

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GARMIN INTERNATIONAL, INC. and GARMIN USA, INC.,
Petitioner,

v.

LOGANTREE, LP,
Patent Owner.

Case IPR2018-00564
Patent 6,059,576 C1

Before PATRICK R. SCANLON, MITCHELL G. WEATHERLY, and
JAMES A. WORTH, *Administrative Patent Judges*.

SCANLON, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

Garmin International, Inc. and Garmin USA, Inc. (collectively, “Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 20–26, 29, 104–107, 110, 113–122, 126–128, 134–138, and 175 (the “challenged claims”) of U.S. Patent No. 6,059,576 C1 (Ex. 1001, “the ’576 patent”). LoganTree LP (“Patent Owner”) did not a Preliminary Response. The Board instituted a trial as to the challenged claims. Paper 9 (“Dec.”).

After institution of trial, Patent Owner filed a Patent Owner Response (“PO Resp.”) to the Petition. Paper 13. Petitioner filed a Reply (“Reply”) to the Patent Owner Response. Paper 16. Patent Owner filed a Sur-Reply (“Sur-Reply”). Paper 19. Petitioner relies on the Declaration of Dr. Andrew C. Singer (Ex. 1010) in support of its Petition, and Patent Owner relies on the Declaration of Vijay K. Madiseti, Ph.D. (Ex. 2001) in support of its Response.

An oral hearing was held on June 4, 2019, and the record contains a transcript of this hearing. Paper 24 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner has not shown by a preponderance of the evidence that claims 20–26, 29, 104–107, 110, 113–122, 126–128, 134–138, and 175 of the ’576 patent are unpatentable.

II. BACKGROUND

A. *Related Matters*

The parties indicate that the ’576 patent is the subject of a patent infringement litigation, *LoganTree LP v. Garmin International, Inc.*, Case

No. 6:17-cv-01217 (D. Kan.), and that another proceeding with the same parties in a different jurisdiction has been dismissed without prejudice to refile in another district, *LoganTree LP v. Garmin International, Inc.*, Case No. 5:17-cv-00098 (W.D. Tex.). Pet. 71; Paper 4, 2.

In addition, Petitioner states that it has filed another petition for *inter partes* review of the '576 patent, in IPR2018-00565. Pet. 71. Petitioner states that two other *inter partes* review proceedings with respect to the '576 patent terminated after the filing of a petition but before any decision on institution, i.e., IPR2017-00256, -00258. Pet. 71–72.

*B. The '576 Patent*¹

The '576 patent is titled “Training and Safety Device, System and Method to Aid in Proper Movement During Physical Activity” and relates to “the field of electronic training and safety devices used to monitor human physical activity.” Ex. 1001, [54], 1:6–7. More specifically, the '576 patent discloses a method that detects, measures, records, and/or analyzes the time, date, and other data associated with movement of the device and produces meaningful feedback regarding the measured movement. *See id.* at 1:8–11.

The '576 patent discloses that certain prior art devices recorded the number of times that a predetermined angle was exceeded but were not convenient to operate and served to report rather than analyze the information. *See id.* at 1:45–54. The '576 patent discloses that it is also important to measure the angular velocity to monitor and analyze improper movement. *Id.* at 1:55–67.

¹ An ex parte reexamination certificate issued on March 17, 2015, with all claims either amended from their original form or newly added during reexamination. Ex. 1001, [45] C1, cols. 1–12 C1.

The '576 patent discloses an electronic device that tracks and monitors an individual's motion through the use of a movement sensor capable of measuring data associated with the wearer's movement. *Id.* at 2:10–13. The device of the '576 patent also employs a user-programmable microprocessor, which receives, interprets, stores and responds to the movement data based on customizable operation parameters; a clock connected to the microprocessor; memory for storing the movement and analysis data; a power source; a port for downloading the data from the device to other computation or storage devices contained within the system; and various input and output components. *Id.* at 2:13–21.

Figure 4 of the '576 patent is a block diagram of the movement measuring device (*id.* at 3:11–12):

