

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE, INC.,
Petitioner,

v.

UNILOC 2017 LLC,
Patent Owner.

IPR2018-01028
Patent 7,881,902 B1

Before SALLY C. MEDLEY, JOHN F. HORVATH, and
SEAN P. O'HANLON, *Administrative Patent Judges*.

HORVATH, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

A. Background

Apple Inc. (“Petitioner”) filed a Petition requesting *inter partes* review of claim 8 (“the challenged claim”) of U.S. Patent No. 7,881,902 B1 (Ex. 1001, “the ’902 patent”). Paper 2 (“Pet.”). Uniloc 2017 LLC (“Patent Owner”)¹ filed a Preliminary Response. Paper 7 (“Prelim. Resp.”). Upon consideration of the Petition and Preliminary Response, we instituted *inter partes* review of claim 8 on the ground raised in the Petition. Paper 8 (“Dec. Inst.”)

Patent Owner filed a Response to the Petition (Paper 10, “PO Resp.”), Petitioner filed a Reply (Paper 11, “Pet. Reply”), and Patent Owner filed a Sur-Reply (Paper 12, “PO Sur-Reply”). We held a consolidated oral hearing for this case and related cases involving the same parties and related patents on April 2, 2019, and the hearing transcript is included in the record. See Paper 17 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6(b). This is a Final Written Decision under 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons set forth below, we find Petitioner has shown by a preponderance of evidence that claim 8 of the ’902 patent is unpatentable.

B. Related Matters

Petitioner and Patent Owner identify numerous district court matters that could affect, or be affected by, a decision in this proceeding. See Pet. 1–2; Paper 3, (2); Paper 6, (2). In addition, our Institution Decision identifies

¹ Uniloc 2017 LLC identifies itself, Uniloc USA, Inc., and Uniloc Licensing USA LLC as real parties-in-interest. Paper 6 (1).

numerous *inter partes* reviews challenging claims of the '902 patent and related U.S. Patent Nos. 7,653,508 B1 and 8,712,723 B1, that could affect, or be affected by, this proceeding. *See* Dec. Inst. 2–3.

*C. Evidence Relied Upon*²

Reference		Effective Date ³	Exhibit
Pasolini	US 7,463,997 B2	Oct. 2, 2006	1005
Fabio	US 7,698,097 B2	Oct. 2, 2006	1006
Tsuji	US 7,297,088 B2	Apr. 19, 2005	1010

D. Instituted Ground of Unpatentability

Claim Challenged	35 U.S.C. §	References
8	103(a)	Fabio, Pasolini, and Tsuji

II. ANALYSIS

A. The '902 Patent

The '902 patent relates to “a method of . . . counting periodic human motions such as steps.” Ex. 1001, 1:9–11. The method involves the use of a “portable electronic device that includes one or more inertial sensors” that “measure accelerations along a single axis or multiple axes.” *Id.* at 2:24–28.

² Petitioner also relies upon the Declaration of Joseph A. Paradiso, Ph.D. (Ex. 1003).

³ Petitioner relies on the filing dates of Pasolini, Fabio, and Tsuji as the effective date for determining their availability as prior art under 35 U.S.C. § 102(e). Pet. 8–9.

Figure 1 of the '902 patent is reproduced below.

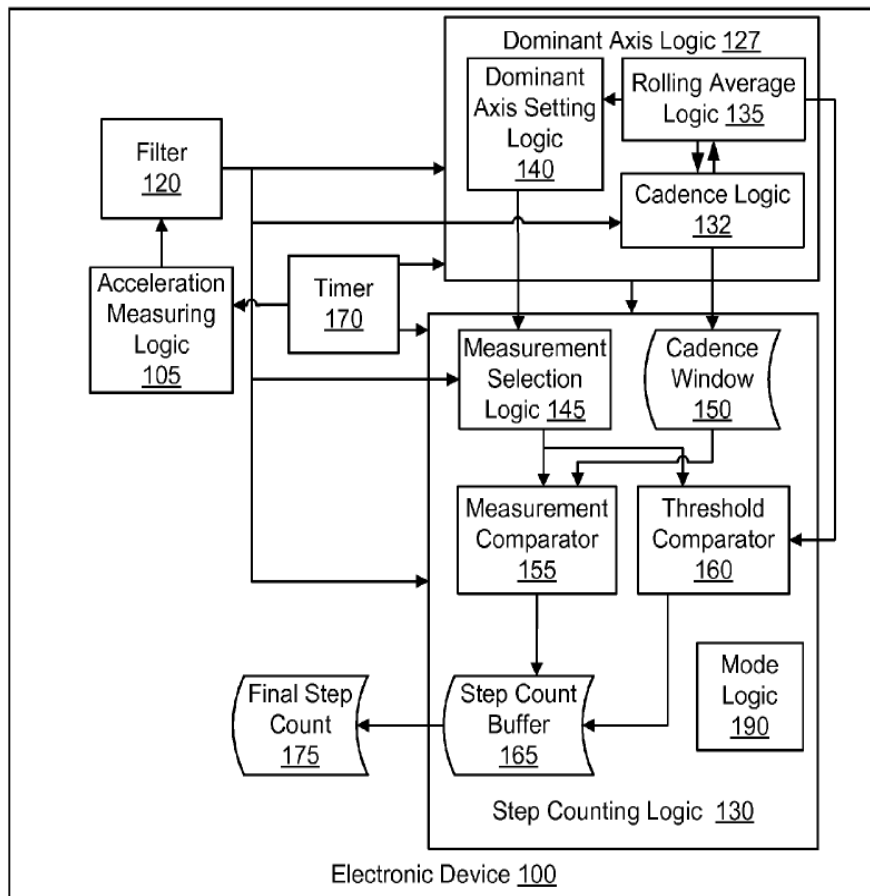


Figure 1 of the '902 patent is a block diagram illustrating electronic device 100. *Id.* at 1:47–48. Device 100 includes acceleration measuring logic 105 (e.g., inertial sensors), dominant axis logic 127, and step counting logic 130. *Id.* at 2:19–24, 2:38–43, Fig. 1. Device 100 “may be used to count steps or other periodic human motions,” where a “step” is “any user activity having a periodic set of repeated movements.” *Id.* at 2:29–30, 3:34–38. According to the '902 patent, device 100 accurately counts steps “regardless of the placement and/or orientation of the device on a user,” and regardless of

whether the device “maintains a fixed orientation or changes orientation during operation.” *Id.* at 2:31–35.

Dominant axis logic 127 includes cadence logic 132 and rolling average logic 135. *Id.* at 2:66–3:2, Fig. 1. Inertial sensors 105 measure acceleration data, and cadence logic 132 analyzes this data to detect “a period and/or cadence of a motion cycle,” which may be based on user activity such as running or walking. *Id.* at 2:38–40, 3:14–18, 3:46–51. Cadence logic 132 determines “a cadence window 150 to be used by the step counting logic 130.” *Id.* at 3:11–14. Cadence window 150 is “a window of time since a last step was counted that is looked at to detect a new step.” *Id.* at 3:65–4:1. Cadence window 150 is initially set to a default value, and can be dynamically updated to reflect the cadence or period of detected steps once a minimum number of steps have been detected. *Id.* at 3:57–61, 4:22–28, 4:61–5:6. The cadence or stepping period can be determined as a “rolling average of the stepping periods over previous steps.” *Id.* at 3:61–62.

Cadence logic 132 also determines “one or more sample periods to be used by the rolling average logic 135.” *Id.* at 3:11–14, 5:31–34. The sample periods can be set to “the length of, or longer than, the stepping period,” including a “multiple of the stepping period.” *Id.* at 5:34–37. Rolling average logic 135 “creates one or more rolling averages of accelerations . . . measured by the inertial sensor(s) over the sample period(s) set by the cadence logic 132.” *Id.* at 5:39–41. These rolling averages are used to determine an orientation of the electronic device and a threshold against which acceleration measurements are compared. *Id.* at 5:41–45.

Dominant axis logic 127 includes dominant axis setting logic 140, which determines an orientation of device 100 or of the inertial sensor(s)

within device 100. *Id.* at 6:8–10. This may be done “based upon the rolling averages of accelerations created by the rolling average logic 135.” *Id.* at 6:10–12. In particular, “[t]he axis with the largest absolute rolling average” over a given sampling period is identified as the “axis most influenced by gravity” and is designated the dominant axis. *Id.* at 6:14–18, 6:23–25. The ’902 patent explains that because device orientation may change over time, the rolling average acceleration may change and “a new dominant axis may be assigned when the orientation of the electronic device 100 and/or the inertial sensor(s) attached to or embedded in the electronic device 100 changes.” *Id.* at 6:16–22. Dominant axis setting logic 140 can also set the dominant axis to be a virtual “axis that is defined as approximately aligned to gravity,” and that is found from “trigonometric calculations on the actual axes based on the gravitation influence” on those axes. *Id.* at 6:25–34.

Step counting logic 130 includes measurement selection logic 145, measurement comparator 155, and threshold comparator 160. *Id.* at 6:38–41. Measurement selection logic 140 “monitor[s] accelerations relative to the dominant axis, and select[s] only those measurements with specific relations to the dominant axis.” *Id.* at 6:44–47. “Selected measurements [are] forwarded to the measurement comparator 155 and the threshold comparator 160 to determine whether a step has occurred.” *Id.* at 6:57–59.

