US010331083B1

(12) **United States Patent**
Ness et al.

(10) **Patent No.: US 10,331,083 B1**
(45) **Date of Patent: Jun. 25, 2019**

(54) **WATCH BAND WITH OPTICAL SENSOR**

(71) Applicant: **Apple Inc.**, Cupertino, CA (US)

(72) Inventors: **Trevor J. Ness**, Santa Cruz, CA (US); **Michael B. Wittenberg**, Sunnyvale, CA (US); **Elizabeth B. Diaz**, Woodside, CA (US)

(73) Assignee: **APPLE INC.**, Cupertino, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 306 days.

(21) Appl. No.: **15/268,531**

(22) Filed: **Sep. 16, 2016**

(51) **Int. Cl.**

G04B 47/06	(2006.01)
H04N 5/247	(2006.01)
H04N 5/225	(2006.01)
G04B 37/14	(2006.01)

(52) **U.S. Cl.**
CPC ***G04B 47/06*** (2013.01); ***G04B 37/1486*** (2013.01); ***H04N 5/2252*** (2013.01); ***H04N 5/2257*** (2013.01); ***H04N 5/247*** (2013.01)

(58) **Field of Classification Search**
CPC G04B 47/06; G04B 37/1486; H04N 5/247; H04N 5/2257; H04N 5/2252
See application file for complete search history.

(56) **References Cited**

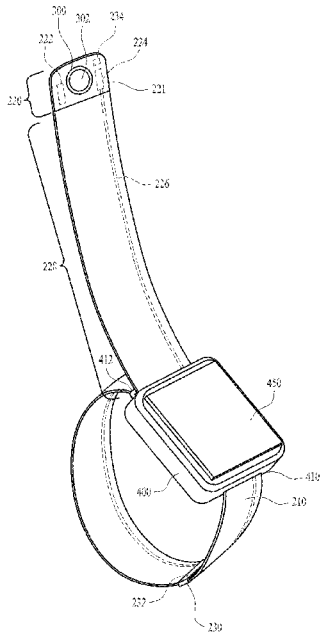
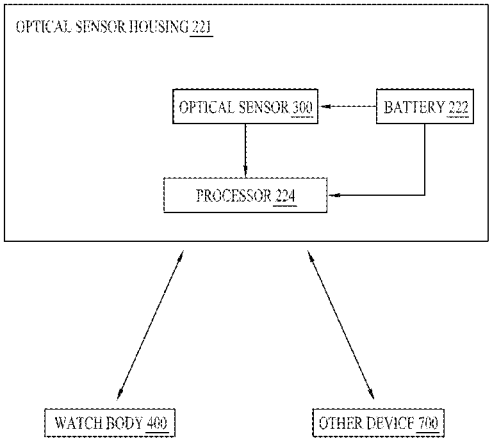
U.S. PATENT DOCUMENTS

8,994,827	B2	3/2015	Mistry et al.	
9,191,482	B1	11/2015	Sidbury	
2002/0068600	A1*	6/2002	Chihara	H04B 1/385 455/557
2008/0081968	A1*	4/2008	Numada	A61B 5/02007 600/322
2009/0162043	A1*	6/2009	Chou	G03B 17/40 396/56
2014/0362544	A1	12/2014	Han et al.	
2015/0003210	A1	1/2015	Joung et al.	
2015/0172538	A1*	6/2015	Nordstrom	H04N 5/2252 348/207.1
2015/0241916	A1	8/2015	Choi et al.	
2016/0283809	A1*	9/2016	Rice	A45F 5/00
2016/0291550	A1*	10/2016	Chen	H02J 50/10

* cited by examiner

Primary Examiner — Ahmed A Berhan
(74) *Attorney, Agent, or Firm* — Morgan, Lewis & Bockius LLP

(57) **ABSTRACT**

A camera optical sensor is disposed at a distal end portion of a camera watch band that attaches a watch body to a user's wrist. The camera watch band is configured to be coupled to at least one side of the watch body, and the camera watch band includes an optical sensor or camera, and an operable connection to transfer data between the optical sensor and the display or other device. The band is flexible and may be manipulated by a user to aim an optical sensor disposed at the distal end portion of the camera watch band separately from the watch body. The display or other device functions as the viewfinder for the optical sensor.

20 Claims, 11 Drawing Sheets