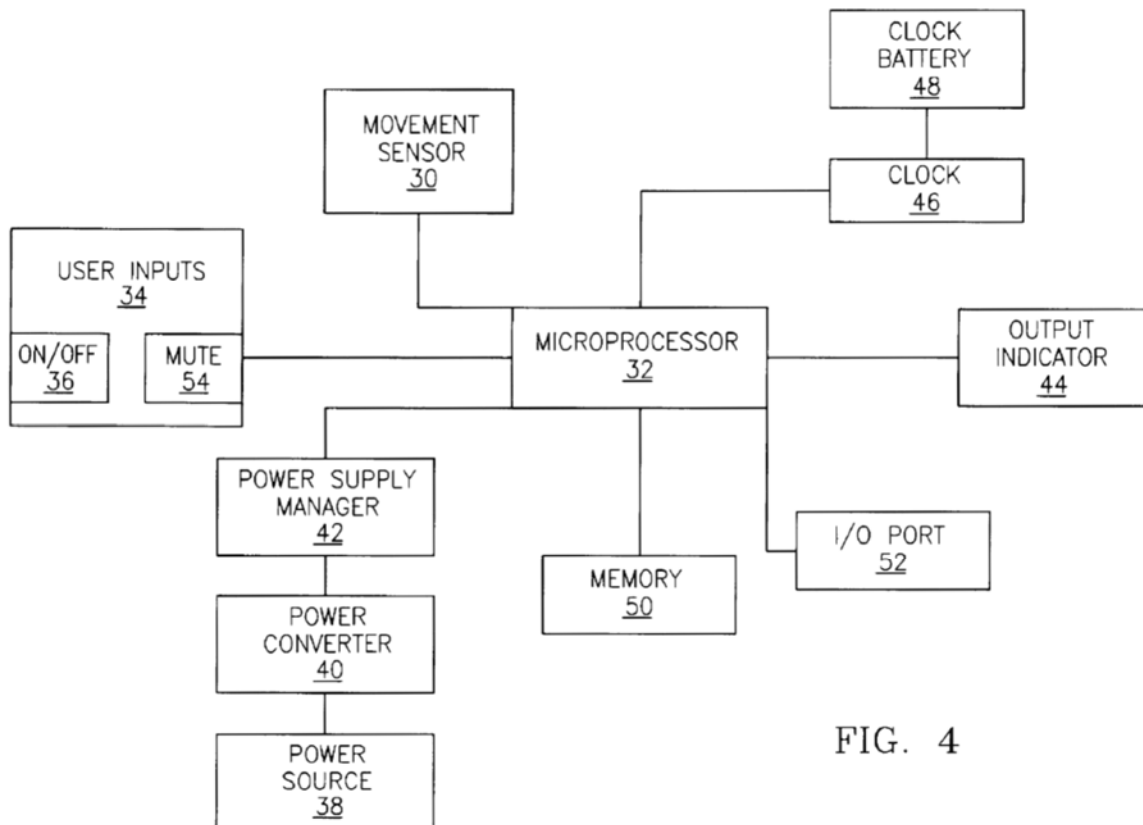


FIG. 4

Figure 4 depicts a block diagram of the components of the device.

The downloadable, self-contained device can be worn at various positions along the torso or appendages being monitored depending on the specific physical task being performed. *Id.* at 2:21–24. The device also monitors the speed of the movements made while the device is being worn. *Id.* at 2:24–25. When a pre-programmed recordable event is recognized, the device records the time and date of the occurrence while providing feedback to the wearer via visual, audible and/or tactile warnings. *Id.* at 2:25–29. Periodically, data from the device may be downloaded into an associated computer program, which analyzes the data. *Id.* at 2:29–31. The program can then format various reports to aid in recognizing and correcting trends in incorrect physical movement. *Id.* at 2:31–33.

C. Challenged Claims

As noted above, Petitioner challenges claims 20–26, 29, 104–107, 110, 113–122, 126–128, 134–138, and 175. Of these claims, claim 20 is the sole independent claim and is illustrative of the subject matter. Claim 20, as amended in the reexamination proceeding, reads as follows:

20. A method to monitor physical movement of a body part comprising the steps of:

attaching a portable, self-contained movement measuring device to said body part for measuring unrestrained movement in any direction;

measuring data associated with said physical movement;

interpreting, using a microprocessor included in the portable, self-contained movement measuring device, said physical movement data based on user-defined operational parameters and a real-time clock;

storing said data in memory;

detecting, using the microprocessor, a first user-defined event based on the movement data and at least one of the user-

defined operational parameters regarding the movement data;
and

storing, in said memory, first event information related to the detected first user-defined event along with first time stamp information reflecting a time at which the movement data causing the first user-defined event occurred.

Ex. 1001, 2:23–41 C1.

D. The Prior Art

Petitioner’s asserted grounds of unpatentability for the challenged claims rely on the following references:

US 5,197,489, iss. Mar. 30, 1993 (Ex. 1007, “Conlan”);

US 5,474,083, iss. Dec. 12, 1995 (Ex. 1008, “Church”);

US 5,546,609, iss. Aug. 20, 1996 (Ex. 1006, “Rush”);

US 5,976,083, iss. Nov. 2, 1999 (Ex. 1009, “Richardson”);

US 5,978,972, iss. Nov. 9, 1999 (Ex. 1004, “Stewart”)².

E. Grounds of Unpatentability at Issue

The Petition challenges claims 20–26, 29, 104–107, 110, 113–122, 126–128, 134–138, and 175 of the ’576 patent on the following four grounds of unpatentability. Pet. 8–9. We instituted trial on all four grounds, and for all claims subject to each asserted ground. Dec. 2, 22.

² As Petitioner points out, the filing date of the application that issued as Stewart (June 11, 1997) precedes the filing date of the application that issued as the ’576 patent (November 21, 1997). See Pet. 4, 11–12, 11 n.2. Petitioner asserts that Stewart claims priority to U.S. Provisional Application No. 60/020271 (Ex. 1005), which was filed June 14, 1996. *Id.* at 11. Because Patent Owner has not argued that the ’576 patent is entitled to an earlier priority date, we do not reach the issue of the effective filing date of Stewart in this Decision.

References	Basis	Claim(s) Challenged
Stewart and Rush	§ 103(a) ³	20–26, 29, 104–107, 110, 113–116, 118, 121, 126–128, 134, 135, and 175
Stewart, Rush, and Conlan	§ 103(a)	119, 120, 122, 136, and 137
Stewart, Rush, and Church	§ 103(a)	117
Richardson and Stewart	§ 103(a)	20 and 138

III. ANALYSIS

A. Relevant Legal Principles

To prevail in challenging Patent Owner’s claims, Petitioner must demonstrate by a preponderance of the evidence that the claims are unpatentable. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). “In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). The burden of persuasion rests with Petitioner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burden of proof in *inter partes*

³ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103. Because the ’576 patent was filed before the effective date of the relevant amendment, the pre-AIA version of § 103 applies.

review). Furthermore, Petitioner cannot satisfy its burden of proving obviousness by employing “mere conclusory statements.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and, (4) where in evidence, so-called secondary considerations, including commercial success, long-felt but unsolved needs, failure of others, and unexpected results. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

For an obviousness analysis, prior art references must be “considered together with the knowledge of one of ordinary skill in the pertinent art.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994) (quoting *In re Samour*, 571 F.2d 559, 562 (CCPA 1978)). Moreover, “it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom.” *In re Preda*, 401 F.2d 825, 826 (CCPA 1968). That is because an obviousness analysis “need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR*, 550 U.S. at 418.

