**UNITED STATES PATENT AND TRADEMARK OFFICE**

_____

**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

_____

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

v.

NIKE, INC.,
Patent Owner.

_____

Patent No. 9,278,256

_____

*Inter Partes* Review No. IPR2023-00189

---

# REPLY DECLARATION OF DR. KEVIN LYNCH, PH.D.

## TABLE OF CONTENTS

# I. INTRODUCTION

1. I am a professor at Northwestern University's McCormick School of Engineering and the director of Northwestern University's Center for Robotics and Biosystems. I described my qualifications in detail in my opening declaration dated November 8, 2022, which I understand is Exhibit 1003 to this proceeding.

2. I have been asked to consider Nike's Patent Owner Response (Paper 18) and the August 7, 2023, Declaration of Dr. Toney-Bolger (Ex. 2005) and provide rebuttal opinions regarding the same. In performing my analysis in this proceeding, I have considered the '256 patent (Ex. 1001), its prosecution history, and Exhibit Nos. 1004-1012, 1016, 1018 and 2005-2012. I also observed the deposition of Dr. Toney-Bolger on October 12, 2023, at the Chicago offices of Arnold & Porter Kaye Scholer LLP.

3. I am being compensated for my time at my standard consulting rate. I am also being reimbursed for expenses that I incur during my work. My compensation does not depend on the results of my study and analysis, the substance of my opinions, or the outcome of any proceeding involving the Challenged Claims. I have no financial interest in the outcome of this matter or in any litigation involving the '256 patent.

4. I have personal knowledge of the facts and opinions set forth in this declaration and believe them to be true. If called upon to do so, I would testify

competently thereto. I have been warned that willful false statements and the like are punishable by fine or imprisonment, or both.

5. Although I am not a lawyer and will not provide any legal opinions, I have been advised to apply certain legal standards in forming my opinions. I set forth my understanding of those legal standards in my opening declaration. (*See* Ex. 1003 (Nov. 8, 2022, Lynch Decl.), ¶¶ 16-20.)

## II. REBUTTAL OPINIONS

6. I understand that Nike and/or Dr. Toney-Bolger have argued that the prior art does not disclose certain limitations claimed in the '256 patent, including under their proposed constructions of "continuously," "simultaneously," and "real time." I offer the following opinions in response.

### A. Claim Construction

7. I understand that Nike and Dr. Toney-Bolger have proposed constructions for the following limitation:

> continuously generate and simultaneously communicate in real-time to the first user at the first location and the second user at the second location, an interface indicating whether the challenge has been met.

(Ex. 1001 ('256 patent), 40:64-67.) This limitation appears in claim 1 of the '256 patent and a nearly identical term appears in claim 11 of the '256 patent. (Ex. 1001 ('256 patent), 40:64-67, 42:5-8.) I will refer to it as "Limitation 1[G]/11[E]."

### 1. Nike's Proposed Construction of Limitation 1[G]/11[E]

8. I understand that Nike proposes construing Limitation 1[G]/11[E] as "generating and communicating to the first user at the first location and the second user at the second location, at the same time and without interruption or perceived delay, an interface indicating whether the challenge has been met." (Paper 18 (Patent Owner Response), 28.) Put differently, Nike proposes replacing "continuously" with "without interruption," "simultaneously" with "at the same time," and "real time" with "without . . . perceived delay." (Paper 18 (Patent Owner Response), 28.) I understand that Nike's expert, Dr. Toney-Bolger, proposes the same construction for this term. (*See* Ex. 2005 (Aug. 7, 2023, Toney-Bolger Decl.), ¶ 35.)

9. I also understand that Nike and Dr. Toney-Bolger sometimes write "without perceived interruption" rather than "without interruption," when referring to "continuously." For instance, in its Patent Owner Response, Nike writes:

> Under the ordinary and customary meaning of this limitation, a POSITA would have understood continuous generation of the interface to first and second users to mean that the interface is generated without perceived interruption.

(Paper 18 (Patent Owner Response), 35.) Dr. Toney-Bolger offered the same opinion in her declaration. (*See* Ex. 2005 (Aug. 7, 2023, Toney-Bolger Decl.), ¶ 49.) I do not know whether Nike and Dr. Toney-Bolger meant to offer two different constructions for "continuously," or whether Nike and Dr. Toney-Bolger contend that "without interruption" and "without perceived interruption" have the same

meaning. Regardless, this distinction does not appear to matter for the purpose of this IPR proceeding: if a system generated an interface without interruption, there also would be no interruption to perceive. As I explain in paragraphs 19-26 and 35-44 below, the prior art discloses generating an interface without interruption according to Nike's construction.

10. I note that an interface generated "continuously," or "without interruption" (or "without perceived interruption") per Nike, may nonetheless remain unchanged for substantial periods of time. As an example, if an interface displays the distance run by a runner in 0.1 mile increments, the display would remain unchanged for 36 seconds if the runner runs at a six-minute-mile pace. For this example, the appearance of the interface is identical whether it is generated and communicated at a high constant frequency, or whether it is updated only when the runner has traveled 0.1 mile since the last update. In either case, there would be no interruption, and no interruption would be perceived by a user.

### 2. Dr. Toney-Bolger's Alternative Proposed Construction of "real time"

11. I understand that Dr. Toney-Bolger has proposed an alternative construction for "real time" beyond what Nike argued in its Patent Owner Response. Specifically, Dr. Toney-Bolger proposes construing "real time" as "processing and display[ing]" an interface within an interval of "approximately 20 to 30 ms." (Ex. 2005 (Aug. 7, 2023, Toney-Bolger Decl.), ¶ 70.)

12. I disagree with Dr. Toney-Bolger's alternative construction of "real time." The independent claims never mention "display" of the interface, and I do not see any basis to add a "display" requirement to them. They also never define the exact speed with which the system must generate and communicate the interface, nor does anything in the specification or file history add such a requirement to the claims. In fact, as I understand Dr. Toney-Bolger's opinion, she drew the 20 to 30 milliseconds figure from a scientific article published in 1957, not the '256 patent. (Ex. 2005 (Aug. 7, 2023, Toney-Bolger Decl.), ¶ 70 (citing Ex. 2009).) I have reviewed that article and it never mentions the phrase "real time." I also do not believe that a POSITA in 2008 would have found the article applicable for understanding the ordinary and customary meaning of "real time." In short, I see no evidence in the '256 patent or elsewhere that a POSITA in 2008 would have understood "real time" as limited to generating and communicating an interface within 20 to 30 milliseconds in the context of the '256 patent.

13. Although Dr. Toney-Bolger's 20 to 30 milliseconds opinion appears to be directed to "real time," I note that she also mentions the 20 to 30 millisecond figure in the same paragraph of her declaration as "continuously" and "simultaneously." (*See* (Ex. 2005 (Aug. 7, 2023, Toney-Bolger Decl.), ¶ 70.) To the extent Dr. Toney-Bolger contends that a POSITA would have incorporated the concept of 20 to 30 milliseconds into either the "continuously" or "simultaneously"

limitations, I disagree. Neither the '256 patent's specification nor its claims refer to a 20 to 30 millisecond requirement. And as I already noted, Dr. Toney-Bolger appears to have drawn the 20 to 30 millisecond figure from a 1957 article on which I do not believe a POSITA would have found applicable. In short, I see no evidence in the '256 patent or elsewhere that a POSITA would have understood "continuous" or "simultaneous" as somehow restricted by a 20 to 30 millisecond period.

