

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LULULEMON ATHLETICA CANADA INC. and LULULEMON USA INC.,
lululemon,

v.

NIKE, INC.,
Patent Owner

Case No.: IPR2023-00348
U.S. PATENT NO. 10,188,930

**DECLARATION OF SCOTT G. MCLEAN, PH.D. IN SUPPORT OF
PATENT OWNER NIKE, INC.'S PRELIMINARY RESPONSE**

lululemon v. NIKE, Inc. IPR2023-00348 Patent No. 10,188,930 Ex. 2001

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I, Scott G. McLean, Ph.D., declare as follows:

I. INTRODUCTION

1. I have been retained by Nike (“Patent Owner”) as an independent expert in this *inter partes* review (“IPR”) proceeding before the Patent Trial and Appeal Board (“PTAB”), which I understand involves U.S. Patent No. 10,188,930 (“the ’930 patent”). I have been asked to opine on technical issues related to the patentability of the ’930 patent. My areas of expertise include the technological field in which the ’930 patent resides.

2. I understand that this proceeding involves claims 1, 5–7, and 12 (the “Challenged Claims”) of the ’930 patent, with claims 5–7 and 12 depending from independent claim 1. I further understand that lululemon athletica canada inc. and lululemon usa inc. (“lululemon”) raises three grounds in the Petition for *Inter Partes* Review based on combinations of the following three prior art references.

International Publication No. WO2006/111687 A1 (“Lofi”) and English certified translation	Ex. 1002
EP 2324762 A1 (“Maeueler”)	Ex. 1003
U.S. Patent No. 7,810,392 B2 (“Kitagawa”)	Ex. 1004

3. Ground 1 alleges that claims 1 and 5–7 are anticipated by Lofi. Ground 2 alleges that claims 1 and 5–7 are rendered obvious by Lofi in view of Kitagawa. And Ground 3 alleges that claims 1, 5–7, and 12 are rendered obvious by Maeueler

in view of Kitagawa. I have been asked to provide opinions for each of the grounds asserted in the Petition. My opinions are set forth below.

4. This declaration is based upon the information presently available to me. Should additional information become available, I hereby respectfully expressly reserve the right to supplement my opinions based upon information that may subsequently become available, which may include a review of information that may be produced, or from testimony or depositions that are subsequently taken if the PTAB institutes review.

5. The opinions I express in this declaration are based on my own personal knowledge and professional judgment. If called as a witness during the proceedings, I am prepared to testify competently about my opinions.

II. BACKGROUND AND EXPERIENCE

6. The following educational qualifications, work experience, and associated expertise speak directly to my ability to successfully and confidently opine on the issues outlined herein. My full CV is attached hereto as Exhibit 2002.

7. I am currently a Principal within Exponent's Biomechanics practice where I lead a team of consultants specializing in different wearable technology initiatives. I possess over 25 years of expertise and experience in the areas of biomechanics, gait and locomotion, human performance, health, and wellness, and in a broad range of associated measurement and analysis techniques and supporting

technologies, including but not limited to, motion capture and force plate-derived kinematic and kinetic analysis, muscle electromyography (EMG), 3-D imaging (e.g., MRI), computational modeling, wearable sensors, cadaveric testing, and robotics systems. I possess considerable expertise in being able to interpret and distill the often large and multi-faceted data sets derived from these approaches and technologies into easily understood and contextually relevant measures that can characterize and improve key performance and activity outcomes.

8. I have published extensively across the aforementioned fields, with over 50 peer-reviewed publications in high-impact academic journals and have brought in over 10 million dollars in funding from various national, government, and non-profit agencies to support my research. I have presented my work at various high-profile national and international conferences and symposia, being invited as the keynote speaker on multiple occasions. I have been on the editorial board of the Journal of Science and Medicine in Sport, and Medicine and Science in Sport and Exercise, and a peer reviewer for many scientific, engineering, and clinical journals. I am a previous chair of the American Colleges of Sports Medicine's Biomechanics Interest Group, and a previous Executive Council Member of the International Society of Biomechanics.

9. I obtained my Ph.D. in Human Movement Studies in 2001, from the University of Queensland, Brisbane, Australia, where my research focused on

quantifying explicit human performance outcomes and mechanisms of lower limb, and particularly knee joint injuries. I utilized what were considered at that time to be state-of-the-art technological approaches such as motion analysis and electromyography to conduct this research.

10. I completed my Postdoctoral Fellowship in 2001 within the Department of Biomedical Engineering at the Cleveland Clinic and was a Project Staff Scientist within the same department through 2006. During that time, I conducted extensive research into human performance and associated mechanisms of orthopedic injury and/or disease, utilizing a combination of human experimentation, cadaveric and computational modeling approaches, and state-of-the-art technologies and measurement techniques. This work led to several high-profile publications that pushed the associated fields of research forward at that time. For example;

11. In 2004, I published an article based on computational modeling techniques that challenged existing theories on anterior cruciate ligament injuries (Ex. 2002 at 6 [McLean *et al.*, 2004]). At the time of this declaration, the article had been cited 589 times, with 9 of these citations being in 2023.

12. I co-authored a paper in 2005 that was based on cutting edge motion capture collection and analysis techniques to provide new insights into athletic knee injury causality (Ex. 2002 at 6 [Hewett *et al.*, 2005]). This article won the American

Orthopaedic Society for Sports Medicine O'Donoghue award and had been cited 4086 times at the time of preparing this declaration, with 66 of those being in 2023.

13. As the Cleveland Clinic Sports Health and Orthopaedic Rehabilitation Research Director, I oversaw and drove targeted research efforts, again using state-of-the-art approaches and technologies to inform athlete performance, injury prevention, and rehabilitation. I used similar methods in my role as biomechanics consultant for Cleveland's professional sporting teams to support elite athlete performance monitoring and optimization, and injury prevention.

14. As a Professor of Biomechanics within the School of Kinesiology at the University of Michigan from 2007–2015, I furthered my work on human performance optimization, injury causality and prevention, and associated orthopedic disease (e.g., osteoarthritis) progression and mitigation, becoming an internationally renowned leader in the field. In 2014–2015, I developed a wearable sensor framework to monitor soldier performance in various battlefield simulations and activities. This framework, comprising a series of inertial measurement units (IMUs), could be worn by the soldier under or on clothing, and on complementary equipment (e.g., armor, backpacks, weapons) to measure different performance characteristics during different activities. This work was funded by the U.S. military and resulted in multiple peer reviewed publications focused on the technology

development and application (Ex. 2002 at 2–3 [Cain *et al.*, 2016; Davidson *et al.*, 2016; McGinnis *et al.*, 2015]).

