufficient to transform abstract ideas and known correlations under laws of nature, the court

concludes Claim 5 is directed to an unpatentable subject matter. Accordingly, Claim 5 is invalid under section 101.

**C. Representative Claim and Invalidity of Claims 15, 21, and 43**

As stated above, the claims at issue in this case are Claims 5, 15, 21, and 43. Firstbeat centered its argument on Claim 5 as a representative claim “to demonstrate that each of the Asserted Claims are directed to the abstract idea of assessing a person’s energy consumption during exercise.” Mot. for S. Jdmt. on Invalidity, at 25 (ECF No. 441). It did so “[g]iven the similarity of the method and apparatus claims.” *Id.* Polar disputes that Claim 5 is a representative claim and asserts that the calculating unit in Claim 21 is not a generic computer because it “performs specific, inventive functions.” Polar’s Mem. in Opp’n to Mot. for S. Jdmt., at 6–7, 15 (ECF No. 458). It does not appear that Polar addressed whether Claim 5 is representative of Claims 15 or 43.

“When addressing the patent eligibility of multiple asserted claims, the Court may designate a representative claim or claims where the parties are unable to reach an agreement.” *e-Numerate Sols., Inc. v. United States*, 149 Fed. Cl. 563, 574 (2020) (citing *Berkheimer*, 881 F.3d at 1365). In *Berkheimer*, the Federal Circuit stated, “[c]ourts may treat a claim as representative in certain situations, such as if the patentee does not present any meaningful argument for the distinctive significance of any claim limitations not found in the representative claim or if the parties agree to treat a claim as representative.” *Berkheimer*, 881 F.3d at 1365 (citations omitted). Because Polar did not dispute that Claim 5 is representative of Claims 15 and 43, the court concludes Claim 5 is representative of those two claims.



As to Claim 21, in *Accenture Global Services, GmbH v. Guidewire Software, Inc.*, 728 F.3d 1336, 1341 (Fed. Cir. 2013), the Federal Circuit recognized “that system claims that closely track method claims and are grounded by the same meaningful limitations will generally rise and fall together.” *Id.* (citation omitted). In that case, “the method and system claims were so closely related that the system claim essentially implemented the process of the method claim on a general purpose computer.” *Id.* (citation omitted). The same is true in this case.

Although Claim 21 has “a measuring means for measuring a person’s heart rate,” and “a calculating unit for calculating an assessment of the person’s energy consumption during exercise,” along with “a presenting means for presenting the formed assessment of the person’s energy consumption,” those limitations do not change that Claim 21 essentially implements the method of Claim 5 on a general purpose computer. Claim 21 does not disclose an advancement to the computer itself or to the display or to the means for measuring a person’s heart rate. Instead, it merely uses those limitations generically to implement Claim 5’s method. Accordingly, the court concludes that Claim 5 also is representative of Claim 21, and that Claims 15, 21, and 43 are invalid under section 101.

### **CONCLUSION**

For the reasons stated above, the court concludes Claims 5, 15, 21, and 43 of the ‘227 Patent are invalid under section 101. Because that conclusion is dispositive, the court does not reach the parties’ other contentions. Accordingly, the court rules on the pending motions as follows:

1. Firstbeat’s Motion for Summary Judgment on Non-Infringement and Invalidity (ECF No. 439) is granted in part and denied as moot in part. The court grants

Firstbeat's motion on the ground that Claims 5, 15, 21, and 43 of the '227 Patent are invalid under section 101 and denies as moot the remainder of the motion.

2. Polar's Motion for Summary Judgment on Validity (ECF No. 435) is denied as moot.
3. Polar's Motion for Summary Judgment on Infringement (ECF No. 436) is denied as moot.
4. Polar's Motion to Exclude Firstbeat's Technical Expert Thomas Blackadar (ECF No. 475) is denied as moot.

DATED this 4<sup>th</sup> day of April, 2024.

BY THE COURT:

A handwritten signature in blue ink, appearing to read "Clark Waddoups", is written over a solid black horizontal line.

Clark Waddoups  
United States District Judge