B. Level of Ordinary Skill in the Art

Petitioner contends that a person having ordinary skill in the art to which the '576 patent pertains is “a person with a Bachelor of Science Degree in Electrical Engineering or Computer Engineering or equivalent, and at least two years of experience in embedded signal processing systems or a related field.” Pet. 7–8 (citing Ex. 1010 ¶ 38). Patent Owner argues that a person having ordinary skill in the art to which the '576 patent pertains “would have had a bachelor’s degree in electrical engineering or computer engineering or equivalent, and two years of experience in embedded signal processing and/or systems, or equivalent.” PO Resp. 12 (citing Ex. 2001 ¶ 54). Patent Owner adds that “[a]dditional industry experience or technical training may offset less formal education, while advanced degrees or additional formal education may offset lesser levels of industry experience.” *Id.*

Factual indicators of the level of ordinary skill in the art include “the various prior art approaches employed, the types of problems encountered in the art, the rapidity with which innovations are made, the sophistication of the technology involved, and the educational background of those actively working in the field.” *Jacobson Bros., Inc. v. U.S.*, 512 F.2d 1065, 1071 (Ct. Cl. 1975); *see also Orthopedic Equip. Co. v. U.S.*, 702 F.2d 1005, 1011 (Fed. Cir. 1983) (quoting with approval *Jacobson Bros.*).

The parties’ respective proposals are substantially similar such that there is no apparent dispute between the parties. Also, based on our review of the record before us, we find that Petitioner’s stated level of ordinary skill in the art is reasonable because it is consistent with the evidence of record, including the asserted prior art. Thus, for the purposes of this Decision, we

adopt Petitioner’s definition. We note, however, that our findings in this proceeding would not differ under Patent Owner’s proposed definition.

C. Claim Construction

The parties agree that the ’576 patent expired on November 21, 2017. Pet. 9; PO Resp. 13. The ’576 patent was filed on November 21, 1997, and issued on May 9, 2000. Ex. 1001, [22], [45]. The issued patent bears a notice stating “This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).” *Id.* at cover page. We thus agree with the parties that the ’576 patent has expired.

For expired patents, we apply a district court-type claim construction approach.⁴ *Wasica Finance GmbH v. Continental Auto. Sys., Inc.*, 853 F.3d 1272, 1279 (Fed. Cir. 2017) (“The Board construes claims of an expired patent in accordance with *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc).”). Under the *Phillips* standard, we assign claim terms their ordinary and customary meaning, as would have been understood by a person of ordinary skill in the art at the time of the invention, in light of the language of the claims, the specification, and the prosecution history of record. *Phillips*, 415 F.3d at 1312–19; *Thorner v. Sony Comput. Entm’t Am. LLC*, 669 F.3d 1362, 1365–66 (Fed. Cir. 2012).

⁴ A recent rule change that makes applicable the *Phillips* standard in all trial proceedings before the Board does not apply here because the Petition was filed before November 13, 2018. See Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b), effective November 13, 2018).

In view of our analysis discussed below, we determine that “interpreting . . . said physical movement data” from claim 20 is the only term requiring construction in order to resolve the disputed issues in this proceeding. *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.”); *see also Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs.* in the context of an *inter partes* review).

Neither party proposes an explicit claim construction for “interpreting . . . said physical movement data,” but Patent Owner argues that the arguments relating to Stewart in the Petition show that Petitioner misinterprets the limitation as data collection. PO. Resp. 13–14 (citing Pet. 20; Ex. 2001 ¶ 57). In its Reply, Petitioner argues that the parties “seemingly agree that the plain and ordinary understanding of the ‘interpreting, using a microprocessor’ limitation applies. And, when read in light of the specification, it is clear the claim must encompass, for example, an event threshold or specific timing triggering data storage.” Reply 11–12 (citing Ex. 1004, 4:63–66, 5:62–66).

The ’576 patent does not include an explicit definition for “interpreting.” *See generally* Ex. 1001. We note, however, that claim 20 recites “interpreting, using a microprocessor.” With this language in mind, the ’576 patent discloses that the device “employs a user-programmable microprocessor which receives, interprets, stores and responds to the movement data.” *Id.* at 2:13–15; *see also id.* at Abstract (making substantially similar statement). These disclosures indicate that

“interpreting” is distinct from receiving, storing, and responding to the data. Furthermore, the ’576 patent discloses that microprocessor 32 “receives the signals generated by the movement sensor 30 for *analysis and subsequent processing*” and “*analyzes and responds* to the movement data signals from the sensor 30.” *Id.* at 4:52–57 (emphases added).

Therefore, in the context of the Specification of the ’576 patent, we determine that the ordinary and customary meaning of the phrase “interpreting . . . said physical movement data” is “analyzing the physical movement data.”

D. Constitutional Issues

Patent Owner contends “the *inter partes* review process is unconstitutional in this case in that the process is being applied retroactively, where the ’576 Patent issued May 9, 2000 and the AIA review process was not in place at that date.” PO Resp. 37. Patent Owner also contends this proceeding violates its constitutional right to due process. *Id.* Petitioner argues that Patent Owner’s constitutionality arguments should be rejected. Reply 23–24.

