EXHIBIT 1002

PTO/AIA/15 (03-13)
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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	LEO-2
First Named Inventor	Charles A. Leonard
Title	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROG
Express Mail Label No.	

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. [✓] **Fee Transmittal Form** (PTO/SB/17 or equivalent)
2. [✓] **Applicant asserts small entity status.** See 37 CFR 1.27
3. [ ] **Applicant certifies micro entity status.** See 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent.
4. [✓] **Specification** [*Total Pages* 46] Both the claims and abstract must start on a new page. *(See MPEP § 608.01(a) for information on the preferred arrangement)*
5. [✓] **Drawing(s)** (35 U.S.C. 113) [*Total Sheets* 13]
6. **Inventor's Oath or Declaration** [*Total Pages* ____] *(including substitute statements under 37 CFR 1.64 and assignments serving as an oath or declaration under 37 CFR 1.63(e))*
   a. [ ] Newly executed (original or copy)
   b. [ ] A copy from a prior application (37 CFR 1.63(d))
7. [✓] **Application Data Sheet** * *See note below.* See 37 CFR 1.76 (PTO/AIA/14 or equivalent)
8. **CD-ROM or CD-R** in duplicate, large table, or Computer Program (*Appendix*)
   [ ] Landscape Table on CD
9. **Nucleotide and/or Amino Acid Sequence Submission** *(if applicable, items a. – c. are required)*
   a. [ ] Computer Readable Form (CRF)
   b. [ ] Specification Sequence Listing on:
      i. [ ] CD-ROM or CD-R (2 copies); or
      ii. [ ] Paper
   c. [ ] Statements verifying identity of above copies

ADDRESS TO:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

ACCOMPANYING APPLICATION PAPERS

10. [ ] **Assignment Papers** (cover sheet & document(s))
    Name of Assignee _____
11. [ ] **37 CFR 3.73(c) Statement** (*when there is an assignee*) [ ] **Power of Attorney**
12. [ ] **English Translation Document** (*if applicable*)
13. [ ] **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
    [ ] Copies of citations attached
14. [✓] **Preliminary Amendment**
15. [ ] **Return Receipt Postcard** (*MPEP § 503*) (*Should be specifically itemized*)
16. [ ] **Certified Copy of Priority Document(s)** (*if foreign priority is claimed*)
17. [ ] **Nonpublication Request** Under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.
18. [ ] **Other:** _____

***Note:** (1) Benefit claims under 37 CFR 1.78 and foreign priority claims under 1.55 **must** be included in an Application Data Sheet (ADS).
(2) For applications filed under 35 U.S.C. 111, the application must contain an ADS specifying the applicant if the applicant is an assignee, person to whom the inventor is under an obligation to assign, or person who otherwise shows sufficient proprietary interest in the matter. See 37 CFR 1.46(b).

19. CORRESPONDENCE ADDRESS

[✓] The address associated with Customer Number: 44728 **OR** [ ] Correspondence address below

Name					
Address					
City		State		Zip Code	
Country		Telephone		Email	

Signature	David M. Sigmon	Date	December 7, 2015
Name (Print/Type)	David M. Sigmon	Registration No. (Attorney/Agent)	52,224

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	LEO-2
	Application Number	
Title of Invention	EHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Charles	A.	Leonard	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Hickory	State/Province	NC	Country of Residence	US

Mailing Address of Inventor:

Address 1	3702 Pinecrest Drive NE		
Address 2			
City	Hickory	State/Province	NC
Postal Code	28601	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	44728		
Email Address	docketing@mullinaxpatent.com	Add Email	Remove Email

Application Information:

Title of the Invention	EHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES		
Attorney Docket Number	LEO-2	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	13	Suggested Figure for Publication (if any)	

Filing By Reference :

ETN1002

2/655

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Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	44728		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the application number blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Claims benefit of provisional	62088115	2015-12-05
Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Claims benefit of provisional	62101109	2015-01-08

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	LEO-2
	Application Number	
Title of Invention	EHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES	

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Authorization to Permit Access:

☐ Authorization to Permit Access to the Instant Application by the Participating Offices

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	LEO-2
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If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date o f filing this Authorization.

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

○ Assignee	○ Legal Representative under 35 U.S.C. 117	○ Joint Inventor
○ Person to whom the inventor is obligated to assign.	○ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. ☐

Prefix	Given Name	Middle Name	Family Name	Suffix

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Mailing Address Information For Applicant:			
Address 1			
Address 2			
City		**State/Province**	
Country		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not subsitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication . An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:			
Address 1			
Address 2			
City		**State/Province**	
Country		Postal Code	
Phone Number		Fax Number	
Email Address			

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Signature:

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Signature				Date (YYYY-MM-DD)	2015-12-07
First Name	David	Last Name	Sigmon	Registration Number	52224

Additional Signature may be generated within this form by selecting the Add button.

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DESCRIPTION

VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES

RELATED APPLICATIONS

The presently disclosed subject matter claims the benefit of U.S. Provisional Patent Application Serial. No. 62/088,115, filed December 5, 2014, and U.S. Provisional Patent Application Serial. No. 62/101,109, filed January 8, 2015; the disclosures of both applications are incorporated herein by reference in their entireties.

TECHNICAL FIELD

The present subject matter relates to leveling systems and processes for leveling vehicles, such as recreational vehicles. The present subject matter also relates to computer program products for leveling vehicles, such as recreational vehicles, using smart devices.

BACKGROUND

Whether in a storage or use state, a recreational vehicle (RV) should be leveled for both practical and technical reasons. Practical reasons include a level floor, proper door swings, stove and sink use, as well as many others. Technical reasons include proper operation of the ammonia based refrigerator, level holding tanks for proper level detection by electronic means and for the proper operation of the plumbing and various other systems. Some higher end Class A RV's have onboard leveling systems that

utilize digital sensors and hydraulic jacks, but most do not have any native leveling capability beyond the raising and lowering of the front of the RV using manual or electric jacks. Level indicators are generally bubble levels attached to both the side and front or rear of the RV. In addition, there are many other vehicles and trailers that require a level position to operate properly such as food vending trucks, mobile medical trailers, transport trailers and in some cases heavy equipment although there are many others.

The described device provides leveling indication for the 2 main axes of the RV (side-to-side and front-to-back). For the purposes of describing both the typical and proposed leveling method, pitch will be defined as the angle of the RV from front to back and roll will be defined as the angle of the RV from side to side.