### B. Tagliabue

#### 1. Overview of Tagliabue

14. Tagliabue is a United States Patent numbered 8,162,804 and is labelled Exhibit 1003 in this proceeding. I understand that Nike does not dispute Tagliabue is prior art to the '256 patent.

15. Tagliabue contains, word for word, much of the same disclosure as the '256 patent. For instance, I understand that Nike has filed what Dr. Toney-Bolger called "[a] redline comparing the figures and detailed description of the '256 Patent against Tagliabue show[ing] the differences between these two documents" as Exhibit 2008. (Ex. 2005 (Aug. 7, 2023, Toney-Bolger Decl.), ¶ 55 (citing Ex. 2008).) That document indicates that most of the "DETAILED DESCRIPTION OF THE INVENTION" of the '256 patent and Tagliabue are the same. (*See* Ex. 2008.)

16. In my opening declaration, I gave an overview of the '256 patent's system. (Ex. 1003 (Nov. 8, 2022, Lynch Decl.), ¶¶ 23-41.) That overview also

summarizes Tagliabue: although column and line numbers differ between the two patents, all the disclosures that I cited from the '256 patent also appear in Tagliabue.

### 2. Tagliabue Discloses Certain Disputed Limitations

17. I understand that the Board preliminarily found that Tagliabue's specification from column 22 at line 45 to column 22 at line 65 does not "appear to explicitly disclose" that Tagliabue's "'special purpose interface' is ***continuously*** generated and ***simultaneously*** communicated in ***real-time*** to the users." (Paper 11 (Institution Decision), 34.) I also understand that Dr. Toney-Bolger opined that Tagliabue's specification from column 22 at line 31 to column 22 at line 60 does not disclose "continuous generation and real-time communication of an interface indicating whether or not a challenge has been met." (Ex. 2005 (Aug. 7, 2023, Toney-Bolger Decl.), ¶ 68; *see also id.*, ¶¶ 66-72.) I respectfully disagree with the Board's preliminary finding and with Dr. Toney-Bolger's opinion.

18. Below are the two paragraphs from Tagliabue that contain the disclosures cited by the Board and Dr. Toney-Bolger:

> After the athletic data display configuration device 601 has identified the participants in a challenge, it monitors the collected athletic data for each of the participants, and aggregates the relevant data values in the collected athletic data. For example, if the challenge is a race to determine who can be the first to run 100 miles, for each participant the athletic data display configuration device 601 will sum the total distance value in each athletic data set collected for that participant after the start date. When a participant has a sum of his or her total distance values that matches or exceeds the specified challenge distance (and is

> the first invitee to do so), then the athletic data display configuration device 601 will identify that participant as the winner of the challenge. In response, the athletic data display configuration device 601 will notify each participant of the winner. The athletic data display configuration device 601 may notify the participants using any desired technique, such as by sending an electronic mail message, by displaying a special-purpose interface when each participant connects to the athletic data display configuration device 601, etc. A variety of such notification techniques are well known in the art, and thus will not be discussed in detail.
>
> With various examples of the invention, the athletic data display configuration device 601 may additionally provide updates regarding the status of a participant relative to the other participants. These updates also can be provided using any desired technique such as by sending an electronic mail message, by displaying a special-purpose interface when each participant connects to the athletic data display configuration device 601, etc. For example, the athletic data display configuration device 601 may configure and provide a user interface showing each participant's progress toward the goal of the challenge using, e.g., bar graphs for each participant of the type previously described with regard to monitoring individual goals.

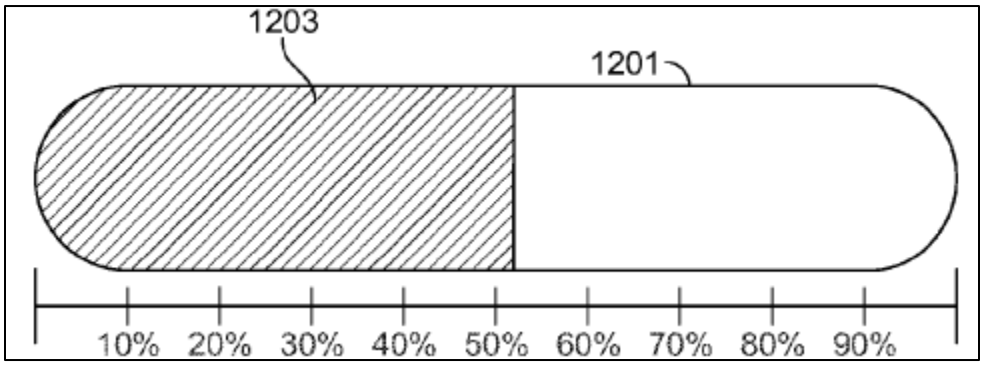
(Ex. 1004 (Tagliabue), 22:31-65.) In my opinion, a POSITA would have understood that these disclosures, along with the other disclosures I cite below, teach an interface that is continuously generated and simultaneously communicated in real-time according to Nike's constructions of those terms.

### a) Tagliabue Discloses "continuously generate[d]" Interfaces Under Nike's Construction

19. A POSITA would have understood Tagliabue's statement that "the athletic data display configuration device 601 may configure and provide a user

interface showing each participant's progress toward the goal of the challenge" to refer to a continuously generated interface. (Ex. 1004 (Tagliabue), 22:60-65.) A POSITA reading Tagliabue would have understood that such an interface would be generated "without interruption" because the alternative would not provide "updates regarding the status of a participant relative to other participants," as Tagliabue discloses. (Ex. 1004 (Tagliabue), 22:55-56, 22:62-63.)

20. A POSITA also would have understood that Tagliabue's interface is continuously generated based on its description of "showing each participant's progress toward the goal of the challenge using, e.g., bar graphs for each participant of the type previously described with regard to monitoring individual goals." (Ex. 1004 (Tagliabue), 22:62-65.) Tagliabue's Figure 12 is an example of the referenced "bar graphs," (*See* Ex. 1004 (Tagliabue), 3:53-56, 20:63-21:17, 22:63-65), and it depicts "a user interface graphically displaying the user's progress" (Ex. 1004 (Tagliabue), 21:3-4):



(Ex. 1004 (Tagliabue), Fig. 12.) Based on the appearance of Figure 12 and Tagliabue's present-tense description of Figure 12 as "displaying the user's progress," a POSITA would have understood that Tagliabue's interfaces showing "bar graphs for each participant" are continuously generated. The alternative—a progress bar that stuttered, lagged, or otherwise was generated with interruptions—would not be consistent with either Figure 12's appearance or its description of Figure 12 as "displaying the user's progress." Or put differently, a POSITA would expect that Tagliabue's interfaces would fulfill their function of "displaying the user's progress," and an interface depicting a live athletic challenge that was subject to interruptions would not do so.