In general, “administrative agencies do not have jurisdiction to decide the constitutionality of congressional enactments,” and “[a] finding that the agency lacks jurisdiction to decide constitutional questions is especially likely when the constitutional claim asks the agency to act contrary to its statutory charter.” *Riggin v. Office of Senate Fair Emp’t Practices*, 61 F.3d 1563, 1569 (Fed. Cir. 1995); *see also Harjo v. Pro-Football, Inc.*, 50 USPQ2d 1705, 1710 (TTAB 1999) (“[T]he Board has no authority . . . to declare provisions of the Trademark Act unconstitutional.”), *rev’d on other grounds*, 284 F. Supp. 2d 96 (D.D.C. 2003). *But see Am. Express Co. v.*

Lunenfeld, Case CBM2014-00050, slip op. at 9–10 (PTAB May 22, 2015) (Paper 51) (“[F]or the reasons articulated in *Patlex [Corp. v. Mossinghoff]*, 758 F.2d 594 (Fed. Cir. 1985)], we conclude that covered business method patent reviews, like reexamination proceedings, comply with the Seventh Amendment.”).

We note, however, that Federal Circuit has recently held that “the retroactive application of IPR proceedings to pre-AIA patents is not an unconstitutional taking under the Fifth Amendment.” *Celgene Corp. v. Peter*, No. 2018-1167, 2019 WL 3418549, at *16 (Fed. Cir. July 30, 2019). The Federal Circuit addressed arguments made under both the due process and takings clauses of the Fifth Amendment in so holding. *Id.* at *11–16. We discern no other argument from Patent Owner in this case other than those expressly rejected by the Federal Circuit. Thus, in view of *Celgene*, we find Patent Owner’s argument unpersuasive.

E. Asserted Obviousness over Stewart and Rush

1. Overview of Stewart

Stewart is titled “Helmet System Including at Least Three Accelerometers and Mass Memory and Method for Recording in Real-Time Orthogonal Acceleration Data of a Head” and relates to a helmet-based system that is typically worn while playing a sport such as boxing or football, and to the method of recording and storing data relating to translational and angular accelerations of the person’s head due to impact forces acting thereon. Ex. 1004, [54], 1:19–23.

Stewart describes drawbacks in conventional prior art devices. According to Stewart, conventional devices did not measure and record translational and angular forces to a living human head over a period of time

of exposure, particularly when the exposure was of a level below that which would normally cause concern for injury. *Id.* at 4:3–7. Further, conventional devices that measured acceleration in a single direction, or from a single event, or only above a predetermined threshold, or in a way that did not permit use during performance of the actual sport did not provide the dynamics necessary to correlate exposure to forces with the injury caused by that exposure over a period of time. *Id.* at 4:13–19.

Stewart discloses “Head Acceleration-monitoring Technology” or “HAT,” which is a portable system designed to measure and record acceleration data in real time in both translational and angular directions of an individual’s head during normal activity. *Id.* at 4:28–31. Stewart discloses that the device may be used to monitor other body parts, or the body in general. *Id.* at 4:31–33.

The HAT is designed as a standard component of otherwise conventional sporting gear, in particular the helmet. It includes at least three orthogonally-placed accelerometers and means to record their output in real time. *Id.* at 4:45–47. The data from the accelerometers are recorded in real time during performance of the sport. *Id.* at 4:60–61. The data is either recorded on a memory card or other mass memory installed in the helmet, or is transmitted to a nearby receiver for storage on a computer’s hard drive or other conventional mass storage device. *Id.* at 4:61–65.

Figure 2B of Stewart is a top view of an embodiment using three orthogonal accelerometers and a memory card installed inside a boxing helmet (*id.* at 5:30–35):

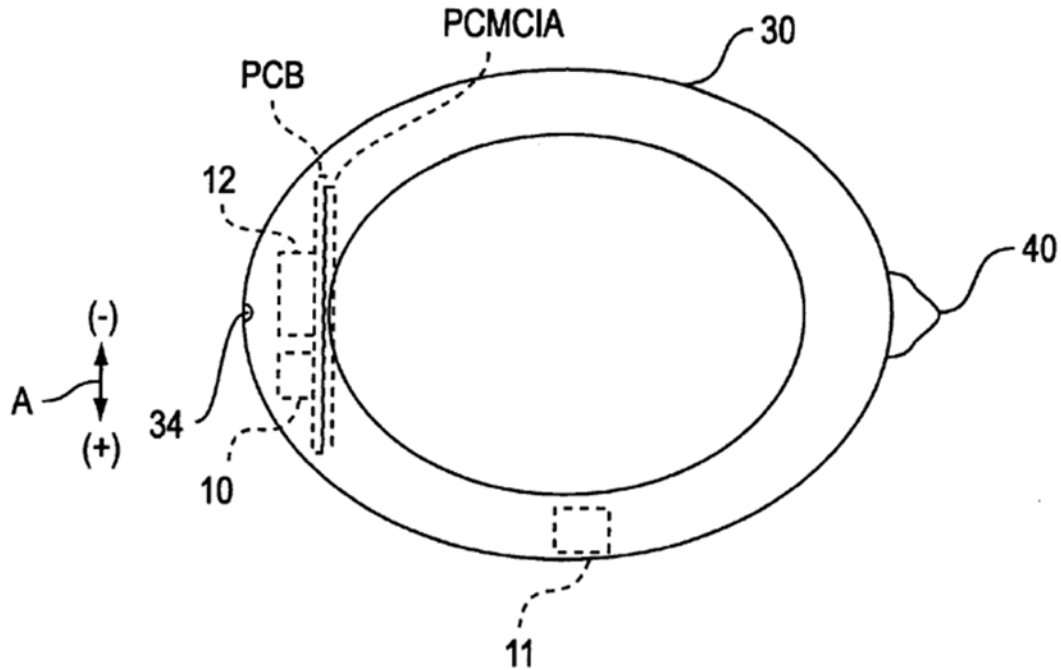


Figure 2B of Stewart is a top view of a boxing helmet.