15. Prior to joining Exponent, I was the Director of Innovation at Fitbit from 2016–2018, where I led multiple phases of wearable device research and development. This work included key aspects of device design and development, including but not limited to: hardware, software, and sensor design ideation and testing, algorithm development and characterization, device verification, validation, and benchmarking, and large-scale device integration for outcome monitoring. During my tenure at Fitbit, I supported multiple products from conception to market, with these products incorporating various wearable sensors to track and monitor different activity and physiology outcomes on the user.

16. In my current role, I draw on the above credentials and extensive expertise and experience to support a broad range of wearable technology design, development, and testing, and large-scale wearable technology adoption requirements. I design and undertake wearable sensor device testing and validation efforts to understand sensor and device capabilities in real-world conditions. I also advise different entities on optimal wearable device determination and integration based on their overarching use-case requirements. For example, I currently support the U.S. military across several different efforts in the development, integration, and application of a scalable wearables system architecture for monitoring and

optimizing soldier health, wellness, and performance. Specifically, my work focuses on the identification, testing and evaluation, and reporting of various wearable sensor solutions to inform optimal solutions across different military use-cases and environments. I am also using similar techniques to determine optimal wearable device applications for other large-scale stakeholders in clinical and pharmaceutical sectors targeting patient outcome monitoring and optimization.

17. As part of my declaration, I have relied upon: my expertise and experience as stated herein in the fields of biomechanics, biomedical engineering, and wearable sensor technology; my underlying knowledge of the principles of physics, physiology, and human performance and activity; my extensive personal research and experimentation; and books and publications across these and complementary fields. My opinions and conclusions are supported by established and accepted principles and practices in the fields of biomechanics, engineering, and human performance and activity testing.

III. COMPENSATION AND PRIOR TESTIMONY

18. I have been engaged at the rate of \$475 per hour for my work in connection with this proceeding. My compensation is in no way dependent upon the opinions that I offer or the outcome of this proceeding. I have no personal interest in the outcome of this proceeding.

19. Attached as Exhibit 2003 is a list of cases in which I have provided testimony in the last four years. To the best of my knowledge, no court has ever excluded or prohibited me from providing trial testimony as an expert witness.

IV. MATERIALS CONSIDERED

20. All my opinions are based on my knowledge and professional judgment, and the following documents that I considered:

- lululemon's Petition for *Inter Partes* Review of U.S. Patent No. 10,188,930;
- Exhibits 1001-1016; and
- other materials discussed herein.

V. LEGAL STANDARDS

21. I am not an attorney. For the purposes of this Declaration, I have been informed about certain aspects of the law that are relevant to my opinions. My understanding of that law is summarized below.

22. I understand that, in this *inter partes* review, lululemon has the burden of showing a reasonable likelihood that at least one challenged claim is unpatentable. I have been informed that, in an IPR proceeding, a patent claim may be unpatentable under theories of anticipation and/or obviousness.

23. I understand that a patent claim may be unpatentable as anticipated if each element of that claim is present either expressly or inherently in a single prior art reference.

24. I further understand that a patent claim is unpatentable if, at the time of the invention, it would have been obvious to a POSITA at the time the application was filed. I understand that it is not required (although it is acceptable) that each limitation of a patent claim be found in a single reference in order to find a patent claim obvious. Rather, for a patent claim to be found obvious, all the limitations of the patent claim must be found in teachings of one or more references that would have been combined by a POSITA with a reasonable expectation of success. I understand that a proper analysis of whether an invention is unpatentable for obviousness includes a review of the scope and content of the prior art, the differences between the patent claims at issue and the prior art, the level of ordinary skill in the field of the invention at the time of the invention, and other objective indicia considerations.

25. I understand that a showing of obviousness requires some articulated reasoning with a rational underpinning to support the combination of the references. I understand that in consideration of the issue of obviousness it is important to identify whether a reason existed at the time of the invention that would have led a POSITA to combine elements of the references in a way that yielded the claimed invention.

26. I understand that a claim may be considered unpatentable for obviousness for various reasons. I have been informed that the following exemplary rationales may support a finding of obviousness:

- combining prior art elements according to known methods to yield predictable results;
- simply substituting one known element for another to obtain predictable results;
- use of a known technique to improve similar devices in the same way;
- applying a known technique to a known device ready for improvement to yield predictable results;
- choosing from a finite number of identified, predictable solutions with a reasonable expectation of success;
- known work in a field that prompts variations in the work in the same or a different field that leads to predictable results; and
- some teaching, suggestion, or motivation in the prior art that would have led a POSITA to modify a prior art reference or combine multiple prior art references or teachings to arrive at the claimed invention.

VI. LEVEL OF ORDINARY SKILL IN THE ART

27. lululemon claims that a POSITA for the '930 patent would have had (1) a bachelor's degree in engineering, computer science, industrial design,

biomechanics, or a related field, and (2) at least two years of experience researching, developing, designing, and/or testing fitness or physiological sensors, wearable devices, physiological or biomechanical devices, remotely-controlled systems or interfaces, and/or network-based applications and/or equipment, or the equivalent experience or education. Petition at 13.

28. For purposes of this declaration, I am accepting lululemon's description of a POSITA. My agreement with the above description of a POSITA does not imply agreement at all times moving forward. I reserve the right to supplement my opinion if the Board institutes review. I understand that Nike reserves the right to further address lululemon's formulation of a POSITA if trial is instituted.

29. In view of my experience and qualifications noted above, I am well positioned to opine as to what a POSITA at the time of the invention would have understood and done.

30. My opinions contained herein are from the perspective of a POSITA. My opinions reflect how a POSITA would have interpreted the claims, the prior art, and any available evidence.

VII. CLAIM CONSTRUCTION

31. I understand that lululemon has not proposed construction for any claim limitations in the '930 Patent. Petition at 14. Therefore, I offer no opinions on claim

construction in this declaration, although I reserve the right to do so at a later date if necessary.

32. I understand that the claim terms of the '930 Patent are to be given their plain and ordinary meaning, which I have applied in forming the opinions in this declaration.

VIII. OVERVIEW OF THE TECHNOLOGY

A. OVERVIEW OF THE '930 PATENT

33. The '930 Patent relates to “a system, method, apparatus, and computer readable media configured for monitoring a user performing an athletic movement and/or exercise and generating a combinatory fitness and athleticism score.” '930 Patent at Abstract. Further, this combinatory score may comprise a fitness sub-score and an athleticism sub-score. *Id.* at Abstract.

34. The '930 patent discusses the problem that people “have difficulty finding the motivation required to maintain a regular exercise program,” particularly those including “repetitive motions, such as running, walking and bicycling.” *Id.* at 1:18–23. It also teaches that prior art services or systems “directed toward encouraging individuals to engage in athletic activities” were too focused on explicit activities at the expense of the individual’s interests. *Id.* at 1:29–32. The '930 Patent discloses an invention aimed at addressing these concerns, relating to “systems and

methods” for estimating a combinatory fitness-athleticism score based on a user’s athletic movement.” *Id.* at 1:49–54.

