

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LULULEMON ATHLETICA CANADA INC. and LULULEMON USA INC.
Petitioners

v.

NIKE, INC.
Patent Owner

Case IPR2023-00348
Patent 10,188,930

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

lululemon v. NIKE, Inc. IPR2023-00348 Patent No. 10,188,930 Ex. 2004

TABLE OF CONTENTS

	<u>Page</u>
I. INTRODUCTION	1
II. BACKGROUND AND EXPERIENCE.....	2
III. COMPENSATION AND PRIOR TESTIMONY	8
IV. MATERIALS CONSIDERED.....	8
V. LEGAL STANDARDS	8
VI. LEVEL OF ORDINARY SKILL IN THE ART.....	11
VII. THE '930 PATENT.....	12
A. Overview of the '930 Patent.....	12
VIII. Claim Construction.....	14
A. “[first/second] athletic movement”	15
B. “[first/second] instructions”	18
C. “[first/second] activity data”	19
IX. OVERVIEW OF THE PRIOR ART REFERENCES	20
A. Lofi	20
B. Maeueler	22
C. Kitagawa.....	24
X. LULULEMON FAILS TO SHOW THAT ANY CHALLENGED CLAIM IS UNPATENTABLE UNDER ANY OF GROUNDS 1–3	27
A. Ground 1: lululemon Fails To Demonstrate That Lofi Anticipates Claims 1 and 5-7.....	28

1.	lululemon fails to show Lofi discloses “calculating with a processor, based on the first activity data, a first combinatory fitness-athleticism score” (Limitation 1C)	28
2.	lululemon fails to show Lofi discloses “calculating, with the processor, based on the second activity data, a second combinatory fitness-athleticism score” (Limitation 1F).....	31
3.	lululemon fails to show Lofi discloses “wherein the first instructions and the second instructions include a predefined ordering of drills that are configured to be provided to the user during a single workout session” (Claim 7)	32
B.	Ground 2: lululemon Fails To Show The Lofi-Kitagawa Combination Renders Obvious Claims 1 and 5–7	33
1.	lululemon fails to show Lofi in view of Kitagawa teaches or suggests “calculating with a processor, based on the first activity data, a first combinatory fitness-athleticism score” (Limitation 1C)	33
2.	lululemon fails to show Lofi in view of Kitagawa teaches or suggests “calculating, with the processor, based on the second activity data, a second combinatory fitness-athleticism score” (Limitation 1F).....	38
3.	lululemon fails to show a motivation to combine Lofi with Kitagawa	39
C.	Ground 3: lululemon fails to show Maeueler in view of Kitagawa renders obvious claims 1, 5–7, and 12	40
1.	lululemon fails to show Maeueler teaches or suggests calculating “a first combinatory fitness-athleticism score” that is “based on the first activity data” (Limitation 1C).....	40
2.	lululemon fails to show Maeueler teaches or suggests calculating a second combinatory fitness-athleticism score” that is “based on the second activity data” (Limitation 1F).....	43

3. lululemon fails to show a motivation to combine
Maeueller with Kitagawa 46
4. lululemon fails to show Maeueller in view of Kitagawa
discloses “wherein the first instructions and the second
instructions include a plurality of drills configured to test
a plurality of fitness attributes of the user and a plurality
of athleticism attributes of the user” (Claim 6).....48

I, Scott 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 Attachment A.

7. I am currently a Principal within Exponent's Biomechanics practice where I lead a team of consultants specializing in different wearable technology initiatives. In particular, efforts focus on characterizing, benchmarking, and implementing a broad range of state-of-the art wearable technology solutions. I possess over 25 years of expertise and experience in the areas of biomechanics, gait

and locomotion, human performance, health, and wellness, utilizing 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 analyses, 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, activity, and health outcomes based on the explicit use case of interest.

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, knee joint, and particularly anterior cruciate ligament 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 (Attachment A at 6 [McLean *et al.*, 2004]). At the time of this declaration, the article had been cited 593 times, with 14 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 (Attachment A at 6 [Hewett *et al.*, 2005]). This article won the American Orthopaedic Society for Sports Medicine O'Donoghue award and had been cited 4275 times at the time of preparing this declaration, with 203 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 discrete 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 (Attachment A at 2–3 [Cain *et al.*, 2016; Davidson *et al.*, 2016; McGinnis *et al.*, 2016]).

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 ideation and design, including but not limited to: hardware, software, and sensor development and testing, algorithm development and characterization, device verification, validation, and benchmarking, and large-scale device integration for use-case specific (e.g., clinical patients) 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, physiological, and biomechanical 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, testing and evaluation, and large-scale 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 sensors 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 Attachment B 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
- Institution Decision in IPR 2023-00348; and
- All 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 proving that each challenged claim is unpatentable by a preponderance of the evidence

23. I understand that a claim may be unpatentable over prior art under either an anticipation theory or an obviousness theory. I understand that, to anticipate a claim, each and every element of that claim must be either expressly or inherently disclosed in a single prior art reference. I further understand that the claim elements must be arranged in the prior art reference as in the claim. I have been informed that even slight differences between a prior art reference and the claimed invention may be insufficient to show anticipation.

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. For the purposes of this declaration, I apply lululemon's definition of a POSITA.

28. 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.

29. 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.

30. My opinions are based on generally-accepted methodologies in the scientific and biomechanical communities.

VII. THE '930 PATENT

A. Overview of the '930 Patent

31. The '930 patent concerns “systems and methods for estimating a combined or a combinatory fitness-athleticism score comprised of a fitness sub-score and an athleticism sub-score.” '930 patent, 1:49–51; *see also id.*, 22: 25–31. One example of a combinatory fitness-athleticism score, the “Fuel Print,” is shown below with a fitness sub-score (left) and an athleticism sub-score (right).

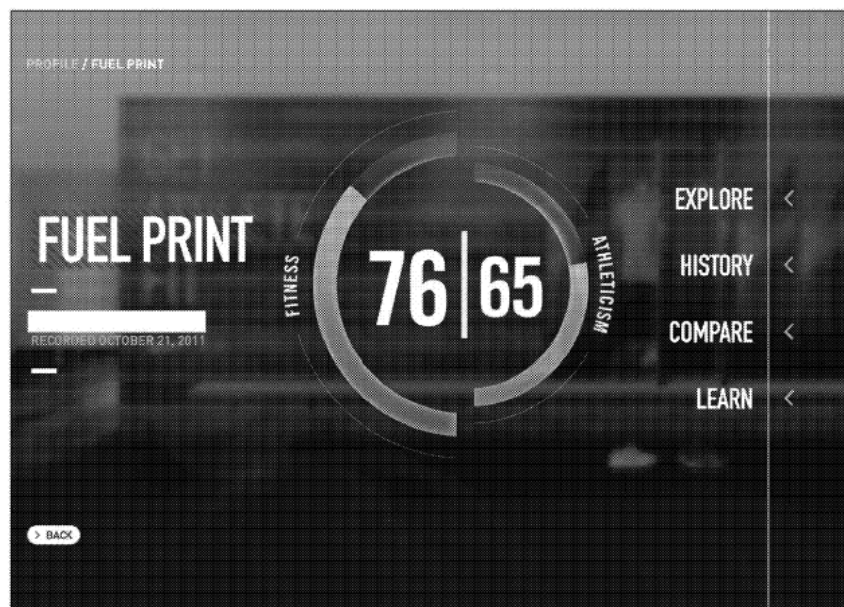


FIGURE 12

Id., Fig. 12.

32. The apparatus “may instruct a user to perform an athletic movement with predefined criteria.” *Id.*, 12:55–57; *see also id.*, 22:48–59. The apparatus

monitors the user with one or more sensors while the user performs an exercise, and then determines the sub-scores and a combinatory score based on “a plurality of parameters relating to the user’s performance,” such as “form, tempo, estimated fatigue, oxygen kinetics and/or other parameters.” *Id.*, 23:7–11, 23:56–59.

33. In my opinion, the ’930 patent specification makes clear that a user’s performance during a single “athletic movement,” including a single type of exercise or activity, may serve as the basis for determining *both* one or more attribute(s) of athleticism *and* one or more attribute(s) of fitness. *See id.*, 23:25–7, 23:31–33. These attributes are “detected, measured, and/or calculated” and then used to determine fitness and athleticism sub-scores, which are then used to calculate the combined fitness-athleticism sub-score. *See id.*, 23:33–36, 22:23–31. “[E]xample fitness attributes may include, but are not limited to: endurance, flexibility, strength and combinations thereof.” *Id.*, 23:36–38. “[E]xample athleticism attributes may include, but are not limited to: speed, agility, reaction, power, balance, and combinations thereof.” *Id.*, 23:39–41.

34. Claim 1 is an independent claim from which all other Challenged Claims depend. Independent claim 1 is reproduced below with limitations 1A–1I identified:

1. A computer-implemented method comprising:
[1A] providing first instructions to a user to perform a first athletic movement;
[1B] receiving, from a sensor, first activity data

- representing the first athletic movement;
- [1C] calculating with a processor, based on the first activity data, a first combinatory fitness-athleticism score;
- [1D] providing, in response to a triggering event, second instructions to the user to perform a second athletic movement;
- [1E] receiving, from the sensor, second activity data representing the second athletic movement;
- [1F] calculating, with the processor, based on the second activity data, a second combinatory fitness-athleticism score,
- [1G] 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,
- [1H] wherein the fitness sub-score is calculated, by the processor, using one or more of an endurance fitness attribute, a flexibility fitness attribute and a strength fitness attribute of the user, and
- [1I] wherein the athleticism sub-score is calculated, by the processor, using 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 of the user.

Id., 26:16–42.

VIII. Claim Construction

35. I understand that in the Institution Decision, the Board asked the parties to submit proposed constructions for the terms “first athletic movement,” “first

instructions,” and “first activity data,” each of which appear in claim 1.¹ Institution Decision at 20. I address each of these limitations in turn below.