Orthogonal accelerometers 10, 11, and 12 “provide aggregated data relating to three translational directions and two angular accelerations, but not sufficient information to separate translational and rotational components uniquely.” *Id.* at 6:45–47. In one embodiment, accelerometers 10, 12 are mounted at right angles on a printed circuit board (PCB), together with a processor, an A/D converter, a Program RAM/ROM component, a Personal Computer Memory Control Interface Adapter (PCMCIA) interface, and a serial control interface. *Id.* at 7:12–16.

2. Overview of Rush

Rush is titled “Helmet” and relates “to a helmet which will prevent damaging axial compressive forces, occasioned by impacts to the crown area of the head, i.e. the helmet, from being transmitted to the cervical spine of the wearer” and “to helmets which provide a signal or indication that the

wearer has participated in activity which can be potentially dangerous to the wearer.” Ex. 1006, [54], 1:11–15, 1:21–23. Rush discloses a protective helmet that in one embodiment is accompanied by a bag that inflates on impact. *Id.* at 3:44–58. In one embodiment, a helmet transmits a signal to a remote observer to indicate that the wearer has engaged in potentially self-injurious activity. *Id.* at 3:21–24.

3. *Independent Claim 20*

Petitioner asserts that Stewart alone discloses the limitation “interpreting, using a microprocessor included in the portable, self-contained movement measuring device, said physical movement data based on user-defined operational parameters and a real-time clock” (“the interpreting limitation”). Pet. 18–21. Specifically, Petitioner argues that Stewart discloses a processor, such as a microprocessor, that controls operation of the HAT system and receives accelerometer data from an A/D converter. *Id.* at 18 (citing Ex. 1004, 8:58–62, 8:64–9:3, Fig. 1). Petitioner also argues that Stewart discloses user-defined commands that cause the processor to start and stop the recording of data at specific times. *Id.* (citing Ex. 1004, 11:51–63, 12:35–37, 12:43–44). According to Petitioner, one of ordinary skill in the art would recognize that Stewart’s disclosure of these user-defined time commands necessarily requires the processor to access a real-time clock to determine when to start and stop data collection such that Stewart inherently discloses a real-time clock.⁵ *Id.* at 19 (citing Ex. 1010 ¶¶ 49, 51–54).

⁵ Alternatively, Petitioner argues that it would have been obvious to one of ordinary skill in the art to provide Stewart’s device with a real-time clock to enable the processor to know when to start and stop data collection. Pet. 21 (citing Ex. 1010 ¶¶ 55, 58).

Based on these disclosures, Petitioner asserts that Stewart's processor interprets the accelerometer data based on the user-defined time commands (which presumably correspond to the claimed user-defined operational parameters) and the real-time clock. *Id.* at 20. Petitioner adds that "[a]s part of the data collection process, the processor interprets the data in by integrating it to 'determine the translational, angular and normal components of acceleration of the sportsperson's head,'" and "[t]he processor may also interpret the accelerometer data by comparing it to a predetermined threshold." *Id.* (quoting Ex. 1004, 5:7–11; citing *id.* at 5:4–7, 14:6–11). Thus, Petitioner asserts, Stewart's "processor interprets the acceleration data by integrating it and/or comparing it to thresholds." *Id.* at 21.

Petitioner's analysis essentially relies on three different functions of Stewart to jointly satisfy the claimed interpreting limitation: (1) collecting data, (2) integrating data, and (3) comparing data to a threshold. We are not persuaded, however, by Petitioner's attempt to designate data collection as a form of interpreting data. First, data collection, which does not require any analysis of the data, is not "interpreting" data as we have construed this term. *See supra* § III.C. Second, we disagree with Petitioner's assertion that Stewart's disclosure of "integrating" data is *part of the data collection process*. *See* Pet. 20. Stewart discloses that "[t]he data is recorded in real-time, but may be processed in either real-time as the data is recorded, or at a later time so as to integrate and otherwise determine the translational, angular and normal components of acceleration of the sportsperson's head." Ex. 1004, 5:7–11. This disclosure merely indicates that, once recorded or collected, the data is processed either contemporaneously or at a later time, but does not suggest that the integrating process is part of the data collection

process. Rather, Stewart's data collection process is simply an antecedent to the integrating process.

For these reasons, Petitioner's argument that Stewart's data collection function combines with the other functions of integrating data and comparing data to a threshold to satisfy the claimed interpreting limitation is unpersuasive. This deficiency exposes another flaw in Petitioner's position. Namely, to satisfy the claim 20 requirement that interpreting the data is based on user-defined operational parameters and a real-time clock, Petitioner asserts that Stewart interprets accelerometer data based on the user-defined time commands (i.e., Stewart's commands that start and stop data collection) and the real-time clock that Petitioner contends is necessary to start and stop data collection at the specified times.⁶ Pet. 20. But only Stewart's data collection process relies on these time commands and the real-time clock (assuming for the sake of argument that Stewart inherently discloses a real-time clock or including a real-time clock would have been obvious to one of ordinary skill in the art). We are not persuaded on the full record that Stewart integrates data or compares data to a threshold based on the user-defined time commands or the real-time clock. As such, we are not persuaded that Stewart discloses interpreting data *based on user-defined operational parameters and a real-time clock*.

⁶ Petitioner also notes that Stewart discusses a defined threshold and a predetermined threshold in connection with accelerometer data (Pet. 20 (citing Ex. 1004, 5:4–7, 14:6–11)), but the section of the Petition addressing the interpreting limitation for this asserted ground does not contend explicitly that such a threshold corresponds to the claimed user-defined operational parameters (*id.* at 18–21).