35. The ’930 patent discloses embodiments that include a device worn around the appendage of the user, such that the “apparatus may include a sensor configured to capture data related to the movement” of that appendage. *Id.* at 1:56–59. The sensors considered “may include, but are not limited to: an accelerometer, a gyroscope, a location determining device (e.g., GPS), light sensor, temperature sensor [], sleep pattern sensors, heart rate monitor, image-capturing sensor, moisture sensor, and/or combinations thereof.” *Id.* at 5:36–41. The apparatus may also include “a processor, and a non-transitory computer-readable medium with computer-executable instructions.” *Id.* at 1:59–61.

36. The disclosed apparatus “may instruct a user to perform an athletic movement with predefined criteria.” *Id.* at 12:55–57. For example, a user may be instructed to perform “a predetermined number of repetitions” of, for example, “pushups, squats, lunges, etc.” *Id.* at 12:62–65. Upon performing the exercise, the apparatus monitors a “plurality of parameters relating to the user’s performance,” and quantifies the sub-scores and the combinatory score therefrom. *Id.* at 23:8–9. These parameters may include the “user’s form, tempo, estimated fatigue, oxygen kinetics, and/or other parameters.” *Id.* at 23:9–11. The ’930 patent also teaches that both fitness and athleticism sub-scores can be calculated from a single athletic

activity (e.g., run 10 miles). *Id.* at 23:25–27, 31–33 (“In yet another embodiment, a single exercise may be utilized to measure at least one athleticism attribute and at least one fitness attribute.”).

37. Figure 12 illustrates an example graphical user interface that displays to the user a combinatory score including a fitness sub-score (i.e., 76) and an athleticism sub-score (i.e., 65). In the figure, the combinatory score may be represented by two individual sub-scores, but in further embodiments, the combinatory score may be represented by a single score. *Id.* at 22:25–27. In formulating these sub-scores (and the combinatory fitness-athleticism score), “fitness attributes may include, but are not limited to: endurance, flexibility, strength and combinations thereof.” *Id.* at 23:36–38. Similarly, “athleticism attributes may include, but are not limited to: speed, agility, reaction, power, balance, and combinations thereof.” *Id.* at 23:39–41.

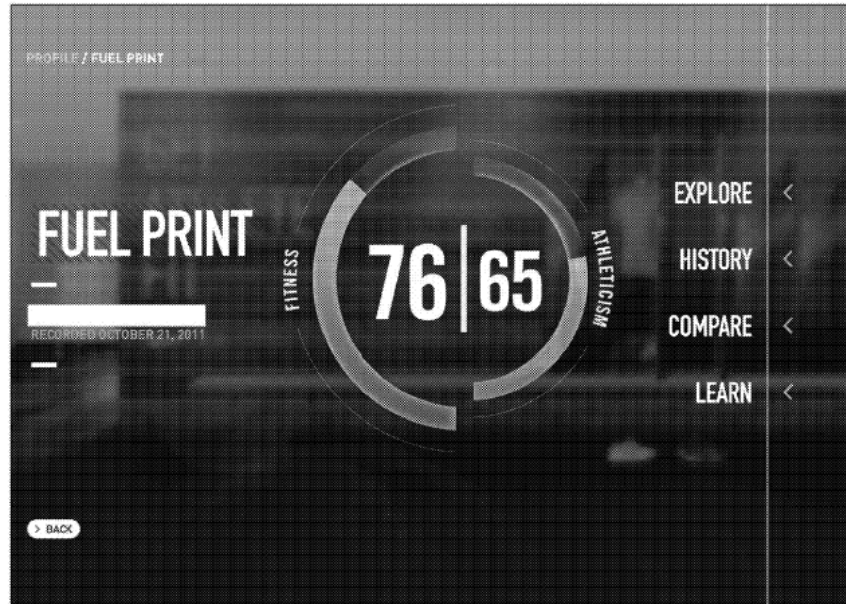


FIGURE 12

Id. at Fig. 12.

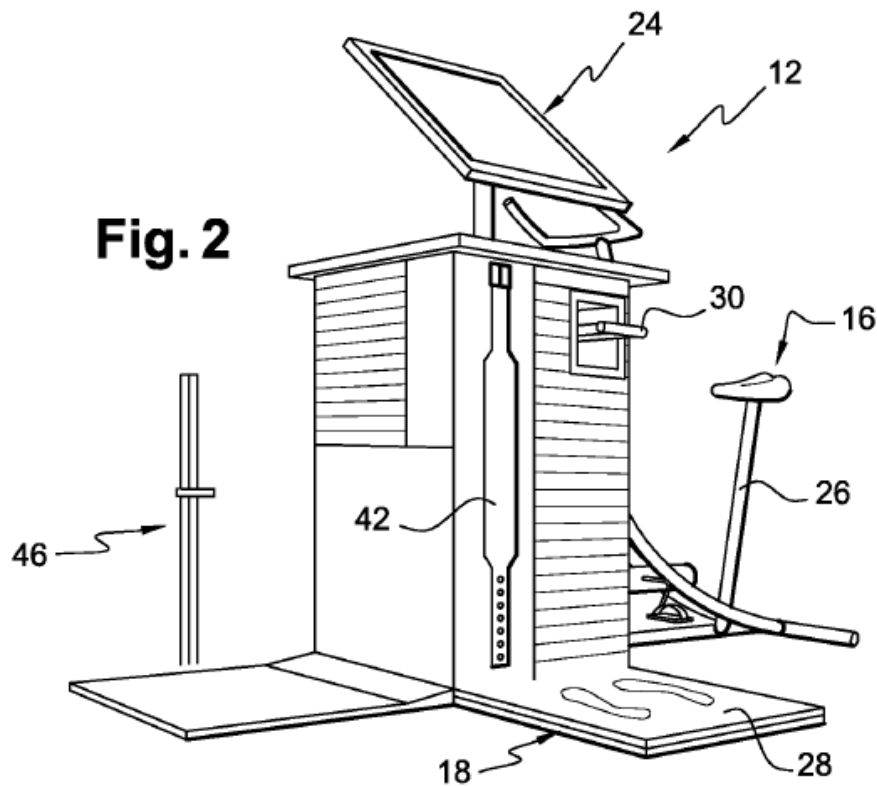
B. OVERVIEW OF THE PRIOR ART REFERENCES

1. Lofi

38. Lofi discloses an invention that relates to a device for evaluating physical fitness by measuring data from a user undergoing a series of tests. Ex. 1002 at Abstract. The invention also includes storage means that incorporates a different population distribution curve for each measurement of physical fitness undertaken, a means for determining a population group to which the user belongs to, and a “means of processing to determine for each measurement a score based on comparison of the measured value with the distribution curve corresponding to the user’s population group.” *Id.* at 31:23–25.