A. “[first/second] athletic movement”

36. I disagree with the Board’s preliminary finding that “multiple ‘movements,’ exercises, or drills may constitute a ‘first athletic movement.’” Institution Decision at 19. Having reviewed the intrinsic record of the ’930 patent through the lens of a POSITA at the time of invention, and for the reasons I discuss below, it is my opinion that an “athletic movement” refers only to a *single* “athletic movement.”

37. ***First***, the inventors’ disclosure of certain embodiments that include a singular “athletic movement,” and other embodiments that include plural “athletic movements” would have informed a POSITA at the relevant time that these two terms must be different. *Compare* ’930 patent, 12:55–57 (“With reference again to FIG. 3, in block **304**, one or more embodiments may instruct a user to perform an athletic movement with predefined criteria.”), *with* 22:51–54 (“[E]mbodiments may include prompting a first user, such as user 124 shown in FIG. 1, to perform ***athletic movements***, including completing at least one drill and/or exercise.”). In my opinion, this reveals that the drafters recognized a difference between single and plural

¹ My discussion of each of these three terms pertains equally to the terms “second activity data,” “second instructions,” and “second athletic movement.”

athletic movements. Additionally, the inventors make this distinction with other related terms like “movement” and “exercise.” For example, the inventors differentiate between “a movement” and a “series of movements (such as an exercise routine).” ’930 patent, 13:43–44. As another example, the inventors disclose embodiments that involve a “single exercise,” and other embodiments that involve multiple exercises, i.e., “a first exercise” and a “second exercise”:

In another embodiment, at least a first exercise may be designed to specifically test attributes of athleticism and at least a second exercise may be utilized to specifically test attributes of fitness. In yet another embodiment, a single exercise may be utilized to measure at least one athleticism attribute and at least one fitness attribute.

’930 patent, 23:25–33; *see also id.*, 23:31–33 (“a single exercise may be utilized to measure at least one athleticism attribute and at least one fitness attribute.”). It would make little sense for a single “athletic movement” to include multiple “athletic movements.” If that were the case, the plural form of the word would have no effect.

38. ***Second***, the inventors’ definition demonstrates that “athletic movement” recited in claim 1 of the ’930 patent refers only to a *single* athletic movement. The ’930 specification discloses:

As used herein, an “athletic movement” ***includes movements*** relating to fitness, exercise, flexibility, including movements that may be ***part of*** one or more single and multiple participant athletic competitions, exercise routines, and/or combinations thereof.

'930 patent, 4:7–11 (emphasis added). It is my opinion that a POSITA reading this definition in view of the intrinsic record would have understood that the inventors were defining “athletic movement” to “include,” or be selected from only a certain type of “movements.” In other words, an “athletic movement” is selected from a specific class of movements, i.e., “movements relating to fitness, exercise, flexibility.” *Id.* For example, fitness movements or exercises may include, but are not limited to: cycling, running, rowing, or shot-put. It is also my opinion that a POSITA would have understood that the inventors are defining “athletic movement” as only “part of” an “exercise routine” or “athletic competition.” In other words, an “athletic movement” is a single movement or exercise that—when combined with one or more other “athletic movements”—may create an “exercise routine” or “exercise competition.” *Id.* For these reasons, it is my opinion that the inventors’ lexicography confirms that an “athletic movement” as recited in claim 1 of the '930 patent refers to a *single* “athletic movement.”

39. ***Third***, it is my opinion that the sentence in the abstract cited by the Board does not mean that an “athletic movement” encompasses multiple “athletic movements.” *See* Institution Decision, 18. The abstract of the '930 patent states that “[t]he athletic movement may comprise a plurality of drills configured to test a plurality of fitness attributes and/or a plurality of athleticism attributes of the user.” Institution Decision, 18 (citing '930 patent, Abstract). To me, this sentence does no

more than describe a class of movements that fall within the scope of an “athletic movement”—just like inventors’ definition of this term discussed above. At most, it is my opinion that a POSITA would have understood this sentence to mean that an athletic movement may be selected from a class of drills.

40. For all of these reasons, it is my opinion that the term “athletic movement” in claim 1, when properly viewed in light of the ’930 patent specification, means a *single* athletic movement. Further, it is my opinion that the “athletic movement” of claim 1 may include a single type of exercise or athletic activity, such as running, pushups, squats, or cycling. These individual movements may include multiple coordinated bodily movements, like the way the runner coordinates the motions of the arms and legs, or a basketball free throw considers explicit body segmental sequencing and phasing in order to achieve the required outcome with high precision. But a single “athletic movement” as recited in claim 1 of the ’930 patent does not include a user performing a series of different discrete “athletic movements” or exercises.

B. “[first/second] instructions”

41. It is my opinion that a POSITA at the relevant time would have understood the ordinary and customary meaning of these terms to be “instructions provided to a user to perform an athletic movement with predefined criteria.” And based on my opinion regarding “athletic movement” discussed above, instructions

provided to a user to perform a single type of exercise or activity. This proposed construction is supported by the intrinsic record and the plain language of the claims. *See, e.g.*, '930 patent, 12:54–67; 26:17–18 (“providing first instructions to a user to perform a first athletic movement”).

C. “[first/second] activity data”

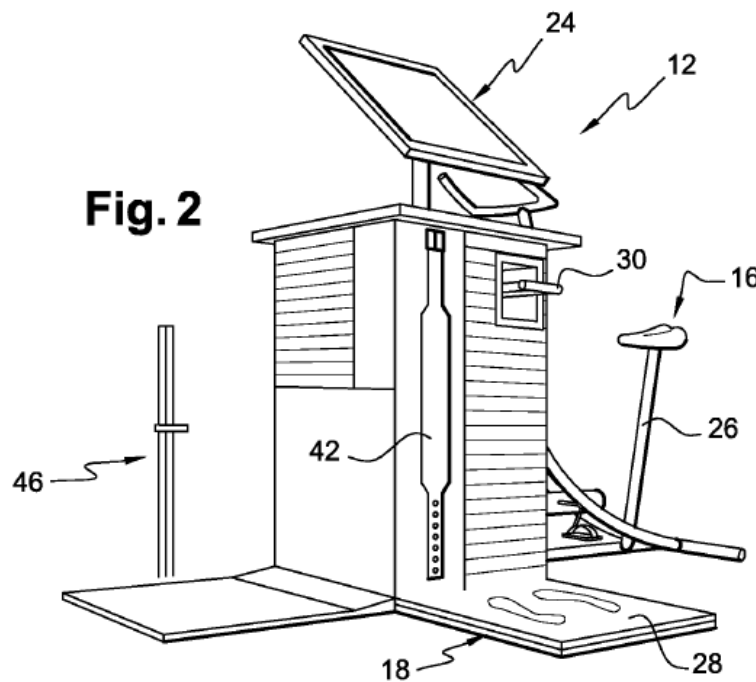
42. It is my opinion that a POSITA at the relevant time would have understood the ordinary and customary meaning of these terms to be “data, received from a sensor, that represents the [first/second] athletic movement.” This construction directly conforms to the plain language of the claims. It is further my opinion that the “activity data” recited in claim 1 must (i) derive from a *single* “athletic movement,” as I discuss above in Section VIII.A, performed in response to “[first/second] instructions,” as I discuss above in Section VIII.B and (2) include separate measurements of both fitness and athleticism. This proposed construction is consistent with the intrinsic record of the '930 patent. *See, e.g.*, '930 patent, 1:57–59 (“The apparatus may include a sensor configured to capture data related to the movement of the ... user.”); 11:27–28 (“Sensor data may be received at a computer ...”); 26:19–20 (receiving, from a sensor, first activity data representing the first athletic movement”).

IX. OVERVIEW OF THE PRIOR ART REFERENCES

A. Lofi

43. Lofi (Ex. 1002) is directed to a device that evaluates a user's physical fitness by administering a series of tests. *See* Ex. 1002, 30:1–3.² According to Lofi, individuals interested in their physical fitness historically relied on a “competent person” to conduct a physical evaluation because it was difficult to evaluate physical fitness “autonomously and reliably.” *See id.*, 30:4–31:12.

44. Lofi purports to overcome this difficulty by providing the “one-stop” device or “terminal,” shown in Figure 2 below.



² I cite to the exhibit page numbering stamped at the bottom right-hand side of the PDF of Lofi (Ex. 1002). The English document begins at page 28.

Id., Fig. 2. “This terminal makes it possible, in a reduced space, to collect [] different measurements” from a person using the terminal and “facilitate[s] the evaluation of their physical fitness, autonomously and with reliability.” *Id.*, 38:18–20. To do so, the terminal prompts a user to perform a series of exercises, and measures data during the performance of those exercises to evaluate a user’s endurance, body composition, muscular strength, and coordination or motricity. *Id.*, 31:13–25. The terminal then determines a score for each exercise by comparing the measured value with a “distribution curve corresponding to the person’s population group.” *Id.*, 31:23–25.

45. Lofi discloses that “terminal 12” has a “means of measurement.” *Id.*, 32:21–22. Specifically, “terminal 12” provides (1) a “means 16 of measurement of endurance”; (2) a “means 18 of measurement of body composition”; (3) a “means 20 of measurement of muscular strength”; and (4) a “means 22 of measurement of . . . coordination or motricity.” *Id.*, 32:21–26. The terminal (12) further includes a “screen 24 and/or keyboard” to enable the user to input data. *Id.*, 32:23–33:2.

46. Lofi’s terminal (12) instructs the user to perform a series of tests for evaluating the four categories listed above. *Id.*, 40:9–18. For example, in determining muscle strength, the device instructs the user to contract their abdominal muscles while wearing abdominal belt 42 and “[t]he belt then transmits a signal proportionate to the effort exerted by the abdominal muscles” to the device. *Id.*,

36:4–7. As another example, to measure flexibility, the device instructs the user to “stand on a heightened pedestal,” and then to “bring [a] pallet to as low as possible, bending forwards without giving way to their legs.” *Id.*, 36:20–8:4. Lofi describes other test prompts given to users such as pedaling, gripping, balancing on one foot, etc. *Id.*, 33:7–38:17.