A method for determining whether a step has occurred is disclosed in Figure 8 of the ’902 patent, which is reproduced below.

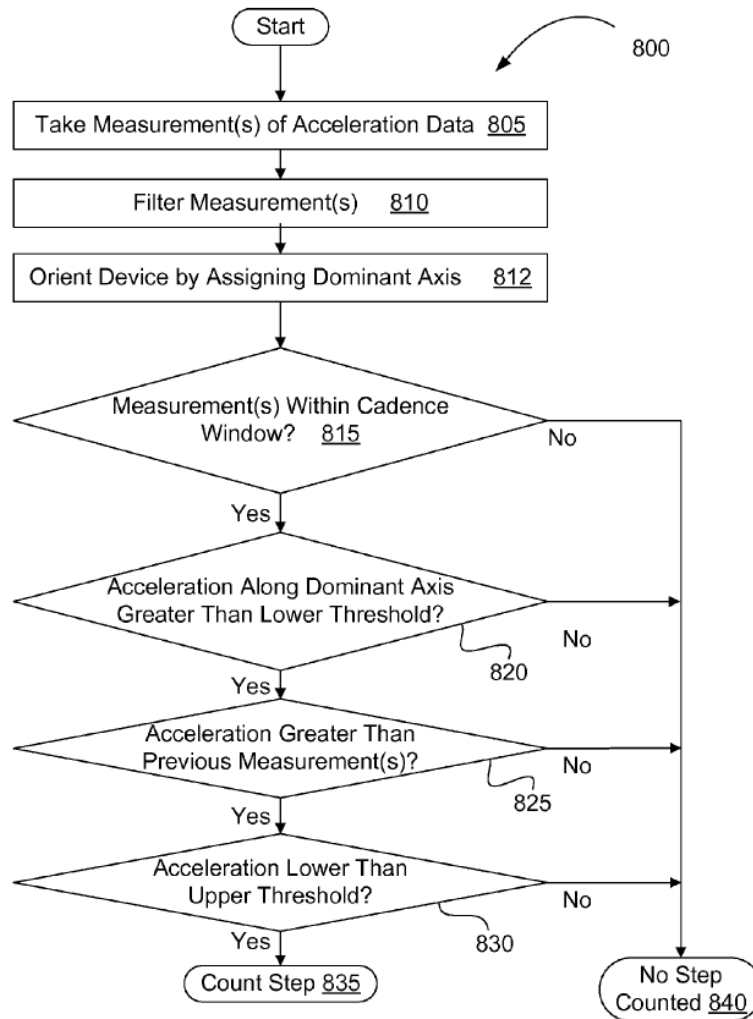


Figure 8 is a flow diagram of a method for recognizing that a step has occurred. *Id.* at 2:1–4, 12:25–27. Acceleration measurement data is received and filtered to remove low and high frequency components. *Id.* at 12:31–38, Fig. 8 (steps 805 and 810). A dominant axis is assigned as described above. *Id.* at 40–44, Fig. 8 (step 812). If the acceleration measurement falls outside the cadence window, it is discarded. *Id.* at 12:45–48, Fig. 8 (step 815). If the acceleration measurement falls within the cadence window, three additional tests are performed to determine whether a

step is counted. First, the acceleration along the dominant axis must be greater than a lower threshold, such as the rolling average acceleration along the dominant axis. *Id.* at 7:9–12, 12:51–55, 12:64–65, Fig. 8 (step 820). Second, the acceleration along the dominant axis must be greater than the previous measured accelerations along the dominant axis. *Id.* at 7:9–12, 13:34–38, 13:53–56, Fig. 8 (step 825). Third, the acceleration along the dominant axis must be lower than an upper threshold, which “prevent[s] sudden accelerations such as taps from being counted as steps.” *Id.* at 13:66–14:3, 7:9–12, 13:59–62, Fig. 8 (step 830).

Device 100 is battery operated, and has multiple operating modes to preserve battery life, including sleep mode 305, entry mode 315, stepping mode 325, and exit mode 335. *Id.* at 8:16–18. The power level of device 100 is linked to these modes. *Id.* at 8:18–19. The different modes and the relationships between them are shown in Figure 3 of the '902 patent, which is reproduced below.

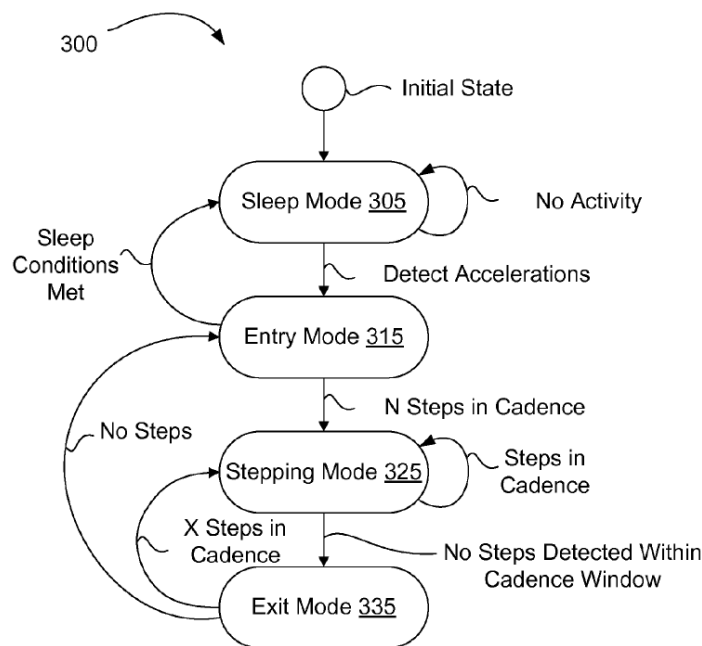


Figure 3 of the '902 patent is a state diagram showing the different modes of electronic device 100. *Id.* at 1:52–54. When no acceleration data is measured, device 100 is in sleep mode 305. *Id.* at 8:20–22. When acceleration data is detected, device 100 enters entry mode 315 to detect steps in the acceleration data. *Id.* at 8:22–25. If a predetermined number (N) of steps are detected in a sampling period, device 100 enters stepping mode 325; otherwise, it reverts to sleep mode 305. *Id.* at 8:25–28. In stepping mode 325, steps are detected and counted as described above until no steps are detected within the cadence window, at which point device 100 enters exit mode 335. *Id.* at 8:30–37. In exit mode 335, device 100 determines whether a predetermined number (X) of steps are detected at a particular cadence. *Id.* at 8:38–40. If so, device 100 reverts to stepping mode 325; if not, device 100 reverts to entry mode 315. *Id.* at 8:41–44.

The method by which device 100 transitions from entry mode 315 to stepping mode 325 is shown in Figure 5, which is reproduced below.