The typical RV leveling method is described. Once the RV has been moved into the desired location and orientation for use, the driver must exit the RV or tow vehicle to inspect the current level condition of the RV by using the bubble levels attached to the RV. The first step is to level the roll of the RV. Typically this is done by driving or towing the appropriate RV wheels onto a board, block or other object to raise one side of the RV closer to level. Since the bubble levels being used do not give any exact information regarding the amount the RV is out of level, it is an educated guess at best to determine just how high the appropriate wheels must be raised. Typically, this is a trial and error system requiring the driver to make multiple attempts at raising the appropriate wheels the necessary amount to achieve a level position. Each attempt requires the driver to get back into the vehicle to move the wheels off of the previously placed object being used to raise wheels, exit the vehicle to add or take away from the height of the object being used to raise the wheels, enter the vehicle again to drive or

tow the wheels back onto the object being used to raise the wheels and finally exiting the vehicle again to check the new roll orientation relative to level. It is not uncommon for this process to be repeated several times to achieve a level roll orientation. If bubble levels are being used to determine a level orientation, it is common knowledge that a bubble between the lines on a bubble level has an error range of 2-3 degrees. This can be a significant error amount as it relates to RV's and can cause doors, plumbing and other objects and systems within the RV not to operate properly. Once the roll orientation is level, the pitch orientation leveling operation must be completed. Typically, the bubble level mounted to the side of the RV will be used in this process. In the case of a towable RV, this process generally involves using the jack(s) on the front of the RV to raise or lower the front of the RV until a level position is achieved. Since the upward travel of the jack(s) is limited, it is sometimes required to place blocks or some other object under the jack to enable the jack(s) to raise the front of the RV high enough to achieve a level position. Placing blocks or other objects under the jack(s) requires the RV to be reattached to the tow vehicle, the jack(s) raised, blocks or objects placed under the jack(s), the jack(s) lowered onto the blocks or objects and then released from the tow vehicle. In the case of a driveable RV, the same iterative process used to level the roll of the RV is necessary to level the pitch of the RV. This process may require many attempts as in the case of leveling the roll of the RV.

As such, a need exists for a system for easily and inexpensively leveling a recreational vehicle that does require not many attempts to achieve a level balance of the recreational vehicle in both the pitch and the roll directions.

SUMMARY

The present subject matter provides leveling vehicles, such as recreational vehicles, and related systems and processes.

The present subject matter also relates to computer program products for leveling vehicles, such as recreational vehicles, using smart devices. The subject matter described herein may be implemented in software, in combination with hardware and/or firmware. For example, the subject matter described herein may be implemented in software executed by a hardware-enabled processor. In one exemplary implementation, the subject matter described herein of using leveling information for leveling a vehicle, such as a recreational vehicle, may be implemented using a non-transitory computer readable medium having stored thereon executable instructions that when executed by the processor of a computer control the processor to perform steps. Exemplary non-transitory computer readable media suitable for implementing the subject matter described herein include chip memory devices or disk memory devices accessible by a processor, programmable logic devices, and application specific integrated circuits. In addition, a computer readable medium that implements the subject matter described herein may be located on a single computing platform or may be distributed across plural computing platforms. Further, it should be noted that the systems and methods utilize and can comprise recreational vehicle leveling systems, devices and their components and functionality described herein. These recreational vehicle leveling systems and devices constitute special purpose devices that improve the technological field of providing guidance for and/or mechanisms for leveling recreational vehicles.

While one or more objects of the presently disclosed subject matter having been stated hereinabove, and which is achieved in whole or in part by the presently disclosed subject matter, other objects will become evident as the description proceeds when taken in connection with the accompanying drawings as best described hereinbelow.

BRIEF DESCRIPTION OF THE DRAWINGS

A full and enabling disclosure of the present subject matter including the best mode thereof to one of ordinary skill in the art is set forth more particularly in the remainder of the disclosures and the specification, including reference to the accompanying figures, in which:

Figure 1 illustrates a schematic side view of an embodiment of a vehicle that includes an embodiment of leveling system according to the present subject matter;

Figure 2 illustrates a schematic front view of an embodiment of a vehicle that includes an embodiment of leveling system according to Figure 1;

Figure 3 illustrates a screen shot of an embodiment of a software application on a smart device for use in an embodiment of the leveling system according to the present subject matter;

Figure 4 illustrates another screen shot of an embodiment of a software application on a smart device for use in an embodiment of the leveling system according to the present subject matter;

Figures 5A and 5B illustrate possible additional screen shots of an embodiment of a software application on a smart device for use in an embodiment of the leveling system according to the present subject matter;

Figure 6 illustrates a further screen shot of an embodiment of a software application on a smart device for use in an embodiment of the leveling system according to the present subject matter;

Figure 7A illustrates a schematic front view of an embodiment of a recreational vehicle positioned at a desired location before leveling;

Figure 7B illustrates a schematic front view of the embodiment of the recreational vehicle according to Figure 7A positioned at a desired location after leveling in the roll direction according to the present subject matter;

Figure 8A illustrates a schematic side view of the embodiment of the recreational vehicle according to Figure 7A positioned at a desired location before leveling;

Figure 8B illustrates a schematic side view of the embodiment of the recreational vehicle according to Figure 7A positioned at a desired location after leveling in the pitch direction according to the present subject matter;

Figure 9 illustrates an embodiment of a flowchart of a method of leveling a vehicle according to the present subject matter; and

Figure 10 illustrates an embodiment of a flowchart of a method of leveling a vehicle performed by a software application of a smart device in according to the present subject matter.

Repeat use of reference characters in the present specification and drawings is intended to represent the same or analogous features or elements of the invention.

DETAILED DESCRIPTION

Reference now will be made to the embodiments of the present subject matter, one or more examples of which are set forth below. Each example is provided by way of an explanation of the present subject matter, not as a limitation. In fact, it will be apparent to those skilled in the art that various modifications and variations can be made in the present subject matter without departing from the scope or spirit of the present subject matter. For instance, features illustrated or described as one embodiment can be used on another embodiment to yield still a further embodiment. Thus, it is intended that the present subject matter cover such modifications and variations as come within the scope of the appended claims and their equivalents. It is to be understood by one of ordinary skill in the art that the present discussion is a description of exemplary embodiments only, and is not intended as limiting the broader aspects of the present subject matter, which broader aspects are embodied in exemplary constructions.

Although the terms first, second, right, left, front, back, etc. may be used herein to describe various features, elements, components, regions, layers and/or sections, these features, elements, components, regions, layers and/or sections should not be limited by these terms. These terms are only used to distinguish one feature, element, component, region, layer or section from another feature, element, component, region, layer or section. Thus, a first feature, element, component, region, layer or section discussed below could be termed a second feature, element, component, region, layer or section without departing from the teachings of the disclosure herein.

