



US009940769B2

(12) **United States Patent**
Wooley

(10) **Patent No.:** **US 9,940,769 B2**
(45) **Date of Patent:** **Apr. 10, 2018**

(54) **WEARABLE KEY FOB**

(71) Applicant: **Flextronics AP, LLC**, Broomfield, CO
(US)

(72) Inventor: **George Michael Wooley**, Troy, MI
(US)

(73) Assignee: **Flextronics AP, LLC**, San Jose, CA
(US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 82 days.

(21) Appl. No.: **14/472,783**

(22) Filed: **Aug. 29, 2014**

(65) **Prior Publication Data**

US 2016/0063777 A1 Mar. 3, 2016

(51) **Int. Cl.**
G08C 19/00 (2006.01)
G07C 9/00 (2006.01)
A61B 5/00 (2006.01)

(52) **U.S. Cl.**
CPC **G07C 9/00944** (2013.01); **A61B 5/00**
(2013.01); **A61B 5/681** (2013.01); **A61B**
2560/045 (2013.01); **G07C 2009/00769**
(2013.01); **G07C 2009/00984** (2013.01)

(58) **Field of Classification Search**

CPC **G07C 9/00111**; **G08B 21/02**; **G08B 21/22**;
G08B 21/0275; **G08B 21/0286**; **G08B**
21/0291; **G08B 21/0423**; **G08B 21/0453**;
G08B 21/0461; **G08B 21/0476**; **G08B**
21/0484; **G08B 21/0492**; **A61B 5/0022**;
A61B 5/0404; **A61B 5/1117**; **A61B**
5/0006; **A61B 5/6806**; **A61B 5/01**; **A61B**

5/7264; **A61B 5/681**; **A61B 5/0488**; **A61B**
5/0008; **A61B 5/0402**; **A61B 5/0013**;
A61B 5/02055; **A61B 5/0476**; **A61B**
5/6807; **A61B 5/1112**; **A61B 5/6891**;
A61B 5/6803; **A61B 5/0077**; **A61B**
5/002; **A61B 5/1116**

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,523,740 A * 6/1996 Burgmann G08B 21/22
340/539.1
5,561,331 A * 10/1996 Suyama E05B 19/0082
180/287
6,255,951 B1 * 7/2001 De La Hueraga A61J 1/035
340/5.8
D545,220 S * 6/2007 Leung D10/31
8,088,043 B2 * 1/2012 Andren A63B 24/00
368/10
8,115,621 B2 * 2/2012 Rajala G01S 1/042
340/539.11
9,007,195 B2 * 4/2015 Ghabra B60R 25/04
340/426.16
9,031,812 B2 * 5/2015 Roberts G08B 21/182
235/105
9,064,391 B2 * 6/2015 Vardi G08B 13/1463
2004/0233786 A1 * 11/2004 Ting G04B 47/00
368/2

(Continued)

Primary Examiner — Firmin Backer

Assistant Examiner — Adnan Aziz

(74) *Attorney, Agent, or Firm* — Volpe and Koenig, P.C.

(57) **ABSTRACT**

A wearable key fob is disclosed herein. The wearable key fob includes a wrist band including a slot and a key fob including a charging tab that fits into the slot of the wrist band; wherein the key fob is configured for vehicle operability and monitoring a user's health.

20 Claims, 3 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

2005/0033515 A1* 2/2005 Bozzone G01C 22/006
701/472
2007/0066088 A1* 3/2007 Rambosek H05K 5/0278
439/37
2007/0179356 A1* 8/2007 Wessel A61B 5/14532
600/300
2007/0290793 A1* 12/2007 Tran G07C 9/00309
340/5.64
2008/0016738 A1* 1/2008 Talbott A44C 5/0023
40/633
2008/0043575 A1* 2/2008 Fasciano G04G 9/0076
368/13
2008/0045274 A1* 2/2008 Witkowski G07C 5/008
455/569.2
2008/0309451 A1* 12/2008 Zellweger G07C 9/00309
340/3.32
2009/0040874 A1* 2/2009 Rooney A61J 7/0472
368/10
2009/0163322 A1* 6/2009 Andren A63B 24/00
482/8
2009/0243791 A1* 10/2009 Partin G08C 17/00
340/5.2