39. Lofi teaches that there are many tests capable of measuring a person's physical (e.g., endurance, strength, and flexibility) characteristics. *Id.* at 30:18–31:3. Lofi also teaches that the prior art tests used to obtain such measures could “only be implemented by a competent person” (*id.* at 31:3–4), that there was “no method for analysis of measurements obtained directly from these tests” (*id.* at 31:6–7), and that the overall evaluation process was “relatively lengthy and require[d] implementation of a number of tests” (*id.* at 31:8-9). Lofi proposes to overcome these challenges by providing a “one-stop” device that allows a person to evaluate explicit endurance, body composition, strength, and coordination or motricity characteristics of their physical fitness “autonomously and reliably.” *See id.* at 31:10–19.

40. Fig. 2, shown below, illustrates Lofi's device. The device includes “means of measurement” for the different physical activity characteristics, which are grouped at terminal 12, with “means 16 of measurement of endurance, means 18 of measurement of body composition, means 20 of measurement of muscular strength, and means 22 of measurement of at least one characteristic relating to coordination or motricity. *Id.* at 32:21–27. Additionally, means 14 of data input includes “a screen 24 and/or keyboard to enable the [user]” to input demographic or population relevant data. *Id.* at 32:27–33:2.



Id. at Fig. 2.

41. After the person inputs their data “to identify the population to which they belong” (*id.* at 40:10–11), the user is instructed to perform a series of tests to evaluate their performance across the four pre-mentioned categories (i.e., endurance, body composition, strength, and coordination or motricity), with each test stage having a duration of approximately 15 minutes (*id.* at 40:15–19). As an example, for the means 16 for measurement of endurance, a user is instructed to pedal an ergonomic bicycle 26 for a period of 8 minutes and the workload is increased progressively over that time based on the user’s measured cardiac rhythm as a

function of their theoretical maximum heart rate. *Id.* at 33:5–13. Similarly for the means 20 of measurement for muscular strength, the user is instructed to contract their abdominal muscles voluntarily while wearing an abdominal belt 42 at waist level, with a belt transmitting a signal to the device that is “proportionate to the effort exerted by the abdominal muscles.” *Id.* at 36:5–6.

42. Each individual physical fitness component measured for a user is then compared to the distribution curve for that measurement, with an associated score then being allocated to the user. *Id.* at 39:5–16. A user’s overall physical fitness score, being equivalent to the average scores across each of the four components, can then be calculated. *Id.* at 39:16–25.

43. Lofi additionally discloses that the storage means 62 is also used to store the user’s demographic and population data with an associated username. As such, if a person uses another terminal, they “will be able to revise their profile and results by taking over the username” allocated to them. *Id.* at 41:1–5.

2. Maeueler

44. Maeueler discloses a system for “determining a fitness test result indicative of a user’s fitness, for a plurality of components of physical fitness.” *Id.* at Abstract. Maeueler discusses that “[p]hysical fitness is a crucial factor for a healthy life; and people who are physically inactive risk different kinds of diseases.” *Id.* at [0002]. Maeueler also teaches that there are “five crucial components of

physical fitness as far as it relates to health: endurance, strength, flexibility, balance, and body composition” (*id.* at [0004]), with many fitness tests available to measure these components. However, these tests are considered “hard to do without assistance” and involve complex data collection and calculations to inform a user’s fitness level. *Id.* at [0004]. Maeueller thus proposes to overcome the challenges of prior art fitness tests via a fitness assessment system for comprehensively and objectively measuring different components of a person’s fitness level that is additionally suitable for personal use in the home-setting. *Id.* at [0005], [0006], [0009].

45. Maeueller’s system includes “a computing module for accessing a collection of fitness tests” for a series of different physical fitness components. *Id.* at [0007]. It also includes one or more peripheral devices being “connected to the computing module,” and “being adapted to measure one or more input parameters.” *Id.* Figure 2 shows an embodiment of the invention in which the system makes use of “three peripheral devices: a handheld computing device 20, an exercise mat 21 and a distance detecting device 22.” *Id.* at [0028].

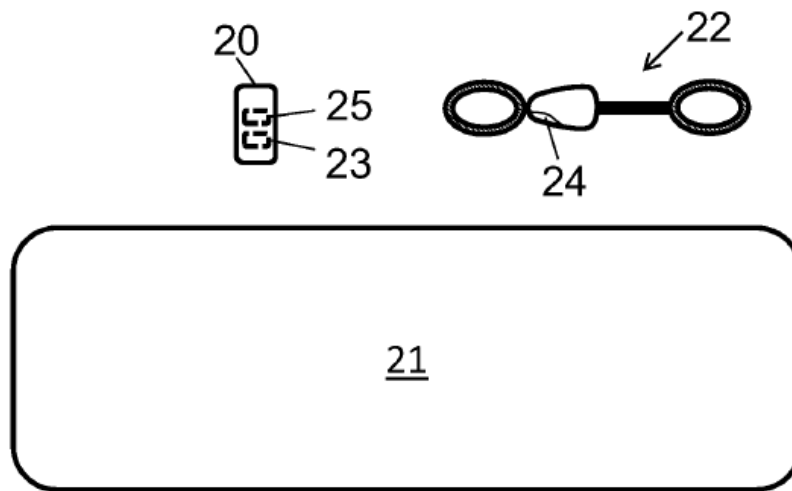


FIG. 2

Id. at Fig. 2.

46. Maeueller presents a series of tests relating to five crucial components listed above. *Id.* at [0027]. A user may select a physical fitness component (e.g., muscle strength) to measure, and then a representative set of fitness tests (e.g., push-up, curl-up, wall-sit). *Id.* at [0027]. Each component is evaluated via an independent test comprising its own group of exercises and input parameters. *Id.* at [0019].

47. To initiate the selected fitness test, “the user runs a computer program implemented by the handheld computing device.” *Id.* at [0029]. The “computing module stores instructions associated with the tests and presents instructions to the user” such as how to conduct the warmup, the order of the tests, and how the tests should be performed. *Id.* at [0029]. As the user performs the test for the associated

fitness component, one or more input parameters are used to calculate the fitness test result for that fitness component. *Id.* at [0025].

48. Example fitness component tests presented within Maeueller include: estimating the maximal oxygen consumption of the user to test the endurance component (*id.* at [0031]), using a mat with pressure sensors to perform push-ups to a set rhythm to test for the strength component (*id.* at [0038]), performing a sit-and-reach test for the flexibility component (*id.* at [0041]), and performing a Stork balance test on an exercise mat instrumented with pressure sensors for the balance component (*id.* at [0044]).

49. The computing module can also be “adapted” to access the fitness test system user data to further base the fitness test calculations on that data and hence provide a “more detailed and personalized personal fitness evaluation.” *Id.* at [0016].