Similarly, when a layer or coating is being described in the present disclosure as "on" or "over" another layer or substrate, it is to be understood that the layers can either be directly contacting each other or have another layer or feature between the layers, unless expressly stated to the contrary. Thus, these terms are simply describing the relative position of the layers to each other and do not necessarily mean "on top of" since the relative position above or below depends upon the orientation of the device to the viewer.

Embodiments of the subject matter of the disclosure are described herein with reference to schematic illustrations of embodiments that may be idealized. As such, variations from the shapes and/or positions of features, elements or components within the illustrations as a result of, for example but not limited to, user preferences, manufacturing techniques and/or tolerances are expected. Shapes, sizes and/or positions of features, elements or components illustrated in the figures may also be magnified, minimized, exaggerated, shifted or simplified to facilitate explanation of the subject matter disclosed herein. Thus, the features, elements or components illustrated in the figures are schematic in nature and their shapes and/or positions are not intended to illustrate the precise configuration of the subject matter and are not intended to limit the scope of the subject matter disclosed herein.

It is to be understood that the ranges and limits mentioned herein include all ranges located within the prescribed limits (i.e., subranges). For instance, a range from about 100 to about 200 also includes ranges from 110 to 150, 170 to 190, 153 to 162, and 145.3 to 149.6. Further, a limit of up to about 7 also includes a limit of up to about

5, up to 3, and up to about 4.5, as well as ranges within the limit, such as from about 1 to about 5, and from about 3.2 to about 6.5 as examples.

"Smart device," or "mobile smart device," as used herein means any mobile electronic device configured with imaging and/or computing capabilities that can process image and sensor data. Such smart devices can include, but are not limited to, at least one of a mobile smartphone, a personal digital assistant (PDA), a computing tablet, a personal media player, or any like mobile electronic device configured with imaging and/or computing capabilities. In some embodiments, the smart device may be provisioned with a hardware-based processor that is configured to execute software programs or applications.

"Vehicle leveling device," and "RV leveling device" as used herein means a sensor device that include at least one of a gyroscope, a digital compass, a tilt sensor, a digital accelerometer or some other digital angle measurement device or sensor therein that includes a software application that permits the smart device to measure and asset angles of inclination and/or orientation of a recreational vehicle to permit the pitch and roll of the recreational vehicle to be adjusted to level the recreational vehicle. A digital temperature sensor may also be included on the vehicle leveling device and used to collect temperature data necessary to correct variations or irregularities in the data obtained by the above mentioned angle measurement sensors. A computer processor may also be included on the vehicle leveling device and used to perform calculations, security functions, storage management and functions as well as other tasks. Firmware associated with the desired functionality may be executed by the computer processor of the vehicle leveling device.

"Vehicle" as used herein means both powered vehicles and non-powered vehicles, trailers or the like, and includes but is not limited to cars, trucks, recreational vehicle, recreational vehicle trailers, food vending trucks, mobile medical trailers, transport trailers, boon trucks, backhoes, or the like.

"Mobile smart device software application" as used herein means specific software applications for and used on a mobile smart device that can be in the form of a non-transitory computer readable medium comprising computer executable instructions embodied in a computer readable medium that when executed by a processor of a computer control of the smart device, the smart device can perform specific steps.

"Software" or "Software application" as used herein means software applications for and used on a computer, which can include, but is not limited to a mobile smart device, that can be in the form of a non-transitory computer readable medium comprising computer executable instructions embodied in a computer readable medium that when executed by a processor of a computer control of the computer, the computer can perform specific steps.

The leveling system, method, device, and/or computer program product embodiments described herein refer mainly to recreation vehicles. There are many other vehicles and trailers that require a level position to operate properly such as food vending trucks, mobile medical trailers, transport trailers and in some cases heavy equipment although there are many others. It should be understood that that leveling system, method, device, and/or computer program product embodiments described herein can be used in conjunction with these other vehicles and/or trailers.

As stated above, the devices, systems, methods and computer program products relate to leveling an RV relative to the two main axes of the RV (side-to-side and front-to-back). As used herein to describe the proposed leveling method and shown in Figures 1 and 2, pitch is defined as the angle of the RV from front to back and roll will be defined as the angle of the RV from side to side. As shown in Figure 1, when adjusting the pitch, an embodiment of an RV **10** can be adjusted in pitch rotational directions **P** depend on the inclination of the RV from front-to-back. For example, if the RV **10** is inclined forward so that a rear section **12** is above a front section **14** proximal to a jack **26** of the RV **10**, then the pitch of RV **10** can be adjusted in the direction of arrow point $\mathbf{P_1}$. If the RV **10** is inclined backward so that the front section **14** is above the rear section **12**, then the pitch can be adjusted in the direction of arrow point $\mathbf{P_2}$. Similarly, as shown in Figure 2, when adjusting the roll, the RV **10** can be adjusted in roll rotational directions **R** depending on the inclination of the RV from side-to-side. For example, if the RV **10** is inclined forward so that a first side section **16** of the RV **10** is above a second side section **18** of the RV **10**, then the roll of RV **10** can be adjusted in the direction of arrow point $\mathbf{R_1}$. If the RV **10** is inclined backward so that the second side section **14** is above the first side section **16**, then the pitch can be adjusted in the direction of arrow point $\mathbf{R_2}$.

To accomplish the adjustments so that, upon parking the RV **10**, the RV **10** will be leveled in both the pitch and roll directions, a leveling system **20** can be provided that provides measurements to determine the amount of adjustment needed in both the pitch and roll directions. For example, the leveling system **20** can comprise one or more sensor devices **22**, which can comprise a vehicle leveling device, (shown schematically

as a box) that can be secured to the RV **10** to sense the inclination and/or orientation of the RV **10** in both the pitch and roll directions. Additionally the leveling system **20** can also comprise a smart device **24** that can be in communication with the sensor device **22**. For example, the smart device **24** can have a specific software application thereon that allows information received from the sensor device **22** about the inclination and/or orientation of the RV **10** to be processed to provide measurements to a user and to determine the amount of adjustments needed to the RV **10**. The smart device **24** and the sensor device can communicate with each other in a variety of ways. For example, in some embodiments, the sensor device **22** and smart device **24** can communicate through a wired connection. In some embodiments, as shown in Figures 1 and 2, the sensor device **22** and smart device **24** can communicate through wireless communications, such as Bluetooth.

