

**United States Patent and Trademark Office
Before the Patent Trial and Appeal Board**

***lululemon athletica inc. et al. v.
Nike, Inc.***

IPR2023-00438

U.S. Pat. No. 8,620,413

**Patent Owner's Presentation
April 16, 2024**

lululemon athletica inc. et al. v. Nike, Inc. IPR2023-00438 Patent No. 8,620,413 Demonstrative Ex. 2014
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1. Overview of the '413 Patent and Instituted Grounds

2. Prosecution History

1. Claim Construction

A. “wherein an exertion level is based on a level of physical fitness of a user”

1. lululemon Failed to Prove Unpatentability by a Preponderance of the Evidence

- A. Ground 1: lululemon Failed To Prove Amano Anticipates Any Challenged Claim
- B. Ground 2: lululemon Failed To Prove Matsumoto Anticipates Any Challenged Claim
- C. Ground 3: lululemon Failed To Prove That Lubell + Ceci Renders Obvious Any Challenged Claim
- D. Grounds 4, 6, 8: lululemon Failed To Prove Any Dependent Claims Obvious Under Gorman
- E. Grounds 5, 7, 9: lululemon Failed To Prove Any Dependent Claims Obvious Under Flach



Overview of the '413 Patent and Instituted Grounds

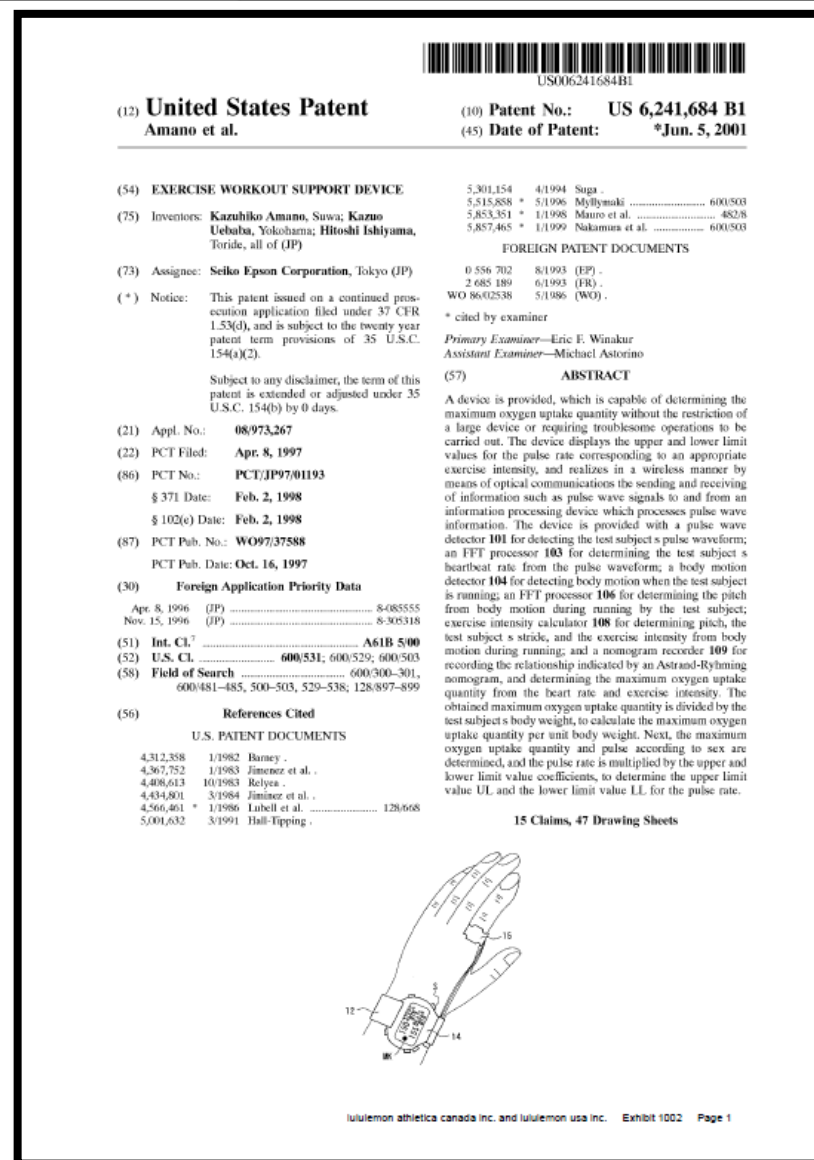


Overview of instituted grounds

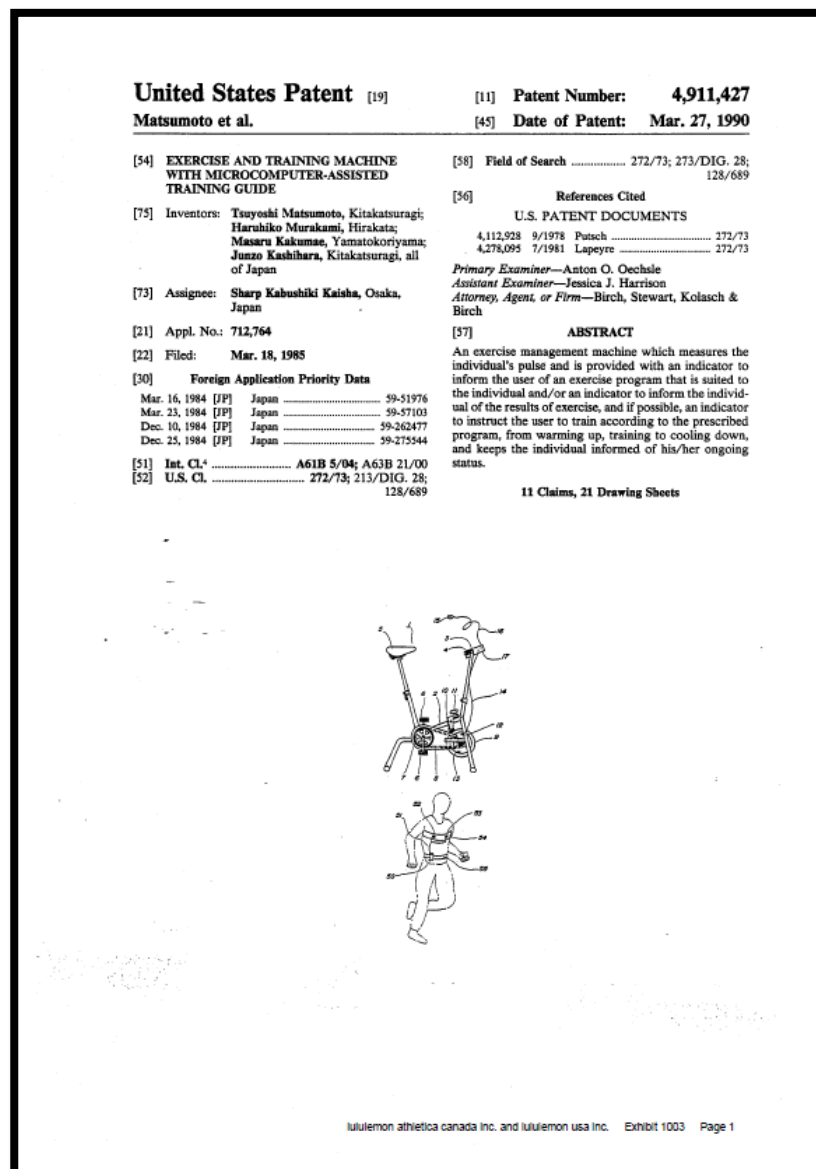


Grounds	35 U.S.C. §	Claims (Independent Claims In Bold)	Reference(s)
1	102	1, 5, 7, 12, 17	Amano
2	102	1, 5, 7, 12, 17	Matsumoto
3	103	1, 12, 17	Lubell + Ceci
4, 6, 8	103	2, 3, 4, 13, 18	Gorman + Lubell + Ceci / Amano / Matsumoto
5, 7, 9	103	9, 14, 19	Flach + Lubell + Ceci / Amano / Matsumoto

Petition, Paper 2 at 19



Amano, Ex. 1002 at Cover





United States Patent [19] Lubell et al.

[11] Patent Number: 4,566,461
[45] Date of Patent: Jan. 28, 1986

[54] HEALTH FITNESS MONITOR

[76] Inventors: Michael Lubell, 1504 Jefferson St.;
Stephen Marks, 603 Sunderland Rd.,
both of Teaneck, N.J. 07666

[21] Appl. No.: 466,671

[22] Filed: Feb. 15, 1983

[51] Int. Cl. A61B 5/02

[52] U.S. Cl. 128/668; 128/689;

128/700; 128/707; 364/417

[58] Field of Search 128/668, 707, 700, 706,

128/687-690, 670, 364/417

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Primary Examiner—William E. Kamm

Assistant Examiner—John C. Hanley

Attorney, Agent, or Firm—Bruns and Wall

[57] ABSTRACT

A heart rate monitor device suitable for use in monitor-

ing aerobic exercise training, automatically calculates a

fitness parameter for a subject by monitoring the sub-

ject's heart rate and pacing the subject through a sub-

maximal exercise stress test protocol. A microprocessor

in the device is fed data peculiar to the individual sub-

ject, and then generates pacing signals to produce audi-

ble tones or beeps. The stride frequency, or rate of the

tones varies at intervals so that the subject can exercise

by running at progressively faster speeds. At the point

of exhaustion, or maximum heart rate, the subject's

maximal oxygen uptake capacity is calculated, based on

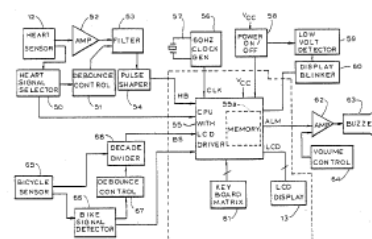
the elapsed time, and is displayed as a fitness parameter.

The subject's exercise level is automatically monitored

based on his or her exercise heart rate, maximum heart

rate, and rest heart rate.

17 Claims, 6 Drawing Figures





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Self-monitored exercise at three different RPE intensities in treadmill vs field running

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ABSTRACT

CECI, R. and P. HASSMÉN. Self-monitored exercise at three different RPE intensities in treadmill vs field running. *Med. Sci. Sports Exerc.*, Vol. 23, No. 6, pp. 732-738, 1991. The aims of the present study were a) to compare the outcome of running exercise performed on a treadmill (laboratory) and an outdoor track (field) using an RPE production protocol and b) to study this kind of protocol used over time (3-5 wk). A group of 11 healthy male subjects participated, with ages varying from 33 to 65 yr (mean = 42.9 ± 11.0 yr). Two test sessions consisting of both treadmill and track exercise were performed in a rotated order to control for sequential effects. All subjects exercised according to an identical protocol: two successive trials (3 min each) at RPE 11 (light exertion), followed by a RPE 13 (somewhat hard) trial (11 min) and, finally, a RPE 15 (hard) trial (5 min). Results show significantly different levels of heart rate (HR), blood lactate, and velocity at the three RPE levels. Large differences were also observed in all measured variables between field and laboratory. These differences were consistent over time. A high internal consistency, measured by test-retest reliability (alpha > 0.9), was obtained for both velocity and HR between the first two trials at RPE 11. In conclusion, the RPE method functioned well as a means of monitoring and regulating exercise intensity.

EXERCISE REGULATION, PERCEIVED EXERTION,
RUNNING VELOCITY, HEART RATE, BLOOD LACTATE,
PSYCHOPHYSICAL PRODUCTION

The process of self-monitoring and self-regulation in physical exercise deals with how well individuals are capable of adjusting the intensity of any exercise modality in order to reach a level that is best suited to their state of health, fitness, or any other limiting factor, such as instructions from a trainer or a test leader concerning how hard the work should be (10,20,24,29). Subjectively adjusting the exercise intensity can be seen as a continuous, as well as simultaneous, process involving monitoring of internal cues (e.g., perceived exertion, proprioception, and respiration) as well as external cues (e.g., velocity, and wind resistance). This self-monitoring leads to self-regulation, i.e., adjusting the exercise intensity.

In certain groups of patients, for example cardiac and pulmonary, it is of great interest to develop methods

that offer reliable and safe guidelines for physical training (3,6,8,10,12,22,24). Also, for healthy people and the "ordinary exerciser," such methods can be of help during everyday training, especially when they perform an activity which is predominantly of an aerobic character.

Previous studies (3,7,9,11,15,18,29) have shown that self-regulation of exercise, in which subjects are asked to produce exercise intensities based on feelings of perceived exertion, seems to function well in a number of exercise modes investigated. However, various methods have been used in the different studies: either purely verbal instructions (e.g., "slow jog" or "preferred speed") or purely numerical ones, such as percentage of maximal intensity (e.g., "50% or 75% of max."). Ekblom et al. (17) showed that both untrained and trained subjects could produce different intensity levels in a number of variables (i.e., velocity, step rate, heart rate, and blood lactate, as well as perceived exertion) based on four different verbal instructions (i.e., "normal walking," "fast walking," "slow jogging," and "comfortable jogging").