21. Dr. Toney-Bolger's deposition testimony also is in agreement with my opinion that Tagliabue describes a continuously generated interface. During her deposition, Dr. Toney-Bolger testified that Figures 36 and 37 of the '256 patent are examples of interfaces that are "continuously generated and simultaneously communicated in realtime." (Ex. 1016 (Oct. 12, 2023, Toney-Bolger Dep. Tr.), 14:5-12.) A POSITA would have recognized that Figures 36 and 37 depict what Tagliabue describes, i.e., using Figure 12's bar graphs to show each user's progress toward a goal:

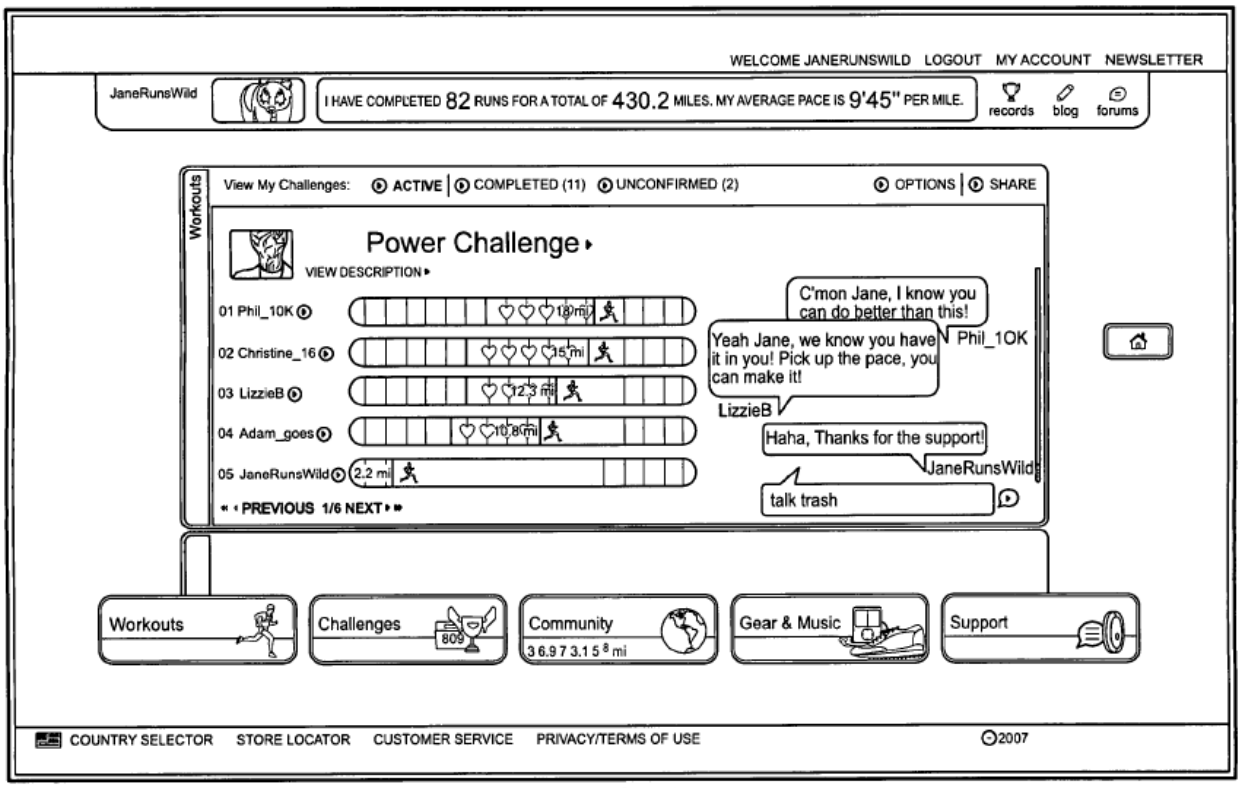



**FIG. 36**

(Ex. 1001 (’256 patent), Fig. 36.)

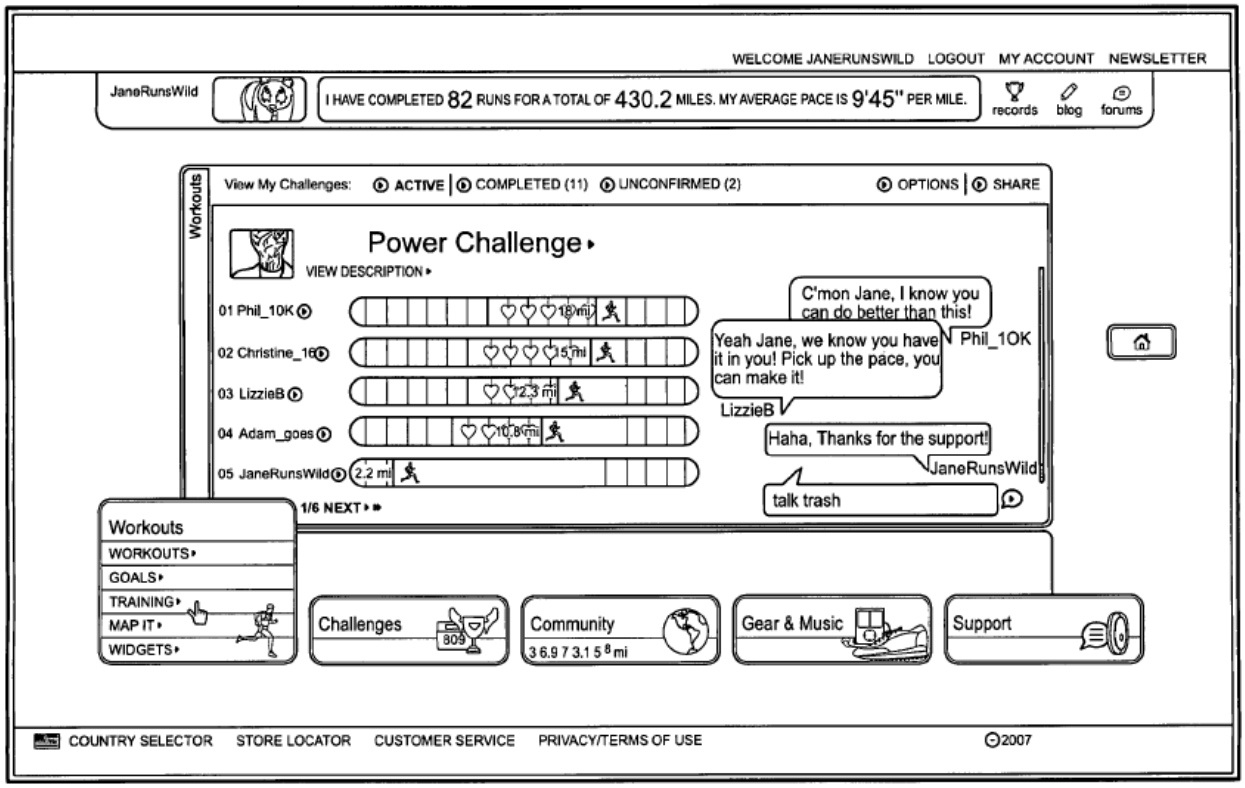



**FIG. 37**

(Ex. 1001 ('256 patent), Fig. 37.) Thus, Dr. Toney-Bolger's testimony that Figures 36 and 37 are continuously generated supports my opinion that Tagliabue discloses the same.