As noted above, the sensor device **22** of the RV leveling system **20** is shown schematically, and while it is shown on the exterior front section of the RV **10**, it is noted that the sensor device can located at a variety of location and positions of the RV **10**. For example, the sensor device **22** can be on the rear, sides or at a central location of the RV **10**. Additionally, the sensor device **22** can be on the exterior, interior or inside the framework of the RV **10**. As noted above, the mobile smart device software application may have a screen designed to define the installed orientation of the sensor device so that data from the appropriate axes can be used for pitch and roll calculations. The sensor device **22** can comprise a printed circuit board ("PCB") that can include various digital sensors including one or more digital accelerometers, one or more digital gyroscopes, a global positioning system ("GPS") sensor, and other sensors required for

accomplishing the desired functionality of the RV leveling system. For example, a digital temperature sensor may also be included that can be used to collect temperature data. For instance, the temperature data collected by the digital temperature sensor can be used to correct variations or irregularities in the data obtained by the sensor device **22**. The PCB can also include a processor and stored software, such as firmware, to allow for the processing of data and performing calculations related to the desired functionality of the RV leveling system. The PCB can also include the components for Bluetooth or other wireless communication. The PCB can be battery powered or use other means of power such as AC or DC connections. The sensor device **22** can also comprise a housing or enclosure in which the PCB can be mounted for protection from damage and the environment.

For example, in some embodiments, the PCB of the sensor device **22** can have digital accelerometer that uses multiple axes, for example an X-axis, a Y-axis and a Z-axis that are used to determine movement and position. When installing the sensor device **22** or after installation, whether on the front, the rear, sides or at a central location of the RV **10**, one of the axes of the accelerometer can be assigned to measure the pitch **P** and another of the axes can be assigned to measure the roll **R**. For instance, the orientation of the sensor device **22** relative to the front, the rear, passenger side or drive side upon or after installation can be noted using the software application on either the PCB of sensor device **22** or the smart device **24** so that an appropriate axis can be assigned to determine the pitch angle measurement and an appropriate axis can be assigned to determine the roll angle measurement. In this manner, the orientation of the sensor device **22** can be identified or assigned relative to

the vehicle. The mobile smart device **24** software application may have a screen designed to define the installed orientation of the sensor device **22** so that data from the appropriate axes can be used for pitch and roll calculations.

In some embodiments, the smart device **24** can have a compatible wireless communication capability such as Bluetooth or other wireless communication protocol to obtain and/or share information from the PCB of the sensor device **22**. The smart device **24** can comprise software that is capable of communicating with the PCB of the sensor device **22**, storing information obtained from the PCB of the sensor device **22**, manipulating the information obtained from the PCB of the sensor device **22** and/or user input related to the inclination and/or orientation of the RV **10**, and displaying of information obtained from the PCB of the sensor device **22** and user input as well as information generated from the information obtained from the PCB of the sensor device **22** and/or the user input related to the inclination and/or orientation of the RV **10**. In some embodiments, the sensor device **22** can comprise a memory in communication with the processor of the PCB and can be used to store information transmitted from the mobile smart device **24**. In some embodiments, the sensor device **22** can use sensor data and/or stored user data to perform calculations on the sensor device **22** and transmit the calculated data to the mobile smart device **24** for further calculation or display or both. In the some embodiments, the smart device **24** can be a smartphone capable of storing and executing software applications. These calculations can be based off of the determination of the pitch and roll angles using the calibration data to determine the pitch angle measurements and the roll angle measurements. These calculations can include geometric calculations that can convert changes in angles to

distance of movement need to obtain a level position of the vehicle in both the roll direction and the pitch direction based on the length and width of the vehicle being leveled. Such geometric calculations can be based on common geometric formulas that would be understood by those skilled in the art.

Figures 3-6 illustrate embodiments of graphical user interface screens of an embodiment of a software application that can be used on the smart device **24**. Figure 3 illustrates a screen **28** of an entry or beginning screen through which a user can enter the software application, which can be used in some embodiments of the software application. In some embodiments of the software application, an entry screen may not be used. As shown in Figure 4, the software application can have the ability to accept user input relating to the RV **10**. For example, the software application can prompt the user to enter information such as the measurements of the RV **10**, for example, the length and the width of the RV **10**, that can be used to correctly calibrate the amount of adjustment needed in the pitch and roll directions. For example, as shown in Figure 4, the software application as shown in a screen **30** can be provide an entry cell **32** for entry of a width of the RV **10** as measured from the outside of a first wheel, or tire, on a first side of the RV **10** to the outside of a second wheel, or tire, on a second side of the RV **10** along an axle of the RV **10**. The screen **30** can also provide an entry cell **34** for entry of a length of the RV **10** as measured from a center point of the rear axle to the jack **26** at the front of the RV **10**. The software application can store this information for use in calculating displayed information at the time of entry or at a later time. In some embodiments, the software application can save the entered information for recall at a later time as needed. In some embodiments, this information can be stored on the RV

sensor device **22** after transmission from the smart device **24**. In some embodiments, the software application can individually save information on multiple RV's that can be recalled at a later time as needed.

To begin, an initial level position can be determined for the RV to help determine any inconsistencies inherent in the leveling system, such as inconsistencies due to the installation or placement of the sensor device on the RV that may cause the sensor readings to be slightly off. The smart device **24** can be used to determine the initial level position using the accelerometer, gyroscope and/or GPS functions therein through a portion of the software application, or a different software application, as shown in Figure 6 and described in more detail below. A typical digital or spirit level can also be used to achieve this initial level position. The smart device **24** can then capture, i.e., save and store the current pitch and roll angle measurements from the sensor device **22**. These measurements will be used as offsets from the initial level position when displaying angles or calculating and displaying adjustment values necessary to move the RV back to the initial level position. Thus, the software application can determine if the measurements from sensor device **22** are slightly off when the RV is at the initial level position and then take those inconsistencies into consideration when taking measurement readings in the future.

In particular, the software application on the smart device **24** can have a calibration function as represented by a "Set Level" button **36** in the screen **30** for the initial set up of the software application. The "Set Level" button **36** can be used to obtain the current sensor readings in the roll and pitch directions from the sensor device **22** when the smart device **24** indicates that the vehicle is in an initial level position.

These sensor readings when the RV **10** is at the initial level position may be stored as calibration data on the smart device **24** or the sensor device **22** or both. This calibration data can be used to compensate for any imperfections in the sensor readings that may derive from the installation and/or placement of the sensor device **22** on the vehicle **10**. Once this calibration function is completed, it does not necessarily need to be performed again. Additionally, in some embodiments as shown in Figure 4, the software application can have a conversion function as represented by the "inches" and "mm" buttons **38A**, **38B** in the screen **30**. These buttons **38A**, **38B** can be used to set and/or change the metrics system used to measure, calibrate, and compute. For example, as shown, the system used for measurements can be set and/or changed between U.S. Customary System ("inches") and the Metric System ("mm").