It is also possible to utilize the 15-graded Ratings of Perceived Exertion (RPE) scale (5,6) as a method of self-regulation. This scale has become a generally accepted subjective method in *estimation* studies, that is, studies in which subjects are asked to rate the degree of exertion they perceive as related to a certain physical intensity. Subjects are typically asked to rate an overall (undifferentiated) or local (differentiated) feeling of exertion (28). Depending upon the type of physical exercise, it should be possible to decide which sort of exertion rating is best suited to the purpose of the study. Likewise, subjects could be asked to *produce* a certain work level by using the same scale method (i.e., psychophysical production).

Another method, often used, is the training or target heart rate (THR). This method allows the subjects/patients to monitor their heart rate (HR) by palpation of the radial or carotid arteries, thereby keeping track of exercise intensity. The accuracy of such a method




 US005400794A

United States Patent [19]
Gorman

[11] **Patent Number:** 5,400,794
 [45] **Date of Patent:** Mar. 28, 1995

[54] **BIOMEDICAL RESPONSE MONITOR AND TECHNIQUE USING ERROR CORRECTION**
 [76] Inventor: **Peter G. Gorman**, Lakeview Dr., Mahopac, N.Y. 10541
 [21] Appl. No.: **33,826**
 [22] Filed: **Mar. 19, 1993**
 [51] Int. Cl.⁶ **A61B 5/0428**
 [52] U.S. Cl. **128/696; 128/903**
 [58] Field of Search **128/696, 706, 903**

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Primary Examiner—William E. Kamm

[57] **ABSTRACT**
 A monitor for measuring and displaying a biomedical response such as heartbeat rate, including a transmitting unit and a receiving unit. The monitor detects the response (heartbeat) and produces a digital pulse train representing this response. The digital pulse train is then encoded to produce an encoded digital signal having a first identification part identifying the transmitting unit and a second data part representing the person's response. This encoded digital signal is wirelessly sent to the receiving unit which reads the received signal to determine if it is from the transmitting unit. If it is from that transmitting unit, the data part is read. If there are too many errors in the data part, a new frequency of wireless transmission is used in the monitor. If the errors are within a reasonable bound, the data bits representing the biomedical response are sent to a memory and/or a display. If the received signal were not from the correct transmitting unit, the received signal is rejected. Interference from other monitors or electrical equipment is minimized, and the data displayed is very accurate.

45 Claims, 5 Drawing Sheets

TRANSMITTER UNIT

lululemon athletica canada inc. and lululemon usa inc. Exhibit 1007 Page 1





US 2001/0023315A1

(19) **United States**
 (12) **Patent Application Publication** (10) **Pub. No.: US 2001/0023315 A1**
 Flach et al. (43) **Pub. Date: Sep. 20, 2001**

(54) **CELLULAR ARCHITECTURE AND DATA TRANSFER METHODS FOR REAL TIME PATIENT MONITORING WITHIN MEDICAL FACILITIES**

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(21) **Appl. No.:** 09/769,233
 (22) **Filed:** Jan. 24, 2001

Related U.S. Application Data

(60) Continuation of application No. 09/315,254, filed on May 20, 1999, now Pat. No. 6,213,942, which is a division of application No. 08/675,594, filed on Jul. 3, 1996, now Pat. No. 5,944,659 and which is a non-provisional of provisional application No. 60/006,600, filed on Nov. 13, 1995.

Publication Classification

(51) **Int. CL⁷** A61B 5/00
 (52) **U.S. CL** 600/300

ABSTRACT
 A medical telemetry system is provided for collecting the real-time physiologic data of patients (including ambulatory patients) of a medical facility, and for transferring the data via RF to a real-time data distribution network for monitoring and display. The system includes battery-powered remote telemeters which attach to respective patients, and which collect and transmit (in data packets) the physiologic data of the patients. The remote telemeters communicate bi-directionally with a number of ceiling-mounted RF transceivers, referred to as "VCELLs," using a wireless TDMA protocol. The VCELLs, which are hardwire-connected to a LAN, forward the data packets received from the telemeters to patient monitoring stations on the LAN. The VCELLs are distributed throughout the medical facility such that different VCELLs provide coverage for different patient areas. As part of the wireless TDMA protocol, the remote telemeters continuously assess the quality of the RF links offered by different nearby VCELLs (by scanning the frequencies on which different VCELLs operate), and connect to those VCELLs which offer the best link conditions. To provide a high degree of protection against multi-path interference, each remote telemetry maintains connections with two different VCELLs at-a-time, and transmits all data packets (on different frequencies and during different timeslots) to both VCELLs; the system thereby provides space, time and frequency diversity on wireless data packet transfers from the telemeters. The telemeters and VCELLs also implement a patient location protocol for enabling the monitoring of the locations of individual patients. The architecture can accommodate a large number of patients (e.g., 500 or more) while operating within the transmission power limits of the VHF medical telemetry band.

lululemon athletica canada inc. and lululemon usa inc. Exhibit 1008 Page 1



Prosecution History



Amendments to the Claims

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims

1. (Currently Amended) An apparatus comprising:

a processor; and

a memory storing instructions that, when executed by the processor, cause the apparatus

at least to:

prompt a user to exercise at a plurality of successive exertion levels, wherein an exertion level is based on a level of physical fitness of a user ~~multiple exertion levels~~;

determine a plurality of heart rate zones based on first heart rate measurements received from a sensor while the user exercises at the ~~multiple~~ plurality of successive exertion levels;

generate a prompt instructing a user to exercise while maintaining heart rate within a particular one of the plurality of heart rate zones;

process second heart rate measurements received from the sensor subsequent to generating the prompt; and

determine whether the second heart rate measurements are within the particular heart rate zone.

Response to Office Action, Ex. 1014 at 3 (cited in Patent Owner's Response, Paper 22 at 24)



Claim Rejections Under 35 U.S.C. § 102

Claims 1, 12 and 17 stand rejected under 35 U.S.C. 102(b) as being anticipated by Lubell et al. US 4,566,461, hereinafter “Lubell.” The Applicants respectfully traverse.

Lubell does not disclose “prompt[ing] a user to exercise at a plurality of successive exertion levels, wherein an exertion level is based on a level of physical fitness of a user, as recited in amended claim 1, and supported at least at paragraphs [71] (see “EASY” level of exertion), [73] (see “MEDIUM” level of exertion), and [75] (see “HARD” level of exertion) of the instant application. In contrast, and as cited in the “Response to Arguments” section of the Action, Lubell is directed to a *prescribed* exercise test. *See Lubell, column 8, lines 23-60*. In other words, Lubell automatically executes a predefined exercise test protocol that is not based on a level of physical fitness of a user.

Lubell’s prescribed exercise test will incrementally increase a running speed from 4 miles per hour, with a test subject increasing his/ her speed in response to *predetermined* “pacing tones.” *See Lubell, column 8, lines 43-49*. Accordingly, Lubell exercise test protocol is not based on a level of physical fitness of a user. For example, Lubell’s prescribed 4 miles per hour *starting* speed may, for some users, be considered difficult to achieve, or may, in other instances, be beyond the capabilities of some users. In such instances, these users would not be able to increase their speeds in response to predetermined “pacing tones.” Therefore, because Lubell’s exercise test protocol is predetermined, it is not adaptive to the physical fitness of a user.

Response to Office Action, Ex. 1014 at 7-8 (cited in Patent Owner’s Response, Paper 22 at 12)



Reasons for Allowance

2. The following is an examiner's statement of reasons for allowance: the invention is drawn towards a device (*singular*) and related methods which include a processor and a memory for storing instructions; the processor causes the apparatus to prompt the user to exercise at a plurality of exertion levels, exertion levels are based on a level of physical fitness of the user and are specifically chosen by the user there is no external device which is choosing the exercise level.

are determined for a plurality of exertion levels (i.e. low, medium and high); finally the user is prompted to exercise in a particular heart rate zone based on the calculation. Therefore in this device and method, the user is given a prompt to exercise at a first level, for that first level chosen by the user, a heart rate zone is calculated. Next, the user is prompted to exercise at a different level and a new heart rate zone is calculated. The prior art fails to disclose or render obvious all of the limitations of the independent claims in combination with prompting the user to exercise at a plurality of exertion levels, wherein an exertion level is based on a level of fitness of the user and determining a plurality of heart rate zones based on heart rate measurements received from the sensors while the user exercises at the plurality of exertion levels. Although this is a device and method which guides the user, the exertion level is chosen and maintained exclusively by the user and not in any way acted upon by the device.

Notice of Allowance, Ex. 1015 at 8-9 (cited in Patent Owner's POPR, Paper 10 at 33-34)



Claim Construction



“wherein an exertion level is based on a level of physical fitness of a user” (all three independent claims 1, 12, 17)



The invention claimed is:

1. An apparatus comprising:

a processor; and

a memory storing instructions that, when executed by the processor, cause the apparatus at least to:

prompt a user to exercise at a plurality of successive exertion levels, wherein an exertion level is based on a level of physical fitness of a user;

determine a plurality of heart rate zones based on first heart rate measurements received from a sensor while the user exercises at the plurality of successive exertion levels;

generate a prompt instructing a user to exercise while maintaining heart rate within a particular one of the plurality of heart rate zones;

process second heart rate measurements received from the sensor subsequent to generating the prompt; and
determine whether the second heart rate measurements are within the particular heart rate zone.

'413 Patent, Ex. 1001 at 18:4-23

Construction necessary because the Petition read out “level of physical fitness”



“Wherein an exertion level is based on a level of physical fitness of a user”: Amano envisions multiple ways of progressing through the stages of intensity. In one embodiment, the device prompts a user to increase their intensity by 10% every 120 seconds. (*Id.* at 13:53-55.) Each 10% increase is an exertion level. This intensity, as measured and subsequently increased, is based on a user’s stride length and weight, aspects of a user’s physical fitness. (*Id.* at 12:15-20.) Therefore, this matches the claim language of Element 1[C].’

Petition, Paper 2 at 22

“Wherein an exertion level is based on a level of physical fitness of a user”: Before the first exercise, the Matsumoto user enters their sex, age, and weight. (*Id.* at 5:8-15.) This information is compared to typical fitness tables to estimate the physical fitness of the user. (*Id.* at 3:23-50, 5:17-18.) From this estimated fitness, the machine sets the initial exertion level targets. (*Id.* at 5:20-23.) Indeed, the stated objective of the invention is “providing an exercise program that is suited to the individual user’s physical fitness.” (*Id.* at 4:33-35.) The levels must be based on the physical fitness of the user. Matsumoto first estimates fitness based on input parameters. (Ex. 1003 at 5:17-18). This estimate determines the first workout program. (*Id.*) Even though not subjective, Matsumoto’s exertion levels are based on the physical fitness of a user, so the machine anticipates the language of Element 1[C].

Petition, Paper 2 at 31-32



Limitations 1[C] / 12[A] / 17[A]	lululemon’s Proposed Construction
“prompt a user to exercise at a plurality of successive exertion levels, wherein an exertion level is based on a <u>level</u> of physical fitness of a user” “prompting a user to exercise at a plurality of successive exertion levels, wherein an exertion level is based on a <u>level</u> of physical fitness of a user” “prompt a user to exercise at a plurality of successive exertion levels, wherein an exertion level is based on a <u>level</u> of physical fitness of a user”	“wherein an exertion level is adaptive to a <u>user’s physical fitness</u>”

’413 Patent, Ex. 1001 at 18:10-12, 18:61-63, 19:28-30

Petitioner’s Reply, Paper 26 at 1



Limitations 1[C] / 12[A] / 17[A]	Nike's Proposed Plain and Ordinary Meaning
“prompt a user to exercise at a plurality of successive exertion levels, wherein an exertion level is based on a level of physical fitness of a user” “prompting a user to exercise at a plurality of successive exertion levels, wherein an exertion level is based on a level of physical fitness of a user” “prompt a user to exercise at a plurality of successive exertion levels, wherein an exertion level is based on a level of physical fitness of a user”	an exertion level that takes into account an individual user’s particular physical fitness condition, as assessed by fitness condition criteria such as cardiorespiratory endurance

'413 Patent, Ex. 1001 at 18:10-12, 18:61-63, 19:28-30

Patent Owner's Response, Paper 22 at 19-20

Dr. Lynch admits “weight” and “stride length” are not a “level of physical fitness”



and weight,” without identifying any fitness “level.” *Id.*, at 4. But Dr. Lynch previously admitted that weight “certainly doesn’t equate,” and stride length is “not equated,” to a level of physical fitness. Ex. 2012, 148:5-149:16. Thus, while Dr. Lynch claims it was not *his* intention to remove the fitness “level” (Ex. 2013, 42:5-12), Petitioner is clearly removing the fitness “level” in *applying* its construction.