2011/0003665 A1* 1/2011 Burton G04F 10/00
482/9
2011/0115624 A1* 5/2011 Tran G06F 19/3418
340/540
2013/0204455 A1* 8/2013 Chia G07C 5/008
701/1
2014/0180019 A1* 6/2014 Martinez A61B 5/02055
600/301
2014/0266739 A1* 9/2014 Chen B60Q 9/00
340/576
2014/0333417 A1* 11/2014 Sun G09F 3/0297
340/10.1
2014/0358012 A1* 12/2014 Richards A61B 5/02438
600/479
2015/0054628 A1* 2/2015 Roth G06F 19/3418
340/10.4
2015/0061828 A1* 3/2015 Fischer G07C 9/00007
340/5.61
2015/0182130 A1* 7/2015 Utter, II A61B 5/0205
600/483
2015/0186609 A1* 7/2015 Utter, II A61B 5/0022
600/301

* cited by examiner



FIG. 1

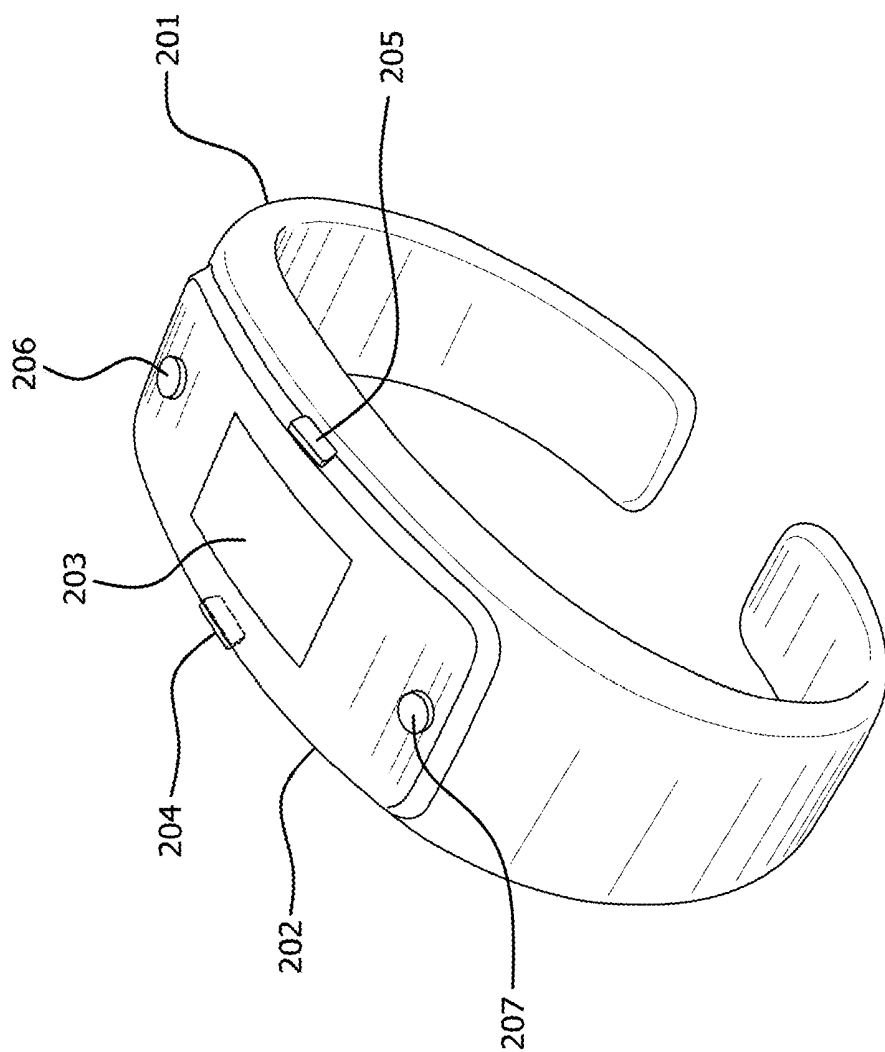


FIG. 2

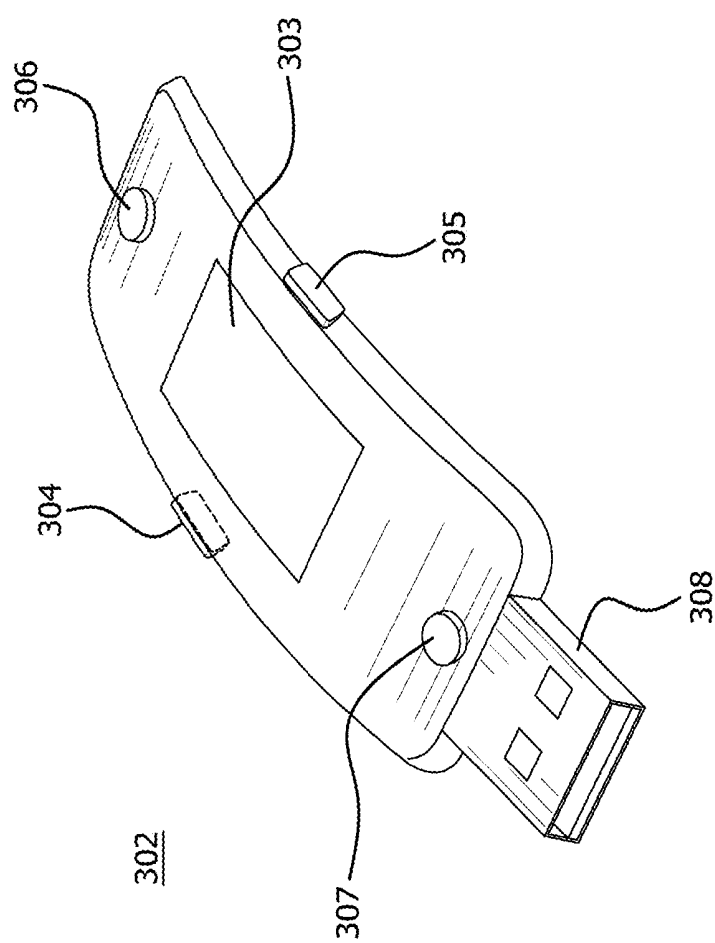


FIG. 3

1

WEARABLE KEY FOB

FIELD OF INVENTION

This application is related to vehicle electronics.

BACKGROUND

Cars increasingly require a programmable key fob for keyless entry or to initiate other functions relating to the vehicle, for example, unlocking car doors, opening the trunk/lift gate, activating a sliding door, and the like. Additionally, many active consumers use wearables to track their activity rate, health, and location. The ability to offer scalable functions into a wearable radio frequency (RF)/Bluetooth device reduces the clutter a consumer has to manage, for example, keys, watch, pedometer, and the like. There is an increasing need to combine the two technologies into an affordable product for easy access when the consumer's hands are full.

SUMMARY

A wearable key fob is disclosed herein. The wearable key fob includes a wrist band including a slot and a key fob including a charging tab that fits into the slot of the wrist band; wherein the key fob is configured for vehicle operability and monitoring a user's health.