In addition, we agree with Patent Owner that one of ordinary skill in the art “would recognize that the processor in *Stewart* is not interpreting the measured data based on the commands because the processor is merely controlling the storage of the measured data.” PO Resp. 18 (citing Ex. 2001 ¶¶ 45, 63, Fig. A2).⁷ *Stewart* discloses that processor 52 controls data sampling and storage operations. Ex. 1004, 5:56–57. *Stewart* also discloses processing the data to “integrate” it, without expressly indicating that this processing is performed by processor 52. *See id.* at 5:7–11. Similarly, *Stewart* discloses that “it is possible to correlate certain responses of the accelerometers 10–12 with desirable punches exceeding a predetermined threshold,” but does not disclose expressly that processor 52 compares acceleration data with the predetermined threshold. *See id.* at 14:6–8. Indeed, *Stewart* discloses that the accelerometer responses are “processed and scored *at a ringside receiver*,” implying that the ringside receiver—and not processor 52—performs this processing.⁸ *See id.* at 14:8–9 (emphasis added). Thus, on the record before us, we are not persuaded that processor 52 performs the integrating and comparing functions.

In reply, Petitioner argues that *Stewart*’s processor does more than control storage of data. Reply 10. According to Petitioner, “[o]nce *Stewart*’s microprocessor obtains movement data from the accelerometers, it interprets the data to determine the ‘precise motions of the head.’” *Id.*

⁷ Petitioner argues that certain figures, including Figure 2A, produced in Dr. Madisetti’s declaration are factually flawed. Reply 8. We do not rely, however, on any of these figures in this Decision.

⁸ We note that Petitioner’s arguments at the hearing suggest it is relying on *Stewart*’s comparing function alone as corresponding to the claimed interpreting limitation. Tr. 7:14–17.

(citing Ex. 1004, 5:2–3). This statement, however, mischaracterizes Stewart’s disclosure. The pertinent passage of Stewart, in full, recites:

The HAT provides real-time storage of data over a length of time such that cumulative exposure effects and thus limits can be established for further or future participation in the sport by the individual wearing the helmet equipped with the present invention. The data also allows detection of the precise motions of the head which precede the occurrence of a severe head injury.

Ex. 1004, 4:65–5:4 (emphases added). Thus, Stewart discloses that the system stores data, and the *data* allows for the detection of the precise motions of the head. This passage does not teach that *processor 52* interprets the data to determine the precise motions of the head; Stewart appears to be silent as to how, and by what means, the precise motions of the head are detected. *See id.*; *see also* Sur-Reply 7 (“Nowhere does Stewart teach or render obvious that the processor performs such detection.”).

Petitioner points to Stewart’s disclosure that processor 52 “controls the operation of the HAT system” as indicating the processor controls the entire operation of the system and, thus, controls the integrating and comparing functions. Reply 9 (citing Ex. 1004, 8:58–62; Pet. 18); Tr. 16:2–8, 18:25–19:11. This argument is unpersuasive for the following reasons.

Stewart provides several specific disclosures that processor 52 controls the data storage operation. Ex. 1004, 5:56–57 (“A processor 52 controls data sampling and storage operations.”); *id.* at 8:58–59 (“The processor 52 controls the storage of data from the A/D Converter 46 to the data storage 51.”); *id.* at 11:29–32 (“Storage of data from the outputs of the accelerometers 10–12 is started and stopped by the processor 52.”); *id.* at 11:51–54 (“The operating software of the processor 52 monitors the serial

control interface 42 for the presence of commands. These commands set the general parameters of the data storage operation of the HAT.”); *id.* at 12:64–67 (“The processor 52 controls storage of the data in the PCMCIA memory card such that the file parameters in the PCMCIA memory card are not changed.”).

The single passage cited in the Petition, however, is a more general statement that processor 52 “controls the operation of the HAT system.” *Id.* at 8:59–62. We are not persuaded that this single, general disclosure is sufficient to support Petitioner’s assertion that processor 52 necessarily controls *every* aspect of the HAT system and, in particular, the integrating and comparing functions. In fact, as discussed above, Stewart’s disclosure indicates that the comparing function is accomplished by a receiver remote from the self-contained helmet system, thereby identifying at least one function that is not performed by the processor. *See id.* at 14:6–9 (disclosing that when correlating accelerometer responses “with desirable punches exceeding a predetermined threshold,” the responses are “processed and scored at a ringside receiver”).

When asked during the hearing for other disclosures in Stewart that support the assertion that processor 52 controls the integrating and comparing functions, Petitioner identified two passages from Stewart’s abstract and column 4 of the Specification. Tr. 16:14–23. Both of these passages refer to a system designed to measure and record acceleration data in real-time in both translational and angular directions of an individual’s head during normal activity. Ex. 1004, Abstract, 4:28–31. Neither passage mentions a processor, integrating the data, or comparing the data, and, thus,

these passages fail to support the assertion that processor 52 controls the integrating and comparing functions.

In addition, the Petition does not identify any expert testimony supporting the assertion that processor 52 controls the integrating and comparing functions. *See* Pet. 18–21. At the hearing, Petitioner argued that its expert opined that Stewart’s disclosure indicates the processor performs the comparing process. Tr. 6:20–23. We are not directed, however, to where in Dr. Singer’s declaration such an opinion is given. Nevertheless, we note that Dr. Singer testifies that Stewart’s “processor may interpret the accelerometer data by comparing it to a predefined threshold,” and “may also process the accelerometer data ‘in real-time as the data is recorded . . . so as to integrate and otherwise determine the translational, angular and normal components of acceleration of the sportsperson’s head.’” Ex. 1010 ¶ 56 (citing Ex. 1004, 5:4–11). This testimony merely repeats the Petition’s assertions and, thus, is not supported sufficiently by objective evidence or analysis. For this reason, we do not credit the testimony of Dr. Singer on this issue. *See* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”).