22. Other testimony by Dr. Toney-Bolger relating to the '256 patent's interface 1700 also is consistent with my opinion. During her October 12, 2023, deposition, she testified that interface 1700 of the '256 patent is an example of the claimed "continuously generated" interface:

> Q. Is user interface 1700 an example of an interface that is continuously generated and simultaneously communicated in realtime?
>
> A. Yes.

(Ex. 1016 (Oct. 12, 2023, Toney-Bolger Dep. Tr.), 25:22-26:1.)

23. Similarly, in Dr. Toney-Bolger's August 7, 2023, declaration, she appears to argue that a passage from the '256 patent relating to interface 1700 describes a continuously generated interface. (Ex. 2005 (Aug. 7, 2023, Toney-Bolger Decl.), ¶ 69 (citing Ex. 1001 ('256 patent), 31:41-46).) The passage she cited states:

> . . . athletic performance tracking site upon completion of a workout. Thus, bi-directional communication is provided between the portable device 203/athletic equipment and the athletic performance tracking site. Constant updates can be provided from the athletic performance tracking site to the athletic equipment and portable device 203. Communication . . . .

(Ex. 1001 ('256 patent), 31:41-46.) A POSITA would have understood that the "constant updates" in that passage refer to updates provided via interface 1700. Just before '256 patent's reference to "constant updates," it states, "the information can be displayed on the interface 1700." (Ex. 1001 ('256 patent), 31:35-36.) And it further states that interface 1700 is part of "the athletic performance device or machine," i.e., the athletic equipment, to which the "constant updates" are provided. (Ex. 1001 ('256 patent), 30:16-17.)

24. Dr. Toney-Bolger's testimony that interface 1700 is an example of an interface that is "continuously generated and simultaneously communicated in real time" supports my opinion that Tagliabue discloses the same because, like Figures 36 and 37, it is an example of what Tagliabue describes. For instance, in the

configuration of interface 1700 shown in Figure 17, the interface states, "You are 12 Cardio Miles Behind the Leader in Your Challenge."

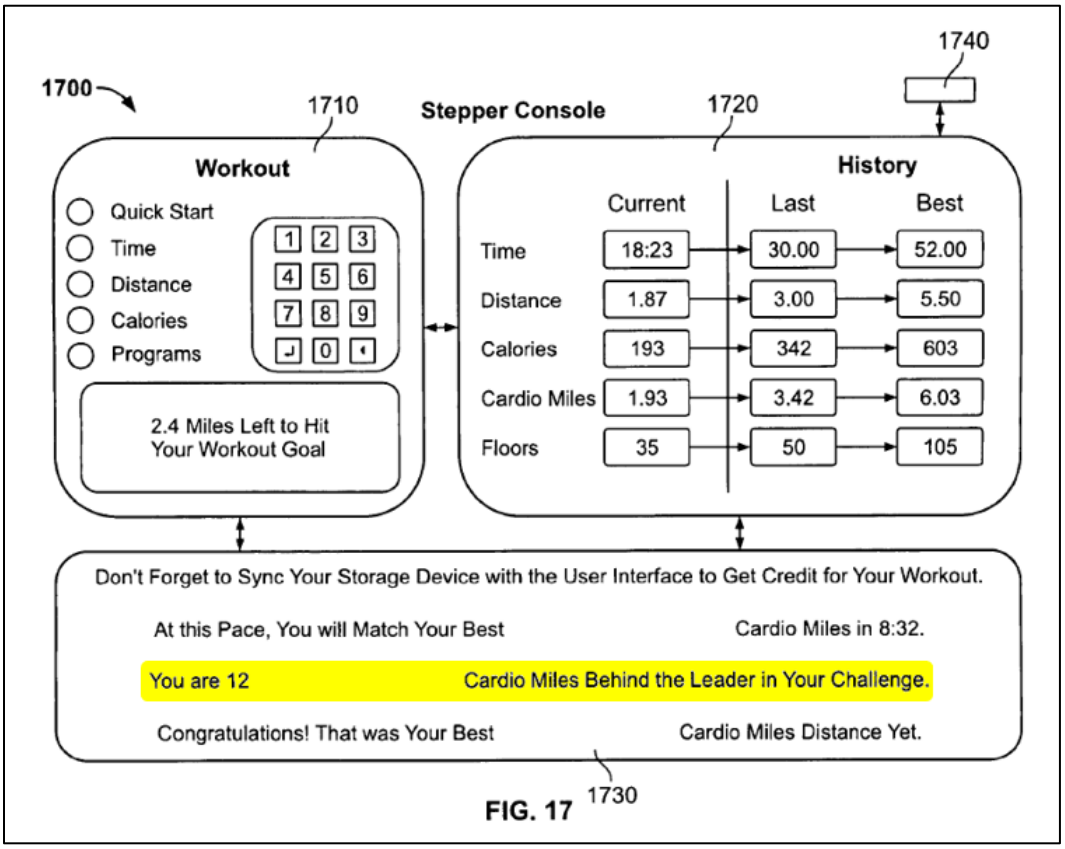



FIG. 17

(Ex. 1001 ('256 patent), Fig. 17 (highlighted).) A POSITA would have understood from interface 1700's use of the whole number "12," without a decimal point, that its message about "Cardio Miles" is recurrently generated at whole-mile intervals. Moreover, according to the '256 patent, interface 1700 need not display all of portions 1710, 1720, and 1730. Instead, it "***may*** include one or more portions," meaning it can include, in one embodiment, only "message portion 1730." (Ex. 1001 ('256 patent), 30:45-48 (emphasis added).) That message portion, in turn, "***may***" display each of the messages shown in Figure 17's version of portion 1730, meaning

it can, in one embodiment, only display a "comparison to the challenge or competition leader," such as the text highlighted above. (Ex. 1001 ('256 patent), 33:29-43 (emphasis added).) Thus, a POSITA would have understood that the '256 patent discloses recurrently generating an embodiment of interface 1700 at a rate of once-per-mile.

25. Like the '256 patent's description of interface 1700, Tagliabue states that its "athletic data display configuration device 601 may additionally provide updates regarding the status of a participant relative to the other participants," including via "a user interface . . . ." (Ex. 1004 (Tagliabue), 22:53-62.) And it describes doing so in the context of a challenge for "who can run the most miles in a given period of time . . . ." (Ex. 1004 (Tagliabue), 22:66-23:2, 23:36-40.) A POSITA reading these passages from Tagliabue would have understood them to describe an interface that, like interface 1700, depicts a competitor's progress relative to the leader in a relevant unit. Thus, because Tagliabue describes an interface like interface 1700, Dr. Toney-Bolger's testimony that interface 1700 is an example of a continuously generated interface supports my opinion that Tagliabue discloses the same.