Patent Owner’s Sur-Reply, Paper 30 at 3

5 So I’m asking does a person’s weight, does
6 that equate to a level of physical fitness?
7 A. It certainly doesn’t equate. It’s an aspect
8 of it.

Dr. Lynch 9-27-23 Dep. Tr. (Ex. 2012), at 148:5-8

11 Q. And is a person’s stride length a level of
12 physical fitness?
15 A. Again, it’s a characteristic of the physical
16 fitness, but it’s not equated.

Dr. Lynch 9-27-23 Dep. Tr. (Ex. 2012), at 149:11-16 (objections omitted)



9 Q. Okay. And is a person's age a level of
10 physical fitness?

13 A. It's one characteristic or aspect of this
14 broad concept.

Dr. Lynch 9-27-23 Dep. Tr. (Ex. 2012), at 148:9-14 (objections omitted)

16 Q. And does a person's sex or gender equal a
17 level of physical fitness?

18 A. Certainly doesn't equal a level of physical
19 fitness.

Dr. Lynch 9-27-23 Dep. Tr. (Ex. 2012), at 148:16-19

7 Q. Is a person's height a level of physical
8 fitness?

9 A. By itself, height is not a level of physical
10 fitness.

Dr. Lynch 9-27-23 Dep. Tr. (Ex. 2012), at 149:7-10

18 Q. Is a person's body mass index, or BMI, a
19 level of physical fitness?

20 A. It is not, it's just a characteristic of a
21 level of physical fitness.

Dr. Lynch 9-27-23 Dep. Tr. (Ex. 2012), at 149:18-21

lululemon's expert agrees with portions of Nike's plain and ordinary meaning



asserted prior art.⁴ Ex. 1018, ¶12. In contrast, Dr. Bergeron testified that Nike's "takes into account" has the same meaning as "based on." Ex. 1017, 73:13-22. And Dr. Lynch testified that if those phrases have the same meaning, he agrees with that aspect of Nike's construction. Ex. 2013, 12:12-25. In fact, Dr. Lynch testified that "[i]n the context of this patent," "is adaptive to" also has the same meaning. *Id.*, 36:19-37:7.

Patent Owner's Sur-Reply, Paper 30 at 5

12 Q. If "based on" and "takes into account" had
13 the same meaning, would you have any disagreement
14 with the use of "takes into account" in Nike's
15 construction?

17 THE WITNESS: So up to "based on" -- and
18 forgetting grammar, up to "based on" in Nike's --
19 or sorry -- the original claim language and "takes
20 into account" and Nike's proposed construction, so
21 up to those points -- I'm not talking about past
22 there -- if you say to me that let's all agree that
23 "takes into account" is equivalent to "based on,"
24 then I would say, yes, those two, up to that point,
25 are equivalent.

Dr. Lynch 2-22-24 Dep. Tr. (Ex. 2013), at 24:12-25 (objections omitted)

lululemon's expert agrees with portions of Nike's plain and ordinary meaning



A “level of physical fitness” thus relates to how “difficult” a user finds exertion levels. The specification explains that “heart rate” and “breathing” can be used to determine a user’s level of physical fitness. *E.g.*, Ex. 1001, 15:10, 15:44-16:55; Ex. 2008, ¶28. Dr. Lynch *agrees*, opining that the specification “describes setting an exertion level based on cardiorespiratory endurance, measured by a user’s physical attributes, such as the user’s heart rate or breathing.” Ex. 1018, ¶8.³ But nowhere did the patentee disclaim the fitness “level,” or redefine the term to mean attributes such as weight or stride length, which Dr. Lynch admits are not fitness “levels.”

Patent Owner’s Sur-Reply, Paper 30 at 4

8. With respect to the intrinsic evidence, the ’413 specification exemplarily describes setting an exertion level based on cardiorespiratory endurance, measured by a user’s physical attributes, such as the user’s heart rate or breathing. As the specification describes, “an easy level of [exertion] is one that only slightly elevates the user’s heart rate. This level of exercise should not feel challenging, but should instead feel as if the user is performing a warm-up routine, so that the user feels at ease. The user should be able to maintain this workout intensity for approximately 30 minutes to one hour with his or her breathing only slightly greater than when the user began exercising.” (EX1001, 15:54-61.) The specification also provides similar descriptions for a “medium level of exertion” at 16:18-23 and a “hard level of exertion” at 16:48-55. (*Id.*, 16:18-23, 16:48-55.)

Dr. Lynch Reply Declaration, Ex. 1018 at ¶8



Accordingly, in addition to simply measuring a user's heart rate, various heart rate monitors will also allow a user to designate one or more various heart rate zones, and alert an athlete when his or her measured heart rate goes above or falls below a selected heart rate zone. With these heart rate monitors, however, an athlete must calculate the parameters of these zones himself or herself. This typically requires that the athlete employ a mathematical formula incorporating the athlete's sitting heart rate, the athlete's age, and a general estimate of the athlete's fitness condition. Thus, these formulas are typically difficult for an athlete to calculate. Further, when a user attempts to "shoot" for a number that they have seen on a heart rate chart or have calculated using a heart rate equation, the heart rate values reached using these techniques may be appropriate for a few individuals, by they often are inaccurate for many users because they cannot take into account an individual's particular exercise ability.

'413 patent, Ex. 1001 at 15:1-17 (cited in Patent Owner's Response, Paper 22 at 22)



When the user is ready to begin exercising, he or she depresses the start button 213. The watch 201 then briefly displays the words “5 MIN EASY,” as shown in view 809, instructing the user to begin exercising at an easy level for five minutes. Next, after approximately two seconds the watch 201 begins counting down the amount of time remaining during the five minute period, starting with 5'00" and ending with 0, as shown in views 811 and 813, respectively. It also displays the word “EASY” during this time period, to indicate to the user that he or she should be exercising at an easy level. As will be appreciated by those of ordinary skill in the art, an easy level of exercise is one that only slightly elevates the user's heart rate. This level of exercise should not feel challenging, but should instead feel as if the user is performing a warm-up routine, so that the user feels at ease. The user should be able to maintain this workout intensity for approximately 30 minutes to one hour with his or her breathing only slightly greater than when the user began exercising.

'413 patent, Ex. 1001 at 15:44-61 (cited in Patent Owner's Sur-Reply, Paper 30 at 4)



Lubell's prescribed exercise test will incrementally increase a running speed from 4 miles per hour, with a test subject increasing his/ her speed in response to *predetermined* "pacing tones." See Lubell, column 8, lines 43-49. Accordingly, Lubell exercise test protocol is not based on a level of physical fitness of a user. For example, Lubell's prescribed 4 miles per hour *starting* speed may, for some users, be considered difficult to achieve, or may, in other instances, be beyond the capabilities of some users. In such instances, these users would not be able to increase their speeds in response to predetermined "pacing tones." Therefore, because Lubell's exercise test protocol is predetermined, it is not adaptive to the physical fitness of a user.

Accordingly, nowhere does Lubell disclose, teach, or suggest a prompt for a user to exercise "at a plurality of successive exertion levels, wherein an exertion level is based on a level of physical fitness of a user," and Lubell does not anticipate amended claim 1. Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. 102(b) rejections of claim 1.

Response to Office Action, Ex. 1014 at 8 (cited in Patent Owner's Response, Paper 22 at 21)

Extrinsic evidence confirms Nike's plain and ordinary meaning



23. For instance, *Exercise Physiology*, by William D. McArdle and other authors, is a standard textbook in the field, and the fifth edition was published in 2001. Ex. 2011 ("McArdle"). McArdle explains that "physical fitness" refers to "[a]ttributes related to how well one performs physical activity," and describes "health-related physical fitness" as including an "aerobic and/or cardiovascular fitness" component. *Id.*, 871. McArdle also explains that "an individual's

Supp. Declaration of Dr. Bergeron, Ex. 2008 at ¶123

indicates how difficult that level is for that person. *Id.*, 481. In other words, McArdle supports my understanding that physical fitness levels relate to performance (*i.e.*, how easy or difficult it is for a person to exercise at a given intensity level), not to physical characteristics that do not, in and of themselves, indicate what a particular person's performance level will be. And McArdle explains that cardiorespiratory endurance is a common measure for assessing a person's level of physical fitness, which can be measured by VO_{2max} . *Id.*, 162-163, 232. McArdle also reports five classifications of cardiovascular fitness—poor, fair, average, good, and excellent—which are like those used colloquially by people when referring to someone's athletic "shape" or fitness level. *Id.*, 163. As McArdle mentions, "cardiac patients" and "sedentary persons" are likely to be at a poor level of cardiovascular fitness, while "world-class runners and cross-country skiers" are likely to be at an excellent level of cardiovascular fitness. *Id.*

Supp. Declaration of Dr. Bergeron, Ex. 2008 at ¶123



The health-related components of physical fitness are (a) cardiorespiratory endurance, (b) muscular endurance, (c) muscular strength, (d) body composition, and (e) flexibility. These components are defined in the glossary (p. 129). Just as the amount of physical activity ranges from low to high, so does the level of physical fitness. Moreover, the levels of

Caspersen, Ex. 2009 at 3

8. With respect to the intrinsic evidence, the '413 specification exemplarily describes setting an exertion level based on cardiorespiratory endurance, measured by a user's physical attributes, such as the user's heart rate or breathing. As the specification describes, "an easy level of [exertion] is one that only

Dr. Lynch Reply Declaration, Ex. 1018 at ¶18



IN A PRACTICAL SENSE

►► INTERPRETING $\dot{V}O_{2\text{MAX}}$ —ESTABLISHING CARDIOVASCULAR FITNESS CATEGORIES

Cardiovascular fitness reflects the maximal amount of oxygen consumed during each minute of near-maximal exercise. These values for maximal oxygen consumption, or $\dot{V}O_{2\text{MAX}}$, generally are expressed in milliliters of oxygen per kg of body mass per minute ($\text{mL} \cdot \text{kg}^{-1} \cdot \text{min}^{-1}$). Individual values can range from about $10 \text{ mL} \cdot \text{kg}^{-1} \cdot \text{min}^{-1}$ in cardiac patients to 80 or $90 \text{ mL} \cdot \text{kg}^{-1} \cdot \text{min}^{-1}$ in world-class runners and cross-country skiers. Men and women distance runners, swimmers, cy-

clists, and cross-country skiers generally attain $\dot{V}O_{2\text{MAX}}$ values nearly double those of sedentary persons (see Fig. 11.8).

Researchers have measured the $\dot{V}O_{2\text{MAX}}$ of thousands of individuals of different ages. The average values and respective ranges for men and women of different ages establish category values to classify individuals for cardiovascular fitness. The table presents a five-part classification based upon data from the literature.

CARDIOVASCULAR FITNESS CLASSIFICATIONS

GENDER	AGE	POOR	FAIR	AVERAGE	GOOD	EXCELLENT
Men	≤29	≤24.9	25-33.9	34-43.9	44-52.9	≥53
	30-39	≤22.9	23-30.9	31-41.9	42-49.9	≥50
	40-49	≤19.9	20-26.9	27-38.9	39-44.9	≥45
	50-59	≤17.9	18-24.9	25-37.9	38-42.9	≥43
	60-69	≤15.9	16-22.9	23-35.9	36-40.9	≥41
Women	≤29	≤23.9	24-30.9	31-38.9	39-48.9	≥49
	30-39	≤19.9	20-27.9	28-36.9	37-44.9	≥45
	40-49	≤16.9	17-24.9	25-34.9	35-41.9	≥42
	50-59	≤14.9	15-21.9	22-33.9	34-39.9	≥40
	60-69	≤12.9	13-20.9	21-32.9	33-36.9	≥37

McArdle, Ex. 2011 at 7 (p.163)

“physical fitness” level. As I explained in my earlier declaration, a “physical fitness” level refers to a person’s physical fitness condition, or what is also loosely referred to as “shape”—as in, assessing a person as being in “good shape,” “bad shape,” or “out of shape.” A textbook in the field of exercise physiology uses similar categories, with five cardiovascular fitness classifications ranging from poor, fair, and average, to good and excellent. Ex. 2011, at 163. These various phrasings refer to the same concept, which is how easy or difficult it is for a person to physically exert themselves at a given level of exercise. And for “cardio” (i.e. aerobic) types

Dr. Bergeron Supp. Declaration, Ex. 2008 at ¶120



5 Q. Okay. So by removing the second instance
6 of "level" from the claim language for this term,
7 you didn't intend to change the meaning of the term
8 by removing that second "level"?

9 A. No.
10 I intended it to be a restatement of the
11 original claim language which I ascribe its
12 ordinary and customary meaning to.