3. Kitagawa

50. Kitagawa is related to a “system for measuring a person’s age on the basis of his/her physical strength.” Ex. 1004 at Abstract. More specifically, Kitagawa discloses that “[a] user’s age can be calculated” based on the time it takes to complete each and/or all exercise courses in a series that include a multitude of exercise movements. *Id.* at Abstract Further, Kitagawa discloses that an “index of the amount of exercise that a user performs is measured by the extent to which each of a user’s physical abilities is demonstrated.” *Id.* at 3:59–63. The unique assignment

of exercises for each exercise course also means that courses each have their own independent index. *Id.* at 3:63–65. Examples of these pre-determined indexes for a subset of exercises within a specific course are presented in Table 3 below.

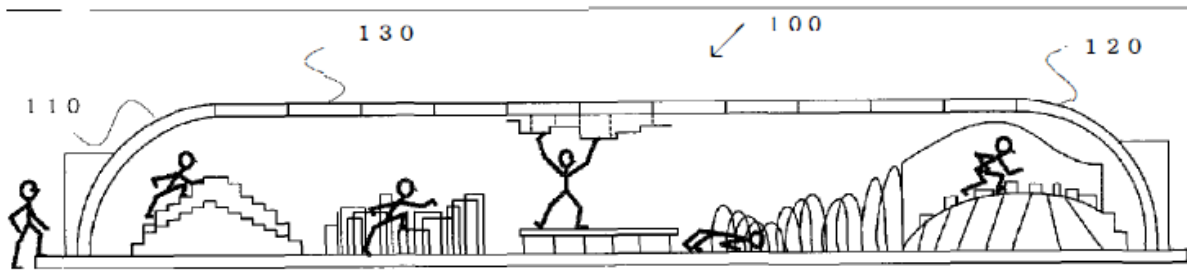
TABLE 3

Course	Legs	Arms	Flexi- bility	Balance	Agility	Intelli- gence
Log Range	6	4	9	10	4	6
Climb of Grief	7	6	6	6	8	6
Divided Pathway	7	2	9	9	9	2
Road of Torsion	7	3	6	10	5	3
Wall of Stagnation	4	8	7	7	4	4
Cave of Bones	4	5	10	7	4	4
Stretch with Hanging Rings	4	6	10	3	5	2

Id. at Table 3.

51. Kitagawa discloses that the exercise courses are structured such that they include different types of exercise-related devices/features, and ensure the user utilizes several physical abilities, including muscle strength, flexibility, balance, and agility. *Id.* at 2:25–31. Further, Kitagawa notes that “[i]t is preferable that said exercise courses be accommodated in a long dome made of polystyrene foam.” *Id.* at 3:52–53, Fig. 18; *see also id.* at 13:4–6 (“FIG. 18 is a longitudinal sectional view of the inside of the long dome 100 in which the exercise courses are accommodated.”).

Fig. 18



Id. at Fig. 18

52. When undertaking the exercise courses disclosed by Kitagawa, the user must first check in with a service counter to use the system and subsequently measure their own blood pressure, pulse rate, and bending forward distance. *Id.* at 8:31–61. Following an initial check of the user’s physical condition (to determine whether they should proceed), the user is given a stopwatch and a pulse meter. *Id.* The user then moves through each course, recording how much time it takes to complete each course on a scorecard. *Id.* The user also records their pulse rate at the end of each course to ensure they are not “exercising excessively.” *Id.* Upon reaching the end of all the courses, the user again measures and records their “blood pressure, pulse rate, and bending forward distance.” *Id.* The person then includes their actual age on the scorecard and submits it to the service counter. *Id.* The scorecard is then “analyzed and the user’s age on the basis of user’s physical strength is calculated and then printed on a certificate[.]” *Id.*

IX. GROUND 1: LOFI DOES NOT DISCLOSE EVERY LIMITATION OF CLAIMS 1 AND 5–7

53. lululemon argues that Lofi anticipates claims 1 and 5–7 of the '930 Patent. Petition at 15. For at least the reasons I discuss below, it is my opinion that Lofi does not disclose each and every limitation of those claims. Omission of a particular claim, limitation, or topic from my discussion below should not be interpreted as agreement with arguments put forth in the Petition or by lululemon's expert, Dr. Fischer, unless I have explicitly stated this to be the case.

A. Limitation 1[C]

54. In my opinion, Lofi does not disclose limitation 1[C], which requires “calculating with a processor, based on the first activity data, a first combinatory fitness-athleticism score.” Claim 1 requires that the “first activity data” be measured from a “first athletic movement.” *See* '930 Patent at 26:17–20 (“providing first instructions to a user to perform a first athletic movement; receiving, from a sensor, first activity data representing the first athletic movement”). That first activity data is then used to calculate both a fitness sub-score and an athleticism sub-score, and thus the combinatory fitness-athleticism score. *Id.* at 26:21–22, 31–42. In my opinion and as I discuss below, Lofi's teachings do not meet these requirements.

55. Claim 1 further requires that the fitness sub-score is calculated using one or more of endurance, strength, and flexibility attributes, and the athleticism

sub-score is calculated using one or more of speed, agility, reaction, power, and balance attributes. *Id.* at 26:34–41. The '930 Patent specification supports that “a single exercise may be used to measure at least one athleticism attribute and at least one fitness attribute.” *Id.* at 23:31–33. For example, the specification describes measuring a power attribute and an endurance attribute both from “drills comprising or consisting of vertical jumps.” *Id.* at 23:50–52, 60–66. Specifically, the power attribute is derived from the user’s measured vertical distance during the jumps, while the endurance attribute is based on the number of these jumps performed within a given timeframe. *Id.*

56. A POSITA would thus understand that Lofi does not disclose a method by which a fitness sub-score, derived from “one or more of an endurance fitness attribute, a flexibility fitness attribute, and a strength fitness attribute” (*id.* at 26:35–37), and a separate athleticism sub-score, derived from “one or more of a speed athleticism attribute, an agility athleticism attribute, a reaction athleticism attribute, a power athleticism attribute and a balance athleticism attribute” (*id.* at 26:38–42), are both measured for a single athletic movement.

57. As I discussed above in the overview of the Lofi reference, and as lululemon showcases in its Petition, Lofi’s invention discloses a series of independent tests, whereby each test is designed to measure only one isolated physical fitness component (e.g., endurance, muscular strength) for a particular

exercise. *See* Petition at 16–18. A POSITA would understand this to be different from Claim 1 of the '930 Patent, which requires a single exercise to yield at least one athleticism attribute and at least one fitness attribute, from which fitness and athleticism sub-scores are then determined. For example, Lofi describes a test for abdominal muscular strength, wherein the user is instructed to contract their abdominal muscles while wearing an abdominal belt, the belt then transmitting a signal that is “proportionate to the effort exerted by the abdominal muscles” Ex. 1002 at 36:5–6. In this instance, muscular strength is the only component being measured, with the exercise itself designed only for this purpose. Lofi never discloses that one test among the series of tests is used to calculate more than one component.