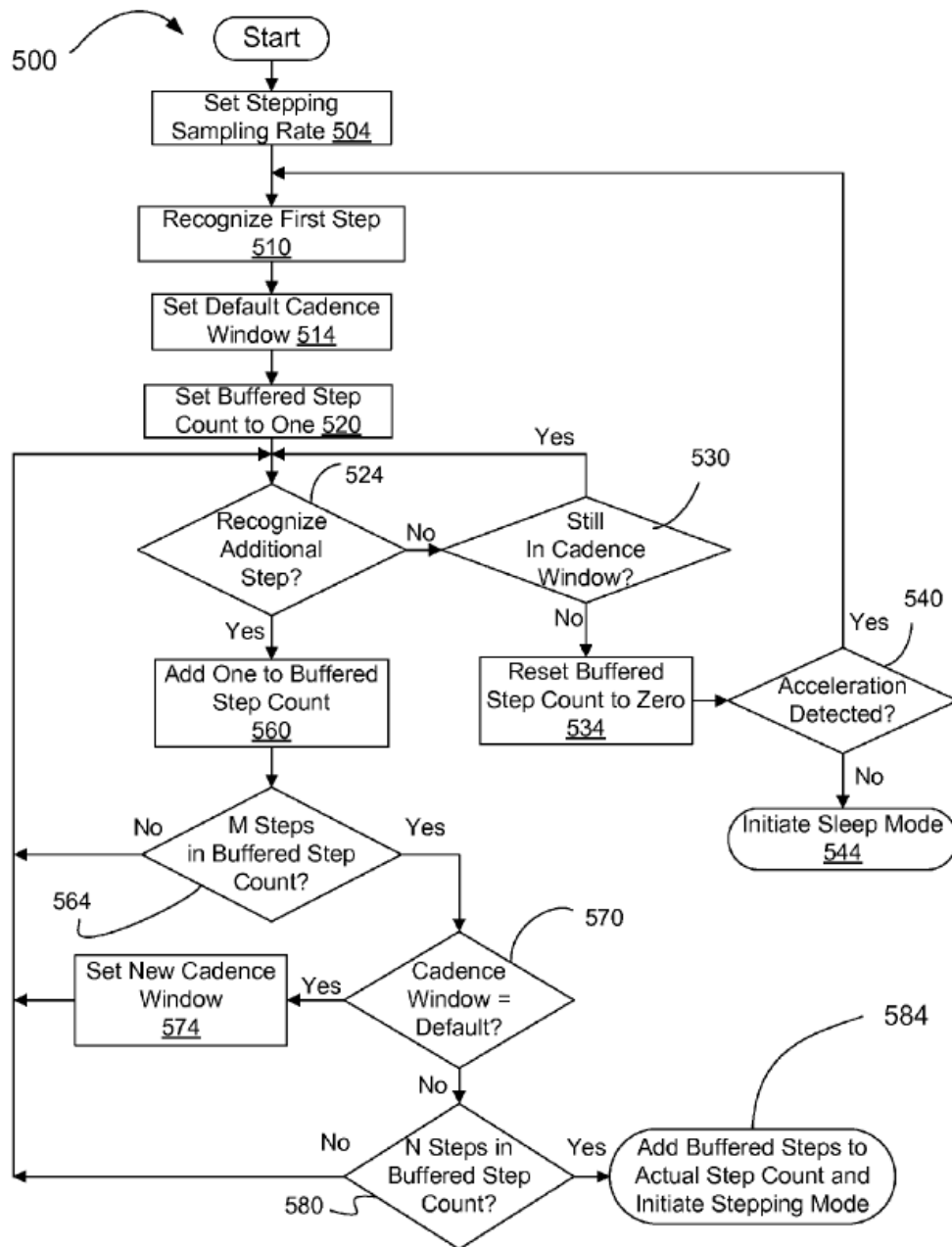


Figure 5 of the '902 patent is a flow chart of entry mode 315. *Id.* at 1:58–60. After setting a sampling rate (504), a first step is detected in the acceleration data (510), a default cadence window is set (514), and a temporary or buffered step count is set to one (520). *Id.* at 9:55–10:8, 10:25. Next additional steps are searched for in the acceleration data (524) using the

criteria discussed above, including whether the acceleration data falls within the default cadence window. *Id.* at 10:25–30, 12:45–46, Fig. 8.

When additional steps are detected (524), they are added to the buffered step count (560). *Id.* at 10:46–47. If the buffered step count is less than a predetermined number M (564), additional steps are looked for in the acceleration data (524). *Id.* at 10:47–52. If the buffered step count is equal to M (564) and the cadence window is the default cadence window (570), a new cadence window is determined based on the cadence of the M steps (574). *Id.* at 10:53–57. The new cadence window is used to look for additional steps in the acceleration data (524) until a predetermined number of N steps is counted in the buffered step count (580). *Id.* at 10:57–67. When the buffered step count reaches N steps, the N steps are added to an actual step count (584), and device 100 enters stepping mode 325. *Id.* at 10:67–11:3. In stepping mode 325, the cadence window is dynamically updated based on the rolling average of previously measured stepping periods. *Id.* at 11:13–17.

As discussed above, measured acceleration data is only counted as a step when it falls within the cadence window. *Id.* at 10:25–30, 12:45–46, Fig. 8. If the measured acceleration data falls outside the cadence window (530), the buffered step count is reset to zero (534). *Id.* at 10:36–37. If acceleration data is subsequently detected (540), the process begins again to look for a first step (510). *Id.* at 10:42–44. Otherwise, the device enters sleep mode (544). *Id.* at 10:41–42.

B. The Challenged Claim

Claim 8, the only challenged claim, depends from independent claim 5. Claims 5 and 8 are reproduced below.

5. A method for a mobile device comprising:

receiving acceleration data that meets stepping criteria from an accelerometer included in the mobile device;

incrementing a step count in a step count buffer;

when at least one of a) the step count is below a step count threshold, or b) a current user cadence fails to match a step cadence of a user profile, using a default step cadence window to identify a time frame within which to monitor for a next step; and

when the step count is at or above the step count threshold, determining a dynamic step cadence window and using the dynamic step cadence window to identify the time frame within which to monitor for the next step.

Ex. 1001, 15:46–16:6.

8. The method of claim 5, wherein determining the dynamic step cadence window comprises:

computing a rolling average of stepping periods of previously counted steps; and

setting the dynamic step cadence window based on the rolling average of stepping periods.

Id. at 16:22–27.

C. Claim Construction

This Petition was filed on May 4, 2018. Pet. 45. For petitions filed before November 13, 2018, claim terms of an unexpired patent are given their broadest reasonable interpretation in light of the specification of the

patent in which they appear. 37 C.F.R. § 42.100(b) (2017).⁴ Under the broadest reasonable interpretation standard, claim terms are generally given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art, in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Only claim terms which are in controversy need to be construed and only to the extent necessary to resolve the controversy. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

Petitioner proposes a construction for the term “cadence window,” which Petitioner argues is defined in the Specification to mean “a window of time since a last step was counted that is looked at to detect a new step.” Pet. 7 (citing Ex. 1001, 3:66–4:1). In our Institution Decision, we determined that this claim term does not require express construction. *See* Dec. Inst. 16. Neither party disputes that determination. *See* PO. Resp. 5 (“Patent Owner agrees no specific construction is necessary here.”); Pet. Reply 1–20. Accordingly, we maintain our decision declining to expressly construe the term “cadence window.”

D. Overview of the Prior Art

1. Fabio

Fabio discloses a method for “controlling a pedometer based on the use of inertial sensors.” Ex. 1006, 1:10–11. The pedometer can be “integrated within a portable electronic device, such as a cell phone.” *Id.* at 2:34–36. The method involves:

⁴ *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent and Trial Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018).

generating a signal correlated to movements of a user of the pedometer; detecting steps of the user based on the signal; checking whether sequences of the detected steps satisfy pre-determined conditions of regularity; updating a total number of valid steps if the conditions of regularity are satisfied; and preventing updating of the total number of valid steps if the conditions of regularity are not satisfied.

Id. at 1:62–2:3. Fabio detects user steps from the sampled acceleration data A_Z of its inertial sensor according to a method illustrated in Figures 5 and 6, which are reproduced below.

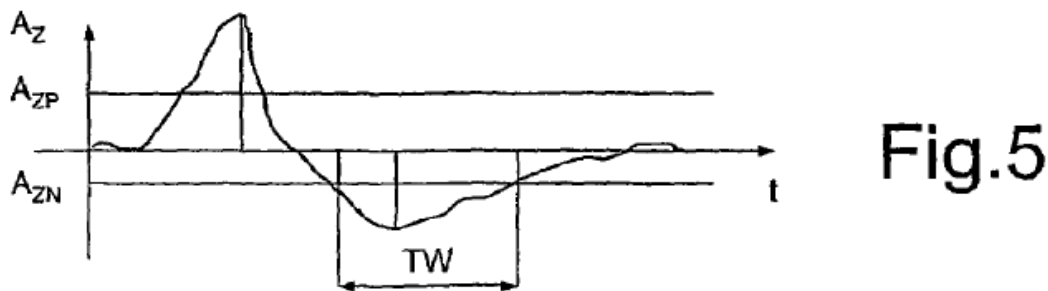


Figure 5 of Fabio is a graph illustrating quantities used to detect user steps from acceleration data. *Id.* at 2:22–23. A step is recognized when a positive peak of acceleration signal A_Z is greater than threshold A_{ZP} , and a negative peak is less than threshold A_{ZN} and falls within a fixed time window TW measured from the positive peak. *Id.* at 4:15–21.

A recognized step is validated when it falls within a validation interval TV , which is illustrated in Figure 6, reproduced below.

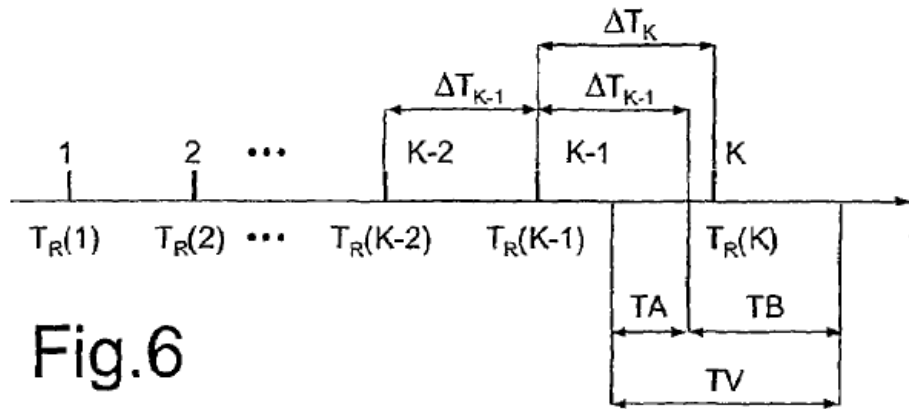


Fig.6

Figure 6 of Fabio is a graph illustrating quantities used to validate user steps detected from acceleration data. *Id.* at 2:24–25. Figure 6 illustrates a sequence of user steps recognized at times $T_R(1)$, $T_R(2) \dots T_R(K-2)$, $T_R(K-1)$, and $T_R(K)$ according to the method disclosed in Figure 5. The time between steps recognized at times $T_R(K-1)$ and $T_R(K-2)$ is ΔT_{K-1} ; the time between steps recognized at times $T_R(K)$ and $T_R(K-1)$ is ΔT_K . *Id.* at 4:28–35. For the step recognized at time $T_R(K)$ to be validated as a step, it must fall within validation interval TV, i.e., $T_R(K)$ must be greater than $T_R(K-1) + \frac{1}{2} (\Delta T_{K-1})$ and less than $T_R(K-1) + 2 (\Delta T_{K-1})$. *Id.* at 4:35–52. Although TV is described as having an amplitude or “width” of $\frac{3}{2} \Delta T_{K-1}$ that depends on the variable time between previous steps K-1 and K-2, Fabio discloses TV can “have a different amplitude.” *Id.* at 4:52–53. Fabio further discloses that TV is used to ensure “the duration ΔT_K of a current step K is substantially homogeneous with respect to the duration ΔT_{K-1} of an immediately preceding step.” *Id.* at 4:28–31.