Dr. Lynch 2-22-24 Dep. Tr. (Ex. 2013), at 42:5-12



**Ground 1: lululemon Failed To Show That Amano Anticipates
Challenged Claims 1, 5, 7, 12, and 17**



lululemon Failed To Show Amano Discloses Limitation [C]



The invention claimed is:

1. An apparatus comprising:

a processor; and

a memory storing instructions that, when executed by the processor, cause the apparatus at least to:

prompt a user to exercise at a plurality of successive exertion levels, wherein an exertion level is based on a level of physical fitness of a user;

determine a plurality of heart rate zones based on first heart rate measurements received from a sensor while the user exercises at the plurality of successive exertion levels;

generate a prompt instructing a user to exercise while maintaining heart rate within a particular one of the plurality of heart rate zones;

process second heart rate measurements received from the sensor subsequent to generating the prompt; and
determine whether the second heart rate measurements are within the particular heart rate zone.

'413 Patent, Ex. 1001 at 18:4-23

Amano chooses the exercise level for the user, just like Lubell does



over Lubell. Ex. 2001, ¶¶81-89. The Examiner found that Lubell does not disclose “prompt[ing] the user to exercise at a plurality of exertion levels,” where the “exertion levels are based on a level of physical fitness of the user and are specifically chosen by the user,” and “there is no external device *which is choosing the exercise level.*” Ex. 1015, at 2 (emphasis added). Instead, the device in Lubell selects the exercise levels for the user by “automatically pacing the subject through a straightforward training protocol” at “predetermined” pacing rates using “pacing tones,” so that heart rates can be measured “at the prescribed cadence.” Ex. 1004, 2:45–51, 3:30–43. Lubell describes that a “preferred” version of the “predetermined” protocol paces a subject through speeds of four, six, eight, ten, twelve, and “fourteen miles per hour” for “successive three minute intervals.” *Id.*,

Patent Owner’s POPR, Paper 10 at 24-25

And Petitioner does not dispute that Amano discloses the same type of device. For example, Petitioner admits that Amano “*notifies an exerciser to increase their exercise intensity* after a certain amount of time *at a particular intensity.*” Petition at 10 (emphases added). Petitioner further admits that Amano uses “beeps that indicate to the subject the pace they should run.” *Id.* Thus, under *Becton, Dickinson*

Claims. Ex. 2001, ¶¶87-89. Instead, the “test subject” in Amano is “notified to increase exercise intensity by 10%” for each interval, and just as in Lubell, the subject is supposed to “tr[y] to maintain running at” the predetermined “pitch,” until the next “intensity increase” notification is made, at which point the subject is again supposed to “tr[y] to maintain running” at the new intensity level. Ex. 1002, 13:52–

Patent Owner’s POPR, Paper 10 at 25-26



Recorder **107** records information relating to test subject's **stride, sex and weight.**

Exercise intensity calculator **108** calculates the exercise intensity from the obtained pitch, and the test subject's stride and body weight. In this example, the exercise carried out by the test subject is assumed to be running, so that exercise intensity may be indicated as the product of the distance run per unit time and the test subject's body weight. The distance run per unit time can be obtained by multiplying the test subject's stride and pitch.

Amano, Ex. 1002 at 7:28-37



24. Dr. Bergeron argues that Amano’s 10% pitch increases are the same for all users. (EX2008, ¶¶66, 67, 69.) While the percentage is 10% for all users, the

Dr. Lynch Reply Declaration, Ex. 1018 at ¶24

First, at step Sb1, CPU 201 detects the pitch of the running by processing the body motion signal of body motion detector 104 in the same manner as in steps S9 and Sa2 described above.

Next, in step Sb2, CPU 201 determines the pitch at which there is a 10% increase over the pitch detected in the preceding step, and controls alarm 207 to generate a beep alarm in accordance with this pitch for 10 seconds, for example. As a result, the test subject is able to referentially know the timing when increasing exercise intensity in stages during running, as well as the pitch when running at the next stage.

Amano, Ex. 1002 at 13:39-50

After starting to run, the test subject carries out running at a constant pitch for 120 seconds, until the first exercise intensity increase notifying processing is initiated. During this 120 seconds, calculation display processing is executed 4 times. However, since the exercise intensity is constant, there is only one exercise intensity-beat rate pair obtained. Accordingly, during this time, the processing in steps Sa6~Sa9 in the calculation display processing are not carried out.

Next, once 120 seconds have elapsed since the test subject started running, the first exercise intensity increase notifying processing is executed. As a result, an alarm sound is generated at an interval which represents a 10% increase over the previous pitch. In accordance with the alarm sound, the test subject increases the pitch by 10%, and tries to maintain running at this pitch for 120 seconds, until the second exercise intensity increase notifying processing is executed. The calculation display processing is carried out 4

Amano, Ex. 1002 at 14:43-60

Iululemon argues the initial pitch can vary, but Amano does not “prompt” that exertion level as required by the claims



When information related to the test subject's sex, body weight, and stride are set in RAM 203, then, in step S8, CPU 201 detects the body motion signal from body motion detector 104, and determines whether or not the test subject has actually started to run. If the test subject has not started to run, then processing again returns to step S8. In other words, the processing order stands by in step S8 until the test subject begins running.

When the test subject actually begins to run, then, in step S9, CPU 201 detects the pitch of running using a method which will be explained below. Next, in step S10, control is carried out with respect to alarm 207, which is to inform the test subject that initiation of running has been confirmed, so that alarm 207 generates an alarm sound corresponding to the detected pitch for 10 seconds, for example. As a result, an alarm sound synchronized to the exercise is generated when the test subject begins to run.

Amano, Ex. 1002 at 10:55-11:4

24. Dr. Bergeron argues that Amano's 10% pitch increases are the same for all users. (EX2008, ¶¶66, 67, 69.) While the percentage is 10% for all users, the increase in pitch (expressed in steps per minute, for example) is not, because the initial pitch depends on the user. (EX1002, 12:12-14.) Amano detects the initial pitch; the first 10% increase is an increase over the detected initial pitch; and then the second 10% increase is an increase over the pitch from the first 10% increase. (*Id.*, 12:36-41, 13:44-55, 14:43-65.) The initial pitch is proportional to the initial

Dr. Lynch Reply Declaration, Ex. 1018 at ¶24



The Reply's discussion of "exercise intensity" is a non-sequitur. Paper 26, 5-8. Dr. Lynch agrees that "exercise intensity" is a measure of "power" (Ex. 1018, ¶14), and that exercise intensity is calculated by multiplying "the user's weight by their speed," which is "the product of the user's *pitch* and stride length." *Id.* In other words, Amano calculates exercise intensity after a user is already running at a given pitch, as shown in Dr. Lynch's steps below, where the pitch "has to be detected first, and then you put it into an equation" (Ex. 2013, 52:23-53:5; Ex. 1018, ¶16):

16. The steps of Amano's "**calculation display processing**" are:

Step Sa1	determine the user's pulse rate (beat rate) (<i>id.</i> , 12:9-11)
Step Sa2	detect the running pitch of the user (<i>id.</i> , 12:12-14) (same as step S9)
Step Sa3	calculate exercise intensity as the product of the pitch (detected in step Sa2), stride length, and body weight (<i>id.</i> , 12:15-20)



lululemon Failed To Show Amano Discloses Limitation [D] And [E]



The invention claimed is:

1. An apparatus comprising:

a processor; and

a memory storing instructions that, when executed by the processor, cause the apparatus at least to:

prompt a user to exercise at a plurality of successive exertion levels, wherein an exertion level is based on a level of physical fitness of a user;

determine a plurality of heart rate zones based on first heart rate measurements received from a sensor while the user exercises at the plurality of successive exertion levels;

generate a prompt instructing a user to exercise while maintaining heart rate within a particular one of the plurality of heart rate zones;

process second heart rate measurements received from the sensor subsequent to generating the prompt; and determine whether the second heart rate measurements are within the particular heart rate zone.

'413 Patent, Ex. 1001 at 18:4-23



5. Element 1[D]

determine a plurality of heart rate zones based on first heart rate measurements received from a sensor while the user exercises at the plurality of successive exertion levels;

Amano focuses on maximum oxygen uptake, a fitness measure with a direct correlation to heart rate zones. (Ex. 1002 at 19:32-33.) Amano describes how this is calculated for a particular subject. “[T]he maximum oxygen uptake quantity (VO_{2max}/wt) is estimated at fixed intervals of time from the test subject’s exercise intensity and heartbeat rate during running.” (*Id.* at 11:66-12:3.) Using this estimated VO_{2max} , the microcomputer takes a pulse rate that corresponds to 50% VO_{2max} . (*Id.* at 19:40-43.) It calculates heart rates 20% above and below this rate and uses them as an upper and lower limit. (*Id.* at 20:19-28.) It thereby creates heart rate zones based on those first heart rate measurements. There is a zone below 40% VO_{2max} (yellow), from 40 to 60% (green), and greater than 60% (red).



“To anticipate a claim, a single prior art reference must expressly or inherently disclose each claim limitation....But disclosure of each element is not quite enough— this court has long held that anticipation requires the presence in a single prior art disclosure of all elements of a claimed invention *arranged as in the claim.*”

Net MoneyIN, Inc., v. Verisign, Inc., 545 F.3d 1359, 1371 (Fed. Cir. 2008) (emphasis original, original quotations and citations omitted)

Cited in Patent Owner’s Sur-Reply, Paper 30 at 15-16



“Instead, a reference may still anticipate **if that reference teaches that the disclosed components or functionalities may be combined** and one of skill in the art would be able to implement the combination. Thus, in *Kennametal*, we found substantial evidence support for the Board’s finding that the reference anticipated the claims even without a particular disclosure of the specific combination recited in the disputed claims.”

Blue Calypso, LLC v. Groupon, Inc., 815 F.3d 1331, 1344 (Fed. Cir. 2016) (emphasis added, internal citations omitted)

Cited in Patent Owner’s Sur-Reply, Paper 30 at 2, 15



Amano – First Embodiment (Ex. 1002, 3:65-4:17, 6:4-16:14)

FIG. 5

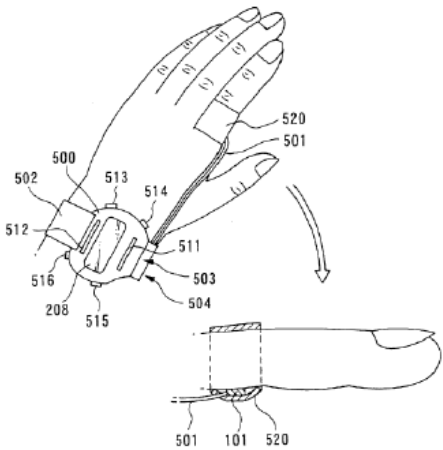
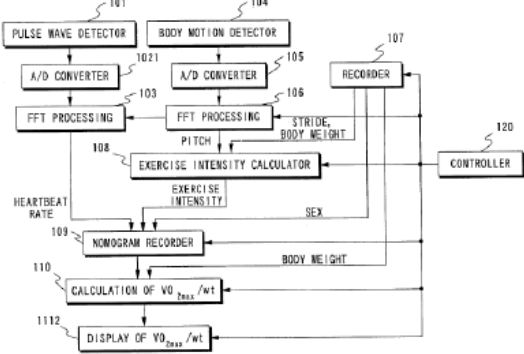


FIG. 1



Patent Owner Sur-Reply, Paper 30 at 11

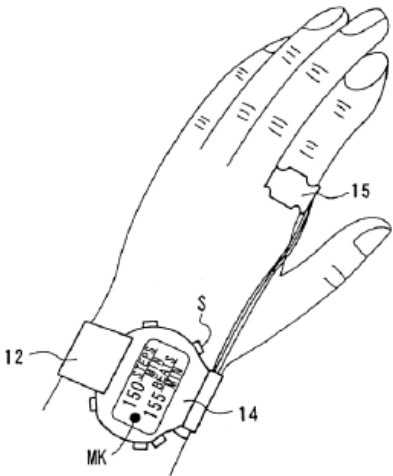
DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Amano – Fourth Embodiment (Ex. 1002, 4:31-5:8, 19:8-26:34)

FIG. 14

VO_{2max}	36	37	38	39	40	41	42
PULSE RATE	105	110	115	120	125	130	135

FIG. 16



Patent Owner Sur-Reply, Paper 30 at 13



12 Q. Okay. And if you flip back to Figure 16,
13 do you see a button or a switch that's labeled "S"
14 in that figure?

15 A. Yes.

16 Q. Okay. And is there a button labeled "S"
17 in Figure 5?

18 A. No, but I think a POSITA would read this
19 to mean the same device with slightly different
20 interfaces because you can use Figure 16 to perform
21 the VO2max estimation that's discussed with respect
22 to Figure 5 and then continue from there.

8 Q. Okay. So it's still your opinion that
9 Figures 5 and 16 depict the same device?

10 A. I think they are depicting the same
11 invention and slightly different physical
12 instantiations of it but functionally the same.