26. Finally, I understand that Dr. Toney-Bolger has testified that Tagliabue does not disclose a continuously generated interface because it describes "displaying a special-purpose interface ***when each participant connects to the athletic data***

***display configuration device 601***, etc." (Ex. 2005 (Aug. 7, 2023, Toney-Bolger Decl.), ¶ 68 (quoting Ex. 1004 (Tagliabue), 22:48-50) (emphasis in original).) I disagree for two reasons. First, the passage that Dr. Toney-Bolger emphasized refers to "display[ing]," the interface, not generating it. In other words, the passage does not exclude continuously generating an interface even if that interface is not continuously displayed. Second, even if the passage did refer to generating an interface, a POSITA would have understood that "connects" refers to more than just a user establishing a connection with device 601. In the context of Tagliabue's discussion of the updates "showing each participant's progress toward the goal," a POSITA would have recognized that "when each participant connects" includes the period of time during which a participant has an ongoing active connection with device 601 over which they can receive updates. (Ex. 1004 (Tagliabue), 22:53-65.)

b) **Tagliabue Discloses "simultaneously communicate[d]" Interfaces Under Nike's Construction**

27. Tagliabue states, "the athletic data display configuration device 601 can notify the participants of . . . the status of each participant during the challenge . . . ." (Ex. 1004 (Tagliabue), 23:36-40.) Since it would not make sense to delay sending the interface—which is supposed to "show[] each participant's progress toward the goal of the challenge" (Ex. 1004 (Tagliabue), 22:62-63)—to any participant relative to another, a POSITA would have understood that Tagliabue's system simultaneously communicated the interface to each participant in a challenge.

28. Additionally, for the same reasons as I discussed in above paragraphs 21-24, Dr. Toney-Bolger's testimony is consistent with my opinion that Tagliabue discloses the "simultaneously communicate" limitation. As for "continuously generate," Dr. Toney-Bolger agreed that the '256 patent's Figures 36 and 37 and interface 1700 were examples of "simultaneously communicated" interfaces. (Ex. 1016 (Oct. 12, 2023, Toney-Bolger Dep. Tr.), 14:5-12, 25:22-26:1.) Thus, because Tagliabue describes what those figures and interface depict (*supra* ¶¶ 21-24), it also describes an interface that is "simultaneously communicate[d]."

c) **Tagliabue Discloses Generating and Communicating Interfaces in "real time" Under Nike's Construction**

29. A POSITA would have understood that Tagliabue generated and communicated its interfaces in real time. As I testified in my opening declaration about the '256 patent's disclosures:

> Device 601 also notifies participants of the status of a challenge ***in real-time***. During a challenge, "device 601 may additionally provide updates regarding the status of a participant relative to the other participants." ([Ex. 1001], 23:26-29.) It can, for example, "configure and provide a user interface showing each participant's progress toward the goal of the challenge using, e.g., bar graphs for each participant …." ([Ex. 1001], 23:33-38.)

(Ex. 1003 (Nov. 8, 2022 Lynch Decl.), ¶ 41 (emphasis added).) These exact same disclosures appear in Tagliabue. (*See* Ex. 1004 (Tagliabue), 22:54-56, 22:61-63.)

30. Just as in the context of the '256 patent, a POSITA would have recognized from these disclosures that Tagliabue's interface is generated and communicated in "real time." If a user perceived a delay between the performance of their athletic activity and the interface's display of the same, then the interface would not accurately reflect "each participant's progress" or their "status . . . relative to other participants." (*See* Ex. 1004 (Tagliabue), 22:54-56, 22:61-63.) Thus, because a non-real time interface would not make sense in the context of Tagliabue's disclosures, a POSITA would have recognized that Tagliabue describes an interface generated and communicated in real time.

31. Also, for the same reasons as I discussed in above paragraphs 21-24, Dr. Toney-Bolger's testimony is consistent with my opinion that Tagliabue discloses the "real time" limitation. As for "continuously generate" and "simultaneously communicate," Dr. Toney-Bolger agreed that the '256 patent's Figures 36 and 37 and interface 1700 were examples of "real time" interfaces. (Ex. 1016 (Oct. 12, 2023, Toney-Bolger Dep. Tr.), 14:5-12, 25:22-26:1.) Thus, because Tagliabue describes what those figures and interface depict (*supra* ¶¶ 21-24), it also describes an interface that is generated and communicated in "real time."

32. Finally, I understand that Dr. Toney-Bolger has testified that Tagliabue does not disclose the "real time" limitation because it describes "displaying a special-purpose interface ***when each participant connects to the athletic data display configuration device 601***, etc." (Ex. 2005 (Aug. 7, 2023, Toney-Bolger Decl.), ¶ 68 (quoting Ex. 1004 (Tagliabue), 22:48-50) (emphasis in original).) I disagree for two reasons. First, the passage that Dr. Toney-Bolger emphasized refers to "display[ing]," the interface, not generating and communicating it. In other words, the passage does not exclude communicating the interface without perceived delay after it is generated. Second, even if the passage did refer to generating and communicating an interface, a POSITA would have understood that "connects" refers to more than just a user establishing a connection with device 601. In the context of Tagliabue's discussion of the updates "showing each participant's progress toward the goal," a POSITA would have recognized that "when each participant connects" includes the period of time during which a participant has an ongoing active connection with device 601 over which they can receive updates. (Ex. 1004 (Tagliabue), 22:53-65.)

### C. Arrasvuori

33. Arrasvuori is a United States Patent Application Publication numbered 2007/0239479. (Ex. 1005.) I described Arrasvuori's system in detail in my opening declaration. (*See* Ex. 1003 (Nov. 8, 2022, Lynch Decl.), ¶¶ 47-82.)

34. I understand that Dr. Toney-Bolger has opined that Arrasvuori does not disclose the following limitations from the '256 patent:

- "continuously generate" (claims 1, 11);
- a "wirelessly connected sensor worn on an appendage of a first user" (claims 1, 11);
- "wherein the challenge is received from the second user" (claims 2, 3, 14);
- "the sensor worn on the appendage of the first users comprises an accelerometer" (claim 13).

(Ex. 2005 (Aug. 7, 2023, Toney-Bolger Decl.), ¶¶ 77-88.) I disagree.

### 1. A POSITA Would Have Understood that Arrasvuori's Interfaces Were "Continuously Generate[d]" Under Nike's Construction (Claims 1, 11)

35. Arrasvuori discloses at least two continuously generated interfaces under Nike's "without interruption" construction of that term. Those interfaces are (1) leaderboards and (2) other graphical representations of user progress. (*See, e.g.*, Ex. 1005 (Arrasvuori), ¶¶ 50-53.)