58. Lofi does disclose that the motricity or coordination component is calculated by a summation of the following sub-components: reflexes, flexibility, and balance. Ex. 1002 at 39:16–25. However, Lofi further discloses that, just like the other components, those sub-components are each measured through an isolated, independent test. *Id.* at 36:10–38:6. Thus, a POSITA would understand, for the same reasons discussed above, that a single athletic movement, as required by Claim 1, is never utilized by Lofi to measure attributes of both fitness and athleticism.

59. Therefore, in my opinion, Lofi does not calculate a “first combinatory fitness-athleticism score” as recited in limitation 1[C].

B. Limitation 1[D]

60. In my opinion, Lofi does not disclose limitation 1[D], which requires “providing, in response to a triggering event, second instructions to the user to perform a second athletic movement.” ’930 Patent at 26:23–25.

61. lululemon points to Lofi’s disclosure that a user can log on to a different terminal, and based on having a profile (e.g., data relating to scores, age, gender, and height) associated with their username, that user can revise their profile and results. *See* Petition at 22–23 (citing Ex. 1002 at 41:3–5). As a POSITA would have understood at the relevant time, however, this only demonstrates that Lofi’s device provides the same instructions to the user to repeat the exact same athletic movement undertaken during the first series of tests. *See id.* (“Lofi discloses this element because it discloses that a user will repeat the same test discussed above with respect to elements 1[a]-1[c].”).

62. For example, in a first test to measure a user’s endurance component, they may be asked to pedal on an ergometric bicycle for a period of 8 minutes while the resistance on the bicycle is gradually increased. *See* Ex. 1002 at 33:7–8. In a second test series, the user would be asked to repeat the exact same test, being provided with the exact same instructions. Further, as Lofi explains, the score obtained during this second repeated test would be used to revise the first score (i.e., override or overwrite) rather than create a second score. Ex. 1002 at 41:3–5. A

POSITA would have understood that the revised “score” discussed by Lofi is simply a recalculation of the same “first combinatory fitness-athleticism score” of limitation 1[C], as it is derived from measuring the exact same physical activity component(s) through the exact same test.

63. Therefore, in my opinion lululemon has not shown that Lofi teaches limitation 1[D].

C. Limitation 1[F]

64. In my opinion, Lofi does not disclose limitation 1[F], which requires “calculating, with the processor, based on the second activity data, a second combinatory fitness-athleticism score.” ’930 Patent at 26:28–30.

65. In my opinion, it is not clear from lululemon’s Petition whether it identifies a single test or the entire series of tests taught by Lofi as the “second activity data.” Petition at 24. But under either theory, Lofi still does not teach a “second combinatory fitness-athleticism score.” If lululemon is pointing to an individual test, just like with the discussion of “first activity data” with respect to limitation 1[C] above, each individual test of Lofi only yields a measurement of a single physical fitness component, not both a fitness attribute and an athleticism attribute. Therefore, for the same reasons described with respect to limitation 1[C], a POSITA would have understood that activity data from a single test in Lofi cannot yield both a fitness sub-score and an athleticism sub-score. If lululemon instead is

pointing to the entire series of discrete tests, then the activity data would not be derived from a single athletic movement, as a POSITA would understand Claim 1 to require.

66. Therefore, in my opinion, Lofi does not calculate a “second combinatory fitness-athleticism score” as recited in limitation 1[F].

X. GROUND 2: LOFI IN VIEW OF KITAGAWA DOES NOT TEACH OR SUGGEST EVERY LIMITATION OF CLAIMS 1 AND 5–7

67. lululemon argues that Claims 1 and 5–7 of the ’930 Patent are obvious over Lofi in view of Kitagawa. Petition at 27. For at least the reasons discussed below, Lofi alone, or in view of Kitagawa, does not teach or suggest each and every limitation of those claims. Omission of a particular claim, limitation, or topic from my discussion below should not be interpreted as agreement with arguments put forward by lululemon or its expert, Dr. Fischer, unless I have explicitly stated this to be the case.

A. Limitation 1[C]

68. In my opinion, Lofi alone, or in view of Kitagawa, does not teach or suggest limitation 1[C], which requires “calculating with a processor, based on the first activity data, a first combinatory fitness-athleticism score.”

69. As I described above with respect to limitations 1[C] and 1[F] in Ground 1, Lofi alone does not disclose calculating “combinatory fitness-athleticism

score” because it does not disclose that the “activity data” derives from a *single* athletic movement and includes separate discrete measurements of *both* fitness and athleticism. And as I discussed particularly with regard to limitation 1[F] in Ground 1, this is true whether lululemon points to an individual test or the entire series of tests administered by Lofi as generating the “activity data.” Thus, for the same reasons discussed above, it is my opinion that a POSITA would have understood that Lofi alone does not calculate a “first combinatory fitness-athleticism score” as required by limitation 1[C].

70. lululemon alternatively argues that Kitagawa fills the gaps in Lofi regarding calculating a “first combinatory fitness-athleticism score.” Petition at 33. lululemon points to Kitagawa’s disclosure of a pulse meter with which “an individual measures their pulse at the beginning and end of each exercise course” as providing the data used to calculate a combinatory score. Petition at 34 (citing Ex. 1004 at 8:43–61). However, as I discussed above in the overview of Kitagawa, the pulse meter is not used to measure activity data as required by Claim 1. In my opinion, a POSITA would have understood Kitagawa to provide a pulse meter to a user solely so that they can self-record their pulse to make sure they are not “exercising excessively.” Ex. 1004 at 8:47–49. This data is thus not used in “scoring” the activity, and as such, is not used to calculate a combinatory score for that activity, as proposed by lululemon.

71. The only measured data that Kitagawa describes using to calculate its “physical-strength age” score is the time it takes a user to complete the exercise courses, as recorded by the user with a stopwatch. Ex. 1004 at 9:6–10 (“Physical-strength age is calculated taking into consideration the time that a user takes in completing the entire series of courses.”), 11:1–4 (“The various types of exercise and various course conditions are designed so that each physical ability can be evaluated by measuring the completion time for each exercise course.”). A POSITA would have understood that a user recording elapsed time is not equivalent to measuring activity data of the user with a sensor, as required by Claim 1, as it is not directly related to how the user’s body performs during the activity. It does not track, for example, a user’s movements, or any physiological data coming from the user.