47. After measuring the user’s performance data during each test, the device compares the collected data with a “distribution curve corresponding to the [user’s] population group,” and “allocate[s] a score to the [user]” for each individual test. *Id.*, 31:23–25, 39:16. A user’s “physical fitness” score is then calculated by averaging that user’s scores for each of the measured criteria, i.e., body composition, endurance, muscular strength, and motricity. *Id.*, 39:17–25. Lofi’s device generates only one criteria score for each test activity. *Id.*

B. Maeueler

48. Maeueler (Ex. 1003) is directed to “a fitness test system for determining a fitness test result that is indicative of a user’s physical fitness.” Ex. 1003, [0001]. Maeueler discloses that “[i]t would be desirable to be able to use such a system in a home setting or in another setting where expert guidance is unavailable, while still maintaining a high level of confidence in the obtained results.” *Id.*, [0006]. The fitness test system includes “a computing module for accessing a collection of fitness tests” and “one or more peripheral devices . . . adapted to measure one or more input

parameters.” *Id.*, [0007]. As depicted in Figure 2, Maeueler discloses three peripheral devices containing one or more sensors: a handheld computing device (20), an exercise mat (21) and a distance detecting device (22):

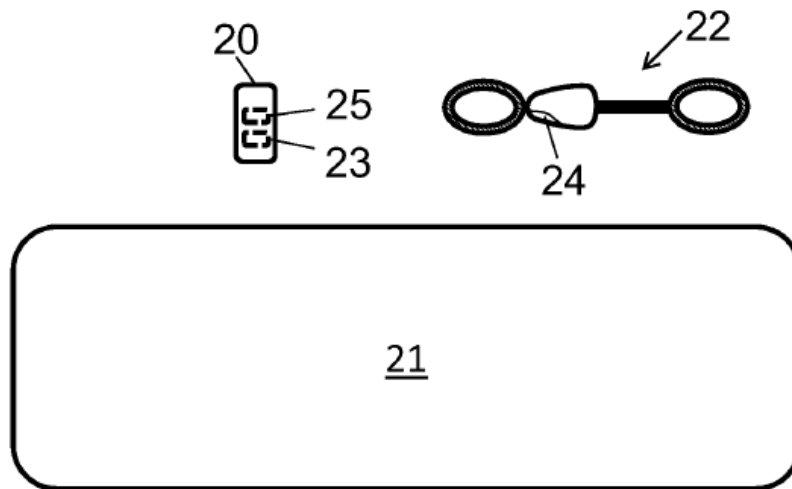


FIG. 2

Id., Fig. 2.

49. Maeueler’s system conducts tests related to five “components of physical fitness”: “cardiovascular endurance, muscle strength, flexibility, balance, and body composition.” *Id.*, [0004], [0010]. Maeueler discloses specific exercises that the user may perform in response to an instruction to determine a “fitness test result” for each of the five aforementioned components. *Id.*, [0019]. As the user performs exercises associated with a particular “component of physical fitness,” a peripheral device measures “one or more input parameters” to determine a fitness test result. *Id.* For example, Maeueler discloses a run test to determine the

“cardiovascular endurance” component of physical fitness and a Stork balance test to determine the “balance component.” *Id.* at [0031], [0044]. Maeueller’s system generates only one “fitness test result” score for each exercise activity. *Id.* Nowhere does Maeueller disclose calculating two separate components of physical fitness from a single test.

C. Kitagawa

50. Kitagawa (Ex. 1004) is directed to a “system for measuring a person’s age on the basis of his/her physical strength.” Ex. 1004, Abstract. Specifically, Kitagawa only discloses that a user’s age is calculated based on the time it takes the user to complete certain exercise courses, each made up of multiple different exercises. *See id.* Kitagawa describes that the “exercise courses are formed so that the user demonstrates various physical abilities, including muscle strength at multiple portions of his/her body, flexibility of the body, balance of the body, and agility of the body.” *Id.*

51. Kitagawa’s system requires an exercise course including a series of obstacles and/or equipment for facilitating exercise movements “in a recreational facility.” *Id.*, 1:15–18. For example, the exercise course may feature “multiple logs . . . installed at a predetermined height” and “a structure, arranged in the middle of the passageway, that has a low ceiling.” *Id.*, 2:46–53. Or, the course may include “a meandering, upward-sloped passage way” for “climbing up and jumping down;

jumping over; crawling up and running down; or climbing while avoiding obstacles.” *Id.*, 2:54–60. Kitagawa explains that “[i]t is preferable that said exercise courses be accommodated in a long dome made of polystyrene foam.” *Id.*, 3:52–53.

52. Kitagawa’s system uses a predefined (i.e. not measured or calculated) “index of the amount of exercise that a user performs.” *Id.*, 3:54–67. Each exercise course has its own predefined index values as shown below in Table 3:

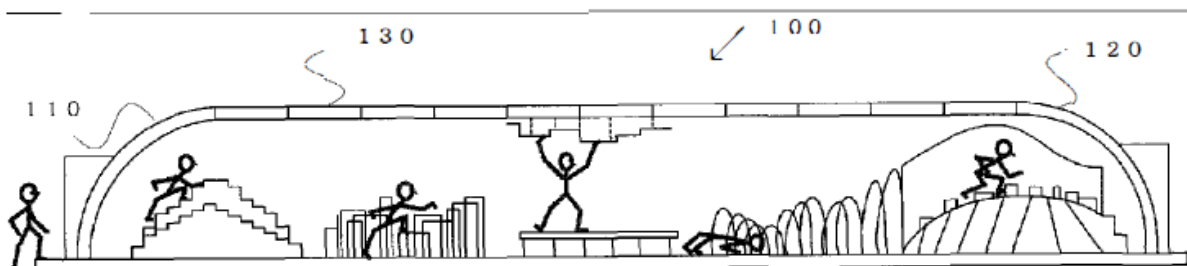
TABLE 3

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., Table 3.

53. An exercise course is depicted below in Figure 18. Kitagawa discloses that Figure 18 shows a “longitudinal sectional view of the inside of the long dome 100 in which the exercise courses are accommodated.”

Fig. 18

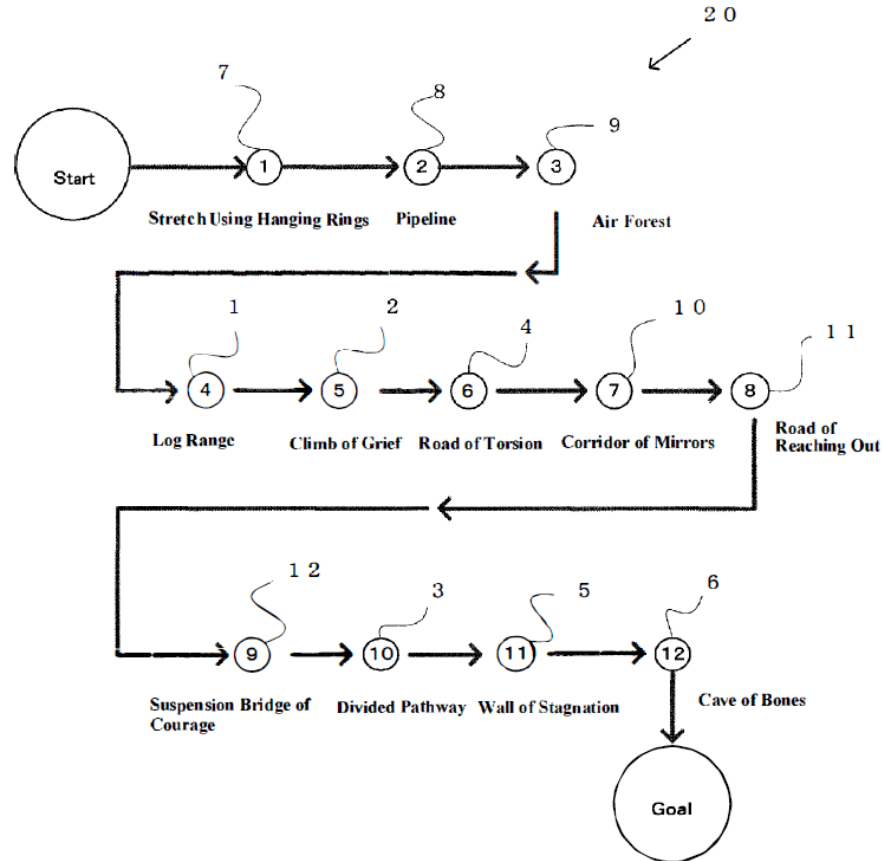


Id., Fig. 18, 13:4–6.

54. In operation, Kitagawa teaches that a user must first check in at a service counter with an application to use the system. *Id.*, 8:31–42. Before performing any exercise, the user then measures and provides the system with certain physiological measurements, such as the user’s blood pressure and pulse rate. *Id.*, 8:31–42. These measurements aid in determining whether the user’s physical condition is good enough to participate in the course. *Id.*; *see also id.*, Fig. 2. The user is then given a stopwatch to manually record on a scorecard how long it took to complete each course. *Id.*, 8:43–52. At the completion of the course(s), the user submits the scorecard at the service counter to have his or her physical-strength age calculated. *Id.*, 8:56–61. After the user provides the elapsed time and other personal information, like actual age, to the service counter, the system analyzes the scorecard and estimates the user’s age “on the basis of [] physical strength.” *Id.*, 8:56–61.

55. In one embodiment, Kitagawa teaches a 12-part exercise course as shown below in Figure 1:

Fig. 1



Id., Fig. 1. Kitagawa discloses that “[t]he various types of exercise and various conditions are designed so that each physical ability can be evaluated by measuring the completion time for each exercise course.” *Id.*, 11:1–4.