Once the calibration has been performed, the software application can be used determine the change in roll and the change in pitch needed for the given RV **10** based on measurements from the sensor device **22** at any given location. In some embodiments, the sensor device **22** may use the calibration data as well as other current sensor data, such as the current pitch angle and roll angle measurements and temperature readings from the sensor device **22** or a another temperature sensor device, and perform calculations, such as an accurate calculation of the current angle of the vehicle and the offset that is needed, using the processor and firmware on the PCB of the sensor device **22**. In some embodiments, a user can activate the software application to initiate the measurements to determine the change in roll and pitch by simply opening the software application on the smart device **24** when connected to a wire communication with the sensor device **22** or within range of the sensor device **22**

for a wireless communication connection, depending on how communication is setup between the smart device **24** and the sensor device **22**. In some embodiments, the software application can display an interface on a display screen, such as a button, once the software application is opened that can be activated to initiate this determination, or calculation, function.

Figure 5A and 5B show similar screen shots of information that can be displayed in real time or near real time. Once the determination/calculation function is initiated and the change in roll and pitch calculated by the software application or the processor and firmware on the PCB of the sensor device **22**, the determined change in roll and pitch can then be displayed as shown in a screen shot **40** in Figures 5A and 5B. For example, a roll display **42** can be given as shown in Figures 5A and 5B. Similarly, a pitch display **44** can be provided. As shown in Figure 5A, in some embodiments, the roll display **42** can provide, for example, the current angle from level for the roll directions measured in degrees **43A** and the amount of elevation change **45A** in inches or millimeters needed on a given side to level the RV in the roll direction. Alternatively, in some embodiments as shown in Figure 5B, the roll display **42** can provide, for example, the current angle from level for the roll directions measured or expressed as the amount of elevation change **45B** in inches or millimeters needed on a given side to level the RV in the roll direction. Similarly, as shown in Figure 5A, in some embodiments, the pitch display **44** can, for example, provide the current angle from level for the pitch directions measured in degrees **47A** and the amount of elevation change **49A** in inches or millimeters needed on either the front or the back to level the RV in the pitch direction. Alternatively, in some embodiments as shown in Figure 5B,

the pitch display **44** can, for example, provide the current angle from level for the pitch directions as measured or expressed in the amount of elevation change **49B** in inches or millimeters needed on either the front or the back to level the RV in the pitch direction.

As the current roll angle changes, the roll angle measurements expressed in degrees **43A** and/or the amount of elevation change **45A**, **45B** will change. As the current pitch angle changes, the pitch angle measurements expressed in degrees **47A** and/or the amount of elevation change **49A**, **49B** will also change. More particularly, for example, for the change in pitch, the amount of elevation change can be affected by the moving of the jack **26** proximal the front section **14** up or down by the requisite distance displayed. The changes in current roll and pitch angles can also be shown in in the graphic image of the vehicle as shown in displays **42** and **44** in real time or near real time.

As shown in the screen **40** in Figures 5A and 5B, the mobile smart device software application can also provide the ability to save a given pitch angle, either on the smart device **24** or on the sensor device **22**, for the purpose of returning to that position at a later time as illustrated by the "save hitch position" button **46** in screen **40**. To reuse the pitch angle that had been saved, a recall can be provided, such as recall button **48**. This functionality can be useful for travel trailers and fifth wheel RV's that must be detached from a tow vehicle when in use. The pitch angle saved when the tow vehicle is detached from the RV will be recalled for pitch angle positioning when reattaching the tow vehicle. This will simplify and increase the speed of reattaching the tow vehicle to the RV.

As mentioned above and described in more detail below, in some embodiments, once the sensor device **22** has been properly mounted to the inside or outside of the RV **10**, the RV **10** can be leveled to an initial level position using the typical method described above or by placing the smart device **24** on the floor or some other horizontal surface of the RV and using a digital level software application, either separate from or integrated into the software application. Figure 6 shows a screen **50**, for example, of the software application that can be used to measure both the pitch and the roll angles using a pitch measuring line **52** and a roll measuring line **54** forming a crosshair **56**. The software application on the smart device **24** can show a display that operates in a similar manner to a spirit level so as to display movement of the pitch and roll angles toward a center bull's eye **60** as the smart device on the horizontal surface is moved toward a leveled position. The progress toward the bull's eye **60** can be measured by the position of the crosshair **56** relative to the area **58** surrounding the bull's eye **60** as the crosshair **56** approaches the demarcation line **62** as the horizontal surface is moved closer to the leveled position. In this manner, the smart device **24** can be used in this initial leveling to determine an initial level position. As mentioned above, a typical digital or spirit level could also be used to achieve this initial level position. The smart device **24** can then capture, i.e., save and store the current pitch and roll angle measurements from the sensor device **22** or cause (by a transmitted instruction from the smart device **24**) the sensor device **22** to save and store the calibration data of pitch and roll angle measurements on the sensor device **22**. This calibration data will be used as offsets from the initial level position when displaying angles or calculating and displaying adjustment values necessary to move the RV back to the initial level position.

Once measurements are generated using the set level button **36** that relate to the initial level position of the RV, these measurements can be stored on the smart device **24**, or stored in a memory storage location on the PCB sensor device **22** and recalled to the smart device **24** at a desired time. The smart device **24** with the software application running can then be used to calculate and display angles relative to the initial level position and to calculate and display adjustment values necessary to move the RV to the initial level position when the RV is moved to a location for use. In some embodiments, the calculation of angles relative to the initial level position can be performed by the processor and firmware on the PCB of the sensor device **22**. Performing the calibration function on the software application, the smart device **24** can wirelessly connect (or, in some embodiments, connect through a wired connection) to the sensor device **22** and request the current angle measurements for pitch and roll. These measurements can be stored on the smart device **24**, or stored in a memory storage location on the PCB sensor device **22** and recalled to the smart device **24** at a desired time, for use in calculating displayed information in the subsequent screens such as screen **40** shown in Figure 5 with the roll display **42** and the pitch display **44** as explained below. These stored measurements can be used as offsets from the initial level position based on the angle indications calculated from the various sensors of the sensor device **22**. This is required to establish the relationship between the position of the mounted sensor device **22** and the initial level position in both pitch and roll as measured and/or captured by the smart device **24** or the sensor device **22** as described above.

In some embodiments, if the RV level system is installed during the manufacturing of the RV, then the RV level system can be calibrated at the factory eliminating the need for the user to do it. In such embodiments, the calibration function can be skipped by the user.