72. lululemon also points to Table 3 of Kitagawa as “disclosing multiple combinatory scores specific to each exercise course.” Petition at 34. I disagree. As I discussed above in the overview of Kitagawa, Table 3 merely shows pre-defined indexes that are not based on any user’s activity. *See* Ex. 1004 at 10:61–62 (“Table 3 shows the amounts of exercise (shown as indexes) to be performed ins [sic] exercise courses 1 to 7.”). The indexes are constant values assigned to an exercise course to indicate the level of difficulty with respect to each indicated physical ability (Legs, Arms, Flexibility, Balance, Agility, and Intelligence in Table 3). A POSITA would have therefore understood that these indexes do not represent the

claimed “fitness sub-score” and “athleticism sub-score,” or the “combinatory fitness-athleticism score” generated therefrom.

73. Therefore, in my opinion, Lofi alone, or in view of Kitagawa, does not calculate a “first combinatory fitness-athleticism score” as recited in limitation 1[C].

B. A POSITA Would Not Have Been Motivated To Combine Lofi With Kitagawa To Render Obvious Limitations 1[C] and 1[F]

74. lululemon argues, regarding the limitations of calculating a “first combinatory fitness-athleticism score” (1[C]) and a “second combinatory fitness-athleticism score” (1[F]) that “it would have been obvious to combine Lofi’s monitoring of an individual’s athletic activity using sensors with Kitagawa’s exercises that simultaneously assess multiple physical activity attributes with a reasonable expectation of success.” Petition at 27. But in my opinion, a POSITA would not have been motivated to turn to Kitagawa to fill the gaps in Lofi.

75. Lofi discloses a device affording measurement of four discrete physical activity components, namely endurance, body composition, muscle strength, and motricity. Ex. 1002 at 31:15–19. Specifically, these measurements are undertaken at a terminal, that also includes a screen and/or keyboard to allow the user to input relevant demographic and population group data. *Id.* at 32:21–33:2. Lofi’s disclosed invention is a compact, efficient, and relatively autonomous system that allows these discrete physical activity characteristics to be measured and scored based on various

activity data types (e.g., pressure, force, center of gravity) derived from a range of incorporated sensors. *See id.* at 30:4–31:12, Fig. 2.

76. Conversely, Kitagawa discloses a method for estimating a person's age based on strength, which is derived from how long it takes a person to complete a series of exercise courses. Ex. 1004 at 9:6–10, 11:1–4. These courses take up a large space and require considerable infrastructure and are designed to enable users to move through the various obstacles and perform associated tasks. *See, e.g., id.* at 3:52–53. Unlike Lofi, a POSITA would have understood that Kitagawa does not teach or even consider the use of sensors to measure any physical activity characteristics, instead relying solely on a stopwatch to time a user as they move through each course. As I also noted with respect to limitation 1(C), while Kitagawa does disclose tracking of a user's pulse rate before and after the exercises, this data is not utilized in scoring fitness characteristics, instead it is used solely to ensure that individuals are not “exercising excessively.” *Id.* at 8:47–49.

77. Kitagawa discloses a system and associated methods for monitoring fitness that are more consistent with conventional testing methods as of the priority date of the '930 Patent. For example, various US military fitness tests manually and independently measured and scored an individual's physical fitness as they progressed through a series of physically discrete obstacles and/or test batteries. A POSITA at that time would have deemed Kitagawa's invention to be cumbersome,

inefficient, and error-prone based on the manual calculation and reporting processes therein, as compared to that of Lofi which would have been viewed as comparatively sophisticated, precise, automated, and temporally and physically efficient. In fact, Lofi purports to overcome the inefficiencies and technical inadequacies of a system or methods that are consistent with those disclosed by Kitagawa.

78. Considering these vast technical and methodological discrepancies, a POSITA would not have been motivated to combine the teachings of Kitagawa and Lofi. Moreover, they would consider Kitagawa to be unhelpful, having no reason to apply its teachings to address the gaps in Lofi's more automatic, sensor-based device for calculating physical fitness scores of a user.

XI. GROUND 3: MAEUELER IN VIEW OF KITAGAWA DOES NOT TEACH OR SUGGEST EVERY LIMITATION OF CLAIMS 1, 5–7, AND 12

79. lululemon argues that Claims 1, 5–7, and 12 of the '930 Patent are obvious over Maeueler in view of Kitagawa. Petition at 46. For at least the reasons discussed below, Maeueler alone, or in view of Kitagawa, does not teach or suggest each and every limitation of those claims. Omission of a particular claim, limitation, or topic from my discussion below should not be interpreted as agreement with arguments put forward by lululemon or its expert, Dr. Fischer, unless I have explicitly stated this to be the case.

A. Limitation 1[C]

80. In my opinion, Maeueller alone, or in view of Kitagawa, does not teach or suggest limitation 1[C], which requires “calculating with a processor, based on the first activity data, a first combinatory fitness-athleticism score.”

81. Maeueller discloses a series of independent tests that relate to five physical fitness components, namely “cardiovascular endurance, muscle strength, flexibility, balance, [and] body composition.” Ex. 1003 at [0027]. Specifically, each of these five components is evaluated separately by an independent test, with each test comprising of its own set of exercises. *Id.* at [0019]. For example, embodiments of Maeueller include measuring an endurance component by estimating maximal oxygen consumption (*id.* at [0031]), and measuring a flexibility component through a separate sit-and-reach test (*id.* at [0042]).

82. Like Lofi, the “first activity data” that lululemon identifies in Maeueller does not derive from a single athletic movement *and* include both fitness and athleticism measurements. *See* Petition at 51–52. A POSITA would have understood that none of the tests taught by Maeueller produce a “combinatory fitness-athleticism score,” comprised of a “fitness sub-score” and an “athleticism sub-score.” Instead, each of the tests yields only one of these five specified physical activity components, which represent either a single fitness attribute or a single athleticism attribute.

83. lululemon points to Maeueller's "aggregate fitness index" as teaching this limitation. *Id.* I disagree. The aggregate fitness index is not derived from measurements obtained within a single activity or movement, but instead is calculated from five separate tests prompting a user to perform five discrete exercises. Figure 5 of Maeueller (shown below) also confirms that the aggregate fitness index is calculated via a user performing a plurality of discrete exercises, from which equally discrete scores are obtained. Specifically, each measured component is symbolized by a user performing a specific exercise which yields a score for that component. A POSITA at the relevant time would have understood that Maeueller's aggregate fitness index thus derives from a plurality of athletic movements, instead of one athletic movement. They would also have been aware that no tests are taught or even suggested by Maeueller that measure both a fitness and an athleticism score for a single movement, such as that recited within Claim 1 of the '930 patent.