X. LULULEMON FAILS TO SHOW THAT ANY CHALLENGED CLAIM IS UNPATENTABLE UNDER ANY OF GROUNDS 1–3

56. For the reasons I discuss below, it is my opinion that lululemon fails to show that any ground anticipates or renders obvious any Challenged Claim of the ’930 patent.

A. Ground 1: lululemon Fails To Demonstrate That Lofi Anticipates Claims 1 and 5-7

57. It is my opinion that lululemon has not shown that Lofi anticipates Claim 1, and thus any Challenged Claim in Ground 1.

1. lululemon fails to show Lofi discloses “calculating with a processor, based on the first activity data, a first combinatory fitness-athleticism score” (Limitation 1C)

58. It is my opinion that lululemon has not shown that Lofi discloses limitation 1C, which recites calculating a “combinatory fitness-athleticism score” based on “the first activity data.” As I discussed above in Section VIII.C, the “first activity data,” as properly construed, is “data, received from a sensor, that represents the first athletic movement.” And as further discussed in Section VIII.A, a “first athletic movement,” as properly construed, is a “*single* athletic movement” including a “*single* type of exercise or athletic activity.” Thus, the “first activity data” in limitation 1C is measured from a *single* athletic movement, namely the “first athletic movement.” ’930 patent, 26:17–18. That “first activity data” is then used to calculate a “combinatory fitness-athleticism score,” which includes both a “fitness sub-score” and an “athleticism sub-score.” Alternatively stated, the “first activity data” recited in claim 1 must (i) derive from a *single* athletic movement performed in response to “[first/second] instructions,” and (ii) include separate measurements of both fitness and athleticism.

59. lululemon identifies the “first athletic movement” as any *one* of the multiple distinct tests disclosed by Lofi. Petition, 16–17. For example, lululemon alleges that “pedaling represents a first athletic movement.” *Id.*, 16. As another example, lululemon alleges that the “balance test” disclosed in Lofi is “a first athletic movement.” *Id.*, 17; *see also id.*, 16 (“[e]ach of these tests qualify as a first athletic movement”); Ex. 1005, ¶¶54–59. But each of these tests is a single “athletic movement” that yields only a single measurement. The “activity data” from any one “athletic movement” of Lofi does not yield both a fitness sub-score *and* an athleticism sub-score. Rather, the “activity data” from each alleged “athletic movement” is only capable of yielding a fitness sub-score *or* an athleticism sub-score.

60. Dr. Fischer opines that Lofi generates both a fitness sub-score and an athleticism sub-score from a single test. I disagree with Dr. Fischer’s opinions, because they are not supported by Lofi. For example, Dr. Fischer opines that Lofi’s 8-minute pedaling test assesses both endurance *and* power. Ex. 1005, *Id.*, ¶64. But the pedaling test measures only one attribute that is used in the calculation of an aggregate score: endurance. *See id.*, 39:16–25. In my opinion, Lofi never discloses a calculation of power. In fact, Lofi has no mention of “power” in the reference. *See* Ex. 1002, 33:7–23. Lofi only discloses that an endurance measurement is expressed as a “maximum oxygen consumption,” using Watts as the unit of measurement. *Id.*

Dr. Fischer offers a similar opinion on Lofi's test for measuring lower limb strength. Ex. 1005, ¶50. Dr. Fischer claims that Lofi's strength test assesses both strength *and* power. *Id.* But once again, Lofi never mentions "power." *Id.*

61. It is my opinion that lululemon also fails to meet its burden on this claim limitation because the "first activity data" identified by lululemon is not derived from a single "athletic movement" performed in response to "first instructions." Instead, the purported "first activity data" identified by lululemon is obtained by measuring a series of athletic activities performed in response to different sets of instructions. For example, lululemon's expert, Dr. Fischer, opines that "a user may be provided with *a first set of instructions* to complete the strength test" where "corresponding activity data related to this movement is collected" and then "[u]pon completion of the strength test, a user may be *subsequently instructed* to commence a balance test"). Ex. 1005, ¶66. In my opinion, this confirms that Lofi's series of tests are performed in response to multiple sets of instructions. Because the activities identified by lululemon are performed in response to different instructions, they are not part of the same "athletic movement" as required by claim 1. In other words, by responding to a different instruction at a different time, the user is performing a different "athletic movement." Thus, in my opinion, lululemon has not shown that Lofi discloses calculating "a first combinatory fitness-athleticism score" from the "first activity data."

2. lululemon fails to show Lofi discloses “calculating, with the processor, based on the second activity data, a second combinatory fitness-athleticism score” (Limitation 1F)

62. It is my opinion that lululemon has not shown that Lofi discloses limitation 1F, i.e., calculating a “second combinatory fitness-athleticism score” based on “the second activity data.” As I discuss above in Section VIII.C, the “second activity data,” as properly construed, is “data, received from a sensor, that represents the second athletic movement.” And as I discuss above in Section VIII.A, a “second athletic movement,” as properly construed, is a “*single* athletic movement,” including a “single type of exercise or athletic activity.” Thus, the “second activity data” in limitation 1F—just like the “first activity data” in limitation 1C—is measured from a *single* “athletic movement.” ’930 patent, 26:26–27. That “second activity data” is then used to calculate both a “fitness sub-score” and an “athleticism sub-score,” which are in turn used to calculate the “combinatory fitness-athleticism score.” *Id.*, 26:28–33. Like the “first activity data” in limitation 1C—the “second activity data” recited in claim 1 must (i) derive from a *single* “athletic movement” performed in response to “second instructions” and (ii) include separate measurements of both fitness and athleticism.

63. In my opinion, the “second activity data” that lululemon identifies in Lofi is different because it does not include measurements of both fitness and athleticism based on a *single* “athletic movement.” At the outset, I note that it is

unclear whether lululemon argues that the “second activity data” it identifies in Lofi is derived from an individual test or a series of tests. *See* Petition, 24. But either way, it is my opinion that lululemon has not shown that Lofi meets this limitation. Each test administered by Lofi is a single distinct test that yields only a single measurement. Ex. 1002, 33:7–38:6. If lululemon’s argument relies on a single test in Lofi, the “activity data” from this “athletic movement” cannot yield both a fitness sub-score *and* an athleticism sub-score. Rather, the measured data from each individual test is only capable of yielding a fitness sub-score *or* an athleticism sub-score—not both. *See id.* If lululemon’s argument relies on the series of tests disclosed in Lofi—i.e., multiple athletic movements—then any activity data derived from that series of tests is not “based on the second activity data.” *See id.* It is thus my opinion that lululemon has failed to show that Lofi discloses “calculating, with the processor, based on the second activity data, a second combinatory fitness-athleticism score,” as recited in limitation 1F.

3. lululemon fails to show Lofi discloses “wherein the first instructions and the second instructions include a predefined ordering of drills that are configured to be provided to the user during a single workout session” (Claim 7)

64. It is my opinion that lululemon has not shown that Lofi discloses claim 7, which recites “wherein the first instructions and the second instructions include a predefined ordering of drills that are configured to be provided to the user during a single workout session.” ’930 patent, 26:61–64. lululemon argues that “Lofi teaches

a series of tests in a single workout session,” each test has a “duration of approximately 15 minutes.” Petition, 26–27. But lululemon fails to support its conclusion that “the order of the tests is determined prior to commencing the workout session.” *Id.*, 27. Thus, in my opinion, lululemon has not shown that Lofi discloses this limitation.

B. Ground 2: lululemon Fails To Show The Lofi-Kitagawa Combination Renders Obvious Claims 1 and 5-7

65. It is my opinion that lululemon has not shown that Lofi in view of Kitagawa discloses or suggests any Challenged Claim in Ground 2.

1. lululemon fails to show Lofi in view of Kitagawa teaches or suggests “calculating with a processor, based on the first activity data, a first combinatory fitness-athleticism score” (Limitation 1C)

66. It is my opinion that lululemon fails to show that Lofi in view of Kitagawa discloses or suggests limitation 1C, which recites calculating a “combinatory fitness-athleticism score” based on “the first activity data.” Lululemon’s arguments fail for two reasons.

67. First, as I discuss above with respect to this limitation in Ground 1, Lofi does not calculate a first combinatory fitness-athleticism score based on “first activity data,” as properly construed. *See* Section VIII.C. The “first activity data” recited in claim 1 must (i) derive from a *single* “athletic movement” performed in response to “first instructions,” and (2) include separate measurements of both

fitness and athleticism. But the “first activity data” that lululemon identifies in Lofi does not serve as the basis for measuring attributes of both fitness and athleticism. In its discussion of limitation 1B, lululemon alleges that Lofi discloses a “first activity data” when it discloses a signal transmitted from a belt for monitoring abdominal contractions that is “proportionate to the effort exerted by the abdominal muscles.” Petition, 30–31. But this “activity data” does not yield both a fitness sub-score *and* an athleticism sub-score. ’930 Patent, 26:19–22, 26:34–42 (requiring that the fitness sub-score be calculated using one or more of an endurance, flexibility, and strength attribute, and the athleticism sub-score be calculated using one or more of speed, agility, reaction, power, and balance attributes). Rather, the “activity data” from this alleged “athletic movement” only yields a fitness sub-score: muscle strength. *See* Ex. 1002, 35:24–36:9. I note that lululemon provides no alternative teachings from Lofi for “activity data” in this Ground.

68. The “activity data” that lululemon points to for limitation 1C is different. Specifically, lululemon states that the terminal in Lofi “enables collection of ‘different measurements’ corresponding to an individual’s performance on each test (e.g., activity data).” Petition, 31–32. According to lululemon, Lofi then provides an “aggregate score corresponding . . . to the weighted average of each fitness test score.” *Id.*, 33. It is unclear whether lululemon is relying on the data from each individual test, or the data from series of tests, as constituting “activity data.”

But either way, it is my opinion that lululemon has not shown that a *single* athletic movement yields a “combinatory fitness-athleticism score” for the reasons I described when addressing limitation 1C for Ground 1 above.