C. Amano's First, Fourth, and Eighth Embodiments Are Not Distinct Embodiments

27. Dr. Bergeron argues that Amano's first, fourth, and eighth embodiments are multiple, distinct embodiments. (EX2008, ¶¶70, 72.) Dr. Bergeron does not explain why these embodiments are distinct. Regardless, Amano explicitly connects the teachings of "Embodiments" 1, 4, and 8 of Amano. Amano explicitly connects its first and fourth embodiments, stating for the fourth embodiment that, "[t]he user estimates his own VO_{2max} in advance using the methods explained in the *first . . . embodiment*[]" (EX1002, 19:49-50 (emphasis added); EX2012 (Lynch Sept. 27, 2023 deposition), 166:5-17.) Amano also explicitly connects its first and eighth embodiments, stating for the eighth embodiment that, "[t]he user[]'s VO_{2max} was obtained in the preceding *first . . . embodiment*[]" (EX1002, 38:23-25 (emphasis added).) I note that it is irrelevant whether VO_{2max} "could have been calculated using [other] methods," as Dr. Bergeron argues. (EX2008, ¶71.) Amano's first, fourth, and eighth embodiments are not distinct.

Dr. Lynch Reply Declaration, Ex. 1018 at ¶27



4. Embodiment 4

4.1. Basic structure and operation

The fourth embodiment according to the present invention will now be explained with reference to the figures.

The user estimates his own VO_{2max} in advance using the methods explained in the first through third embodiments, or by means of a conventional indirect method. In this case, there is available an indirect method wherein VO_{2max}/wt is estimated from heartbeat rate and power under maximum exercise (see Hoken-No-Kagaku (Science of Health), Vol. 32, No. 3, 1990.).

In this state, the display on display 8 is counted up when the user continues to press up switch U, or is counted down when the user continues to presses down switch D. Once the user has matched the display to his own VO_{2max} , he inputs this value by pressing set switch S. As an example in this case, 40 is input.

Amano, Ex. 1002 at 19:8-12, 19:49-55, 20:7-12

18 So here the user effectively uses switches
19 to type in their VO_{2max} . For a person of ordinary
20 skill reading this, it would be immediately
21 apparent that, if possible, you would just import
22 without having to have the user type it in again.

Dr. Lynch 2-22-24 Dep. Tr. (Ex. 2013), at 61:18-22

3 Does Embodiment 4 disclose that the user
4 inputs any heart rate measurements into the device?
5 A. Would you like to point me to a place?
6 Q. Let me ask a slightly different question.
7 Does Embodiment 4 disclose that the user
8 can input heart rate measurements so that the
9 Embodiment 4 device can calculate a VO_{2max} ?

11 THE WITNESS: Do you know that there's a place
12 that it does? If so, you could point me to that.

13 BY MR. SWISHER:

14 Q. It doesn't, but I'm asking if you agree,
15 I guess. Do you agree that it doesn't --

16 A. I am not aware that it does that. I am
17 aware that it allows the user to enter their VO_{2max} .

Dr. Lynch 2-22-24 Dep. Tr. (Ex. 2013), at 65:3-17



**lululemon Failed To Show Amano Discloses Dependent Claims 5 and 7,
Because It Does Not Disclose Independent Claim 1**



**Ground 2: lululemon Failed To Show That Matsumoto Anticipates
Challenged Claims 1, 5, 7, 12, and 17**



lululemon Failed To Show Matsumoto Discloses Limitation [C]



The invention claimed is:

1. An apparatus comprising:

a processor; and

a memory storing instructions that, when executed by the processor, cause the apparatus at least to:

prompt a user to exercise at a plurality of successive exertion levels, wherein an exertion level is based on a level of physical fitness of a user;

determine a plurality of heart rate zones based on first heart rate measurements received from a sensor while the user exercises at the plurality of successive exertion levels;

generate a prompt instructing a user to exercise while maintaining heart rate within a particular one of the plurality of heart rate zones;

process second heart rate measurements received from the sensor subsequent to generating the prompt; and
determine whether the second heart rate measurements are within the particular heart rate zone.

'413 Patent, Ex. 1001 at 18:4-23

Matsumoto chooses the exercise level for the user, just like Lubell does



over Lubell. Ex. 2001, ¶¶81-89. The Examiner found that Lubell does not disclose “prompt[ing] the user to exercise at a plurality of exertion levels,” where the “exertion levels are based on a level of physical fitness of the user and are specifically chosen by the user,” and “there is no external device *which is choosing the exercise level.*” Ex. 1015, at 2 (emphasis added). Instead, the device in Lubell selects the exercise levels for the user by “automatically pacing the subject through a straightforward training protocol” at “predetermined” pacing rates using “pacing tones,” so that heart rates can be measured “at the prescribed cadence.” Ex. 1004, 2:45–51, 3:30–43. Lubell describes that a “preferred” version of the “predetermined” protocol paces a subject through speeds of four, six, eight, ten, twelve, and “fourteen miles per hour” for “successive three minute intervals.” *Id.*,

Patent Owner’s POPR, Paper 10 at 24-25

1003, 4:33–35) (emphasis added). Petitioner glosses over the fact that Matsumoto does not disclose prompting a user to exercise at an “exertion level” that is “*based on*” a user’s own “level of physical fitness,” as required by the claims. Instead, Matsumoto uses an “exercise standard” “table” that selects predetermined exercise programs for a user based only on a “user’s age, sex, [and] weight.” *Id.*, 3:15–55. Ex. 2001, ¶¶94-96. Matsumoto expressly discloses that the preset “data in Table 1” is “used to calculate the user’s exercise program.” *Id.*, 5:20–22. While Matsumoto’s standardized tables may provide exercises “*suited to*” users in various age and weight classes, that is not equivalent to a specific user’s individual fitness level. Ex. 2001, ¶¶94-96. Indeed, Petitioner acknowledges that the workout programs in Matsumoto are “*not subjective*,” and instead are based on “typical fitness tables” that “*estimate the physical fitness of the user.*” Petition at 31–32 (emphases added). Petitioner also does not dispute that in Matsumoto “the *machine sets the initial exertion level targets*” (Petition at 31) (emphasis added), just as the device in Lubell.

Patent Owner’s POPR, Paper 10 at 28-29



An embodiment of the functioning of this exercise management machine will now be explained using FIG. 6 (a) and (b) flow charts. The power ON-OFF switch is first turned on. [Sex? Man . . . 1 Woman . . . 2] appears on the display (19). The user uses the number keys to input his or her sex. The ENT key (21) is used to enter this data. Next, [Age?] appears on the display. The ENT key (21) is used again to enter the user's age. [Weight? kg] then appears on the display at which time the user enters his or her weight and presses the ENT key still again. At this point, the exercise program is set to 0, the initial setting.

Matsumoto, Ex. 1003 at 3:4-15

Matsumoto paces all users through a standardized protocol



Age	Exercise Prog. No.	Target Pulse	Exercise Time	Exercise Standard	
				Men	Women
-29	1	120	5	M1	W1
	2	130	5	M2	W2
	3	140	5	M3	W3
	4	145	5	M4	W4
	5	150	5	M5	W5
	6	155	5	M6	W6
	7	155	6	M7	W7
	8	155	7	M8	W8
	9	155	8	M9	W9
	10	155	9	M10	W10
	11	155	10	M11	W11
	12	155	11	M12	W12
	13	155	12	M13	W13
	14	155	13	M14	W14
	15	155	14	M15	W15
	16	155	15	M16	W16
	17	115	5	M17	W17
	18	125	5	M18	W18
	19	135	5	M19	W19
	20	140	5	M20	W20
	21	145	5	M21	W21
	22	150	5	M22	W22
	23	150	6	M23	W23
	24	150	7	M24	W24
	25	150	8	M25	W25
	26	150	9	M26	W26
	27	150	10	M27	W27
	28	150	11	M28	W28
	29	150	12	M29	W29
	30	150	13	M30	W30
	31	150	14	M31	W31
	32	150	15	M32	W32

The "exercise standard" in the table is the standard work volume when a person continues exercising for a specific time at a certain target pulse. The program for



user. (EX1003, 3:4-64.) The use of the individual user's physical characteristics allows Matsumoto to design a workout program that is "suited to an individual user's physical fitness," and thus, not one-size-fits-all. (EX1003, 4:33-35.) That is, Matsumoto "takes into account an individual user's particular physical fitness condition." Accordingly, under either my or Nike's construction of "wherein an exertion level is based on a level of physical fitness of a user," Matsumoto teaches limitation [1C].

Dr. Lynch Reply Declaration, Ex. 1018 at ¶35



endurance. Instead, Matsumoto selects workout programs for the user from a standardized table, which includes preset increases in target pulses and exercise times (*i.e.*, “exercising at xxx pulses/min. for xx mins”) that are applied to all users of a certain age and sex, without regard to an individual user’s physical fitness condition. Ex. 1003, 3:53–64. Petitioner acknowledges that in Matsumoto’s first

Supp. Declaration of Dr. Bergeron, Ex. 2008 at ¶184

condition. For instance, Table 1 is described as applying to “the age group under 29,” and under Matsumoto’s approach two 27-year-old men each weighing 175 pounds would be assigned the same program, even if one was a non-exerciser and in poor physical fitness condition, and the other was an Olympic athlete in top physical fitness condition. *Id.*, 4:15–18, 3:22–52. To put it another way, men in the

Supp. Declaration of Dr. Bergeron, Ex. 2008 at ¶184



**lululemon Failed To Show Matsumoto Discloses
Limitations [D], [E], [F], and [G]**



The invention claimed is:

1. An apparatus comprising:

a processor; and

a memory storing instructions that, when executed by the processor, cause the apparatus at least to:

prompt a user to exercise at a plurality of successive exertion levels, wherein an exertion level is based on a level of physical fitness of a user;

determine a plurality of heart rate zones based on first heart rate measurements received from a sensor while the user exercises at the plurality of successive exertion levels;

generate a prompt instructing a user to exercise while maintaining heart rate within a particular one of the plurality of heart rate zones;

process second heart rate measurements received from the sensor subsequent to generating the prompt; and
determine whether the second heart rate measurements are within the particular heart rate zone.

'413 Patent, Ex. 1001 at 18:4-23



5. Element 1[D]

determine a plurality of heart rate zones based on first heart rate measurements received from a sensor while the user exercises at the plurality of successive exertion levels;

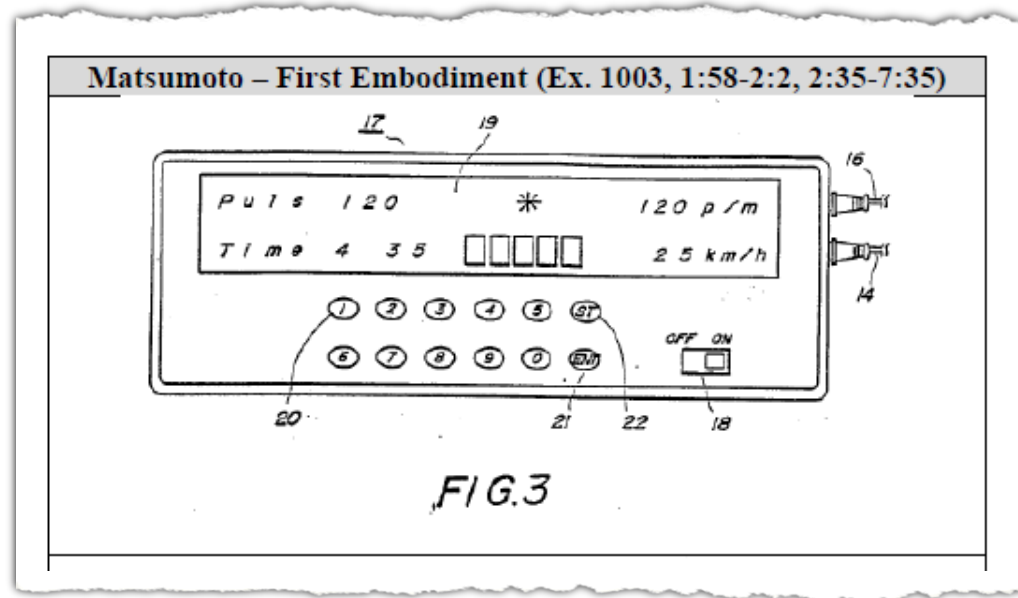
The target pulses in an exercise program are not just a single heart rate but heart rate zones. There is a range around each target pulse so that a user knows whether they are “above, below or within the target pulse zone (e.g. target pulse $\pm$ 5).” (*Id.* at 7:50-51.) Matsumoto regularly refers to target pulses in terms of zones, for example, “[i]f the user’s pulse is within the target pulse zone, the LED emits green light, yellow light if it is below the target pulse zone, and red if it is above the target pulse zone. (*Id.* at 9:36-40.) Just as in the ’413 patent, there is a lower limit heart rate and an upper limit heart rate that determine the bounds of a heart rate zone.