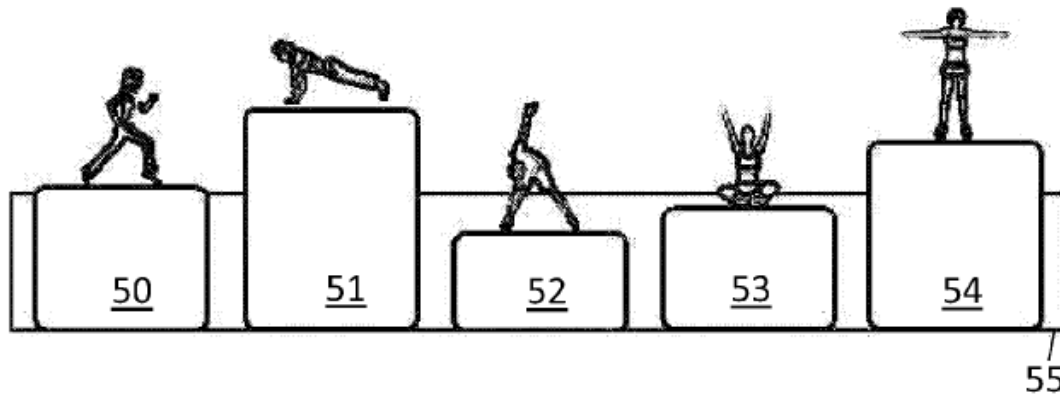


FIG. 5

Ex. 1004 at Fig. 5.

84. Therefore, in my opinion, Maeueller alone, or in view of Kitagawa, does not calculate a “first combinatory fitness-athleticism score” as recited in limitation 1[C].

B. Limitation 1[F]

85. In my opinion, Maeueller alone, or in view of Kitagawa, does not teach or suggest limitation 1[F], which requires “calculating, with the processor, based on the second activity data, a second combinatory fitness-athleticism score.”

86. For the same reasons I discuss regarding limitation 1[C] above, Maeueller alone does not teach or suggest a “combinatory fitness-athleticism score.”

87. Regarding this limitation only, lululemon and Dr. Fischer further contend that the endurance test described in Maeueller (i.e., running for 12 minutes) yields both fitness and athleticism sub-scores and thus, a combinatory fitness-

athleticism score. Petition at 55–56; Ex. 1005 at ¶ 105. Dr. Fischer opines that “the user is monitored by one or more peripheral devices [that] collect heart rate and speed data,” and therefore Maeueller “calculates a fitness index numerical score that is a combination of the endurance and speed attributes being assessed.” *Id.* I disagree.

88. A review of Maeueller’s text, however, shows that Maeueller never mentions measuring speed data during the endurance test. Maeueller only discusses measuring endurance for the 12-minute run test. Ex. 1003 at [0031]–[0036]. Specifically, Maeueller discusses using the “Cooper test” to measure the VO_{2max} of the user. *Id.* at [0031]. Maeueller explicitly provides a formula for calculation of endurance in the Cooper test which is only dependent on the distance (D) that the user runs in the 12-minute period. *Id.* A POSITA would have understood that this endurance calculation is distinct from speed, and that Maeueller does not disclose a calculation of speed regarding the endurance test.

89. lululemon alternatively argues that Kitagawa teaches calculating the “second combinatory fitness-athleticism score.” Petition at 56–58. For same the reasons I discussed above with respect to limitation 1[C], Maeueller does not teach or suggest fitness and athleticism sub-scores which both derive from a single “second athletic movement.” And for the reasons I discuss above with respect to

limitation 1[C] in Ground 2, Kitagawa's indexes shown in Table 3 cannot fill the gaps in Maeueller.

90. Therefore, in my opinion, Maeueller alone, or in view of Kitagawa, does not calculate a "second combinatory fitness-athleticism score" as recited in limitation 1[F].

C. A POSITA Would Not Have Been Motivated To Combine Maeueller With Kitagawa To Render Obvious Limitation 1[F]

91. lululemon argues, regarding the limitation of calculating a "second combinatory fitness-athleticism score" (1[F]) that "[i]n order to more comprehensively understand which components [of physical fitness] need improvement, it would have been obvious to a POSITA to ... incorporate Kitagawa's simultaneous monitoring of multiple physical abilities (*e.g.*, flexibility, balance, agility) into Maeueller." Petition at 57–58. But in my opinion, a POSITA would not have been motivated to turn to Kitagawa to fill the gaps in the Maeueller.

92. For the same reasons outlined above in Ground 2, a POSITA would also understand that Maeueller in view of Kitagawa does not teach or suggest "calculating, with the processor, based on the second activity data, a second combinatory fitness-athleticism score." *Id.* at 26:28–30. Further, a POSITA would not consider Kitagawa, and thus Maeueller in view of Kitagawa, to teach or suggest "wherein the first and the second combinatory fitness-athleticism scores each

comprise a fitness sub-score and a separate athleticism sub-score of the user.” *Id.* at 26:31-33.

93. As was the case for Lofi, a POSITA would be aware that Maeueller’s system presents substantial technological, methodological, and application use-case differences compared to Kitagawa. Maeueller, for example, discloses a system containing one or more peripheral devices within a compact design for measuring different components of a person’s fitness level that is additionally suitable for use within “a home-setting or in another setting where expert guidance is unavailable.” Ex. 1003 at [0006].

94. Kitagawa, however, discloses a system requiring considerable space and infrastructure that is cumbersome, inefficient, and prone to measurement error based on the manual, user-based calculation, and reporting processes. *See, e.g.*, Ex. 1004 at 3:52–53, 8:30–61. A POSITA would thus not have been motivated to combine the teachings of Maeueller and Kitagawa since Kitagawa’s system would have compromised, rather than improved, Maeueller’s comparatively sophisticated and automated sensor-based system. Moreover, applying the teachings of Kitagawa would have destroyed the benefits posited by Maeueller compared to prior art systems and methods for measuring a user’s physical activity. *See* Ex. 1003 at [0006].

95. Therefore, in my opinion, lululemon has failed to establish that Maeueller and Kitagawa teach or suggest each and every limitation of Claim 1 and the Challenged Claims dependent thereon.

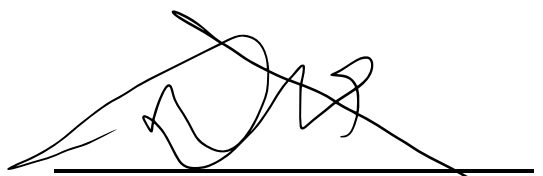
XII. CONCLUSION

96. I reserve the right to supplement my opinions in the future to respond to any arguments that lululemon raises. This declaration represents only those opinions that I have formed to date. I reserve the right to revise, supplement, and/or amend my opinions stated herein based on new information that becomes available to me and on my continuing analysis of the materials already provided.

97. I recognize that this declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross examination in the case and that cross examination will take place within the United States. If cross examination is required of me, I will appear at the appropriate time as mutually agreed between the parties.

98. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: April 10, 2023



Scott G. McLean, Ph.D.