69. Second, it is my opinion that lululemon’s proposed combination of Kitagawa with Lofi fails to cure these deficiencies. lululemon argues that “it would have been obvious to a POSITA to look to Kitagawa to incorporate simultaneous monitoring of multiple physical abilities (e.g., flexibility, balance, agility) into Lofi’s fitness tests and include Kitagawa’s pulse meter to achieve this goal.” Petition, 35–36. I disagree for a number of reasons. First, Kitagawa does not use a pulse meter to sense or monitor any physical or physiological parameters of the user while the user is performing an exercise course. A user of Kitagawa’s system only records their pulse prior to and after completing courses, and that measurement does not factor into any calculated score. Ex. 1004, 8:43–52. Rather, the only measurement taken as a user completes the courses is elapsed time (to complete each course), as measured from a stopwatch. Further, Kitagawa’s indexes are pre-defined constants stored in the memory of Kitagawa’s system that do not vary by user. *See id.*, 10: 61–65 (“Table 3 shows the amounts of exercise (shown as indexes) *to be performed* ins (sic) exercise courses 1 to 7”) (emphasis added). Thus, it is my opinion that Kitagawa does not use “activity data,” i.e., data, received from a sensor, that represents the first athletic movement, to calculate any assessment score.

70. Further, in my opinion, it would not have been obvious to “include Kitagawa’s pulse meter” into Lofi in order to meet Limitation 1[C]. Petition, 35–36. As noted above, Kitagawa does not use pulse data to calculate “physical strength age.” Kitagawa describes that a user only records their pulse at the beginning and ending of each exercise course. Ex. 1004, 8:43–52. More specifically, the purpose of measuring this pulse rate is “to help ensure that the user refrains from exercising excessively” and to “tell whether he/she has been exercising enough.” *Id.* Again, the only parameter that Kitagawa discloses is used in the calculation of “physical strength age” and/or “physical ability[ies]” is the time it takes him or her to complete the exercise course(s). Ex. 1004, 9:6–10, 11:1–4. Using pulse rate to inform readiness for physical activities or overall physiological state would have been obvious to a POSITA at this time. However, it is this same constrained understanding that would have rendered combining the teachings of Kitagawa with Lofi, and more specifically expanding the use of a pulse meter to continuously measure pulse rate and use these data to score the underlying activity, to be unobvious.

71. As noted above, completion time does not constitute “activity data” as recited in the ’930 patent’s claims. *Id.* It is not sensed by a sensor, nor does it “represent the first athletic movement.” As I discussed above in Section VIII.C, “activity data” is “data, received from a sensor, that represents the first athletic

movement.” Through the teachings of Kitagawa, a POSITA would understand that if two separate users perform one of Kitagawa’s obstacle courses and receive the same completion times, they would necessarily receive the same score. As such, insights into their comparative explicit performance attributes (i.e., fitness and/or athleticism) cannot be gleaned therefrom. For example, important performance distinctions between a first user demonstrating superior fitness attributes (e.g., strength), and a second user demonstrating superior athleticism attributes (e.g., power), could not be gleaned from Kitagawa’s time-governed scoring approach. It is thus my opinion that Kitagawa’s teachings are entirely independent of a user’s individualized performance.

72. All this aside, from a common-sense standpoint, incorporating Kitagawa’s pulse meter into Lofi’s system would still not meet this limitation. Kitagawa’s pulse meter would not be used to measure flexibility, strength, speed, agility, reaction, power, or balance. The only attribute that could arguably be measured by pulse data is endurance. Therefore, it is my opinion that there would be no need, for example, to also measure a user’s pulse as they are performing abdominal contractions. Thus, in my opinion, combining Kitagawa with the teachings of Lofi would neither have been considered obvious nor of value to a POSITA.

2. lululemon fails to show Lofi in view of Kitagawa teaches or suggests “calculating, with the processor, based on the second activity data, a second combinatory fitness-athleticism score” (Limitation 1F)

73. It is my opinion that lululemon fails to show that Lofi in view of Kitagawa discloses or suggests limitation 1F, which recites calculating a “second combinatory fitness-athleticism score” based on “the second activity data.”

74. For the same reasons I discussed above with respect to limitation 1F in Ground 1, lululemon has not shown that Lofi renders obvious limitation 1F. lululemon has not met its burden to show that Lofi discloses limitation 1F because the “second activity data” that lululemon identifies in Lofi does not include *separate* measurements of both fitness and athleticism based on a *single* athletic movement performed in response to “second instructions,” as required by the proper construction of “second activity data.” Petition, 20–22, 24, 39–41. These same flaws undermine any argument that Lofi renders obvious limitation 1F, and support my opinion that lululemon does not present any arguments that Lofi renders obvious limitation 1F.

75. It is also my opinion that Kitagawa does not cure the deficiencies in lululemon’s arguments. As I discussed above in Section X.B.1, Kitagawa does not disclose the calculation of a “combinatory fitness-athleticism score” calculated with a processor based on “activity data.” Kitagawa only relies on elapsed time, not any data directly related to a user’s activity. Ex. 1004, 9:6–10, 11:1–4. Thus, for the same

reasons Kitagawa does not teach or suggest the calculation of a first combinatory fitness-athleticism score based on first activity data (limitation 1C), it is my opinion that Kitagawa also does not teach or suggest the calculation of a second combinatory fitness-athleticism score based on second activity data (limitation 1F).

3. lululemon fails to show a motivation to combine Lofi with Kitagawa

76. lululemon argues 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, 27. But it is my opinion that a POSITA would never have looked to Kitagawa to remedy Lofi’s failure to calculate combinatory scores based on data measured from a single “athletic movement.”

77. Kitagawa does not use “activity data” that is received from a sensor or based on user performance when “measuring age on the basis of physical strength.” Ex. 1004, 2:14–16. Contrary to how Dr. Fischer describes Kitagawa—a “sensing system[]” for “monitor[ing] users” that “streamline[s]” “physical fitness assessments”—Kitagawa would be more aptly described as a standard process for self-monitoring fitness at that time. Ex. 1005, ¶¶125–126. As Kitagawa describes, a user must check in at a service counter to have biometric measurements taken, and take a scorecard to record their own time as they move through the exercise courses, and then return to the counter to have their age score calculated. *See id.*, 8:30–42.

Kitagawa does not use any user-specific physiological data in the calculation of the age score. Instead, Kitagawa only compares a user's course completion time against an index to arrive at a score. Thus, it is my opinion that there would have been no reason for a POSITA, looking to use sensed data to calculate fitness and athleticism scores, to turn to Kitagawa.

78. Therefore, it is my opinion that lululemon fails to show that a POSITA would have been motivated to combine Lofi and Kitagawa.

C. Ground 3: lululemon fails to show Maeueler in view of Kitagawa renders obvious claims 1, 5-7, and 12

79. It is my opinion that lululemon has not shown that Maeueler in view of Kitagawa discloses or suggests any Challenged Claim in Ground 3.

1. lululemon fails to show Maeueler teaches or suggests calculating “a first combinatory fitness-athleticism score” that is “based on the first activity data” (Limitation 1C).

80. It is my opinion that lululemon fails to show that Maeueler in view of Kitagawa discloses or suggests limitation 1C, which recites calculating a “combinatory fitness-athleticism score” based on “the first activity data.” As I discussed above in Section VIII.C, the “first activity data,” as properly construed, is “data, received from a sensor, that represents the first athletic movement.” And as I further discussed above in Section VIII.A, a “first athletic movement,” as properly construed, is a “*single* athletic movement, which consists of a *single* type of exercise or athletic activity.” Thus, the “first activity data” in limitation 1C is measured from

a *single* athletic movement, namely the “first athletic movement.” That “first activity data” is then used to calculate both a “fitness sub-score” and a separate “athleticism sub-score,” which are in turn used to calculate the “combinatory fitness-athleticism score.” In other words, the “first activity data” recited in claim 1 must (i) derive from a *single* athletic movement performed in response to “first instructions,” and (ii) include separate measurements of both fitness and athleticism.

81. It is my opinion that the activity data that lululemon identifies in Maeueller is different than the claimed “first activity data.” lululemon relies on Maeueller’s disclosure of an “aggregate fitness index” calculated from activity data gathered from *multiple* distinct exercises, i.e., “athletic movements,” performed in response to separate instructions. Petition, 51–52. Maeueller teaches assessing health by measuring up to five “components of fitness”: “endurance, strength, flexibility, balance, and body composition.” Ex. 1003, [0004]. Maeueller teaches that each component is assessed separately by performing separate tests in response to separate instructions. Ex. 1003, [0023] (“[T]he user may also select one or more components of physical fitness and the computing module handles the selection of suitable, representative fitness tests associated to each selected component.”). For example, Maeueller teaches the “Stork balance test” to measure balance. *Id.*, [0044]. Maeueller also teaches “a run test, a walk test or a step test” to measure cardiovascular endurance and push-ups to measure muscle strength of the upper

body. *Id.*, [0031], [0037]. Accordingly, it is my opinion that lululemon cannot identify any teaching or suggestion in Maeueller of a “combinatory fitness-athleticism score” derived from a *single* “athletic movement” performed in response to “first instructions.