BRIEF DESCRIPTION OF THE DRAWINGS

A more detailed understanding may be had from the following description, given by way of example in conjunction with the accompanying drawings wherein:

FIG. 1 is a first example of a wearable key fob;

FIG. 2 is a second example of a wearable key fob; and

FIG. 3 is an example of the key fob removed from the wrist band.

DETAILED DESCRIPTION

It is to be understood that the figures and descriptions of embodiments of a wearable key fob have been simplified to illustrate elements that are relevant for a clear understanding, while eliminating, for the purpose of clarity, many other elements found in typical vehicle systems. Those of ordinary skill in the art may recognize that other elements and/or steps are desirable and/or required in implementing the present invention. However, because such elements and steps are well known in the art, and because they do not facilitate a better understanding of the present invention, a discussion of such elements and steps is not provided herein.

The non-limiting embodiments described herein are with respect to a wearable key fob. Other electronic devices, modules and applications may also be used in view of these teachings without deviating from the spirit or scope as described herein. The wearable key fob may be modified for a variety of applications and uses while remaining within the spirit and scope of the claims. The embodiments and variations described herein, and/or shown in the drawings, are presented by way of example only and are not limiting as to the scope and spirit. The descriptions herein may be applicable to all embodiments of the wearable key fob although it may be described with respect to a particular embodiment.