36. Leaderboards. I understand that the Board preliminarily found that Arrasvuori's leaderboards are "continuously generate[d]" in its May 15, 2023, institution decision. I have reproduced part of the Board's opinion below:

> First, we preliminarily find that Patent Owner relies upon an unreasonably narrow (and unrealistic) interpretation of a "leaderboard,"

in arguing that the skilled artisan would not have interpreted a "leaderboard" as disclosed in Arrasvuori to be "continuously generate[d] and simultaneously communicate[d] in real-time." Indeed, Patent Owner concedes, in the context of the '256 patent, that the skilled artisan "would have understood that *updates* from [an] athletic performance tracking site, such as the messages indicating the user's relative status in a challenge, *may be continuously generated and communicated to the user*." Prelim. Resp. 7. Based on the record before us, it does not appear credible that the skilled artisan would have understood Arrasvuori to disclose "leaderboards" as being displayed (or generated) only periodically, rather than continuously—doing so only periodically would seemingly defeat the very purpose of using a "leaderboard" such as used at a golf tournament, NASCAR race, or other sporting/athletic event, where current scores are presented as the event progresses, not merely every so often.

Second, we preliminarily find that Patent Owner ignores (or at least unreasonably dismisses) Arrasvuori's disclosure *as a whole* of presenting "leaderboards" to users via interfaces that show the relative, "real-time" status of users as they progress in a given challenge. Indeed, Arrasvuori explicitly discloses generating and providing "real-time feedback"; generating and providing "leaderboards" showing that "real-time" performance of users, and doing so "with respect to other users" "during performance of a real-world fitness task"; and generating and providing "leaderboards" that depict graphical indicators corresponding to users that "are performing" the real-world fitness task "positioned relative to one another," and displaying those indicators "as progressing along a game-world route terminating in the game-world landmark," which would allow users to determine "how well each such user was competing relative to other such users." Ex. 1005 ¶¶ 49–50, 52–53. Taking Arrasvuori's disclosure as a whole, it is not clear to us on the present record why the skilled artisan would not have understood Arrasvuori to disclose, at least via its use of leaderboards, continuously generating and simultaneously communicating in real-time an interface indicating whether a challenge

> has been met. Even though Patent Owner imagines scenarios where an alleged "leaderboard" might be presented to users only at designated times or checkpoints, we disagree on the record before us that this precludes the skilled artisan from understanding *Arrasvuori* to disclose and use "leaderboards" that satisfy the subject limitation.

(Paper 11 (May 15, 2023, Institution Decision) at 28-29 (italics in original).)

37. In my opinion, the Board's preliminary finding that Arrasvuori's leaderboards were continuously generated is correct. Arrasvuori describes its leaderboards as follows:

> Such a leaderboard might, for example, show the performance of users with respect to other users, and/or the performance of teams with respect to other teams. A wireless node and/or other computer making available leaderboards might, for instance, make such leaderboards available for direct viewing by users (e.g., via a GUI and/or other interface provided by the node and/or other computer), and/or might make such leaderboards available for receipt by other wireless nodes and/or other computers. For example, a server might make leaderboards available for receipt by user wireless nodes and/or other computers, which in turn could provide leaderboard display to their users via GUIs and/or other interfaces.

(Ex. 1005 (Arrasvuori), ¶ 50.) Arrasvuori further states:

> As another example, with completion of and/or during performance of a real-world fitness task, display might be provided wherein graphical indicators corresponding to users that are performing and/or that have performed the real-world fitness task are positioned relative to one another, a goal corresponding to the task, and/or a route corresponding to the task. Such display might, for instance provide a game-world depiction and/or be presented via one or more GUIs and/or other interfaces provided by wireless nodes and/or other computers of users.

(Ex. 1005 (Arrasvuori), ¶ 52.)

38. In my opinion, a POSITA would have recognized from the foregoing disclosures that Arrasvuori's leaderboards were continuously generated according to Nike's construction. First, the word "leaderboard" itself refers to a continuously generated interface. The 2006 American Heritage Dictionary defines "leaderboard" as "[a] board that displays the leaders in a competition," i.e., the current state of an athletic competition. (Ex. 1018, 995.) A POSITA would have understood that "leaderboard" refers to an interface generated "without interruption," or continuously, because otherwise it might not accurately reflect "the leaders in a competition."

39. Second, a POSITA also would have understood from Arrasvuori's descriptions of the leaderboards that the leaderboards are continuously generated. Arrasvuori states, "***during performance*** of a real-world fitness task, display might be provided wherein graphical indicators corresponding to ***users that are performing*** and/or that have performed the real-world fitness task are positioned relative to one another, [or] a goal corresponding to the task . . . ." (Ex. 1005 (Arrasvuori), ¶ 52 (emphasis added).) A POSITA would have understood that "graphical indicators" in the foregoing sentence included Arrasvuori's leaderboards. And a POSITA also would have understood that Arrasvuori's discussion of providing graphical indicators corresponding to users' positions "during

performance," and while the users "are performing" an athletic activity, referred to providing updates continuously under Nike's construction. Otherwise—if the leaderboards were generated with interruption—the leaderboards would not "correspond[]" to the users' progress "during" the real-world fitness task.

40. Third, Arrasvuori's subject matter also confirms that a POSITA would understand its leaderboards are continuously generated. As I explained during my July 27, 2023, deposition:

> Arrasvuori is a patent application written in the context of multiplayer video games, which were very well-known in 2007. And so it was very clear what sorts of things are being referred to there, and Arrasvuori discloses that also. The realtime, the simultaneous, and the continuous generation.

(Ex. 2006 (July 27, 2023, Lynch Dep. Tr.), 37:19-25.)

> [I]n the context of multiplayer video games as were common in 2007, many very popular ones, people around the world are playing in realtime shooting at each other, and those things have to be done with low latency. It has to be continuously generated. It has to be simultaneously communicated with an appropriate definition of those terms.
>
> Arrasvuori discloses similar sorts of interfaces looking at paragraphs 52 and 53, for example, and I do not have the reference in front of me. But if you read those, you'll see a disclosure of exactly that sort of system where players are playing and getting feedback from each other in realtime.

(Ex. 2006 (July 27, 2023, Lynch Dep. Tr.), 39:4-16.) In other words, given that Arrasvuori's system describes a video game, a POSITA would have expected the

interface to be generated without interruption. The alternative would be a video game subject to interruptions or stutter, which would not be consistent with how a video game designer would design a video game or how a user would expect it to operate. In short, there is no doubt that a POSITA would have understood that Arrasvuori's leaderboards are continuously generated.

41. Graphical Representations. A POSITA also would have understood that the "graphical representation[s]" described in paragraph 53 of Arrasvuori are continuously generated. Arrasvuori states:

> For example, in the case where a stage of a game requires that users reach a game-world landmark by performing a real-world fitness task of running and/or jogging, display might provide a graphical representation for each user performing the task and show the graphical representations as progressing along a game-world route terminating in the game-world landmark. A user viewing such display might, for instance, be able to determine how close each participating user was to the goal and/or how well each such user was competing relative to other such users.