82. In my opinion, lululemon’s reliance on Figure 5 of Maeueller highlights this deficiency. Petition, 51–52. Pointing to Figure 5, lululemon argues that a user of Maeueller’s system “can select two components of physical fitness to assess” such as flexibility and balance. *Id.*, 52. According to lululemon, the user in Maeueller “perform[s] the exercises associated with each test” and “receive[s] a numerical fitness test result reflecting a combination of the flexibility and balance attributes being evaluated.” Petition, 52 (citing Ex. 1005, ¶94). But, in my opinion, Figure 5 clearly shows that the “aggregate fitness index 55” is calculated based on a series of separate exercises—not a *single* “first athletic movement”:

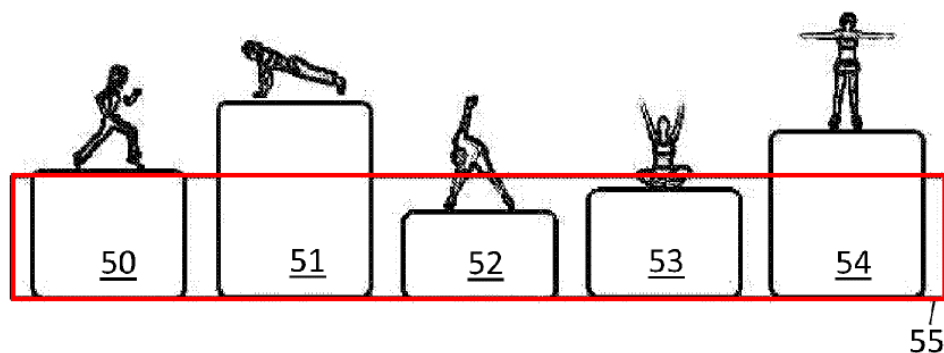


FIG. 5

Ex. 1003, Fig. 5 (annotated to show “aggregate fitness index 55”); *see also id.*, [0052] (“Each health-related component is presented by a column: cardiovascular

endurance 50, muscle strength 51, flexibility 52, balance 53, body composition 54 and an aggregate fitness index 55.”). Further, it is my opinion that lululemon’s discussion of claim 1 further underscores that Maeueller uses multiple different, discrete exercises to generate Maeueller’s aggregate fitness index. *See* Petition at 52 (“a user can . . . perform the exercises associated with each test”), 54 (“Maeueller’s computing module receives both the collected *first activity data corresponding to the first test* (e.g., flexibility) as well as *second activity data corresponding to the second test* (e.g., balance).”).

2. lululemon fails to show Maeueller teaches or suggests calculating a second combinatory fitness-athleticism score that is “based on the second activity data” (Limitation 1F)

83. It is my opinion that lululemon fails to show that Maeueller in view of Kitagawa discloses or suggests limitation 1F, which recites calculating a “second combinatory fitness-athleticism score” based on “the second activity data” performed in response to “second instructions.”

84. As I discuss for Grounds 1 and 2, the “second activity data,” as properly construed, is “data, received from a sensor, that represents the second athletic movement.” And as I discussed above in Section VIII.A, a “second athletic movement,” as properly construed, is a “*single* athletic movement, which consists of a *single* type of exercise or athletic activity.” Thus, the “second activity data” in limitation 1F—just like the “first activity data” in limitation 1C—is measured from

a *single* athletic movement, namely the “second athletic movement.” That “second activity data” is then used to calculate both a “fitness sub-score” and an “athleticism sub-score,” which are in turn used to calculate the “combinatory fitness-athleticism score.” In other words—just like I discuss above with regards to the “first activity data” in limitation 1C—the “second activity data” recited in claim 1 must (i) derive from a *single* athletic movement performed in response to “second instructions” and (ii) include separate measurements of both fitness and athleticism.

a) Each of Maeueller’s tests yield only a single measurement

85. Unlike limitation 1C where lululemon argued that the combinatory score was disclosed by two separate tests (i.e. flexibility and balance, *see* Petition, 51–52), lululemon alleges here that Maeueller’s disclosure of an exemplary endurance test teaches a first combinatory fitness-athleticism score. Petition, 55. It is my opinion that lululemon’s argument fails because each of Maeueller’s tests for endurance, strength, flexibility, balance, and body composition, yield only a single, discrete fitness or athleticism measurement for each test, and, thus, cannot provide a “combinatory fitness-athleticism score.”

86. Specifically, lululemon points to Maeueller’s endurance test in which “a user is instructed to run for 12 minutes,” and alleges that “the user is monitored by one or more peripheral devices [that] collect heart rate data and speed data.” Petition, 55 (citing Ex. 1005, ¶105). According to lululemon, “Maeueller’s computing module

calculates a fitness index numerical score that is a combination of the endurance and speed attributes being assessed.” *Id.* I disagree. Maeueller does not teach calculating a speed component as part of its “aggregate fitness index.” *See* Ex. 1003, [0031]–[0036]. The only “component of physical fitness” that Maeueller associates with the run test is endurance. *See id.* Thus, it is my opinion that Maeueller’s 12-minute run test does not teach or suggest “a combinatory fitness-athleticism score” because Maeueller does not teach or suggest calculating *both* a fitness sub-score and a separate athleticism sub-score based a *single* “athletic movement” (i.e., the run test).

b) Kitagawa does not cure the deficiencies of Maeueller

87. lululemon relies on Kitagawa in the alternative to satisfy limitation 1F. *See* Petition, 56–58. But it is my opinion that Kitagawa does not cure the deficiencies in Maeueller because Kitagawa also fails to teach or suggest a method of calculating *both* a fitness sub-score and an athleticism sub-score (and as a result, a second “combinatory fitness-athleticism score”) based on a *single* “second athletic movement. As I discussed above, the “second activity data” recited in claim 1 must (i) derive from a *single* athletic movement performed in response to “second instructions” and (ii) include separate measurements of both fitness and athleticism.

88. In my opinion, lululemon fails to identify sub-scores based on a *single*, “second athletic movement.” lululemon points to Table 3 of Kitagawa as allegedly teaching “a second combinatory fitness-athleticism score.” *See* Petition, 57–58.

Specifically, lululemon alleges that the collection of “indexes” disclosed in Table 3 represent multiple fitness and athleticism sub-scores. *Id.*, 56 (citing Ex. 1004, 2:33-36). I disagree. Kitagawa’s “indexes” are not fitness and athleticism sub-scores for two reasons. First, Kitagawa’s indexes are not “based on the second activity data” as recited in claim limitation 1F. As I discussed above in Section X.B.1, Kitagawa’s indexes are not based on any “activity data” because they are based on any measured activity parameter at all. Second, the indexes are not based on a *single* “second athletic movement.” Instead, it is my opinion that Kitagawa’s indexes are representative of the amount of exercise to be performed when a user completes an *entire* exercise course. *See id.*, 10: 61–65.

3. lululemon fails to show a motivation to combine Maeueller with Kitagawa

89. It is my opinion that lululemon fails to show that a POSITA would have been motivated to combine Maeueller and Kitagawa to arrive at claim 1 for at least two reasons.

90. First, as I discuss for Ground 2, Kitagawa does not use “activity data” that is received from a sensor or based on user performance when “measuring age on the basis of physical strength.” Ex. 1004, 2:14–16. Kitagawa teaches that a user must check in at a service counter to have biometric measurements taken, and take a scorecard to record their own time as they move through the exercise courses, and then return to the counter to have their age score calculated. *See id.*, 8:30–42.

Kitagawa does not use any user-specific physiological data in the calculation of the age score. Instead, it is my opinion that Kitagawa only compares a user's completion time against an index to arrive at a more generic score. Thus, as I discuss above, two users having different performances, and demonstrating explicitly different fitness and athleticism abilities, would obtain the same age score if they complete the obstacle course in the same time.

91. Second, it is my opinion that a POSITA would not have looked to combine Kitagawa with Maeueller because Maeueller already solves the problem that lululemon relies on Kitagawa to solve. lululemon alleges that “it would have been obvious to a POSITA to look to Kitagawa and incorporate Kitagawa’s simultaneous monitoring of multiple physical abilities . . . into Maeueller” and that a POSITA would have done so “[i]n order to more comprehensively understand which components need improvement.” Petition, 57–58 (citing Ex. 1005, ¶136). Kitagawa’s failure to monitor any activity notwithstanding, it is my opinion that Maeueller already does this. Maeueller monitors a user performing different exercises so that it can “assist the user in deciding upon a direction for further workout.” *See* Maeueller, [0010]. Thus, it is my opinion that the proposed combination is unnecessary because Maeueller already helps the user “to more comprehensively understand which components need improvement.” Petition, 57–58 (citing Ex. 1005, ¶136).

92. Therefore, it is my opinion that lululemon fails to show that a POSITA would have been motivated to combine Maeueller and Kitagawa.

4. lululemon fails to show Maeueller in view of Kitagawa discloses “wherein the first instructions and the second instructions include a plurality of drills configured to test a plurality of fitness attributes of the user and a plurality of athleticism attributes of the user” (Claim 6)

93. It is my opinion that lululemon has not shown by that Maeueller in view of Kitagawa discloses claim 6, which recites “wherein the first instructions and the second instructions include a plurality of drills configured to test a plurality of fitness attributes of the user and a plurality of athleticism attributes of the user.” Ex. 1001, 26:57–60. Specifically, lululemon fails to show that Maeueller discloses “a plurality of athleticism attributes of the user.” Instead, lululemon identifies only a single athleticism attribute—balance. lululemon alleges that “Maeueller provides instructions for a plurality of drills, such as strength, flexibility, endurance, and balance drills.” Petition, 62. But the ’930 patent defines strength, flexibility, and endurance as fitness attributes. *See* ’930 patent, 26:34–37 (“wherein the fitness sub-score is calculated, by the processor, using one or more of an endurance fitness attribute, a flexibility fitness attribute and a strength fitness attribute of the user.”). lululemon therefore only points to a single athleticism attribute, not “a plurality of athleticism attributes of the user” as recited in claim 6.

I hereby 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 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: September 22, 2023

A handwritten signature in dark ink, appearing to read 'S. McLean', with a long horizontal flourish extending to the right.

Scott McLean, Ph.D.

Attachment A



Exponent[®]
Engineering & Scientific Consulting

Scott McLean, Ph.D.

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Professional Profile

Dr. McLean's areas of expertise include injury biomechanics, gait and locomotion and human performance assessment and modification, publishing extensively in each of these fields. He has more than two decades of experience in analyzing and countering injury mechanisms via a combination of human experimentation, cadaveric and computational modeling approaches. In particular, he has targeted joint and soft tissue injuries and resultant disease risk in response to dynamic high impact loading scenarios. His related research foci include sports-specific joint injury mechanisms and prevention, high-impact soft tissue mechanical analyses and lower limb anatomical and neuromechanical adaptations to loads across the lifespan. Through this work, he has obtained extensive expertise in utilizing state-of-the-art 3-D motion analysis techniques, wearable inertial sensor technologies and integrated 3-D imaging and computational (Finite Element) modeling methods.