Petition, Paper 2 at 32-33

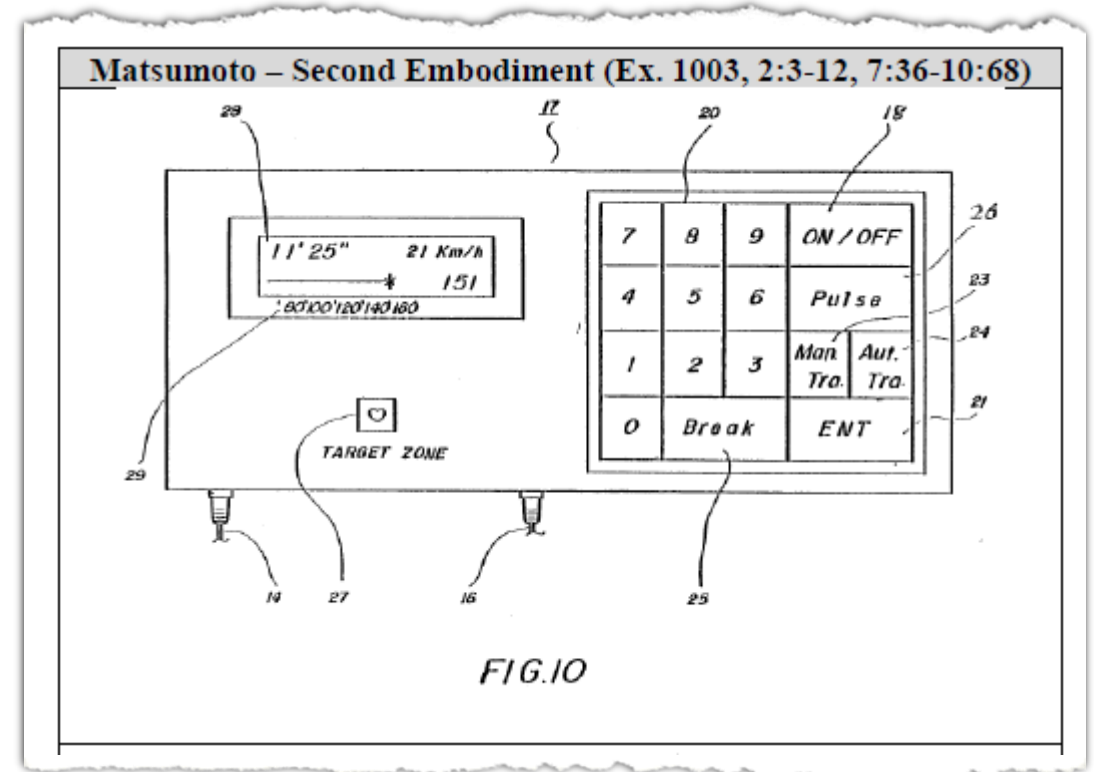
FIG. 10 illustrates another embodiment of this invention, with an outline of the exercise management body (17). 18 is the power ON/OFF key, 20 the number keys, 21 the ENT key used to enter data as shown by the flow charts in FIG. 12 (a) to (c), 26 the pulse mode key used to select the pulse mode, 23 the manual training mode key (with which the user can set his/her target pulse and training time, and/or the number of calories he/she wishes to consume).

Matsumoto, Ex. 1003 at 7:36-44

Matsumoto's embodiments are distinct exercise management machines



Patent Owner Sur-Reply, Paper 30 at 18



Patent Owner Sur-Reply, Paper 30 at 20



“*Kennametal* does not stand for the proposition that a reference missing a limitation can anticipate a claim if a skilled artisan viewing the reference would ‘at once envisage’ the missing limitation. Rather, *Kennametal* addresses whether the disclosure of a limited number of combination possibilities discloses one of the possible combinations.”

Nidec Motor Corp. v. Zhongshan, 851 F.3d 1270, 1274 (Fed. Cir. 2017)

Cited in Patent Owner’s Sur-Reply, Paper 30 at 1, 22-23



Finally, Nike is wrong that the two “embodiments” are separate machines that do not work together. (POR, 44-45.) Figures 3/5 and Figures 10/11 depict features of exercise machines for providing an exercise program suited to the individual user’s physical fitness, where the exercise machines have interfaces and components that are the same. (EX1018, ¶¶40-41; EX1003, 2:36-68, 7:57-8:14, Figs. 3-5, 10, 11; EX2012, 174:3-5, 179:10-181:7.)

Petitioner’s Reply, Paper 26 at 15

Dr. Lynch admitted the embodiments include different “features”



10 Q. Okay. So I just wanted to focus, though,
11 on the exercise management machines that are
12 depicted in Figures 3 and 10 and then also
13 described in the text, if we can just do that.

14 Okay. Is it your opinion, Dr. Lynch, that
15 the devices depicted in Figures 3 and 10 of
16 Matsumoto are the same device?

17 A. They're illustrations of the device with
18 the same functionality, but they have different
19 features in the drawings. So these are different
20 ways to draw the features of those Embodiment 1 and
21 Embodiment 2.

Dr. Lynch 2-22-24 Dep. Tr. (Ex. 2013), at 68:10-21



24 Even though the second embodiment
25 describes a manual training mode and an auto
1 training mode and those modes are not described for
2 Embodiment 1, you think they are the same devices?

4 THE WITNESS: So what Nike is calling
5 Embodiment 2 has an auto training mode that is
6 substantially the same as the auto training mode in
7 what Nike is calling Embodiment 1 in the sense that
8 it's updating the exercise program for the next
9 time based on the results from this time.

10 The manual training mode is different..
11 That's not discussed in what Nike calls
12 Embodiment 1.

Dr. Lynch 2-22-24 Dep. Tr. (Ex. 2013), at 72:24-73:12 (objections omitted)



C. Matsumoto Does Not Disclose Limitations [E], [F], Or [G]

The Reply did not address limitation [E], where Petitioner also combined embodiments. Paper 22, 43-45. And Petitioner failed to rebut combining embodiments for limitation [G], merely asserting that it “did not combine,” citing no support. Paper 26, 15; *Net MoneyIN*, 545 F.3d at 1371.

For limitations [F]-[G], Petitioner also failed to rebut that it relied on the same “heart rate measurements” as for limitation [D]. Paper 22, 45-46. In Reply, Petitioner cites pp. 32 and 36 of the Petition (Paper 26, 15), which proves Nike’s point—on both pages, Petitioner cited the *same* measurements in column 5.

Patent Owner Sur-Reply, Paper 30 at 24



lululemon Failed To Show Matsumoto Discloses Dependent Claims 5 and 7, Because It Does Not Disclose Independent Claim 1



**Ground 4: lululemon Failed To Show That Lubell + Ceci Renders
Obvious Claims 1, 12, and 17**



lululemon Failed To Show A Motivation To Combine For Limitation [C]



The invention claimed is:

1. An apparatus comprising:

a processor; and

a memory storing instructions that, when executed by the processor, cause the apparatus at least to:

prompt a user to exercise at a plurality of successive exertion levels, wherein an exertion level is based on a level of physical fitness of a user;

determine a plurality of heart rate zones based on first heart rate measurements received from a sensor while the user exercises at the plurality of successive exertion levels;

generate a prompt instructing a user to exercise while maintaining heart rate within a particular one of the plurality of heart rate zones;

process second heart rate measurements received from the sensor subsequent to generating the prompt; and determine whether the second heart rate measurements are within the particular heart rate zone.

'413 Patent, Ex. 1001 at 18:4-23



The Examiner and Patent Owner mischaracterize the prior art and miss that self-regulated exercise, if not anticipated, is obvious. There is motivation in Lubell to use other tests in other circumstances. (Ex. 1009, ¶ 60.) Lubell does not disclose only one specific exercise, as argued by Patent Owner. Lubell describes one embodiment designed for running, but notes that “it is to be understood that a device embodying this invention could be suitably adapted for use when cycling, swimming, or some other exercise. . . . In such a case, a suitable submaximal exercise test protocol could be used.” (Ex. 1004 at 5:8-13 (emphasis added).)

It is obvious, in light of Ceci, that such a test protocol could be a self-regulated exercise chosen by a user. (See Ex. 1009, ¶¶ 89-93.) “Perceived exertion” exercises were well known in the sport and exercise field before the ’413 patent. “Previous studies have shown that self-regulation of exercise, in which subjects are asked to produce exercise intensities based on feelings of perceived exertion, seems to function well in a number of exercise modes investigated.” (Ex.

Petition, Paper 2 at 42



The subject runs at the speed corresponding to the pacing tones provided by the fitness monitor device. These tones occur at cadences which increase each three minutes. When the subject reaches the point of exhaustion, or reaches his or her maximum heart rate HR_M , the exercise tolerance test is halted, and the subject pushes an appropriate key or push button on the device. Then, the subject's fitness index is calculated according to the Van der Walt relationship used for the running test:

If the total elapsed time T is less than seven minutes, the fitness VO_{2max} is calculated according to the relationship:

$$VO_{2max} = 3.83T + 13;$$

but where the time T is between 7 and 18 minutes, the fitness index VO_{2max} is calculated according to the relationship

$$VO_{2max} = 2.33T + 24.$$

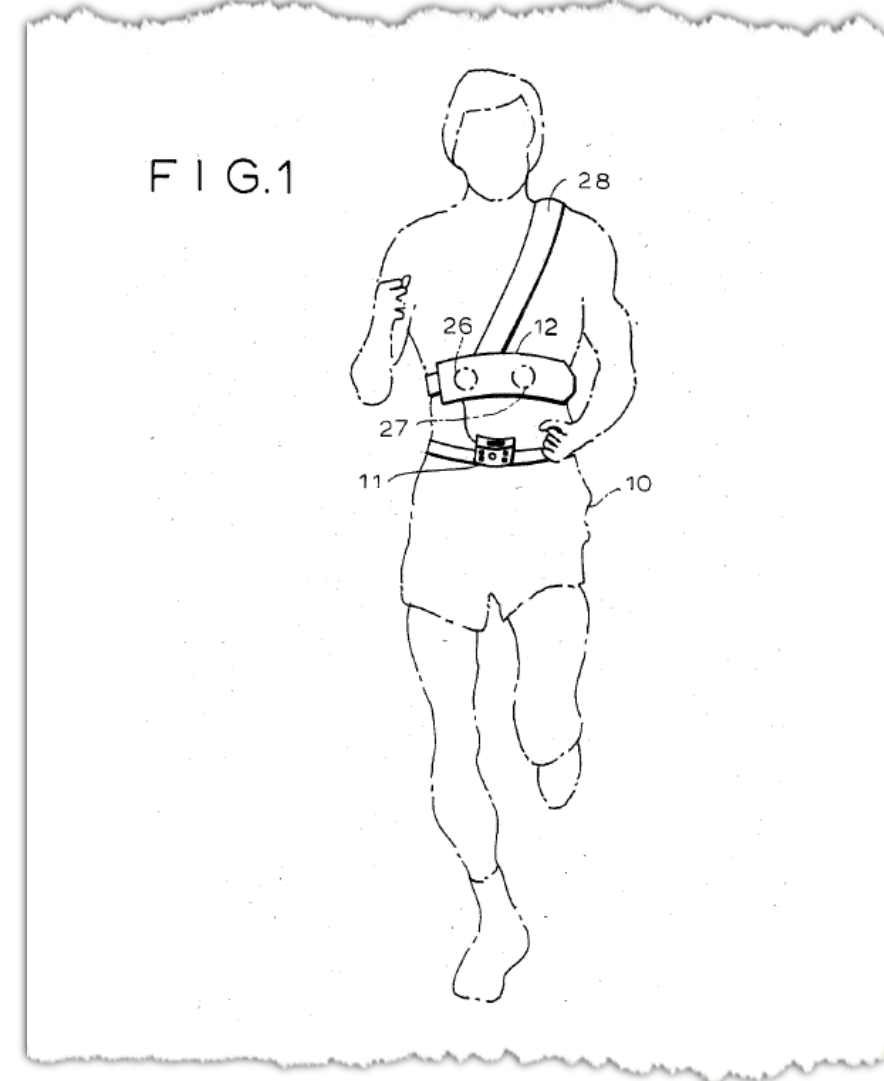
Here, T is expressed in minutes, and VO_{2max} is expressed of milliliters of oxygen per kilogram of body weight per minute.

These values are applicable for men. For women, the value of VO_{2max} would be reduced by about one-eighth.

This quantity VO_{2max} is used in monitoring a program for the subject's fitness training.

Lubell, Ex. 1004 at 4:4-32

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE



Lubell, Ex. 1004 at Fig. 1



14 Does Lubell describe any protocols for
15 calculating any other fitness parameters other than
16 VO2max?
17 A. No.

Dr. Lynch 2-22-24 Dep. Tr. (Ex. 2013), at 88:14-17



15 Does Ceci disclose a protocol for
16 determining VO2 max?
17 A. No.

Dr. Lynch 10-10-2023 Dep Tr. (Ex. 2012), at 272:15-17

18 Q. So what would the purpose be for a POSITA to
19 combine the device of Lubell with the protocol of
20 Ceci that you just discussed doesn't determine VO2
21 max?

22 A. Well, Lubell suggests that other test
23 protocols might be suitable in other circumstances,
24 so Ceci is such a protocol.