When counting steps, Fabio discloses that isolated “or very brief sequences of steps are far from significant and should preferably be ignored because they are, in effect, irrelevant.” *Id.* at 1:47–50. To ignore such steps,

Fabio discloses a two-stage counting procedure, illustrated in Figure 3, which is reproduced below.

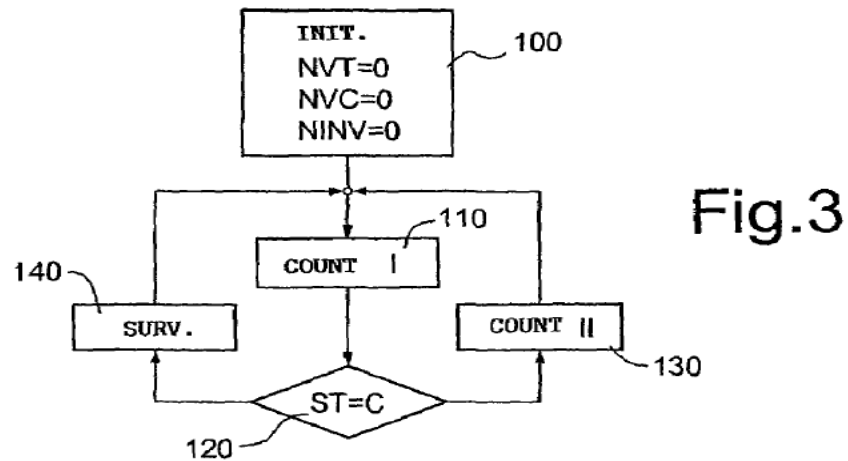


Figure 3 of Fabio is a flow chart depicting a two-stage counting procedure. *Id.* at 2:17–19. Initially, valid step counter N_{VT} , valid control step counter N_{VC} , and invalid step counter N_{INV} are set to zero (100). *Id.* at 3:13–18. Next, first counting procedure 110 counts steps by sampling acceleration data A_Z at a predetermined frequency. *Id.* at 3:19–21. First counting procedure 110 terminates and sets a state flag to C when “a regular gait of the user is recognized,” or terminates and sets the state flag to PD when “a time interval . . . that has elapsed from the last step recognized is longer than a first time threshold.” *Id.* at 3:27–36. If the state flag is set to C, second counting procedure 130 executes; otherwise, survey procedure 140 executes and the pedometer is placed in a wait or power down state. *Id.* at 3:37–41, 3:50–53.

Fabio illustrates first counting procedure 110 in Figure 4, which is reproduced below.

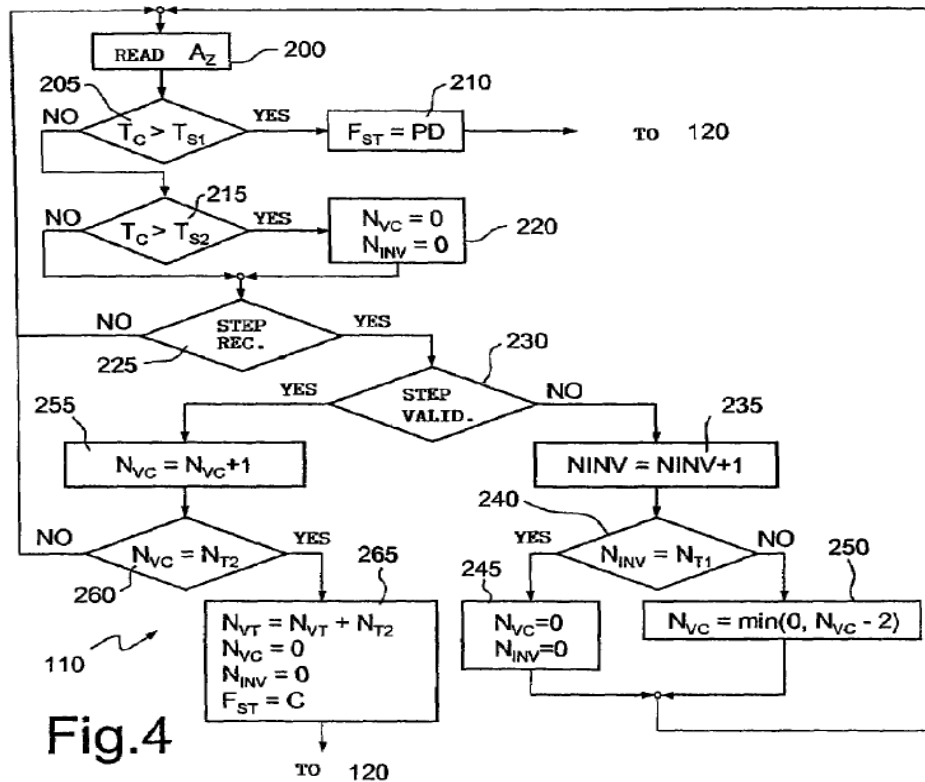


Figure 4 of Fabio is a flowchart illustrating first counting procedure 110. *Id.* at 2:20–21, 3:58–59. Sampled acceleration data A_Z is read (200), and if the time T_C between the sample time and the time of the last detected step is greater than a first threshold T_{S1} (205), state flag F_{ST} is set to PD (210) and survey procedure 140 is called. *Id.* at 3:60–4:2; *see also id.* at Fig. 3. Otherwise, the sample is checked to see if it is both recognized as a step (225) according to the procedure disclosed in Figure 5, and validated as a step (230) according to the procedure disclosed in Figure 6. *Id.* at 4:2–55. As discussed above, to be validated, a step must fall within validation interval TV.

If the sample is recognized (225) and validated (230) as a step, the number of valid control steps N_{VC} is incremented (255) and compared to a threshold N_{T2} (260). *Id.* at 5:10–22. If N_{VC} is less than N_{T2} , another

acceleration data sample is read (200) and the process continues. *Id.* at 5:22–27. However, if N_{VC} is equal to N_{T2} (260), the number of valid control steps N_{T2} is added to the number of valid steps N_{VT} , state flag F_{ST} is set to the count value C (i.e., N_{VT}), and second counting procedure 130 is called (265). *Id.* at 5:30–39; *see also id.* at Fig. 3. If the acceleration sample is recognized (225) but not validated (230) as a step because it falls outside of validation interval TV , an invalid step count N_{INV} is incremented (235), a new acceleration data sample is read (step 200), and the process is repeated. *Id.* at Fig. 4.

Fabio's second counting procedure 130 is illustrated in Figure 7, which is reproduced below.

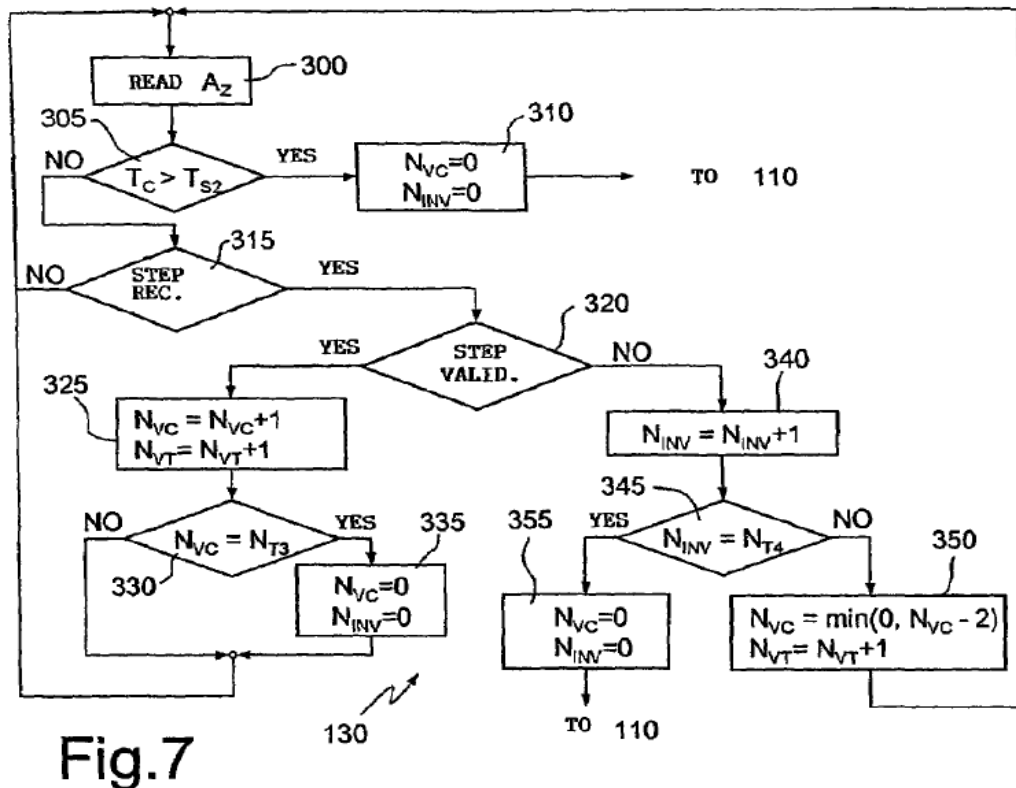


Figure 7 of Fabio is a flowchart illustrating second counting procedure 130. *Id.* at 6:12–13. Sampled acceleration data A_z is read (300), and if the time

T_c between the sample time and the time of the last detected step is greater than threshold T_{S2} (305), second counting procedure 130 is terminated. *Id.* at 6:14–20; *see also id.* at Fig. 3. Otherwise, the sample is checked to see if it is both recognized as a step (315) according to the procedure disclosed in Figure 5, and validated as a step (320) according to the procedure disclosed in Figure 6. *Id.* at 6:21–39. If the sample is recognized and validated as a step, the number of valid steps N_{VT} is incremented (325), another acceleration data sample is read (300), and the process continues searching for valid steps. *Id.* at 6:40–53. Second counting procedure 130 continues until either (a) the time T_c between an acceleration data sample and the time of the last detected step is greater than threshold T_{S2} (305), or (b) a sample is not validated as a step (320) and the incremented number of invalid steps N_{INV} (340) reaches threshold N_{T4} (345). *Id.* at 6:14–20, 6:54–7:6. When second counting procedure 130 terminates, first counting procedure 110 is executed. *Id.* at Fig. 3.

