

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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APPLE, INC., SAMSUNG ELECTRONICS AMERICA, INC.,  
HTC CORP., HTC AMERICA, INC., and LG ELECTRONICS, INC.,  
Petitioner,

v.

UNILOC 2017 LLC,  
Patent Owner.

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Case IPR2018-00424<sup>1</sup>  
Patent 7,881,902 B1

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

HORVATH, *Administrative Patent Judge*.

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

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<sup>1</sup> HTC Corp., HTC America, Inc., and LG Electronics, Inc., who collectively filed a petition in IPR2018-01631, and Samsung Electronics America, Inc., who filed a petition in IPR2018-01653, have been joined to this proceeding.

## I. INTRODUCTION

### A. Background

Apple Inc. filed a Petition requesting *inter partes* review of claims 1–6, 9, and 10 (“the challenged claims”) of U.S. Patent No. 7,881,902 B1 (Ex. 1001, “the ’902 patent”). Paper 2 (“Pet.”). Uniloc Luxembourg S.A., a predecessor-in-interest of the ’902 patent, filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). Upon consideration of the Petition and Preliminary Response, we instituted *inter partes* review of all challenged claims on all grounds raised in the Petition. Paper 7 (“Dec. Inst.”).

Subsequent to our Institution Decision, Uniloc Luxembourg S.A. assigned the ’902 patent to Uniloc 2017 LLC (“Patent Owner”), and we granted motions for Samsung Electronics America, Inc., HTC Corp., HTC America, Inc., and LG Electronics, Inc. to join Apple, Inc. as Petitioner in this proceeding. *See* Papers 10, 13, and 14.<sup>2</sup>

Patent Owner filed a Response to the Petition (Paper 11, “PO Resp.”), Petitioner filed a Reply (Paper 12, “Pet. Reply”), and Patent Owner filed a Sur-Reply (Paper 15, “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 20 (“Tr.”).

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<sup>2</sup> Apple identifies itself as the real party-in-interest. Uniloc 2017 LLC identifies itself, Uniloc USA, Inc., and Uniloc Licensing USA LLC as real parties-in-interest. Paper 10, (1). Samsung Electronics America, Inc. identifies itself and Samsung Electronics Co., Ltd. as real parties-in-interest. Paper 13, 2 n.1. HTC Corp., HTC America, Inc., and LG Electronics, Inc. identify themselves, LG Electronics U.S.A., Inc., and LG Electronics MobileComm USA, Inc. as real parties-in-interest. Paper 14, 2 n.1.

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 claims 1–6 and 10 of the '902 patent are unpatentable, but has failed to show by a preponderance of evidence that claim 9 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. Pet. 1–2; Paper 3, (2). In addition, our Institution Decision identifies 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. Dec. Inst. 2–3.

*C. Evidence Relied Upon*<sup>3</sup>

Reference		Effective Date <sup>4</sup>	Exhibit
Pasolini	US 7,463,997 B2	Oct. 2, 2006	1005
Fabio	US 7,698,097 B2	Oct. 2, 2006	1006
Mitchnick	US 2006/0084848 A1	Oct. 14, 2004	1007
Tanenhaus	US 6,469,639 B2	Oct. 22, 2002	1008
Sheldon	US 5,957,957	Sept. 28, 1999	1009

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<sup>3</sup> Petitioner also relies upon the Declaration of Joseph A. Paradiso, Ph.D. (Ex. 1003).

<sup>4</sup> Petitioner relies on the filing dates of Pasolini, Fabio, and Mitchnick as the effective date for determining their availability as prior art.

*D. Instituted Grounds of Unpatentability*

Reference(s)	Basis	Claim(s) Challenged
Mitchnick	§ 103(a)	1 and 2
Mitchnick and Sheldon	§ 103(a)	3
Mitchnick, Sheldon, and Tanenhaus	§ 103(a)	4
Fabio and Pasolini	§ 103(a)	5, 6, 9, and 10

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.

Figure 1 of the '902 patent is reproduced below.

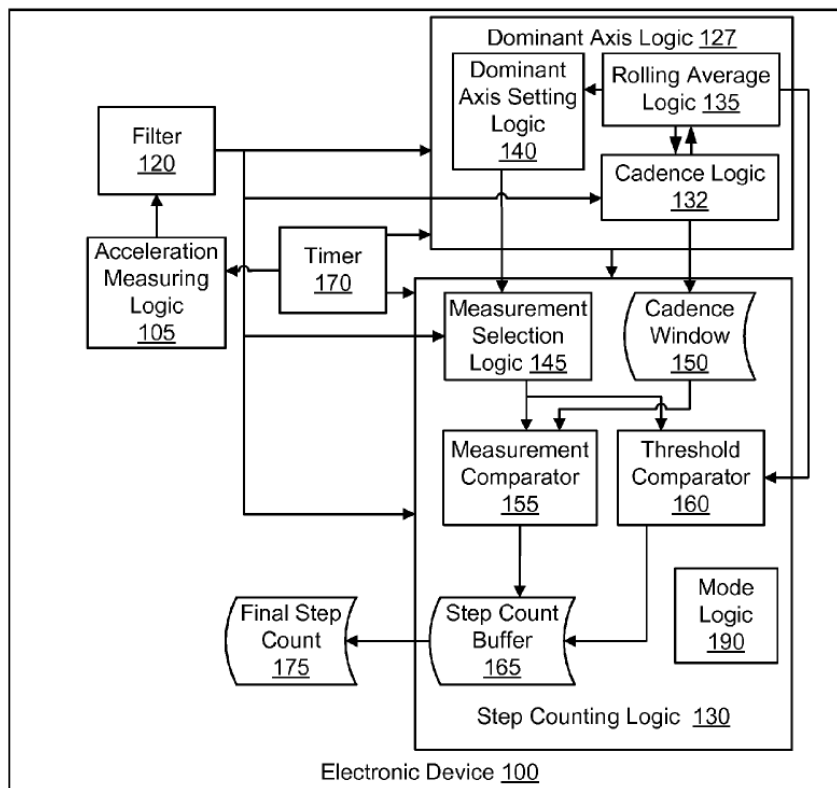


Figure 1 of the '902 patent is a block diagram illustrating electronic device 100. *Id.* at 1:47–48. Device 100 includes acceleration measuring logic 105 (e.g., inertial sensors), dominant axis logic 127, and step counting logic 130. *Id.* at 2:19–24, 2:38–43, Fig. 1. Device 100 “may be used to count 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,”

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