On balance, we are not persuaded on the full record that Stewart discloses that processor 52 controls the integrating and comparing functions. Accordingly, we determine that Petitioner has not met its burden of establishing that Stewart teaches or suggests the interpreting limitation.

Regarding the limitation “detecting, using the microprocessor, a first user-defined event based on the movement data and at least one of the user-defined operational parameters regarding the movement data” (“the

detecting limitation”), Petitioner asserts that Stewart discloses a processor detecting an event, such as a spearing movement in football, based on acceleration data and a predetermined threshold. Pet. 22–23 (citing Ex. 1004, 5:4–7, 14:6–11). Noting that Stewart does not disclose expressly that the predetermined threshold is set by user commands, Petitioner argues that Rush discloses a monitoring device that detects axial loads, such as a spearing movement, in which the threshold value for detecting the spearing movement can be adjustable to accommodate users of different ages and sizes. *Id.* at 23 (citing Ex. 1006, 3:13–18, 9:48–50, 9:54–58). Thus, according to Petitioner, it would have been obvious to one of ordinary skill in the art to modify Stewart’s system to enable user adjustment of the predetermined threshold to accommodate different users as taught by Rush. *Id.* at 23–24 (citing Ex. 1010 ¶¶ 61, 62).

In this analysis, Petitioner maps Stewart’s predetermined threshold to the recited user-defined operational parameters. This claim limitation, however, recites *at least one of the* user-defined operational parameters. In other words, the detection of a first user-defined event must be based on at least one of the same user-defined operational parameters upon which the interpretation of the movement data was based. But, as discussed above, Petitioner maps the user-defined operational parameters of the interpreting limitation to Stewart’s user-defined time commands that cause the processor to start and stop the recording of movement data. Pet. 20. By inconsistently relying on different parameters in Stewart to satisfy the claimed user-defined operational parameters, Petitioner has not met its burden of establishing that the combination of Stewart and Rush meets the subject matter of claim 20.

In addition, we disagree that Stewart expressly discloses that processor 52 detects an event such as spearing. Stewart merely discloses that it may be “possible to determine if a football player is improperly using his helmet (e.g., illegal spearing)” without specifying that such determination is performed by processor 52. *See* Ex. 1004, 14:4–14. Furthermore, as discussed above, Stewart’s disclosure with respect to the accelerometer responses exceeding a predetermined threshold indicates that this processing is accomplished by a receiver remote from the self-contained helmet system and, thus, is not performed by the processor. *See id.* at 14:6–9 (disclosing that when correlating accelerometer responses “with desirable punches exceeding a predetermined threshold,” the responses are “processed and scored at a ringside receiver”).

For these reasons, we determine that Petitioner has not shown that Stewart teaches or suggests the detecting limitation of claim 20.

Accordingly on the full record before us, we determine that Petitioner has not demonstrated, by a preponderance of the evidence, that claim 20 is unpatentable under 35 U.S.C. § 103 as directed to subject matter that would have been obvious to a person of ordinary skill in the art in light of Stewart and Rush.

4. *Dependent Claims 21–26, 29, 104–107, 110, 113–116, 118, 121, 126–128, 134, 135, and 175*

Claims 21–26, 29, 104–107, 110, 113–116, 118, 121, 126–128, 134, 135, and 175 all depend from claim 20 and, thus, contain all the limitations of claim 20. Accordingly, we also determine that Petitioner has not demonstrated, by a preponderance of the evidence, that claims 21–26, 29, 104–107, 110, 113–116, 118, 121, 126–128, 134, 135, and 175 are

unpatentable under 35 U.S.C. § 103 as directed to subject matter that would have been obvious to a person of ordinary skill in the art in light of Stewart and Rush.

*F. Asserted Obviousness over Stewart, Rush, and Conlan
and Stewart, Rush, and Church*

Petitioner contends claims 119–124, 126, 136, and 137 would have been obvious over Stewart, Rush, and Conlan and claim 117 would have been obvious over Stewart, Rush, and Church. Pet. 43–52. Claims 117, 119–124, 126, 136, and 137 all depend from claim 20 and, thus, contain all the limitations of claim 20.

As discussed above, we find that the combination of Stewart and Rush does not render claim 20 obvious because Petitioner has not established that the combination teaches or suggests all the limitations of the claim. See *supra* § III.E.3. Petitioner does not assert that either Conlan or Church overcomes these deficiencies. Accordingly, we determine that Petitioner has not demonstrated, by a preponderance of the evidence, that claims 119–124, 126, 136, and 137 are unpatentable under 35 U.S.C. § 103 as directed to subject matter that would have been obvious to a person of ordinary skill in the art in light of Stewart, Rush, and Conlan, or that claim 117 is unpatentable under 35 U.S.C. § 103 as directed to subject matter that would have been obvious to a person of ordinary skill in the art in light of Stewart, Rush, and Church.

G. Asserted Obviousness over Richardson and Stewart

1. *Overview of Richardson*

Richardson is titled “Portable Aerobic Fitness Monitor for Walking and Running,” and

relates to a personal fitness monitoring device that may be worn by an individual while the individual is exercising. The fitness monitoring device monitors the aerobic fitness of the user as the user exercises and provides the user with information about the current exercise session, an assessment of the user's current fitness level, and a prediction of the user's future fitness.

Ex. 1009, [54], 1:6–13.