2. *Pasolini*

Pasolini discloses a pedometer having a “step detection method using an algorithm for self-adaptive computation of acceleration thresholds.” Ex. 1005, 1:10–12. The pedometer can be housed inside a portable device, such as a mobile phone, and includes an accelerometer having multiple detection axes. *Id.* at 2:60–63, 8:11–13, 8:31–34. The pedometer’s step detection algorithm “identif[ies] the main vertical axis to be used for step detection as the axis of detection that has the highest mean acceleration value $Accm$ (on account of gravity),” and does so “at each acquisition of a new acceleration sample . . . to take into account variations in the orientation

of the pedometer device 1 and consequently of the accelerometer 2 arranged inside it.” *Id.* at 8:16–24.

Pasolini’s step detection algorithm “compares the value of the [measured] acceleration signal A . . . with a positive reference threshold S^+ and with a negative reference threshold S^- , for identifying, respectively, the positive phase (positive acceleration peak) and the negative phase (negative acceleration peak) of the step.” *Id.* at 3:35–41. Once a positive acceleration phase is identified, a negative acceleration phase is searched for “within a certain time interval Mask.” *Id.* at 4:47–50. If a negative step phase is found within the Mask interval, a step is counted, and the length (LPS) of the step is estimated as $LPS = LP \times f(S_{\max}^+)$, where LP is a standard length corresponding to 0.4 to 0.5 times the height of the user, and $f(S_{\max}^+)$ is “a function of the maximum value $S_{\max}^+$ reached by the positive reference threshold S^+ during the positive phase of the step.” *Id.* at 4:66–5:24. Function $f(S_{\max}^+)$ can be tabulated and stored in memory on the basis of experimental tests. *Id.* at 5:24–5:29.

3. Tsuji

Tsuji discloses “an electronic pedometer . . . mounted on a human body in order to electronically count the number of steps by a person.” Ex. 1010, 1:6–8. Figure 1 of Tsuji is reproduced below.

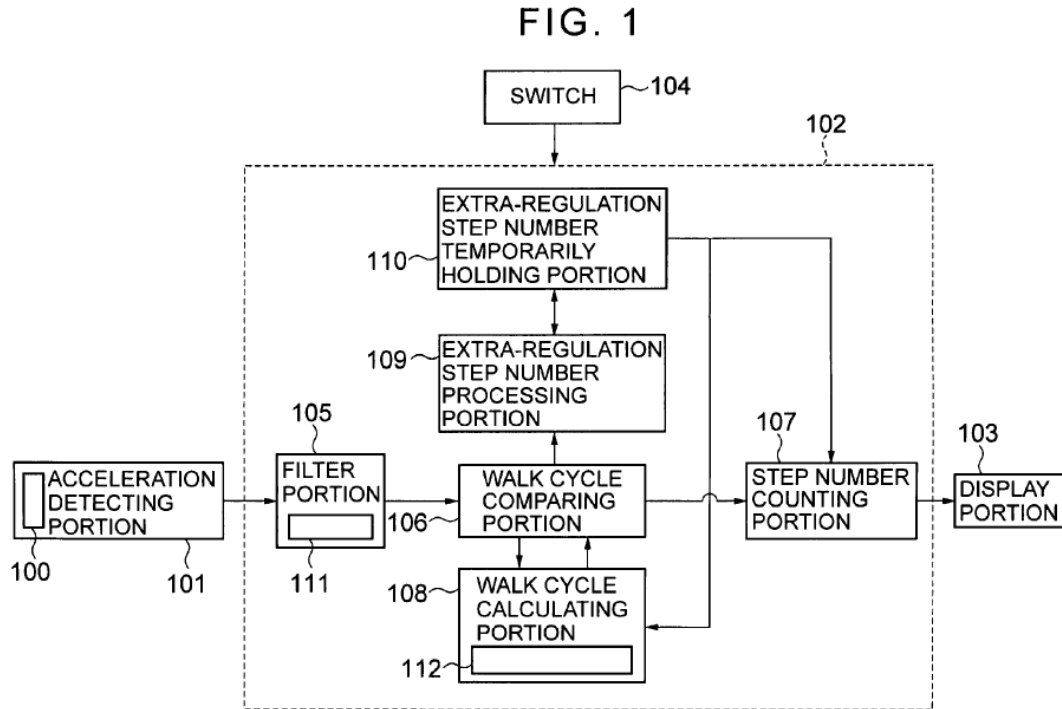


Figure 1 of Tsuji is a block diagram of Tsuji's electronic pedometer. *Id.* at 4:30–31. The pedometer includes walk sensor or accelerometer 100 for detecting and outputting an acceleration signal, and counter 102 for counting the number of user steps based on the acceleration signal. *Id.* at 4:32–39. Counter 102 includes filter 105 for filtering and outputting the signal received from accelerometer 100, walk cycle comparator 106 for comparing a cycle time of the signal received from filter 105 to a range of reference walk cycles (i.e., $T_a \pm 10\%$), and walk cycle calculator 108 for calculating a reference walk cycle (i.e., T_a) as a moving average of a predetermined number of cycle times of accelerometer signals that have been determined to be walk signals by walk cycle comparator 106. *Id.* at 4:50–67, 6:51–7:47.

E. Level of Ordinary Skill in the Art

Petitioner contends a person of ordinary skill in the art would have had a Bachelor of Science degree or equivalent training in electrical

engineering, computer engineering, or computer science, and approximately two years of hardware or software design and development experience related to micro-electro-mechanical (MEM) devices and body motion sensing systems. Pet. 6 (citing Ex. 1003, 8). Patent Owner does not dispute Petitioner's contention, and does not offer an alternative set of qualifications for a person of ordinary skill in the art. PO Resp. 2–3.

We find Petitioner's description to be consistent with the problems and solutions disclosed in the patent and prior art of record, and adopt it as our own for purposes of this Decision. *See, e.g., In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995).

F. Patentability of Claim 5 over Fabio and Pasolini

Claim 8 depends from independent claim 5. In challenging the unpatentability of claim 8, Petitioner repeats its analysis from IPR2018-00424 that claim 5 is unpatentable under 35 U.S.C. § 103(a) as obvious over Fabio and Pasolini. Pet. 9–32. We previously found claim 5 unpatentable over the combination of Fabio and Pasolini based on that analysis. *See Apple Inc. v. Uniloc 2017 LLC*, IPR2018-00424, Paper 21 at 43–52 (PTAB July 16, 2019) (Final Written Decision). Given that claim 8 depends from claim 5, we repeat Petitioner's analysis of claim 5 here, as well as the reasons we find Petitioner's analysis persuasive notwithstanding Patent Owner's arguments to the contrary.

Claim 5 is an independent claim reciting a method to be performed by a mobile device, and requires receiving acceleration data that meets stepping criteria from an accelerometer included in the mobile device. Ex. 1001, 15:46–48. Petitioner demonstrates how Fabio teaches this limitation by disclosing a mobile pedometer that receives acceleration data A_z and

determines whether that data satisfies stepping criteria A_{ZP} and A_{ZN} . Pet. 19–22 (citing Ex. 1006, 1:58–59, 2:23–26, 2:34–36, 2:49–64, Figs. 1, 5). In particular, Fabio’s pedometer determines whether the acceleration data has a positive peak greater than A_{ZP} followed by a negative peak less than A_{ZN} within a time window TW. See Ex. 1006, 4:12–21, Fig. 5. Patent Owner does not dispute these contentions. See PO Resp. 6–16; PO Sur-Reply 1–15.

Claim 5 further requires incrementing a step count in a step count buffer. Ex. 1001, 15:49. Petitioner demonstrates how Fabio teaches this limitation by temporarily counting a number of valid control steps in first counting procedure 110 until “the number of valid control steps N_{VC} reaches the second threshold number N_{T2} .” Pet. 22–23 (citing Ex. 1006, 4:24–26, 5:10–11, 5:40–45, Fig. 4). Relying on the testimony of Dr. Paradiso, Petitioner demonstrates that N_{VC} is a step count buffer because it temporarily stores step counts until a regularity condition is reached, at which time N_{VC} is added to total step count N_{VT} . *Id.* at 23 (citing Ex. 1003, 32–33). Patent Owner does not dispute these contentions. See PO Resp. 6–16; PO Sur-Reply 1–15.