A wearable key fob is extremely useful for the active consumer or the consumer on the go. The active consumer often uses wearables to track their activity rate, health, and

2

location. Offering a wearable key fob with scalable functions reduces the clutter a consumer has to manage. For example, the consumer would only need one device to accommodate all of their needs. Additionally, the wearable key fob provides the consumer with easy access when their hands are full.

FIG. 1 is a first example of a wearable key fob. A wrist band **101** includes a key fob **102**. The key fob **102** has a face **103** and a connector **104**. The connector **104** attached the key fob **102** to the bracelet **101** to enable a user to wear the key fob **102**. The key fob **102** is detachable from the wrist band **101** at the connector **104**. The key fob **102** securely fits back into the wrist band **101** after it is removed.

The wrist band may be different colors and made of different materials to meet the individual consumer's personality and requirements. For example, the wrist band may be made of plastic, metal, ceramic, or the like.

FIG. 2 is a second example of a wearable key fob. A wrist band **201** includes a key fob **202**. The key fob **202** has a display **203**. The key fob **202** may also include several depressible buttons, for example, buttons **204-07**. Button **204** may be used to display the time. Button **205** may be used to display fitness statistics, for example, number of steps, heart rate, calories burned, speed, mileage, and the like. Button **206** may be used to unlock the vehicle doors. Button **207** may be used to open the trunk/lift gate of the vehicle. When more than one of the buttons **204-207** are depressed simultaneously, additional functions may be triggered. For example, pushing buttons **206** and **207** simultaneously may trigger automatic start for the vehicle. In another example, pushing buttons **204** and **205** simultaneously may trigger the panic alarm for the vehicle. Additionally, the key fob **202** could activate a power lift gate, sliding doors, and the like. The key fob **202** is detachable from the wrist band **201**. The key fob **202** may also have blue tooth capability to link to a user's cell phone to upload the fitness statistics.

FIG. 3 is an example of the key fob removed from the wrist band. The key fob **302** includes a display **303**. The key fob **302** may also include several depressible buttons, for example, buttons **304-307**. The key fob **302** may also include a charging tab **308**. The charging tab **308** may connect to a power cell (not shown) to charge the key fob **302**. The key fob **302** may need to be charged regularly depending on the number of functions embedded and how often they functions are utilized. The charging tab **308** is used to connect the key fob **302** to the wrist band. The key fob **302** is embedded with a vehicle start identification. The presence of the key fob **302** inside the vehicle will enable the vehicle to be turned on. The vehicle start identification, embedded in the key fob **302**, will be the identification associated with the user's particular vehicle.

The key fob **302** may be compatible with the automobile's onboard computer system to display any data obtained during the consumer's use. For example, this may allow the consumer to view their daily activities and keep track of their fitness without having to connect the key fob **302** to another readable device. The key fob **302** utilizes a radio frequency (RF) signal, such as blue tooth, to communicate with the automobile's onboard computer system.

The key fob includes embedded devices. The embedded devices may be ARM, MIPS, Intel/Atom. The silicon embedded in the key fob may be manufactured by Broadcom, Marvell, STMicroelectronics, Samsung, Sigma Designs, and Texas Instruments. The embedded devices may include several components, for example, Random Access Memory (RAM), Flash (NAND/NOR) memory, a general

3

purpose input/output (GPIO), a display, a light emitting diode (LED), an input, storage, radio frequency (RF) tuners, controllers, and a power management. The embedded devices may be managed using firmware/systems development and integration, manufacturing life cycle test development (for example, EVT/DVT/PVT), board/system bring-up support, and software architecture and design.

As described herein, the methods described herein are not limited to any particular element(s) that perform(s) any particular function(s) and some steps of the methods presented need not necessarily occur in the order shown. For example, in some cases two or more method steps may occur in a different order or simultaneously. In addition, some steps of the described methods may be optional (even if not explicitly stated to be optional) and, therefore, may be omitted. These and other variations of the methods disclosed herein will be readily apparent, especially in view of the description of the systems described herein, and are considered to be within the full scope of the invention.

Although features and elements are described above in particular combinations, each feature or element can be used alone without the other features and elements or in various combinations with or without other features and elements.