1 Q. Suitable for determining what exactly?

2 A. So Ceci is not determining VO2 max, but it
3 is measuring heart rates.

4 So Ceci is using ratings of perceived
5 exertion and mapping those to heart rates under
6 different exercises.

8 The device in Lubell also measures heart
9 rates, right?

10 A. Yes.



A. A POSITA Would Have Combined Lubell And Ceci

As the Petition explained, a POSITA would have been motivated to combine Lubell and Ceci to employ a different exercise test protocol, as explicitly suggested by Lubell. (Petition, 42; EX1004, 5:13-15 (“a suitable submaximal exercise test protocol could be used”).) Lubell offers a specific predefined exercise test protocol as an example method for automatically calculating a fitness parameter, such as VO_{2max} . (EX1004, 2:45-51; EX1018, ¶48.) But Lubell’s predefined protocol is a maximal test that requires the user to reach a maximal heart rate or point of exhaustion. (EX1004, 3:44-46; EX1018, ¶48.)

Petitioner’s Reply, Paper 26 at 16

A. A POSITA Would Have Combined Lubell and Ceci

48. Lubell provides a specific, predetermined exercise test protocol for automatically calculating a fitness parameter (e.g., “at least the maximal oxygen uptake VO_{2max} ,” heart rate, etc.). (EX1004, 2:45-51, 3:19-20.) Lubell’s predetermined protocol is an extremely intense one: “the subject, wearing the device, is paced to run at speeds of approximately four miles per hour for the first three minutes, and then at six miles per hour, eight miles per hour, ten miles per hour, twelve miles per hour, and fourteen miles per hour for the successive three minute intervals.” (*Id.*, 3:59-64.) The subject exercises until he or she reaches a maximal heart rate or the point of exhaustion, different from a submaximal exercise test protocol. (*Id.*, 3:45-47.) Lubell then explicitly suggests other test protocols, such as a “submaximal exercise test protocol . . . in a controlled exercise environment.”

Dr. Lynch’s Reply Declaration, Ex. 1018 at ¶48



18 Q. Right. Okay. So this is what I'm having
19 trouble understanding: So you agree that you
20 didn't see a reference in Lubell where it describes
21 its own protocol as maximal; right?

22 It only refers to it as submaximal.

24 THE WITNESS: Sitting here now, I'm not aware
25 of a place in the patent where it refers to its own
1 protocol as maximal --

Dr. Lynch 2-22-24 Dep Tr. (Ex. 2013), at 82:18-83:1 (objections omitted)



In a preferred fitness index submaximal exercise test protocol, the subject, wearing the device, is paced to run at speeds of approximately four miles per hour for the first three minutes, and then at six miles per hour, eight miles per hour, ten miles per hour, twelve miles per hour, and fourteen miles per hour for the successive three minute intervals. Although the speed of four miles per hour (i.e. fifteen minutes per mile) can be walked by most persons without much trouble, the experimental data have been derived for running, and the subject should run, even at this relatively low speed.

Lubell, Ex. 1004 at 3:58-68

While the description given below is of an exemplary embodiment intended for use with a human subject using running as the preferred training exercise, it is to be understood that a device embodying this invention could be suitably adapted for use when cycling, swimming, or some other exercise is the preferred training exercise. In such case, a suitable submaximal exercise test protocol could be used, in a controlled exercise environment. Furthermore, devices embodying this invention could be adapted for monitoring the training of non-human subjects, such as race horses or dogs.

Lubell, Ex. 1004 at 5:6-17



The process of self-monitoring and **self-regulation in physical exercise** deals with how well individuals are capable of adjusting the intensity of any exercise modality in order to reach a level that is best suited to their state of health, fitness, or any other limiting factor, such as instructions from a trainer or a test leader concerning how hard the work should be (10,20,24,29). Subjectively adjusting the exercise intensity can be seen as a continuous, as well as simultaneous, process involving monitoring of internal cues (e.g., perceived exertion, proprioception, and respiration) as well as external cues (e.g., velocity, and wind resistance). This self-monitoring leads to self-regulation, i.e., adjusting the exercise intensity.

Ceci, Ex. 1005 at p.732

Treadmill. The subjects were instructed to adjust the velocity on a level treadmill (by a hand-held device) so that they experienced the exertion corresponding to 11 (**“light exertion”**) on the RPE scale at the end of a 3 minute interval. After a short rest (1–2 min), they were asked to reproduce the task in exactly the same way. Next, they were asked to produce an intensity that corresponded to 13 (**“somewhat hard”**) on the scale for 11 min. Finally, they were asked to produce an intensity corresponding to 15 (**“hard”**) for 5 min. Subjects were allowed about 1–2 min of rest between all four trials.

Ceci, Ex. 1005 at p.734



In one previously-proposed fitness monitoring system, this fitness index VO_{2max} was calculated by having the subject exercise, at whatever speed he or she desired, for a period of twelve minutes. Preferably, this exercise was constituted by running. Then, at the end of the twelve minute period, the fitness VO_{2max} was derived from a simple, look-up table, based on the distance covered in that twelve minutes.

This system has the advantage of being simple to administer, but is not universally applicable. That is, it is

Some previously proposed fitness monitors provided pacing tones to provide a footfall cadence for runners to pace themselves at various speeds. However, there is no provision in such fitness monitors to accommodate variability in stride length, which increases as the subject's running speed increases. This variability occurs because

Lubell, Ex. 1004 at 2:1-10, 35-40

Accordingly, it is an object of this invention to provide a heart rate monitor and/or fitness monitor device which avoids the drawbacks of the previously proposed devices, and automatically calculates an appropriate fitness parameter (e.g., maximal oxygen uptake level or VO_{2max}) by automatically pacing the subject through a straightforward training protocol.

Lubell, Ex. 1004 at 2:45-51



lululemon Failed To Show Lubell + Ceci Discloses Limitation [D]



The invention claimed is:

1. An apparatus comprising:

a processor; and

a memory storing instructions that, when executed by the processor, cause the apparatus at least to:

prompt a user to exercise at a plurality of successive exertion levels, wherein an exertion level is based on a level of physical fitness of a user;

determine a plurality of heart rate zones based on first heart rate measurements received from a sensor while the user exercises at the plurality of successive exertion levels;

generate a prompt instructing a user to exercise while maintaining heart rate within a particular one of the plurality of heart rate zones;

process second heart rate measurements received from the sensor subsequent to generating the prompt; and
determine whether the second heart rate measurements are within the particular heart rate zone.

'413 Patent, Ex. 1001 at 18:4-23



Nike also argues that Dr. Lynch does not explain how Ceci's mean heart rates for a group of subjects are used for determining VO_{2max} . (POR, 55-56.) But that was not lululemon's argument. lululemon's Petition relies on Ceci's teachings of continuously measuring heart rates together with Lubell (including its resting heart rate and maximal heart rate) to determine % VO_{2max} zones. (Petition, 44-45; EX1018, ¶55.)

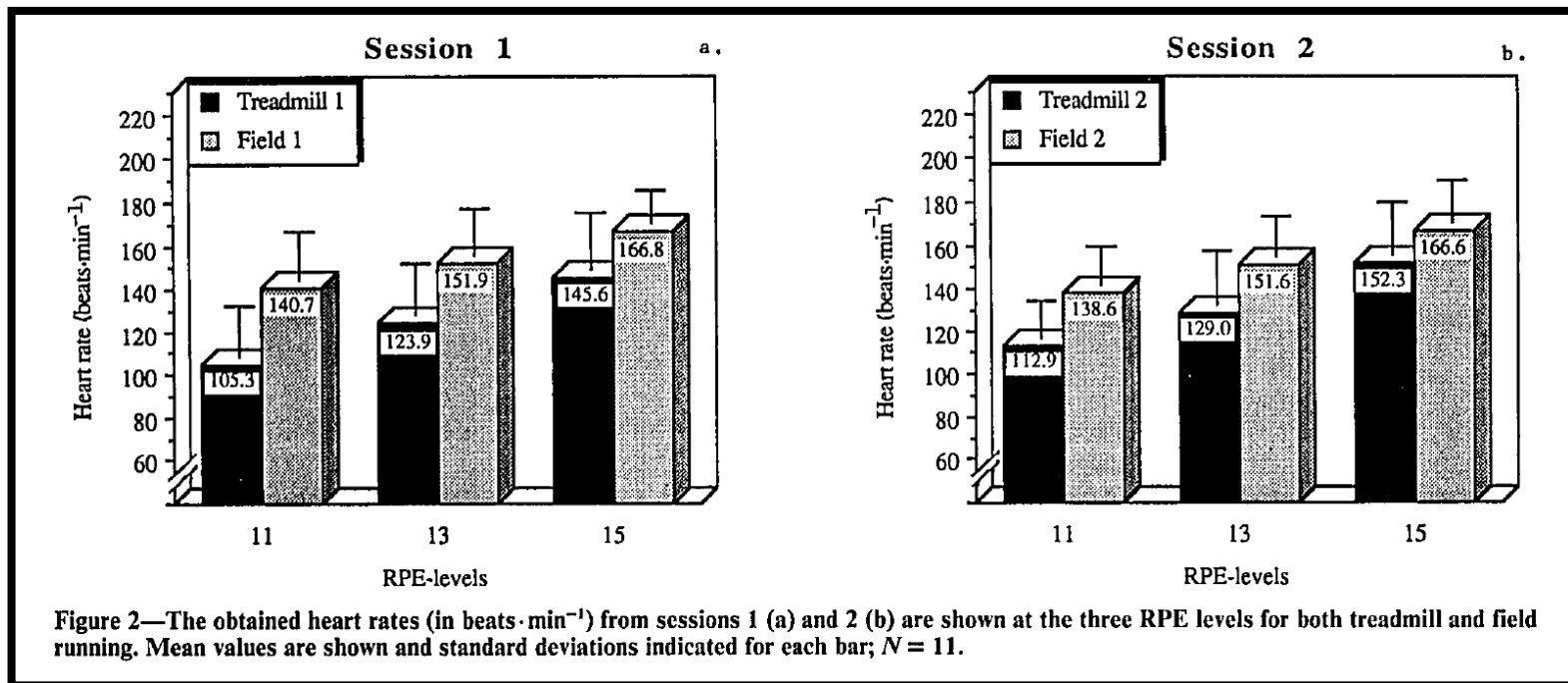
Petitioner's Reply, Paper 26 at 21

The Board already recognized that Ceci does not disclose “heart rate zones”



Ceci. *See, e.g.*, Prelim. Resp. 49–55. We also see potential merit in Patent Owner’s contention that Ceci does not account for the “heart rates zones” that are required by the challenged claims. *See id.* at 55–57. Here too,

Institution Decision, Paper 11 at 36



Ceci, Ex. 1005 at Fig. 2

The equation Lubell points to cannot use measured heart rate to set zones



B. Lubell + Ceci Does Not Disclose Limitation [D]

Petitioner admittedly relies on the combination “to determine $\% \text{VO}_{2\max}$ zones,” not heart rate zones. Paper 26, 21; Ex. 1018, ¶54. While Lubell explains that a “heart rate *corresponding to*” a given “percent of maximal oxygen uptake” can be estimated using an equation (Ex., 1004, 10:8-24), this equation calculates an estimated heart rate, and does not measure the heart rates while exercising, as required. Accordingly, even Lubell’s single “60 to 80 percent of $\text{VO}_{2\max}$ ” zone is not “based on first heart rate measurements.” Dr. Lynch suggests that because there is a relationship “between $\% \text{VO}_{2\max}$ and exercise heart rate,” one could design a system using heart rate zones. Ex. 1018, ¶54. But he identifies no teaching or motivation for doing so in Lubell, or in Ceci, which also references a “range of about 60-80% of $\text{VO}_{2\max}$,” not heart rate zones. *Id.*

Patent Owner’s Sur-Reply, Paper 30 at 28

A well-established linear relationship exists between the percent of $\text{VO}_{2\max}$ required for a given workload, and the heart rate achieved at that work load, so that the heart rate corresponding, e.g., to 70 percent of maximal oxygen uptake level $\text{VO}_{2\max}$ can be easily calculated from the relationship:

$$(\% \text{VO}_{2\max}) = \frac{\text{HR}_E - \text{HR}_R + 10}{\text{HR}_M - \text{HR}_R} \quad (1)$$

In this relationship, the left hand expression ($\% \text{VO}_{2\max}$) corresponds to a percentage value up to one hundred percent, HR_E is the heart rate at that given level of exercise, and HR_R and HR_M are the resting heart rate and maximal heart rate as determined during the test protocol.

Lubell, Ex. 1004 at 10:8-24



**Grounds 4, 6, 8: lululemon Failed To Show That Gorman Renders
Dependent Claims 2, 3, 4, 13, and 18 Obvious In Combination with
Lubell + Ceci, Amano, or Matsumoto**



2. The apparatus of claim 1, wherein the first heart rate measurements and the second heart rate measurements are received in a plurality of encoded messages.