Claim 5 further requires using a default step cadence window to identify a time frame within which to monitor for a next step when at least one of (a) the step count is below a step count threshold, *or* (b) a current user cadence fails to match a step cadence of a user profile. Ex. 1001, 15:50–16:2. Petitioner demonstrates how the combination of Fabio and Pasolini teaches or suggests using a default cadence window to monitor for a next step when a step count is below a step count threshold (i.e., under condition (a) above), which is sufficient to demonstrate the combination meets this limitation. Pet. 24–29 (citing Ex. 1006, 5:22–32, 5:42–45, Figs. 4, 6;

Ex. 1003, 33–36). In particular, notwithstanding Patent Owner’s arguments to the contrary, discussed *infra*, Petitioner demonstrates how Fabio’s first counting procedure 110 counts steps using a default cadence window when step count N_{VC} is below threshold N_{T2} . *Id.*

Petitioner identifies Fabio’s default cadence window as either first timing threshold T_{S1} or validation interval TV modified to have a fixed width. *Id.* at 27–29. Petitioner argues that it would have been obvious to modify validation interval TV to have a fixed width because Fabio expressly teaches (a) that TV can have a different amplitude (i.e., width) than the $3/2 \Delta T_{K-1}$ width shown in Figure 6 (which depends on the variable time interval between previous steps $K-1$ and $K-2$), and (b) that TV is used to verify the compatibility between the timing of a current step and the frequency of previously counted steps. *Id.* at 28 (citing Ex. 1006, 4:52–55; Ex. 1003, 38–39). Dr. Paradiso testifies that these teachings would have suggested to a person skilled in the art the benefit of “modify[ing] the cadence window [TV] to a default value in order to increase compatibility with a user’s previous step as the user is beginning a new activity such as running or walking.” Ex. 1003, 38–39. Additionally, Petitioner argues that it would have been obvious to modify TV to have a fixed width because Pasolini teaches “establishing a default step length value (LP) that is used to determine the distance that a user travels.” Pet. 28 (citing Ex. 1003, 39; Ex. 1005, 5:21–22). Dr. Paradiso testifies that Pasolini’s teaching would have further motivated a person skilled in the art to modify Fabio’s validation interval TV to have a fixed width because “establish[ing] a default cadence window based on [a] user’s physical attributes would increase the

likelihood that the [user's] first few steps are recognized as being compatible.” Ex. 1003, 39.

We agree with Petitioner's reasoning, and find it to have rational underpinnings. Fabio teaches using validation interval TV to determine the timing compatibility of steps, and the timing compatibility of a user's first few steps can only be determined by comparing them to a default time interval because there is no other time interval against which to compare them. See Ex. 1006, 4:28–31 (“[V]alidation occurs when the duration ΔT_K of a current step K is substantially homogeneous with respect to the duration ΔT_{K-1} of an immediately preceding step K-1 . . .”).

Patent Owner argues that Fabio's validation interval TV, even when modified to have a default width, is not a default cadence window because it fails to monitor for a *next* step. See PO Resp. 7, 10–12; PO Sur-Reply 8–10. Specifically, Patent Owner argues:

Fabio's TV is *retrospective* at least in that it is used to validate only the immediately ***preceding*** step (shown in Fig. 6 as K-1) . . . : “[m]ore precisely, the last step recognized is validated if the instant of recognition of the current step $T_R(K)$ falls within a validation interval TV[.]” Unless and until the last step is validated by the current *suspected* step in the manner disclosed, the last step is not counted.

PO Resp. 7 (quoting Ex. 1006, 4:35–41), 10–12. In other words, Patent Owner argues Fabio uses TV “to determine whether to count the immediately preceding step as valid or, instead, to deem the preceding step as an invalid ‘false positive’ (and hence not a step at all).” *Id.* at 11. That is, Patent Owner argues that TV validates preceding step K–1 rather than current step K, and is therefore not a default cadence window used to monitor for step K—the next step.

We are not persuaded by Patent Owner's arguments. Instead, we agree with Petitioner that Fabio teaches "recognizing, validating, and either buffering or counting a step within a single step cycle," where a step cycle "refers to Fabio's iterative process of recognizing (e.g., 225), validating (e.g., 230) and buffering/counting (235) a step upon acquisition of an acceleration sample." Pet. Reply 2 & n.1 (citing Ex. 1006, Figs. 4, 7). This can be seen in Figure 4 of Fabio, which is reproduced below.

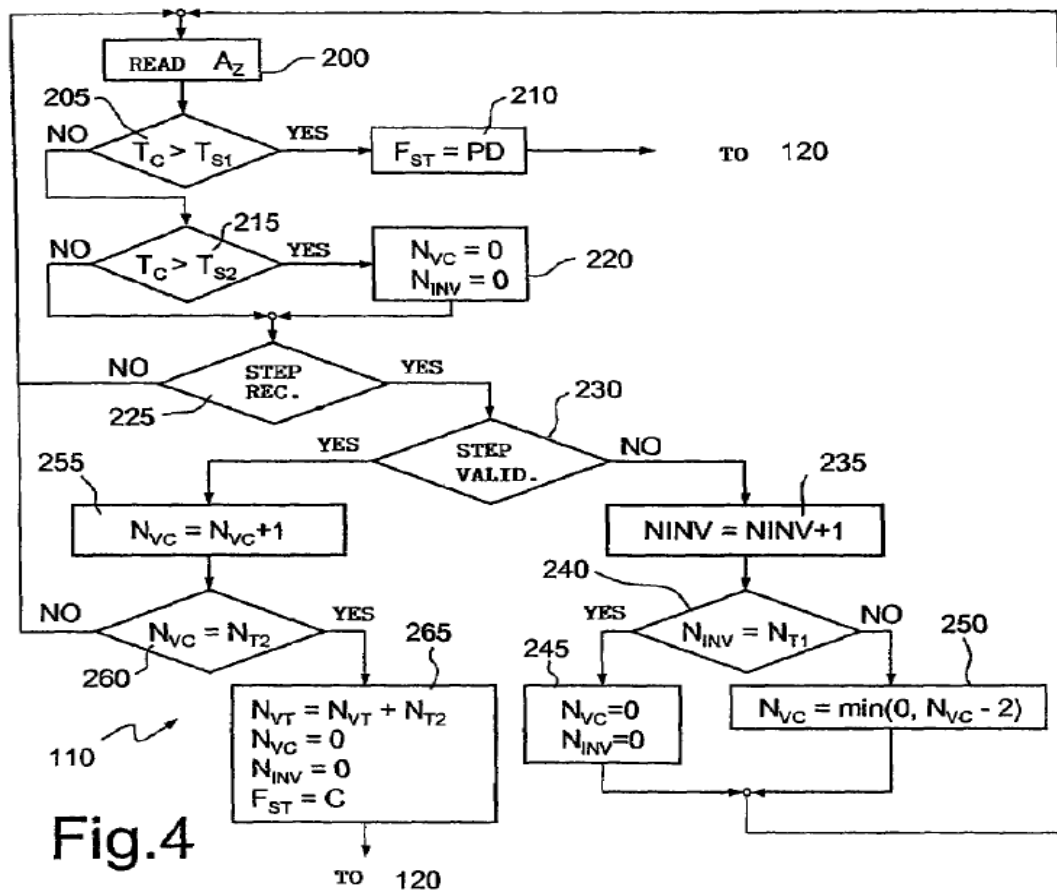


Figure 4 of Fabio is a flowchart illustrating first counting procedure 110. See Ex. 1006, 3:58–59. A current acceleration sample (e.g., K) is obtained (200). *Id.* at 3:60–61. Sample K is rejected (205/210) if “the time interval

T_C that has elapsed from the last step recognized [e.g., $K-1$ ⁵] is higher than the first time threshold T_{S1} .” *Id.* at 3:61–4:2. Otherwise, sample K is tested to see if it includes a recognizable step (225).⁶ *Id.* at 4:2–11. If sample K contains a recognizable step, that step is immediately tested to see if it is also a valid step (230). *Id.* at 4:24–27.

Step validation test (230) is illustrated in Figure 6 of Fabio, which is reproduced below.

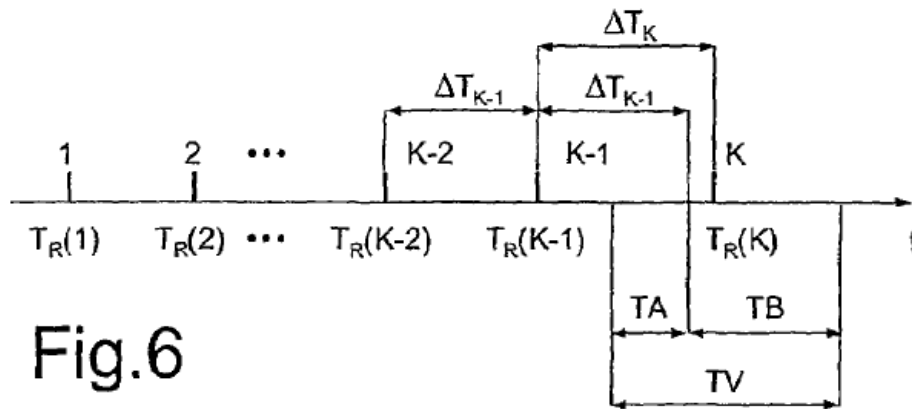


Figure 6 illustrates a sequence of steps *recognized* at times $T_R(1)$, $T_R(2)$. . . $T_R(K-2)$, $T_R(K-1)$, and $T_R(K)$. *Id.* at Fig. 6. The step recognized in sample K at time $T_R(K)$ is validated as a step “when the duration ΔT_K of [the] *current step K is substantially homogeneous* with respect to the duration ΔT_{K-1} of an immediately preceding step $K-1$.” *Id.* at 4:28–31, Fig. 6 (emphasis added). That is, “the last step recognized [i.e., step K] is

⁵ We note that when time interval T_C is evaluated in decision block 205, *the last step recognized* is $K-1$ because sample K has not yet been recognized as a step via step recognition test 225.