What is claimed:

1. A wearable device comprising:
 - a wrist band including a slot; and
 - a key fob including a charging tab that fits into the slot of the wrist band to connect the key fob to the wrist band and a plurality of depressible buttons located on an exterior surface of the key fob; wherein
 the key fob includes an integral transmitter and utilizes a radio frequency signal to communicate wirelessly, the key fob is configured for vehicle operability and monitoring a user's daily activities and health, and at least one of the depressible buttons of the plurality of depressible buttons is covered by the wrist band upon coupling of the wrist band with the key fob.
2. The wearable device of claim 1, wherein the key fob further includes a display.
3. The wearable device of claim 1, wherein the vehicle operability includes at least one of the following: starting a vehicle, activating a power lift gate, activating a panic button.
4. The wearable device of claim 1, wherein the key fob communicates with a vehicle's onboard computer system.
5. The wearable device of claim 4, wherein the key fob utilizes BLUETOOTH® to communicate with the vehicle's onboard computer system.
6. The wearable device of claim 1, wherein the monitoring of a user's health includes at least one of the following: monitoring heart rate, monitoring a number of steps the user takes, monitoring calories burned, and monitoring mileage.
7. The wearable device of claim 1, wherein the wrist band comprises at least one of the following: plastic, metal, and ceramic.

4

8. The wearable device of claim 1, wherein the key fob displays time.

9. The wearable device of claim 5, wherein the key fob utilizes BLUETOOTH® to communicate with the vehicle's onboard computer system to display a user's daily activities and health data obtained during the user's operation of the wearable key fob.

10. The wearable device of claim 1, wherein at least one depressible button faces exteriorly upon coupling of the wrist band with the key fob.

11. The wearable device of claim 1, wherein the at least one depressible button that is covered upon coupling of the wrist band with the key fob is located on a side wall of the key fob.

12. A wearable device comprising:

a wrist band including a slot; and

a key fob including a charging tab that fits into the slot of the wrist band to connect the key fob to the wrist band; wherein

the key fob includes an integral transmitter and utilizes a radio frequency signal to communicate wirelessly,

the key fob includes a vehicle start identification, wherein the presence of the key fob inside the vehicle will enable the vehicle to be turned on, and

the key fob is configured for vehicle operability and monitoring a user's daily activities and health.

13. The wearable device of claim 12, wherein the key fob further includes a display.

14. The wearable device of claim 12, wherein the vehicle operability includes at least one of the following: starting a vehicle, activating a power lift gate, activating a panic button.

15. The wearable device of claim 12, wherein the key fob communicates with a vehicle's onboard computer system.

16. The wearable device of claim 15, wherein the key fob utilizes BLUETOOTH® to communicate with the vehicle's onboard computer system.

17. The wearable device of claim 12, wherein the monitoring of a user's health includes at least one of the following: monitoring heart rate, monitoring a number of steps the user takes, monitoring calories burned, and monitoring mileage.

18. The wearable device of claim 12, wherein the wrist band comprises at least one of the following: plastic, metal, and ceramic.

19. The wearable device of claim 12, wherein the key fob displays time.

20. The wearable device of claim 16, wherein the key fob utilizes BLUETOOTH® to communicate with the vehicle's onboard computer system to display a user's daily activities and health data obtained during the user's operation of the wearable key fob.

* * * * *

专利名称(译)	可穿戴钥匙链		
公开(公告)号	US9940769	公开(公告)日	2018-04-10
申请号	US14/472783	申请日	2014-08-29
[标]申请(专利权)人(译)	伟创力公司		
申请(专利权)人(译)	伟创力AP, LLC		
当前申请(专利权)人(译)	伟创力AP, LLC		
[标]发明人	WOOLEY GEORGE MICHAEL		
发明人	WOOLEY, GEORGE MICHAEL		
IPC分类号	G08C19/00 G07C9/00 A61B5/00		
CPC分类号	G07C9/00944 A61B5/00 A61B5/681 G07C2009/00984 A61B2560/045 G07C2009/00769		
代理机构(译)	、凯尼格、P.C.		
助理审查员(译)	阿齐兹ADNAN		
其他公开文献	US20160063777A1		
外部链接	Espacenet USPTO		

摘要(译)

这里公开了一种可佩戴的钥匙扣。可佩戴钥匙扣包括：包括插槽和钥匙扣的腕带，所述钥匙扣包括装入腕带槽中的充电片；其中所述密钥卡被配置用于车辆可操作性并且监视用户的健康。