(Ex. 1005 (Arrasvuori), ¶ 53.) A POSITA would have understood Arrasvuori's statement that its display could "provide a graphical representation for each user ***performing*** the task and show the graphical representations ***as progressing*** along a game world route" to mean the interface is generated continuously during a competition. (Ex. 1005 (Arrasvuori), ¶ 53 (emphasis added).) That a user "viewing such display" could "determine how close each participating user was to the goal and/or how well each such user was competing relative to other users" further

confirms the interface is continuously generated. (Ex. 1005 (Arrasvuori), ¶ 53.) After all, an interface subject to interruptions would not inform the user of the competition's current status, as Arrasvuori describes. Moreover, a POSITA would have understood that Arrasvuori's disclosures in paragraph 52 of its specification also confirm that the "graphical representation[s]" are continuously generated for the same reasons as I noted in paragraph 39, above.

42. For the same reasons noted above in paragraph 40 of my declaration, above, a POSITA also would have understood from Arrasvuori's subject matter that its graphical representations are continuously generated.

43. I also note that Dr. Toney-Bolger's deposition testimony is in agreement with my opinion that a POSITA would have understood that an interface illustrating user progress with a graphical representation of user progress is continuously generated. During her October 12, 2023, deposition, Dr. Toney-Bolger testified:

> Q. [I]s an interface displaying[,] in a group or challenge setting[,] multiple avatars to illustrate the progress of each user in the group or challenge an example of an interface that is continuously generated and simultaneously communicated in realtime?
>
> A. Yes.

(Ex. 1016 (Oct. 12, 2023, Toney-Bolger Dep. Tr.), 19:12-19).) An interface displaying multiple avatars to illustrate the progress of each user in the group or

challenge is the same as Arrasvuori's interface showing graphical representations of user progress. (*See, e.g.*, Ex. 1005 (Arrasvuori), ¶ 53.) Thus, just as for the leaderboards, there is no doubt a POSITA would have understood that Arrasvuori's interfaces showing graphical representations are continuously generated.

44. Finally, I do not agree with Dr. Toney-Bolger's argument that Arrasvuori did not describe a continuously generated interface because its leaderboards might only update at "certain intervals, such as every mile." (Ex. 2005 (Aug. 7, 2023, Toney-Bolger Decl.), ¶ 80.) An interface generated once per mile would be generated "continuously," or without interruption according to Nike's construction, provided it was designed to update that way. Also, I see that Dr. Toney-Bolger cited paragraph 67 of Arrasvuori as support for her opinion, but nothing in that paragraph cancels out Arrasvuori's other disclosures of a continuously generated interface. (*See* Ex. 2005 (Aug. 7, 2023, Toney-Bolger Decl.), ¶ 80 (citing Ex. 1005 (Arrasvuori), ¶ 67).)

**2. Arrasvuori Describes a "wirelessly connected sensor worn on an appendage of a first user" (Claims 1, 11)**

45. Arrasvuori states that its "wireless nodes and/or other computers" can include "various monitoring equipment," including "sensors." (Ex. 1005 (Arrasvuori), ¶¶ 39, 40.) A POSITA would understand that Arrasvuori's "wireless nodes" are "computers" because Arrasvuori repeatedly uses the phrase, "wireless node and/or ***other*** computers" throughout its disclosure. (*See, e.g.*, Ex. 1005

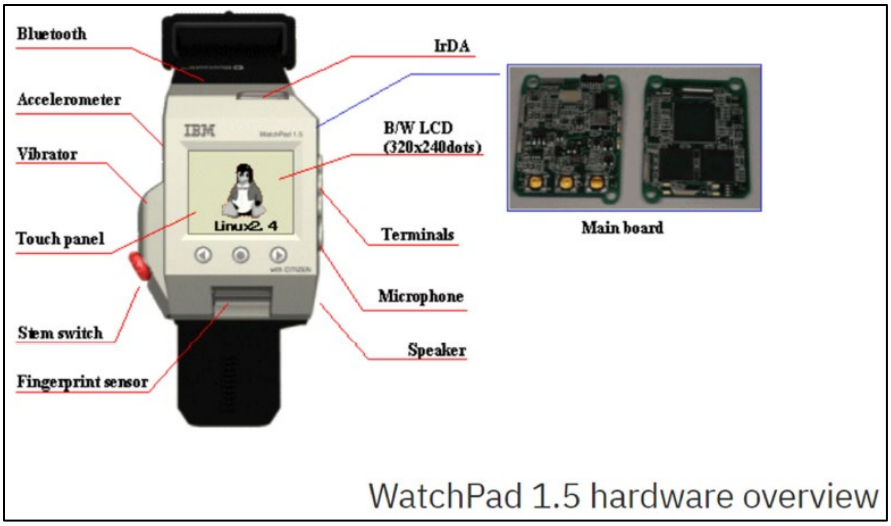
(Arrasvuori), ¶ 19 (emphasis added); *see also* Ex. 1005 (Arrasvuori), ¶ 90 ("[d]evices described herein may be and/or may incorporate computers.").) Arrasvuori also states, "[u]sers might, in various embodiments, wear their wireless nodes and/or other computers." (Ex. 1005 (Arrasvuori), ¶ 39.) And it states that "computer" can mean a "computerized watch." (Ex. 1005 (Arrasvuori), ¶ 90.) Thus, Arrasvuori's wireless nodes and/or other computers can take the form of a computerized watch including sensors, which a user wears. As I explained during my July 27, 2023, deposition:

> Q. Does Arrasvuori ever talk about a user wearing a wireless node on an appendage?
>
> A. Arrasvuori talks about wearing computers and also talks about a computerized watch, which would naturally be on an appendage.

(Ex. 2006 (July 27, 2023, Lynch Dep. Tr.) at 85:15-19.)

### 3. In Arrasvuori's System, "the sensor worn on the appendage of the first user comprises an accelerometer" (Claim 13)

46. Accelerometers, including accelerometer-based pedometers, were well-known by 2008. For example, as I noted in my opening declaration, IBM advertised a smartwatch with an accelerometer in 2001. (Ex. 1010.) That smartwatch was called the "WatchPad 1.5":




(Ex. 1011.)

47. A POSITA would have understood that Arrasvuori's reference to "pedometer" in paragraph 40 of its disclosure includes accelerometer-based pedometers. (Ex. 1005 (Arrasvuori), ¶ 40.) Accelerometer-based pedometers were well known by 2008. For example, the '256 patent refers readers to known "techniques for determining a user's speed from accelerometer signals . . . described in, for example, U.S. Pat. No. 6,898,550 to Blackadar et al." (Ex. 1001 ('256 patent), 9:25-27.) Blackadar, which was filed in 2000, describes a "prior art pedometer device [that] uses an accelerometer:"

> Another prior art pedometer device uses an accelerometer to measure the number of times that a user's foot impacts the surface when the user is in locomotion. That is, an accelerometer is mounted on the user's shoe so as to produce a signal having pronounced downward going peaks that are indicative of moments that the user's foot impacts the surface. These devices therefore produce results similar to the prior art weight-on-a-spring pedometer devices in that they merely count the number of footsteps of the user, and 10 must be calibrated according to the stride

> length of the user in order to calculate the distance traveled by the user. Thus, these accelerometer-based devices are subject to similar limitations as are the weight-on-a-spring devices, and are not capable of measuring the foot contact time (Tc) of a user 15 in locomotion.