⁶ We note that once sample K passes step recognition test 225, it becomes *the last step recognized*, and step $K-1$ becomes the *next to last step recognized*.

validated if the *instant of recognition of the current step* $T_R(K)$ falls within a validation interval TV , defined with respect to the *instant of recognition of the immediately preceding step* $T_R(K-1)$.” *Id.* at 4:35–39 (emphases added). Notably, in step validation test (230), steps K and $K-1$ are both recognized steps because both have passed step recognition test (225). *Id.* at Fig. 4. Thus, step K is the last step recognized with an *instant of recognition* $T_R(K)$, and step $K-1$ is the next to last step recognized with an *instant of recognition* $T_R(K-1)$. Consequently, when Fabio teaches “the *last step recognized is validated*,” Fabio is teaching validating step K , not step $K-1$ as Patent Owner contends, because step K is the last step recognized at time $T_R(K)$. *Id.* at 4:35–39 (emphasis added).

Petitioner also argues that Fabio’s first threshold time T_{S1} is a default cadence window because the “first counting procedure ‘terminates when a time interval T , that has elapsed from the last step recognized is longer than a first time threshold T_{S1} .’” Pet. 27 (quoting Ex. 1006, 3:30–32). Patent Owner argues T_{S1} is not a default cadence window for the same reason TV is not a default cadence window, i.e., because T_{S1} is used to “determine whether a *past* sample of acceleration data constitutes a valid step,” and is therefore used to identify “not a ‘next step’ but rather . . . a *past step*.” PO Resp. 8; *see also id.* at 9–10; PO Sur-Reply 5–8. In other words, like validation interval TV , Patent Owner argues first threshold time T_{S1} is not a default cadence window because it too is used to identify and validate past steps, not current or next steps.

We are not persuaded by Patent Owner’s argument regarding T_{S1} for the same reasons we are not persuaded by Patent Owner’s argument regarding validation interval TV . Fabio teaches reading (200) acceleration

sample K at a time T_C *after* previous step K-1 has been read, validated, and counted, and testing whether sample K includes a recognizable (225) and valid (230) step only when T_C is less than first threshold time T_{S1} (205). See Ex. 1006, 3:60–4:27, Fig. 4. Thus, T_{S1} is a fixed sized “window of time since a last step [K-1] was counted that is looked at to detect a new step [K],” i.e., T_{S1} is a default cadence window.

For the reasons explained above, we find Petitioner has demonstrated that the combination of Fabio and Pasolini teaches or suggests first counting procedure 110 uses a default cadence window (T_{S1} or modified TV) to monitor for a next step when buffered step count N_{VC} is below step count threshold N_{T2} . In the case of modified TV, Petitioner has demonstrated reasoning with rational underpinnings to modify TV to have a default width, i.e., to allow Fabio to detect a user’s first few steps by determining their compatibility with a fixed width validation interval TV.

Lastly, claim 5 requires when the step count is at or above the step count threshold, determining a dynamic step cadence window and using the dynamic step cadence window to identify the time frame within which to monitor for the next step. Ex. 1001, 16:3–6. Petitioner demonstrates, notwithstanding Patent Owner’s arguments to the contrary, discussed *infra*, how the combination of Fabio and Pasolini teaches or suggests using (unmodified) validation interval TV to monitor for and count next steps in second step counting procedure 130 when step count N_{VC} exceeds threshold N_{T2} . Pet. 29–30 (citing Ex. 1006, 5:22–32, 5:37–39, 6:31–34, Fig. 4; Ex. 1003, 40–42). Petitioner further demonstrates how validation interval TV is a dynamic cadence window because it is “defined with respect to the instant of recognition of the immediately preceding step,” and a person

skilled in the art would understand this to mean that it “compensates for changes in each step” and “would also change from step to step.” *Id.* at 30–32 (citing Ex. 1006, 4:28–49; Ex. 1003, 42–43).

Patent Owner argues the combination of Fabio and Pasolini fails to teach this limitation for several reasons. PO Resp. 13–16; PO Sur-Reply 13–16. First, Patent Owner argues the limitation requires determining a dynamic cadence window “when the step count is at or above the step count threshold.” PO Resp. 13. Patent Owner argues that Fabio instead teaches that “when the number of valid control steps is equal to the second threshold number N_{T2} : ‘the total number of valid steps N_{VT} is updated and incremented by a value equal to the second threshold number $N_{[T2]}$ (block 265).” *Id.* at 14 (quoting Ex. 1006, 5:32–36).⁷ Patent Owner argues that “[t]here simply is no discussion, at this point in the Fabio process, of the validation that occurs when the second counting procedure is executed.” *Id.*

We are not persuaded by Patent Owner’s argument. To the extent we understand it, Patent Owner’s argument is that because Petitioner alleges Fabio teaches using a default cadence window (e.g., T_{S1} or modified TV) in first counting procedure 130 *until* the number of valid control steps N_{VC} is equal to step count threshold N_{T2} , Fabio fails to teach using a dynamic cadence window *when* the step count is at the step count threshold. We disagree.

Fabio, as modified by Petitioner, only uses a default cadence window in first counting procedure 110 *until* buffered step count N_{VC} is equal to N_{T2} .

⁷ Patent Owner misquotes the cited passage of Fabio by referring to the second threshold as N_{TV} . We correct the quotation to appear as it does in Fabio, which refers to the second threshold as N_{T2} . See Ex. 1006, 5:34–35.

Ex. 1006, 5:10–11, 5:22–32, Fig. 4. However, once N_{VC} is at or equal to N_{T2} —that is, *when* N_{VC} is at or equal to N_{T2} — “the first counting procedure is terminated” and “the second counting procedure is executed.” *Id.* at 5:36–39, Figs. 3, 4. During second counting procedure 130, which begins *when* N_{VC} is at or equal to N_{T2} , Fabio uses validation interval TV in step validation test 320. *Id.* at 6:27–39, Fig. 7. Specifically, Fabio reads acceleration data (300) to obtain a new acceleration sample K, recognizes sample K as a step (315), and validates sample K as a step (320) when “the instant of recognition of the current step $T_C(K)$ falls within the validation interval TV defined above.” *Id.* at 6:14–37. Validation interval TV is “defined with respect to the instant of recognition of the immediately preceding step $T_R(K-1)$ ” and has a width of $3/2 \Delta T_{K-1}$ that depends on the timing interval between steps K-1 and K-2. *Id.* at 4:28–53. It, therefore, is a *dynamic* cadence window because its width varies from step to step. Thus, Fabio teaches determining a *dynamic* cadence window (unmodified TV) *when* the step count (N_{VC}) is at or equal to the step count threshold (N_{T2}).

Next, Patent Owner argues validation interval TV is not a cadence window *at all* for the reasons discussed above, i.e., because it validates *past steps* rather than *next steps*. PO Resp. 15 (arguing second step counting procedure 130 uses TV in a “retrospective determination (summarized above) as to whether the prior acceleration data constitutes a valid step.”). We are not persuaded by this argument for the reasons explained above.

Finally, Patent Owner argues that because Fabio’s second counting procedure 130 “involves ‘evaluat[ing] whether the time interval T_C that has elapsed from the last step recognized is higher than the . . . second time threshold T_{S2} (block 305),” and because “Petitioner argues that Fabio’s T_{S1}

satisfies the ‘default cadence window,’ Petitioner cannot reasonably argue that the similarly described T_{S2} . . . satisfies, instead, the ‘dynamic cadence window’ limitations.” *Id.* (alteration in original). We are not persuaded by this argument because Petitioner does not rely on T_{S2} for meeting the dynamic cadence window limitation. *See* Pet. 29–32. Rather, Petitioner relies on the unmodified validation interval T_V , which is defined with respect to the timing of immediately preceding steps. *Id.*

For the reasons explained above, and upon consideration of all of the evidence and arguments presented by Petitioner and Patent Owner, we find Petitioner has demonstrated by a preponderance of evidence that the combination of Fabio and Pasolini teaches or suggests all the limitations of claim 5, and that a person skilled in the art would have had rational reasons to combine the teachings of Fabio and Pasolini in the manner suggested by Petitioner.

G. Patentability of Claim 8 over Fabio, Pasolini, and Tsuji

Claim 8 depends from claim 5 and requires the step of determining a dynamic step cadence window to include computing a rolling average of stepping periods of previously counted steps, and setting the dynamic step cadence window based on the rolling average. Ex. 1001, 16:22–27. Petitioner argues claim 8 is unpatentable under 35 U.S.C. § 103(a) as obvious over Fabio, Pasolini, and Tsuji. Pet. 32–44.