In subsequent displays **42**, **44** of the current angles relative to the initial level position on the software application on the smart device **24** as shown in the screen **40** in Figure 5, for example, these stored calibration data measurements will be added or subtracted from the actual, calculated sensor data from the PCB of the sensor device **22** to determine the actual angle relative to the initial level position accounting for the actual mounted orientation of the sensor device **22**. In some embodiments, the displays **42**, **44** can show an image of the vehicle that reflects the actual position of the RV **10** with the actual angles in the respective pitch and roll directions of the RV **10** such that the image of the vehicle moves as the angles in the respective pitch and roll directions of the RV **10** change. Once accurate angle measurements have been calculated and displayed in the screen **40** of the software application on the smart device **24**, additional calculations regarding the added height needed to achieve the initial level position of the RV can be performed either by the software application of the mobile smart device **24** or by the processor and firmware on the PCB of the sensor device **22**. These calculations regarding the added height needed to achieve the initial level position of the RV can be displayed by the software application on the mobile smart device **24**, for example, in the respective roll display **42** and pitch display **44** or on a different screen in other embodiments. The appropriate side or direction of added or removed height can also be displayed using arrows and/or the calculated height required as shown for example

in the respective roll display **42** and pitch display **44** of screen **40** of the described example embodiment of software application. These calculations are achieved by using the stored information about the length and width of the RV **10** and the calculated current angle relative to the initial level position of the RV and using trigonometric formulas to calculate the height and location for the height addition or reduction required to achieve a level position.

For example, as shown in Figure 7A and 8A, an RV **10** can be parked, or positioned, at a desired location. A leveling system **20** on RV **10** (as shown in Figures 1 and 2) can be previously used to determine an initial level position that provides a true level measurement that has been stored on the smart device **24** of the leveling system **20**, or stored in a memory storage location on the PCB sensor device **22**, such as an RV leveling device, and recalled to the smart device **24**, for later use. The RV **10** can have three or more structural supports, such as wheels $\mathbf{W_A}$, $\mathbf{W_B}$ and jack **26** on a ground **G** at the desired location. As shown in Figure 7A, the RV **10** leans toward the first side **A** of RV **10** on first side section **16** at the desired location. Similarly, as shown in Figure 8A, the RV **10** leans toward the front **C** of RV **10** on the front section **14** at the desired location. Thus, the RV **10** is not leveled at the desired location based on the structural supports current position on the ground **G**.

The software application on the smart device **24** of the leveling system can be accessed to initiate the determination of the needed change in the roll and pitch directions to level the RV **10** at the desired location. The smart device **24** can communicate with the sensor device **22** of the leveling system **20** to obtain sensor data used to determine the current angle measurements for the roll and pitch directions off

from true level, i.e., the initial level position stored in the smart device. The needed angle change, distance change, and/or direction of change for the roll and pitch directions can be displayed on the smart device **24** as shown in the roll display **42** and pitch display **44** in screen **40** of the software application (see Figure 5). As shown in Figure 7B, the first side **A** of RV **10** can then be raised the needed amount so that the first side **A** and a second side **B** of the **RV 10** can be level with one another in the roll direction based on the information provided in the roll display **42** (see Figure 5). For example, a jack **70**, or other mechanism can be used to raise the first side **A** of RV **10**. Similarly, as shown in Figure 8B, the front side **C** of RV **10** can be raised the needed amount so that the front side **C** and a rear side **D** of the **RV 10** can be level with one another in the pitch direction based on the information provided in the pitch display **44** (see Figure 5). For example, a jack **26** can raise the front side **C** of RV **10** the needed amount.

As another example, the software application on the smart device **24** or the software on sensor device **22** can calculate that an RV is 2 degrees out of level in the roll direction and height needing to be added to the left side of the RV. In this example, the stored width of the RV is 8 feet or 96 inches. Using a trigonometric function, the height needed to achieve a level position can be calculated as 3.3523 inches. Knowing exactly how much height is needed to reach a perfectly level position in both pitch and roll will simplify and reduce the amount of time required to level the RV. Both the software of the sensor device **22** and the smart device software application can dynamically and in near real time update and graphically display the current pitch and roll of the RV representations using a proportional algorithm.

Additionally, in some embodiments, the sensor device **22** can have sensors that are able to detect relative humidity, temperature and barometric pressure. For example, the PCB of the sensor device **22** may have sensors that are able to detect relative humidity, temperature and barometric pressure. The user may desire to mount the sensor device **22** on the exterior or interior of the RV depending on whether they are more interested in measuring the environmental conditions outside or inside the RV. This environmental information will also be wirelessly transmitted to the smart device **24** and displayed for the user.

In some embodiments as stated above, the mobile smart device software application that can be downloaded and run on the smart device **24** can permit input of the RV length and RV width for the purpose of calculating the amount of height needed at the appropriate place to return the RV to a previously defined level position. In some embodiments, this length and width could be pre-programmed for various makes and models of RV's, eliminating the need for the user to measure and input the length and width dimensions. Instead, the mobile smart device software application can have a screen that lists the make and model of the RV. In some embodiments, the lists of RV's can contain various information about the different makes and models of RV's including pictures and other information. The screen can allow the user to scroll the list or can provide a search mechanism that allows the user to find the exact RV in question or shorten the list of RV's to be viewed. In this manner, the user would simply select the make and model of the RV from a list contained within the mobile smart device software application of the smart device **24**.

RV's typically have control panels that consist of pushbuttons and/or indicator LED's and/or LCD displays. These control panels are used to display data about the condition of various RV systems or to activate various RV systems. Typical data displayed by some RV control panels can include holding tank fluid levels and battery power levels. Typical RV systems that might be activated from some control panels would be power slideouts and starting or stopping the generator. In some embodiments, the smart device **24** can be integrated or in communication with the various RV control panels and systems either through wired or wireless communications. For example, utilizing a wireless communication system or protocol, such as Bluetooth or WiFi, the mobile smart device software application on the smart device **24** can display the data that is generated and displayed on some of the RV control panels such as holding tank levels, battery power levels and the like. In addition, the mobile smart device software application can also be used to activate various RV systems such as power slideouts, starting the generator, stopping the generator, or the like. The mobile smart device software application could also be used to control more general RV systems such as lighting and entertainment systems. For example, the mobile smart device software application can generate screens that are displayed on the smart device **24** that display the data that is generated and displayed on some of the RV control panels. Additionally, the mobile smart device software application can generate screens that are displayed on the smart device **24** that provide user interfaces, such as buttons that can be used to activate various RV systems by the user, for example, remotely or wirelessly.