3. The apparatus of claim 2, wherein the instructions, when executed by the processor, cause the apparatus to decode the encoded messages using identification data of the sensor.

4. The apparatus of claim 2, wherein the encoded messages comprise identification information of the sensor.

'413 Patent, Ex. 1001 at 18:24-31

13. The method of claim 12, further comprising decoding a plurality of encoded messages using identification data of the sensor, wherein the first heart rate measurements and the second heart rate measurements are received in respective ones of the plurality of encoded messages.

'413 Patent, Ex. 1001 at 19:10-14

18. The computer readable medium of claim 17, wherein the executable instructions, when executed, cause the computing system to decode a plurality of encoded messages using identification data of the sensor, wherein the first heart rate measurements and the second heart rate measurements are received in respective ones of the plurality of encoded messages.

'413 Patent, Ex. 1001 at 20:11-17

Iululemon relied on wired devices in Lubell, Amano, and Matsumoto



21 Q. Okay. So do you understand Lubell
22 discloses the use of separate wires to connect a
23 heart beat sensor and the bicycle sensor to the
24 device?

1 THE WITNESS: I see connecting to a lower panel
2 of the device in that quotation that you read.

3 BY MR. SWISHER:

4 Q. Okay. So you agree that Lubell discloses
5 the use of separate wires to connect its heart beat
6 sensor and its bicycle sensor to the device?

8 THE WITNESS: Yes. So, again, 11 is the
9 housing, and it refers to a panel on the housing of
10 the device.

Dr. Lynch 2-22-24 Dep Tr. (Ex. 2013), at 110:21-111:10 (objections omitted)

Amano discloses multiple sensors on a finger belt, a pulse wave sensor and a body motion sensor, sharing a cable to a wrist watch. (EX1002, 7:6-27, 20:40-44, Figs. 16, 19.)

Dr. Lynch Reply Declaration, Ex. 1018 at ¶31

1 Q. Okay. So do you understand the Matsumoto
2 is disclosing separate cables for connecting the
3 pulse sensor and the rotation sensors to the
4 device?

6 THE WITNESS: I believe Matsumoto is teaching,
7 in Figure 1, separate wires or cables that connect
8 the rotation sensor and the pulse sensor to
9 17 which is -- give me a moment, please -- which is
10 the exercise machine body per column 2, line 31,

Dr. Lynch 2-22-24 Dep Tr. (Ex. 2013), at 103:1-10 (objections omitted)



United States Patent [19]		US005400794A
Gorman		[11] Patent Number: 5,400,794
		[45] Date of Patent: Mar. 28, 1995

[54] BIOMEDICAL RESPONSE MONITOR AND TECHNIQUE USING ERROR CORRECTION [76] Inventor: Peter G. Gorman , Lakeview Dr., Mahopac, N.Y. 10541 [21] Appl. No.: 33,826 [22] Filed: Mar. 19, 1993 [51] Int. Cl. ⁶ A61B 5/0428 [52] U.S. Cl. 128/696; 128/903 [58] Field of Search 128/696, 706, 903 [56] References Cited U.S. PATENT DOCUMENTS 3,212,496 10/1965 Preston 128/206 3,724,455 4/1973 Unger 128/2.06 3,949,388 4/1976 Fuller 340/189 3,972,320 8/1976 Kalman 128/2.1 A 3,986,498 10/1976 Lewis 128/2.06 R 4,425,921 1/1984 Fujisaki et al. 128/690 4,478,224 10/1984 Bailey 128/706 4,625,733 12/1986 Saynajakangas 128/687 5,117,825 6/1992 Grevious 128/903 5,157,604 10/1992 Axford et al. 364/413 <i>Primary Examiner</i> —William E. Kamm	[57] ABSTRACT A monitor for measuring and displaying a biomedical response such as heartbeat rate, including a transmitting unit and a receiving unit. The monitor detects the response (heartbeat) and produces a digital pulse train representing this response. The digital pulse train is then encoded to produce an encoded digital signal having a first identification part identifying the transmitting unit and a second data part representing the person's response. This encoded digital signal is wirelessly sent to the receiving unit which reads the received signal to determine if it is from the transmitting unit. If it is from that transmitting unit, the data part is read. If there are too many errors in the data part, a new frequency of wireless transmission is used in the monitor. If the errors are within a reasonable bound, the data bits representing the biomedical response are sent to a memory and/or a display. If the received signal were not from the correct transmitting unit, the received signal is rejected. Interference from other monitors or electrical equipment is minimized, and the data displayed is very accurate. 45 Claims, 5 Drawing Sheets
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Gorman, Ex. 1007 at Cover



Whether wired or wireless, signals communicated over a common communication channel need to be distinguished, as I discussed in paragraph 31 above. And it would have been obvious to a POSITA to combine Matsumoto and Gorman, and Matsumoto and Flach, given that the teachings of Gorman and Flach (encoding, time slots (TDMA), and identification information) were well known to a POSITA, and have been applied to both wired and wireless devices. (EX2012 (Lynch Sept. 27, 2023 deposition), 241:5-16; EX1017 (Bergeron Dec. 21, 2023 deposition), 93:7-19, 100:11-22; EX2008, ¶¶95, 98, 99.)

Dr. Lynch Reply Declaration, Ex. 1018 at ¶46

But Dr. Lynch admits none of the wired references disclose the problem of distinguishing signals



15 What I would like to ask, Dr. Lynch, is
16 are you aware of whether Amano discloses having a
17 problem of needing to distinguish between multiple
18 sensors sending signals on the same communication
19 path?

21 THE WITNESS: I don't think Amano discloses a
22 problem. They -- Amano merely says that this
23 information needs to be communicated, and then you
24 would look to the prior art to see how to
25 accomplish that communication.

Dr. Lynch 2-22-24 Dep Tr. (Ex. 2013), at 95:15-25 (objections omitted)

4 Does Lubell disclose the problem of
5 needing to distinguish between multiple sensors
6 sending signals on the same communication path?
7 A. Again, it does not disclose the problem,
8 but it also does not provide details of
9 communication, and one would look to Gorman and
10 Flach to provide those details.

Dr. Lynch 2-22-24 Dep Tr. (Ex. 2013), at 108:4-10

1 But I'll repeat my other question which
2 was, Dr. Lynch, are you aware whether Matsumoto
3 discloses having a problem of needing to
4 distinguish between multiple sensors sending
5 signals on the same communication path?
6 THE WITNESS: Same as before, I don't see that
7 it discloses a problem, but it also doesn't
8 disclose details of communication.

Dr. Lynch 2-22-24 Dep Tr. (Ex. 2013), at 101:1-9 (objections omitted)



**Grounds 5, 7, 9: lululemon Failed To Show That Flach Renders
Dependent Claims 9, 14, and 19 Obvious In Combination with Lubell +
Ceci, Amano, or Matsumoto**



9. The apparatus of claim 1, wherein the instructions, when executed by the processor, cause the apparatus to determine that a message is from the sensor based upon a time at which the message is received.

'413 Patent, Ex. 1001 at 18:46-49

14. The method of claim 12, further comprising designating a time channel for communicating with the sensor.

'413 Patent, Ex. 1001 at 19:15-16

19. The computer readable medium of claim 17, wherein the executable instructions, when executed, cause the computing system to designate a time channel for communicating with the sensor.

'413 Patent, Ex. 1001 at 20:18-21

Iululemon relied on wired devices in Lubell, Amano, and Matsumoto



21 Q. Okay. So do you understand Lubell
22 discloses the use of separate wires to connect a
23 heart beat sensor and the bicycle sensor to the
24 device?

1 THE WITNESS: I see connecting to a lower panel
2 of the device in that quotation that you read.

3 BY MR. SWISHER:

4 Q. Okay. So you agree that Lubell discloses
5 the use of separate wires to connect its heart beat
6 sensor and its bicycle sensor to the device?

8 THE WITNESS: Yes. So, again, 11 is the
9 housing, and it refers to a panel on the housing of
10 the device.

Dr. Lynch 2-22-24 Dep Tr. (Ex. 2013), at 110:21-111:10 (objections omitted)

221:24-222:21.) Amano discloses multiple sensors on a finger belt, a pulse wave sensor and a body motion sensor, sharing a cable to a wrist watch. (EX1002, 7:6-27, 20:40-44, Figs. 16, 19.) However, Amano does not provide the details of its

Dr. Lynch Reply Declaration, Ex. 1018 at ¶31

1 Q. Okay. So do you understand the Matsumoto
2 is disclosing separate cables for connecting the
3 pulse sensor and the rotation sensors to the
4 device?

6 THE WITNESS: I believe Matsumoto is teaching,
7 in Figure 1, separate wires or cables that connect
8 the rotation sensor and the pulse sensor to
9 17 which is -- give me a moment, please -- which is
10 the exercise machine body per column 2, line 31,

Dr. Lynch 2-22-24 Dep Tr. (Ex. 2013), at 103:1-10 (objections omitted)



(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2001/0023315 A1**

Flach et al.

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(54) **CELLULAR ARCHITECTURE AND DATA
TRANSFER METHODS FOR REAL TIME
PATIENT MONITORING WITHIN MEDICAL
FACILITIES**

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(60) Continuation of application No. 09/315,254, filed on May 20, 1999, now Pat. No. 6,213,942, which is a division of application No. 08/675,594, filed on Jul. 3, 1996, now Pat. No. 5,944,659 and which is a non-provisional of provisional application No. 60/006,600, filed on Nov. 13, 1995.

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(57) **ABSTRACT**

A medical telemetry system is provided for collecting the real-time physiologic data of patients (including ambulatory patients) of a medical facility, and for transferring the data via RF to a real-time data distribution network for monitoring and display. The system includes battery-powered remote telemeters which attach to respective patients, and which collect and transmit (in data packets) the physiologic data of the patients. The remote telemeters communicate bi-directionally with a number of ceiling-mounted RF transceivers, referred to as "VCELLs," using a wireless TDMA protocol. The VCELLs, which are hardwire-connected to a LAN, forward the data packets received from the telemeters to patient monitoring stations on the LAN. The VCELLs are distributed throughout the medical facility such that different VCELLs provide coverage for different patient areas. As part of the wireless TDMA protocol, the remote telemeters continuously assess the quality of the RF links offered by different nearby VCELLs (by scanning the frequencies on which different VCELLs operate), and connect to those VCELLs which offer the best link conditions. To provide a high degree of protection against multi-path interference, each remote telemeter maintains connections with two different VCELLs at-a-time, and transmits all data packets (on different frequencies and during different timeslots) to both VCELLs; the system thereby provides space, time and frequency diversity on wireless data packet transfers from the telemeters. The telemeters and VCELLs also implement a patient location protocol for enabling the monitoring of the locations of individual patients. The architecture can accommodate a large number of patients (e.g., 500 or more) while operating within the transmission power limits of the VHF medical telemetry band.



(Bergeron Dec. 21, 2023 deposition), 92:23-93:19.) Dr. Bergeron also argues that wired devices, like Lubell's, would not face the same problems (such as the need to distinguish among signals, noise, etc.) as wireless devices, like Gorman and Flach. (EX2008, ¶¶117, 119.) Dr. Bergeron further argues that there would be no motivation to combine because Lubell's device already had working components for sending a signal. (*Id.*, ¶118.) Additionally, Dr. Bergeron alleges that the combination would require a complete redesign, and TDMA is not compatible with Lubell's system. (*Id.*, ¶¶118-120.) I disagree with Dr. Bergeron's arguments for the same reasons discussed in paragraphs 29-34 and 45-47 above.

Dr. Lynch Reply Declaration, Ex. 1018 at ¶57

But Dr. Lynch admits none of the wired references disclose a problem with noise



17 Q. Okay. Dr. Lynch, do you know if Amano
18 discloses any problem of noise existing on its
19 wired communication signal path?

21 THE WITNESS: I'm not aware, sitting here, if
22 noise is discussed. If you could give me a moment.

3 I am not aware that Amano specifically
4 worries about noise, but, again, Amano does not get
5 into the details of communication which is why we
6 would look to the prior art, a POSITA would look to
7 the prior art.

Dr. Lynch 2-22-24 Dep Tr. (Ex. 2013), at 99:17-100:7 (objections omitted)

3 Q. Okay. And does Lubell disclose the
4 problem of noise on its wired communication signal
5 path?

7 THE WITNESS: So I believe it's the same answer
8 as before. Lubell does not provide details on the
9 communication method, and so, therefore, it does
10 not go into details about possible noise issues,
11 and so one would look to prior art for that piece
12 of it.

Dr. Lynch 2-22-24 Dep Tr. (Ex. 2013), at 109:3-12 (objections omitted)

16 THE WITNESS: So, again, my analysis
17 combination was not based on looking for problems
18 that are disclosed in the art but rather the lack
19 of details that need to be filled in by the prior
20 art. So I'm not aware that Matsumoto talks about
21 noise.

Dr. Lynch 2-22-24 Dep Tr. (Ex. 2013), at 100:16-21



End