As explained in § II.F, *supra*, Petitioner argues Fabio teaches determining a dynamic step cadence window by determining the width of validation window T_V , which dynamically depends on the time interval ΔT_{K-1} between previous steps K-1 and K-2. *Id.* at 40–41 (citing Ex. 1003, 55; Ex. 1006, 4:28–35). Petitioner further argues that Tsuji teaches

determining a dynamic step cadence window “using not just the duration or cycle of the previous step, but by determining the moving average of the most recent subset of previous steps.” *Id.* at 42–43 (citing Ex. 1003, 55–57; Ex. 1010, 7:6–12, 7:26–35, 7:43–45). Petitioner argues a person skilled in the art would have found it obvious to modify Fabio to use Tsuji’s moving average walk cycle instead of Fabio’s validation interval TV as the dynamic step cadence window because (a) both references “appreciate the need to determine current steps based on the user’s previous behavior,” (b) the modification is a simple substitution of one known element for another known in the prior art, and (c) “using a moving average of previous data rather than a single iteration of previous data offers a number of advantages such as smoothing out variations that may occur in a single step . . . and reducing step recognition errors due to noise.” *Id.* at 43–44 (citing Ex. 1003, 58–59; Ex. 1010, 7:13–17; Ex. 1011, 243).

Patent Owner argues Petitioner fails to demonstrate that Tsuji teaches computing a rolling average because Petitioner “provides no explanation for how a [person of ordinary skill in the art] would interpret the ‘moving average’ in Tsuji to be the same as the claimed ‘rolling average.’” PO Resp. 17; PO Sur-Reply 16. We disagree. Petitioner demonstrates how Tsuji computes “a reference walk cycle by obtaining a moving average T_a of cycles of a predetermined number of newest signals . . . each of which is judged to be a walk signal.” Pet. 40 (quoting Ex. 1010, 4:55–60, 5:50–53) (emphases omitted). Petitioner further demonstrates that a person skilled in the art would have understood “the term ‘moving average’ used in Tsuji is synonymous with the term ‘rolling average’ used in the ’902 patent.” *Id.* at

41 (citing Ex. 1003, 55; Ex. 1011, 243–244, 330). For example, Harris⁸ teaches a “moving average” is “[s]ometimes referred to as a rolling average,” and a “rolling average” is “[s]ometimes referred to as a moving average.” Ex. 1011, 243, 330.

Patent Owner next argues that Tsuji’s moving average is not a dynamic cadence window because Tsuji continuously collects data and has to filter out “irrelevant data . . . in order to properly implement the disclosed comparison to a reference walk cycle.” PO Resp. 17 (citing Ex. 1010, 6:65–7:12, 7:39–48); PO Sur-Reply 16–17. Petitioner responds that like Tsuji, “Fabio and the ’902 patent both describe a similar process of collecting acceleration data on a continuing basis rather than *only* during the cadence window.” Pet. Reply 16 (citing Ex. 1001, Fig. 2; Ex. 1006, 6:53–56, Fig. 5). We agree with Petitioner.

Both Tsuji and the ’902 patent collect data from an accelerometer, filter the data to remove noise, use a dynamic cadence window to identify new steps, and use the new steps to update the dynamic cadence window. For example, both Tsuji and the ’902 patent collect data from an accelerometer, and filter the data to remove as noise the data that falls outside a limited frequency range. *See* Ex. 1001, 2:38–39, 2:44–48, Fig. 1 (using filter 120 to filter data collected from accelerometer 105); Ex. 1010, 6:51–57, 6:62–65, Fig. 1 (using filter 105 to filter data collected from accelerometer 101). Both Tsuji and the ’902 patent use a dynamic cadence window to determine whether the filtered data represents a step. *See*

⁸ Robert L. Harris, *Information Graphics, A Comprehensive Illustrated Reference* (1996).

Ex. 1001, 2:65–66, 3:11–16, Fig. 1 (comparing data passing filter 120 to cadence window 150 in step counting logic 130); Ex. 1010, 7:6–25, Fig. 1 (comparing data passing filter 105 to reference walk cycle T_a in walk cycle comparator 106). If the filtered data represents a step, both Tsuji and the '902 patent use the data to update the dynamic cadence window. See Ex. 1001, 2:65–3:2, 3:11–18, Fig. 1 (using data passing filter 120 to update dynamic cadence window 150 via rolling average logic 135); Ex. 1010, 7:6–25, Fig. 1 (using data passing filter 105 to update reference walk cycle T_a via walk cycle calculator 108).

Given the similarities between the teachings of Tsuji and the '902 patent, as described above, we are not persuaded that Tsuji's moving average is not a dynamic cadence window simply because Tsuji continuously collects data, filters out "irrelevant data," and uses only the filtered data to calculate the moving average. Indeed, as discussed above, the '902 patent similarly collects data and filters out irrelevant data prior to determining a dynamic cadence window using rolling average logic 135.

Finally, Patent Owner argues that modifying Fabio to use Tsuji's moving average T_a instead of Fabio's validation interval TV as the dynamic cadence window would render Fabio inoperable. PO Resp. 18; PO Sur-Reply 17–19. Patent Owner argues Fabio uses a "specific formula" to calculate TV based on "immediately preceding acceleration data" in order "to achieve a level of granularity deemed essential for the step validation described in Fabio," and that this "single-step granularity would be erased if replaced . . . with Tusji's [sic] moving average." PO Resp. 18. Patent Owner further argues that "Fabio purposefully uses current data to retrospectively determine whether to count a last step," and that this

“retrospective scheme would be reversed on its head . . . if replaced . . . with Tsuji’s [sic] scheme of using a moving average of *past data* in evaluating *current data*.” *Id.* at 18–19.

We are not persuaded by Patent Owner’s arguments. First, for the reasons discussed in § II.F, *supra*, we disagree that Fabio uses validation interval TV to retrospectively validate a previous step K-1 using the timing of a current step K. Rather, Fabio uses TV—a period defined by the timing of previous step K-1 and the timing interval ΔT_{K-1} between previous steps K-1 and K-2—to validate step K. *See* Ex. 1006, 4:28–31, Fig. 6.

Second, Fabio does not teach that the “specific formula” disclosed for TV must be used as the validation timing interval. Indeed, Fabio teaches that the disclosed asymmetrical validation interval TV having an amplitude or width of $3/2 \Delta T_{K-1}$ could be replaced with a validation interval that is “symmetrical and ha[s] a different amplitude.” *Id.* at 4:50–53. Tsuji discloses such an alternative validation interval, i.e., a symmetrical interval $T_a \pm 10\%$ having a width of $0.2 T_a$, where T_a is based on the moving average of the timing “cycles of [a] predetermined number of [walk] signals.” Ex. 1010, 5:41–53.

Modifying Fabio to calculate Tsuji’s average walk cycle T_a and to use Tsuji’s timing interval of $T_a \pm 10\%$ as the validation interval is compatible with Fabio, and would achieve Fabio’s goal of using the validation interval to “verif[y] that the last step recognized [i.e., step K] is compatible with the frequency of the last *steps* made previously.” Ex. 1006, 4:53–55 (emphasis added). Thus, we agree with Petitioner that a person skilled in the art would have known that replacing Fabio’s timing interval TV with Tsuji’s moving average interval of $T_a \pm 10\%$ would have “require[d] nothing more than

calculating Fabio's validation interval using a moving average of the user's stepping periods," and would have improved Fabio by "smooth[ing]-out the variations in the user's stepping period as the [user's] pace or gait changes." Pet. 39 (citing Ex. 1003, 50–51).⁹

Accordingly, for the reasons discussed above, we find Petitioner has demonstrated by a preponderance of evidence that the combination of Fabio, Pasolini, and Tsuji teaches all the limitations of claim 8, and that a person skilled in the art would have combined the teachings in the manner suggested by Petitioner. Therefore, Petitioner has demonstrated by a preponderance of evidence that claim 8 is unpatentable over Fabio, Pasolini, and Tsuji.

III. CONCLUSION

We have reviewed the Petition, Patent Owner's Response, Petitioner's Reply, and Patent Owner's Sur-Reply. We have considered all of the evidence and arguments presented by Petitioner and Patent Owner, and have weighed and assessed the entirety of this evidence as a whole. We determine, on this record, that Petitioner has demonstrated by a

⁹ Petitioner cites to pages 60 and 51 of Dr. Paradiso's declaration in support of these contentions. This appears to be a typographical error, as the support is found on pages 50 and 51, in paragraphs 71 and 72. See Ex. 1003 ¶ 71 ("[A] POSITA would understand that using a moving average would serve to . . . smooth-out the variations in the user's stepping period as the pace or gait changes."); *id.* ¶ 72 ("[A] POSITA would understand that implementing Tsuji's method of using a moving average of a predetermined number of walk cycles or stepping periods into Fabio's pedometer would be a simple substitution since it would require nothing more than calculating Fabio's validation interval TV using a moving average of the user's stepping periods."). We correct that typographical error here.

preponderance of evidence that claim 8 of the '902 patent is unpatentable over the combination of Fabio, Pasolini, and Tsuji.¹⁰

Claim	35 U.S.C. §	References	Claims Shown Unpatentable	Claims Not Shown Unpatentable
8	103	Fabio, Pasolini, Tsuji	8	

IV. ORDER

It is ORDERED that claim 8 of the '902 patent is unpatentable under 35 U.S.C. § 103(a) as obvious over Fabio, Pasolini, and Tsuji; and

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

¹⁰ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

IPR2018-01028
Patent 7,881,902 B1

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