In some embodiments, the PCB of the sensor device **22** can contain a GPS sensor allowing the current physical location of a vehicle, such as RV **10**, that the sensor device **22** has been mounted on to be transmitted to the mobile smart device **24** or saved and stored on the sensor device **22**. Positional movements of the vehicle, along with date and time information, can be saved and stored on the mobile smart device **24** or the sensor device **22**. This saved vehicle positional movement information along with saved and corresponding date and time information can be used to determine actual use information regarding the vehicle. For instance, this positional movement information can be used to make determinations on the actual times that the vehicle is used over a given time period, how many days the vehicle is typically used when it is away from the normal storage locations, how many miles the vehicle is typically driven or towed to each use locations, and other information that might be relevant to the manufacturer of the vehicle. Total distance traveled by the vehicle could also be saved and stored on the mobile smart device **24** or sensor device **22** for use by the manufacturer of the vehicle for warranty or other uses. The total number of miles traveled by a non-drivable vehicle such as a trailer or towable RV is not currently recorded in any other manner and this may be useful information for many purposes such as used value determination, tire warranties, and many others. This saved and stored vehicle location, date, time and usage information could be transmitted from the mobile smart device **24** via the internet to email or computer server addresses or locations designated by the vehicle manufacturer.

Thus, according to the disclosure herein, a method, generally designated **50**, for leveling a vehicle, such as a recreational vehicle, can be provided as shown in Figure 9.

To begin, a leveling system can be provide that comprises one or more sensor devices, that can comprise one or more vehicle leveling devices, secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction and a smart device in communication with the one or more sensor devices as shown in step **52**. The method can comprise a step **54** of measuring the pitch angle and the roll angle of the vehicle when the vehicle is at rest using the sensor device as shown as Figure 9. To determine the needed movement of the vehicle to achieve a level position based on the measures of the pitch angle and the roll angle, calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position can then be retrieved as shown in step **55**. The method **50** can additionally comprise a step **56** of calculating any needed change in at least one of the pitch direction or the roll direction of the vehicle using the measurements of the pitch angle and the roll angle of the at rest vehicle and the calibration data of pitch and roll angle measurements to obtain a level position of the vehicle. This calculation can be performed by the one or more sensor devices or the smart device. In step **58**, the calculated change in at least one of the pitch direction or the roll direction of the vehicle can be displayed on the smart device.

In order to initially develop the calculation data, the method described above can also include the step of determining the initial level position for a vehicle to determine any inconsistencies inherent in the leveling system. Depending on the embodiment of the method, this determination step can be performed on the one or more sensor devices or the smart device. In some embodiments, the step of determining an initial level position can comprise receiving measurements of a length and a width of the vehicle. In some

embodiments of the method, the step of determining an initial level position can comprise using at least one of an accelerometer, gyroscope, or global positioning system sensor on the smart device to achieve the initial level position. In some embodiments, the step of determining an initial level position can comprise using at least one of a digital level or spirit level can also be used to achieve the initial level position. In some embodiments of the method, the step of determining an initial level position can be performed by during manufacture of the vehicle and the calibration data stored on the sensor device installed during manufacture. In some embodiments, when installing the sensor device or after installation, whether on the front, the rear, sides or at a central location of the vehicle, an axis can of a plurality of axes of the accelerometer on the sensor device can be assigned to measure the pitch of the vehicle and another axis of the plurality axes of the accelerometer on the sensor device can be assigned to measure the roll of the vehicle. For instance, in some such embodiments, the orientation of the sensor device relative to the front, the rear, the passenger side or the drive side of the vehicle can be noted using the software application on either the sensor device or the smart device so that an appropriate axis can be assigned to determine the pitch angle measurement of the vehicle and an appropriate axis can be assigned to determine the roll angle measurement of the vehicle. The mobile smart device software application may have a screen designed to define the installed orientation of the sensor device so that data from the appropriate axes can be used for pitch and roll calculations. The pitch and roll angle measurements from the sensor device taken at the initial level position can then be captured, i.e., identified and stored or saved, to provide the calibration data of the pitch and roll angle measurements to

permit consideration of any inconsistencies determined when taking measurement readings at a future time. For example, the calibration can be calculated and then saved on a sensor processor on the one or more sensor devices or saved on the smart device that is in communication with the one or more sensor devices. In some embodiments of the method, the step of capturing the pitch and roll angle measurements from the sensor device can comprise communicating calibration data from the sensor device of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position to the smart device and saving the calibration data on the smart device. In some embodiments of the method, the step of capturing the pitch and roll angle measurements from the sensor device can comprise saving the calibration data of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position on the sensor device. In some such embodiments where the calibration data is saved on the sensor device, the step of saving the calibration data of the pitch and roll angle measurements on the sensor device can comprise transmitting instructions from the smart device **to** the sensor device to save and store the calibration data of the pitch and roll angle measurements on the sensor device. In some such embodiments, the method can include recalling the calibration data of the pitch and roll angle measurements from the sensor device to the smart device.

In some embodiments of the method, the step **58** of displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle can comprise displaying the calculated change in the pitch direction and the roll direction of the vehicle in measurements of distance. In some embodiments of the method, the

step **58** of displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle can comprise displaying the calculated change in the pitch direction and the roll direction of the vehicle as angles.

In some embodiments, the method can additionally comprise providing a conversion function to permit the changing of the system used for measurements c between U.S. Customary System and the Metric System. In some embodiments, the method can additionally comprise saving a given pitch angle measurement on at least one of the smart device or the sensor device to permit later recall for the purpose of returning the vehicle to the given pitch angle position at a later time. In some embodiments, the method can further comprise collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

In some embodiments, the method can additionally comprise receiving data at the smart device from one or more vehicle control panels. In some such embodiments, the received data from one or more vehicle control panels can comprise at least one of data regarding holding tank levels or data regarding battery power levels. In some of these embodiments of the method, the smart device can display the data that is generated and displayed on the one or more vehicle control panels.

In some embodiments, the method can additionally comprise activating one or more systems on the vehicle via the software application of the smart device. As described above, the communication between the smart device and the vehicle can be accomplished using a wireless communication system or protocol, such as Bluetooth or WiFi. For example, the one or more systems activated with the smart device can

comprise at least one of a lighting system, an entertainment system, a power slideouts system or a generator system.

As stated above, a software application in the form of a non-transitory computer readable medium can be provided that comprises computer executable instructions embodied in a computer readable medium that when executed by a processor of a computer control the computer to perform the steps similar to the method, generally designated **60**, described above. For the example, as shown in Figure 10, the non-transitory computer readable medium can perform a step **62** of receiving on a smart device a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device. Additionally, the non-transitory computer readable medium can perform a step **64** of retrieving calibration data of pitch angle and roll angle measurements taken by a sensor device when the vehicle was at an initial level position. The sensor device can comprise a vehicle leveling device or an RV leveling device. The non-transitory computer readable medium can also perform a step **66** of calculating any needed change in at least one of a pitch direction or a roll direction of the vehicle using the calibration data of the pitch and roll angle measurements to obtain a level position of the vehicle. The non-transitory computer readable medium can further perform a step **68** of displaying on the smart device the calculated change in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle.