Richardson discloses, *inter alia*, a heart rate monitor and a pedometer for determining locomotion. *Id.* at 1:18–22. Richardson further discloses alarms based on monitoring when an alarm trigger is exceeded, e.g., a heart alarm trigger when a heart rate is exceeded, a milepost alarm trigger when a distance is exceeded, and a cruise control alarm when a chosen speed is exceeded. *Id.* at 30:12–24.

2. *Independent Claim 20*

Regarding the interpreting limitation, Petitioner argues that Richardson discloses microprocessor 123 coupled to accelerometer subsystem 025 and real-time clock 031, and microprocessor 123 interprets data received from accelerometer subsystem 025 based on user-defined operational parameters and real-time clock 031. Pet. 59–60 (citing Ex. 1009, 16:8–20, Fig. 9). According to Petitioner, microprocessor 123 executes monitor sensors process 154, and monitor sensors process 154 uses the acceleration data to detect the user's footfalls and steps. *Id.* at 60–61 (citing Ex. 1009, 16:8–14, 28:28–32, 28:36–39, 28:42–45, Fig. 12).

Petitioner also argues that Richardson discloses estimating the user's velocity based on the acceleration data and the user's personal data 005, such as weight, age, height, and leg length, entered by the user. *Id.* at 63 (citing Ex. 1009, 4:20–27, 13:11–36, 29:10–11, Figs. 11, 14). Based on this

disclosure, Petitioner asserts that “the user’s personal data parameters are user-defined operational parameters used to interpret the acceleration data.” *Id.* Petitioner argues further that microprocessor 123 executes track user status process 156 to compute values such as the total distance travelled during an exercise session and the duration of the session. *Id.* at 64 (citing Ex. 1009, 30:1–5).

Petitioner’s analysis rests on the assertion that Richardson’s microprocessor 123 executes monitor sensors process 154 and track user status process 156. Richardson, however, does not disclose expressly that either monitor sensors process 154 or track user status process 156 is executed by microprocessor 123. Richardson’s description of microprocessor 123, and processor subsystem 144 that includes the microprocessor, is sparse. For instance, Richardson discloses:

The signals from the A/D converter 118 and amplifier/pulse processor 116 go to a processor subsystem 144 including an inexpensive microprocessor 123. The processor subsystem 144 has a program ROM 132 for storing executable instructions, a RAM 124 for storing computations and data during run-time, and an NVRAM 126 for storing a permanent database of facts about the user. The processor subsystem 144 also uses a real-time clock 031 for tracking data rates and the date and time that the fitness monitor 001 is in use.

Ex. 1009, 16:11–20. The only other disclosure in Richardson regarding microprocessor 123 is “[w]ake-up circuitry 136 allows a main user control button 102 to be used to switch on the power, as well as to be used as input to the microprocessor 123 for controlling the voice menu.” *Id.* at 16:38–41. In addition, Richardson’s disclosure is vague with respect to which component executes monitor sensors process 154 and track user status process 156, only mentioning “system software” or “the system.” *See, e.g.,*

id. at 17:57–58 (“An overview of the system software is given as a data flow diagram in FIG. 10.”), 19:39–40 (“[T]he system starts the monitor sensors process 154.”).

Despite the lack of express disclosure, Petitioner does not assert that Richardson inherently discloses that microprocessor 123 executes monitor sensors process 154 or track user status process 156, or that this operation would have been obvious to one of ordinary skill in the art. Rather, Petitioner simply assumes, without support, that microprocessor 123 executes these processes. Furthermore, we are not directed to any supporting testimony from Dr. Singer. Accordingly, based on the full record before us, we determine that Petitioner has not met its burden of establishing that microprocessor 123 executes monitor sensors process 154 or track user status process 156 and, thus, does not demonstrate sufficiently that Richardson discloses interpreting movement data using a microprocessor.

Petitioner’s analysis is also flawed with respect to the limitation “detecting, using the microprocessor, a first user-defined event based on the movement data and at least one of the user-defined operational parameters regarding the movement data.” For this limitation, Petitioner asserts that Richardson’s monitoring device allows the user to set a cruise control alarm that is detected by the microprocessor’s track user status process 156 whenever the user’s speed derived from the acceleration data is out of a user-defined range. Pet. 66–67 (citing Ex. 1009, 17:38–43, 30:12–23). Thus, Petitioner maps Richardson’s cruise control alarm to the recited first user-defined event and the user-defined range to the recited user-defined operational parameters. *Id.*

Mapping the user-defined range to the recited user-defined operational parameters, however, is inconsistent with Petitioner's prior mapping of Richardson's personal data 005 to the recited user-defined operational parameters in connection with the interpreting limitation. *See id.* at 63. In view of this inconsistent mapping, Petitioner has not met its burden of establishing that the combination of Richardson and Stewart meets the subject matter of claim 20. Moreover, for the reasons discussed above, Petitioner has not established adequately that microprocessor 123 executes track user status process 156.

For the above reasons, we determine on the full record before us that Petitioner has not demonstrated, by a preponderance of the evidence, that claim 20 is unpatentable under 35 U.S.C. § 103 as directed to subject matter that would have been obvious to a person of ordinary skill in the art in light of Richardson and Stewart.

3. *Dependent Claim 138*

Claim 138 depends from claim 20 and, thus, contains all the limitations of claim 20. Accordingly, we also determine that Petitioner has not demonstrated, by a preponderance of the evidence, that claim 138 is unpatentable under 35 U.S.C. § 103 as directed to subject matter that would have been obvious to a person of ordinary skill in the art in light of Richardson and Stewart.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 20–26, 29, 104–107, 110, 113–122, 126–128, 134–138, and 175 of the '576 patent have not been shown to be *unpatentable*; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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