Dr. McLean also has considerable expertise in applying state-of-the-art wearable technologies to the optimization of human movement and performance within a variety of clinical, sporting and military settings. His strengths in this area lie specifically in the ability to interpret and distil the often large and unique data sets derived from these technologies into easily understood baseline metrics that successfully characterize and can be used to improve key performance outcomes.

Prior to joining Exponent, Dr. McLean was the Director of Human Innovation Research at Fitbit, where he derived and lead a number of key research initiatives focusing on characterization and improvement of wearable product accuracies and performance on a global scale. He was also a Professor at the University of Michigan, where he drove a number of high-profile research studies geared towards human performance optimization and injury assessment and prevention within naturalistic military and sports environments. During his tenure at Michigan, Dr. McLean gained considerable teaching experience in the areas of biomechanics, imaging and computational analysis and modeling, both at the undergraduate and graduate levels. He initially was a Project Staff Scientist and the Director of Sports Health and Orthopedic Rehabilitation at the Cleveland Clinic, where he was the team biomechanical consultant for Cleveland's professional sporting teams.

Academic Credentials & Professional Honors

Ph.D., Human Movement Studies, University of Queensland, Australia, 2001

M.Sc., Human Movement Studies, University of Queensland, Australia, 1994

B.Sc., Human Movement Studies, University of Queensland, Australia, 1991

Post-Doctoral Research Fellow, Bioengineering, Cleveland Clinic Foundation, 2001

Chair, American College of Sports Medicine, Biomechanics, 2011

Executive Council, International Society of Biomechanics, 2011-2015

Academic Appointments

Adjunct Professor, School of Health and Life Sciences, University of Ballarat (Federation University), 2005-2006.

Prior Experience

Director, Human Innovation Research, Fitbit, 2016-2018

Director, Human Performance and Innovation Laboratory, University of Michigan, 2007-2015

Professor, School of Kinesiology, University of Michigan, 2007-2015

Director, Sports Health and Orthopaedic Rehabilitation, Cleveland Clinic, 2005-2006

Staff Scientist, Department of Biomedical Engineering, Cleveland Clinic, 2001-2006

Professional Affiliations

National Consumer Technology Association (voting member)

American Society of Biomechanics (member)

American College of Sports Medicine (fellow)

International Society of Biomechanics (member)

Publications

Fox AS, Bonacci J, McLean SG, Saunders N. Exploring individual adaptations to an anterior cruciate ligament injury prevention program. *Knee* 2017; 25:83-98.

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Scott McLean, Ph.D.
04/22 | Page 2

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van den Bogert AJ, McLean SG. ACL injuries: do we know the mechanisms? Journal of Orthopaedic Sports Physical Therapy 2007 37:A8-9.

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van den Bogert AJ, McLean SG. Letters to the editor. American Journal of Sports Medicine 2006 34:312-315.

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McLean SG, Walker K, Ford KR, Myer GD, Hewett TE, van den Bogert AJ. Evaluation of a two-dimensional analysis method as a screening and evaluation tool for anterior cruciate ligament injury.

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McLean SG, Huang X, van den Bogert AJ. Sagittal plane biomechanics cannot injure the ACL during sidestep cutting. Clinical Biomechanics 2004 19: 828-838.

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McLean SG, Neal RJ, Myers PT, Walters MR. Knee joint kinematics during the sidestep cutting manoeuvre: potential for injury in females. Medicine and Science in Sports and Exercise 1999 31: 959-968.

McLean SG, Myers PT, Neal RJ, Walters MR. A quantitative analysis of knee joint kinematics during the sidestep cutting maneuver. Implications for non-contact anterior cruciate ligament injury. Bulletin for Hospital of Joint Disease 1998 57: 30-38.

Presentations

Invited Presentations and Seminars

McLean SG. Changing the landscape of injury prevention - Invited Symposium. American Society of Biomechanics Annual Congress, Columbus, OH, August 5, 2015.

McLean SG. Field-based assessment of warfighter performance and performance degradation via a novel body-worn IMU array. American College of Sports Medicine Featured Science Session. Orlando, FL, May 28, 2014.

McLean SG. Taking the lab to the game: Towards innovative field-based injury screening and prevention. IOC World Conference: Prevention of Injury and Illness in Sport. Monaco, April 13, 2014.

McLean SG. Application of innovative technologies to assess injury risk and performance degradation in naturalistic settings: Moving beyond the lab. Invited Visiting Professor, Steadman Phillipon Research Institute, Vail, CO, June 3, 2013.

McLean SG. Effects of maturation on lower limb female joint morphologies: Implications for short- and long-term joint health. Invited Faculty Presentation, University of Aalborg, Aalborg, Denmark, November 14, 2012.

McLean SG. Preventing what we don't know. Modifiable and non-modifiable ACL injury risk factors. Feature Scientific Presentation. National Athletic Trainers Association Annual Meeting, St. Louis, MO. June 26 – 28, 2012.

McLean SG. Interactive morphological and mechanical contributions to knee joint health. Invited Visiting Professor Presentation, University of Oregon, Eugene, OR. April 13, 2012.

McLean SG. Evolving theories pertaining to the mechanism/s of non-contact ACL injury: Integrating the modifiable and non-modifiable factors. Invited Faculty Presentation, University of Limerick, Limerick, Ireland. March 12, 2012.

McLean SG. Fatigue contributions to knee loading during high-impact landings. Training the brain to protect the ACL. Invited Keynote Speaker, The Future of Fatigue: Defining the Problem, Bathurst, Australia. August 22-26, 2011.

McLean SG. Modelling individual-specific neuromuscular and morphologic contributions to knee injury: moving beyond homogeneous prevention models. Invited Symposium Speaker, European College of Sports Science, Liverpool, UK. July 6-9, 2011.

McLean SG. Training for a Stronger ACL: Integrative Anatomical and Ultrastructural Considerations. Invited Keynote at the Oslo Sports Trauma Research Center's Annual Spring Retreat, Oslo, Norway. May, 2011.

McLean SG. The ACL injury enigma: A complex problem requiring an equally complex solution. Invited Keynote Address, Second Muscletech Network Workshop, Barcelona, Spain. September, 2010.

McLean SG. Integrative morphologic and mechanical contributions to knee health across the lifespan. Invited Faculty Presentation, University of North Carolina, Greensboro, NC. April, 2010.

McLean SG. Anatomical predictors of high-risk knee joint loading states. Invited Symposium Speaker and Chair, 2nd World Congress on Sports Injury Prevention. Tromso, Norway, June 25-28, 2008.

McLean SG. The ACL injury enigma: We cannot prevent what we don't understand, Research Retreat IV – ACL Injuries: The Gender Bias, Greensboro, NC. April 3-5, 2008.

McLean SG. A combined assessment of the ACL injury mechanism: Where do we go from here? Invited visiting professor, Department of Physical Therapy, The University of Delaware, April, 2006.

McLean SG. Identifying the ACL injury mechanism: An integrative approach to a complex problem. Invited Symposium Chair, The American College of Sports Medicine Annual Conference, Denver CO, June, 2006.

McLean SG. The ACL injury dilemma: Prevention is impossible if we don't know the cause. Invited Keynote presentation at the Australian Conference of Science and Medicine in Sport, Melbourne Australia, 2005.

McLean SG, Huang X, Su A, van den Bogert AJ. Neuromuscular control contributions to ACL injury: Identification via computer simulation. Invited to present at the AESS Exercise and Sports Science Conference, Brisbane Australia, April, 2004.

Myers P, McLean SG, Neal R (1998). The Cutting Manoeuvre: Kinetics, Kinematics and Caution. Invited to present at the Football Australasia: Reducing the Injury List Conference. Melbourne, Australia, July, 1998.

Selected Published Abstracts and Conference Proceedings (from 112 Total)

Fox A, Cain SM, McGinnis RS, Davidson SP, Vitali R, Perkins NC, McLean SG. Ability of body worn inertial measurement units to detect changes in performance during a loaded step task. 7th World Congress of Biomechanics, Boston, MA, July 6-11, 2014.

Davidson SP, McGinnis RS, Cain SM, Vitali R, McLean SG, Perkins NC. Validating internal measurement units as a method for determining rifle aiming performance. 7th World Congress of Biomechanics, Boston, MA, July 6-11, 2014.

Cain SM, McGinnis RS, Davidson SP, Vitali R, McLean SG, Perkins NC. An IMU-based method for

quantifying gait: algorithm development and comparisons to motion capture and instrumented treadmill data. 7th World Congress of Biomechanics, Boston, MA, July 6-11, 2014.

McGinnis RS, Cain SM, Davidson SP, Vitali R, McLean SG, Perkins NC. Validation of IMU-based method for tracking warfighter motion during jumping maneuver. 7th World Congress of Biomechanics, Boston, MA, July 6-11, 2014.

McGinnis RS, Cain SM, Davidson SP, Vitali R, McLean SG, Perkins NC. Validation of IMU-based method for tracking warfighter torso angle during up-down maneuver. 7th World Congress of Biomechanics, Boston, MA, July 6-11, 2014.

Cain SM, McGinnis RS, Davidson SP, Vitali R, Perkins NC, McLean SG. Using Inertial Measurement Units to Quantify Gait Performance. Dynamic Walking. Zurich, Switzerland, June 10-13, 2014.

McGinnis RS, Cain SM, Davidson SP, Vitali R, McLean SG, Perkins, NC. Validation of Complementary Filter Based IMU Data Fusion for Tracking Torso Angle and Rifle Orientation. 2014 ASME International Mechanical Engineering Congress and Exposition, Montreal, QC, November 14-20, 2014.

Davidson S, Goulet GC, Cain S, Perkins S, McLean SG. IMU derived predictors of jump landing performance success and degradation. 37th Annual Meeting of the American Society of Biomechanics, Omaha, NE, September 4-7, 2013.