(Ex. 1009, 2:1-17.) Dr. Toney-Bolger acknowledges that "accelerometer-based pedometers existed as of 2007 . . . ." (Ex. 2005 (Aug. 7, 2023, Toney-Bolger Decl.), ¶ 86.) And the 2007 article that Dr. Toney-Bolger cites to support her opinion also shows that accelerometer-based pedometers were known. (*See* Ex. 2010, 7 (2007 article stating, "[t]he foot-ground contact pedometer is also accelerometry based").) Thus, in my opinion, a POSITA in 2008 would have recognized that the word "pedometer" included accelerometer-based pedometers.

#### 4. Arrasvuori Describes a System "wherein the challenge is received from the second user" (Claims 2, 3, 14)

48. Arrasvuori discloses this limitation in at least two ways. First, Arrasvuori discloses this limitation by, between paragraphs 17 and 22 of its specification, repeatedly describing multiple users selecting a challenge. (Ex. 1005 (Arrasvuori), ¶¶ 17-24.) For instance, in paragraph 17, Arrasvuori states that its users can, in the context of a multiplayer videogame, indicate their desire to participate:

> With respect to FIG. 1 it is noted that, according to various embodiments of the present invention, ***a user wishing to participate in a video game might indicate a desire to do so*** via her wireless node and/or other computer (step 101). ***Such a video game might, for instance, be a multiplayer video game and/or a video game wherein***

> ***one or more players*** perform real-world fitness tasks in the context of the game.

(Ex. 1005 (Arrasvuori), ¶ 17 (emphasis added).) In paragraph 18, Arrasvuori discloses that its users can issue and accept challenges amongst one another:

> Various operations might, in various embodiments, be performed by the wireless node and/or other computer. For example, the wireless node and/or other computer might offer team-related functionality to the user (e.g., via a Graphical User Interface (GUI) and/or other interface) (step 103). ***The wireless node and/or other computer might, for instance, allow the user (e.g., via a GUI and/or other interface)*** to learn of available users, create one or more teams, to select one or more users for one or more new and/or existing teams, ***to invite one or more users to join one or more new and/or existing teams***, to request to join one or more new and/or existing teams, ***and/or to accept invitation to join one or more new and/or existing teams.*** The user's wireless node and/or other computer might, in various embodiments, communicate with another wireless node and/or other computer. For example, the user's wireless node and/or other computer might act to perform a join operation with a server (e.g., a game server).

In paragraph 20, Arrasvuori repeats that its system allows users to choose what video game they want to participate in:

> As another example of operations performed by the user's wireless node and/or other computer, ***the wireless node and/or other computer might allow for selection of one or more games to play*** (step 105). Such functionality might be implemented in a number of ways. For example, the user might be able to select from one or more indicated games one or more games that she wished to play.

(Ex. 1005 (Arrasvuori), ¶ 20 (emphasis added).) In paragraph 21, Arrasvuori describes users voting on what games they wish to play together:

> As another example, the user might receive indication of one or more games and be able to vote for one or more of the games as being ones that she wished to play. Such voting functionality might, for instance, be employed in the case where the user is a member of a team. Accordingly, for example, ***each team member might vote for one or more of one or more indicated games***, and one or more games receiving the highest numbers of votes might be those that are selected for play by the team. Such indication, selection, and/or voting might, for instance, be via a GUI and/or other interface.

(Ex. 1005 (Arrasvuori), ¶ 21 (emphasis added).) And in paragraph 22, Arrasvuori again refers to a user on a team selecting what game they wish to play:

> It is noted that, in various embodiments, the user's selection of one or more games might affect her membership in one or more teams. For instance, ***the user might select*** (e.g., via a GUI and/or other interface) ***one or more games as being ones that she wanted to play***, and then (e.g., via a GUI and/or other interface) be informed that she has been made a member of, been offered membership in, and/or is able to request membership in ***one or more teams made up of, and/or to be made up of, other users wishing to play one or more of those games***. It is noted that, in various embodiments, teams might not be employed.

(Ex. 1005 (Arrasvuori), ¶ 22 (emphasis added).) What these passages convey is that, in Arrasvuori's system, users could indicate what games they wished to participate in, including multiplayer games. This matters because, as I explained in my opening declaration, a POSITA would have understood that, at least in some embodiments, a user's wireless node sends the user's step 101 indication of desire to participate and the user's selection of one or more games to a server. (*See* Ex. 1003 (Nov. 8, 2022, Lynch Decl.), ¶ 57 (citing Ex. 1005 (Arrasvuori), ¶ 37).) Thus, the foregoing

excerpts from Arrasvuori disclose its server receiving game (i.e., challenge) selections from users for multiplayer games which, by definition, means that the server receives the selections from multiple users.

49. Second, Arrasvuori also discloses this limitation in its paragraph 36:

> Users might, in various embodiments, be able to select (e.g., via GUIs and/or other interfaces provided by their wireless nodes) the order in which they performed the fitness tasks. To illustrate by way of example, some users might choose to do the swimming task first while other uses might choose to do the cycling task first. Users might, for example, be able to indicate (e.g., via button press and/or via GUIs and/or other interfaces provided by their wireless nodes) moving from one fitness task to another. Information regarding such indication might, in various embodiments, be communicated among wireless nodes and/or other computers. For example, such information regarding such an indication might be communicated from a user's wireless node and/or other computer to a server.

(Ex. 1005 (Arrasvuori), ¶ 36.) In Arrasvuori's paragraph 36, each of the "fitness tasks" is a challenge. (Ex. 1005 (Arrasvuori), ¶ 36.) Arrasvuori describes multiple users selecting each of the "swimming" and "cycling" tasks. (Ex. 1005 (Arrasvuori), ¶ 36.) And Arrasvuori's server receives each of those selections. (Ex. 1005 (Arrasvuori), ¶ 36.) Thus, Arrasvuori's paragraph 36 describes a server receiving a challenge from multiple users, which would include at least a second user.

50. Although the two above paragraphs explain how Arrasvuori's server receives a challenge from a second user, I understand that Dr. Toney-Bolger argues Arrasvuori does not disclose this limitation because Arrasvuori does not describe "a

head-to-head challenge wherein a second user specifies the challenge in which first and second users compete." (Ex. 2005 (Aug. 7, 2023, Toney-Bolger Decl.), ¶ 83.) I do not see that requirement in any of claims 2, 3, and 14. (*See* Ex. 1001 ('256 patent), 41:1-4, 42:14-15.) Regardless, Arrasvuori does disclose that scenario. Paragraph 36 of Arrasvuori describes, for example, that "users might be able to participate in a game-world triathlon competition . . . ." (Ex. 1005 (Arrasvuori), ¶ 36.) And it states that "[u]sers might, in various embodiments, be able to select . . . the order in which they performed the fitness tasks." (Ex. 1005 (Arrasvuori), ¶ 36.) That is an example of a user specifying a challenge in which multiple users, i.e., at least a first and second users, compete.

In signing this Declaration, I recognize that the Declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross-examination in the case. If required, I will appear for cross-examination at the appropriate time.

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

Dated: October 29, 2023

Dr. Kevin Lynch