Davidson S, Goulet GC, McLean SG. Modulating ACL and intercondylar notch indices in maturing females: Implications for ligament injury. XXIV Congress of the International Society of Biomechanics, Natal, Brazil, August 4-9, 2013.

Deneweth JM, Arruda EM, McLean SG. Evaluation of hyperelastic models for tibial articular cartilage under high strain rate loading. XXIV Congress of the International Society of Biomechanics, Natal, Brazil, August 4-9, 2013.

Deneweth JM, Newman KE, Pomeroy SM, Sylvia SM, Arruda EM, McLean SG. Physiological mechanical properties of healthy cartilage across the distal femur. XXIV Congress of the International Society of Biomechanics, Natal, Brazil, August 4-9, 2013.

Williams CM, Deneweth JM, Goulet GC, McLean SG. Maturation-induced modifications in non-modifiable tibial slope parameters. American College of Sports Medicine Annual Conference, Indianapolis, IN, May 28 – June 1, 2013.

Pomeroy SM, Deneweth JM, Goulet GC, McLean SG. Hamstring moment arm ratios in maturing females and their influence on ACL injury. American College of Sports Medicine Annual Conference, Indianapolis, IN, May 28 – June 1, 2013.

Davidson SP, Deneweth JM, Goulet GC, McLean SG. Effect of maturation scale on comparative knee joint morphologies. American College of Sports Medicine Annual Conference, Indianapolis, IN, May 28 – June 1, 2013.

Deneweth JM, Pomeroy SM, Arruda EM, McLean SG. Topographical mapping of human femoral elastic moduli under physiological loading. Orthopaedic Research Society Annual Meeting, San Antonio, TX, January 26-29, 2013.

Davidson SP, Deneweth JM, McLean SG. Maturational contributions to comparative lower limb muscle volumes: Implications for knee joint injury. Orthopaedic Research Society Annual Meeting, San Antonio, TX, January 26-29, 2013.

Williams CM, Deneweth JM, McLean SG. Maturation-induced modifications in “non-modifiable joint

morphologic ACL injury predictors. Orthopaedic Research Society Annual Meeting, San Antonio, TX, January 26-29, 2013.

Deneweth JM, Newman KE, Sylvia SM, McLean SG, Arruda EM. Human tibial cartilage reveals non-linear and non-uniform regional topography under physiological loading rates. ASME Summer Bioengineering Conference, Puerto Rico, June 20-23, 2012.

Deneweth JM, Sylvia SM, Newman KE, McLean SG, Arruda EM. Mapping the Mechanical Topography of Healthy Tibial Cartilage. American Society of Biomechanics Annual Meeting. Gainesville, FL. August 15-18, 2012.

Deneweth J, Arruda E, Newman KE, McLean SG. Characterization of Regional Variations in Cartilage Stiffness Across the Human Tibia. Congress of the International Society of Biomechanics. July 4-7, 2011.

Deneweth J, McLean SG, Arruda E. Homogeneous Finite Element Formulations of Articular Cartilage Do Not Reflect Natural Indentation Mechanics. Transactions of the Orthopaedic Research Society, Long Beach, CA. January 16-18, 2011.

McLean SG, Oh Y, Lucey SM, Lucarelli DD, Ashton-Miller JA, Wojtys EH. Tibial acceleration and slope contributions to ACL loading during a simulated landing impact. Proceedings of the American Society of Biomechanics Annual Congress. Providence, RI. August, 2010.

McLean SG, Oh Y, Lucey SM, Lucarelli DD, Ashton-Miller JA, Wojtys EH. Integrative Impact of Tibial Slope and Tibial Acceleration on ACL Injury Risk. Proceedings of the 17th Congress of the European Society of Biomechanics, Edinburgh, Scotland. July 5-8, 2010.

Beaulieu ML, Brown TN, Palmieri-Smith RM, McLean SG. Association between muscle activation patterns, muscle strength, and knee mechanics during a jump landing task varies across maturation. Proceedings of the 17th Congress of the European Society of Biomechanics, Edinburgh, UK. July 5-8, 2010.

Beaulieu ML, Brown TN, Palmieri-Smith RM, McLean SG. Relationship between knee mechanics during a jump landing task and hip strength varies across maturation. Proceedings of the 57th Annual Meeting of the American College of Sport Medicine, Baltimore, MD. June 2-5, 2010.

McLean SG, Rohrer S, Brandon C. Association between knee structure and mechanics during dynamic single leg landings: Implications for ACL injury. American College of Sports Medicine Annual Congress. Seattle, WA. May 26-29, 2009.

McLean SG, Rohrer S, Brandon C. Knee joint anatomy predicts in vivo dynamic knee load states. Orthopaedic Research Society Annual Congress, Las Vegas, February, 2009.

McLean SG, Samorezov J, Palmieri-Smith RM. Non-contact ACL injury risk is linked directly to fatigue-induced central pathway degradation. 2nd World Congress on Sports Injury Prevention. Tromso, Norway, June 25-28, 2008.

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McLean SG, Huang X, Su A, van den Bogert AJ. Identification of neuromuscular control contributors to non-contact ACL injury via computer simulation techniques. Proceedings of the European Society of Biomechanics Annual Conference, The Netherlands, July 4-6, 2004.

McLean SG, Su A, van den Bogert AJ. Determining neuromuscular contributions to ACL injury risk via computer simulation. Transactions of the 49th Annual Meeting of the Orthopaedic Research Society, Vol 48, New Orleans, USA, 2003.

McLean SG, Lipfert S, Bogert AJ van den. Effects of a simulated defensive opponent on sidestep biomechanics. Accepted for presentation at the XIXth Congress of the International Society of Biomechanics, Dunedin, New Zealand, 2003.

McLean SG, Su A, Bogert AJ van den. Estimating 3D external knee loading during sidestepping and their role in ACL injury via computer simulation. Proceedings of the Orthopaedic Research Society, New Orleans, USA, Feb 1st-5th, 2003.

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McLean SG, Su A, Bogert AJ van den. A 3D computer model for non-contact ACL injury simulation. XVIIIth Congress of the International Society of Biomechanics, Zurich, Switzerland, 2001.

McLean SG, Su A, Bogert AJ van den. Simulation of acute musculoskeletal injuries in humans: a novel approach. 8th International Symposium on Computer Simulation in Biomechanics, Milan, Italy, pp. 23-27, 2000.

McLean SG, Bogert AJ van den. ACL elongations during running and sidestepping. American Society of

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McLean, S.G. and Bogert, A.J. van den. Quantification of in vivo ACL elongation during dynamic joint movements: A new methodology. Combined French and Canadian Societies of Biomechanics Annual Conference, Montreal, August, 2000.

McLean SG, Neal, R, Daniel W, Galloway G, Myers P. Mechanical response of the ACL to hazardous movements. Ann. Biomed. Engng. 26, Suppl. 1:S111. Abstract supplement for annual meeting of the Biomedical Engineering Society, Cleveland OH, 1998.

McLean S, Neal R, Daniel W, Galloway G, Grozier S, Myers P. The in vivo mechanical response of the ACL during a typical sidestep cutting maneuver. Sports Medicine Australia Annual Conference (Qld Branch), Coolumb, Queensland, Australia, 1998.

McLean, S., Neal, R. and Walters, M. Three-dimensional knee joint kinetics during running – characterization of joint moment patterns. Proceedings of the Second Australia and New Zealand Society of Biomechanics Conference. Auckland, New Zealand, January 1998.

McLean, S., Neal, R., Myers, P. and Macdonald, M. Gender comparisons of knee joint biomechanics during sidestep cutting manoeuvres: Implications for injury. Proceedings of the International Society of Biomechanics Congress, XVI. Tokyo, Japan, August 1997.

McLean, S., Myers, P. and Neal, R. Knee kinematics during the cutting manoeuvre: A clinical Perspective. Proceedings of the Biennial Congress of the International Society of Arthroscopy, Knee Surgery and Sports Medicine. Buenos Aires, Argentina, May 1997.

Myers, P., McLean, S. and Neal, R. The cutting manoeuvre as a mechanism of non-contact ACL injury. Presented at The Australian Knee Society Annual Conference. Perth, Western Australia, 1996.

Project Experience

Principal Investigator on large-scale research effort utilizing state-of-the-art wearable technologies to develop, analyze and optimize complex warfighter performance metrics in a variety of naturalistic military environments.

Lead a series of experiments for high-profile sports company investigating impact of new sports-specific apparel designs on resultant performance outcomes and injury risk via novel wearable technologies.

Lead a successful research initiative for the National Football League examining effects of game-induced neuromuscular fatigue on key performance outcomes and the subsequent risk of lower limb injury.

Lead a government funded research project adopting complex 3-D computational modeling methods to evaluate mechanisms of knee joint injury and disease risk in at risk female sports populations.

Editorships & Editorial Review Boards

Editorial Board, Journal of Science and Medicine in Sport, 2005 – 2011

Editorial Board, Medicine and Science in Sports and Exercise, 2006 – 2011

Peer Reviewer

Medicine and Science in Sports and Exercise, 2003 – present

Journal of Science and Medicine in Sport, 2004 – present
American Journal of Sports Medicine, 2004 – present
Clinical Biomechanics, 2004 – present
Journal of Biomechanics, 2004 – present
Annals of Biomedical Engineering, 2005 – present
Journal of Athletic Training, 2005 – present
Journal of Orthopaedic Research, 2006 – present
Journal of Motor Behavior, 2006 – present
British Journal of Sports Medicine, 2006 – present
Journal of Biomechanical Engineering, 2006 – present
Journal of Mechanics in Medicine and Biology, 2012 – present

Attachment B

McLean Testimony List – 2019 to 2023

Case Name	Venue	Date	Type
Nike, Inc. v Lululemon USA, Inc., et al.	Southern District of New York, US District Court	Dec 06, 2022	Deposition