In order to initially develop the calculation data, the method performed by the software application described above can also include the step of determining the initial level position for a vehicle to determine any inconsistencies inherent in the leveling

system. In some embodiments, the step of determining an initial level position can comprise receiving measurements of a length and a width of the vehicle. In some embodiments of the software application, the step of determining an initial level position can comprise using at least one of an accelerometer, gyroscope, or global positioning system sensor on the smart device to achieve the initial level position. In some embodiments of the method, the step of determining an initial level position can be performed by during manufacture of the vehicle and the calibration data stored on the sensor device installed during manufacture.

The software application can then be used to capture, i.e., identified and stored or saved, the pitch and roll angle measurements from the sensor device taken at the initial level position to provide the calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time. For example, the calibration can be calculated and then saved on a sensor processor on the one or more sensor devices or saved on the smart device that is in communication with the one or more sensor devices. In some embodiments of the software application, the step of capturing the pitch and roll angle measurements from the sensor device can comprise communicating calibration data from the sensor device of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position to the smart device and saving the calibration data on the smart device. In some embodiments of the software application, the step of capturing the pitch and roll angle measurements from the sensor device can comprise saving the calibration data of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level

position on the sensor device. In some such embodiments where the calibration data is saved on the sensor device, the step of saving the calibration data of the pitch and roll angle measurements on the sensor device can comprise transmitting instructions from the smart device **to** the sensor device to save and store the calibration data of the pitch and roll angle measurements on the sensor device. In some such embodiments, the steps performed by the software application can include recalling the calibration data of the pitch and roll angle measurements from the sensor device to the smart device.

In some embodiments of the software application, the step **68** of displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle can comprise displaying the calculated change in the pitch direction and the roll direction of the vehicle in measurements of distance. In some embodiments of the software application, the step **68** of displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle can comprise displaying the calculated change in the pitch direction and the roll direction of the vehicle as angles.

In some embodiments, the steps of the software application can additionally comprise providing a conversion function to permit the changing of the system used for measurements c between U.S. Customary System and the Metric System. In some embodiments, the steps of the software application can additionally comprise saving a given pitch angle measurement on at least one of the smart device or the sensor device to permit later recall for the purpose of returning the vehicle to the given pitch angle position at a later time. In some embodiments, the steps of the software application can further comprise collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

In some embodiments, the steps of the software application can additionally comprise receiving data at the smart device from one or more vehicle control panels. In some such embodiments, the received data from one or more vehicle control panels can comprise at least one of data regarding holding tank levels or data regarding battery power levels. In some of these embodiments of the software application, the smart device can display the data that is generated and displayed on the one or more vehicle control panels.

In some embodiments, the steps of the software application can additionally comprise activating one or more systems on the vehicle with the smart device. As described above, the communication between the smart device and the vehicle can be accomplished using a wireless communication system or protocol, such as Bluetooth or WiFi. For example, the one or more systems activated with the smart device can comprise at least one of a lighting system, an entertainment system, a power slideouts system or a generator system.

These and other modifications and variations to the present subject matter may be practiced by those of ordinary skill in the art, without departing from the spirit and scope of the present subject matter, which is more particularly set forth herein above. In addition, it should be understood the aspects of the various embodiments may be interchanged both in whole and in part. Furthermore, those of ordinary skill in the art will appreciate that the foregoing description is by way of example only, and is not intended to limit the present subject matter.

What is claimed is:

1. A leveling system for leveling a vehicle that is at rest, the leveling system comprising:

one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction; and

a smart device in communication with the one or more sensor devices to allow information received from the one or more sensor devices about at least one of the inclination or the orientation of the vehicle in both the pitch direction and the roll direction to be processed to provide measurements to a user and to determine the amount of adjustments needed to at least one of the pitch direction or the roll direction to level the vehicle.

2. The system according to claim 1, wherein one or more sensor devices comprises a sensor device comprising a printed circuit board that comprises at least one of a digital accelerometer or a digital gyroscope.

3. The system according to claim 2, wherein the printed circuit board comprises a processor to process of data collected by the one or more sensor devices and to perform calculations related to the determination the amount of adjustments needed to at least one of the pitch direction or the roll direction to level the vehicle.

4. The system according to claim 3, wherein the sensor device comprises a memory in communication with the processor of the PCB, the sensor device capable of storing information transmitted from the smart device.

5. The system according to claim 5, wherein the sensor device uses data sensed by the sensor device and stored data obtained from the smart device to perform calculations on the sensor device and transmit the calculated data to the smart device.

6. The system according to claim 2, wherein one or more sensor devices comprises a housing in which the printed circuit board is mounted.

7. The system according to claim 2, wherein the smart device communicates with the printed circuit board of the sensor device.

8. The system according to claim 1, wherein the smart device and the one or more sensor device communicate with each other through a wired connection.

9. The system according to claim 1, wherein the smart device and the one or more sensor device communicate with each other through a wireless connection.

10. A method for leveling a recreational vehicle, the method comprising:

providing a leveling system comprising one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a

pitch direction and a roll direction and a smart device in communication with the one or more sensor devices;

measuring the pitch angle and the roll angle of the vehicle when the vehicle is at rest using the sensor device;

retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position;

calculating any needed change in at least one of the pitch direction or the roll direction of the vehicle using the calibration data of pitch and roll angle measurements to obtain a level position of the vehicle; and

displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle on the smart device.

11. The method according to claim 10, further comprising:

determining the initial level position for a vehicle to determine any inconsistencies inherent in the leveling system; and

capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide the calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time.

12. The method according to claim 11, wherein the step of determining an initial level position comprises using at least one of an accelerometer, gyroscope, or global positioning system sensor on the smart device to achieve the initial level position.

13. The method according to claim 11, wherein the step of determining an initial level position comprises using at least one of a digital level or spirit level can also be used to achieve the initial level position.

14. The method according to claim 11, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises communicating calibration data from the sensor device of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position to the smart device and saving the calibration data on the smart device.

15. The method according to claim 11, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises saving the calibration data of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position on the sensor device.

16. The method according to claim 15, wherein the step of saving the calibration data of the pitch and roll angle measurements on the sensor device comprises transmitting instructions from the smart device to the sensor device to save and store the calibration data of the pitch and roll angle measurements on the sensor device.

17. The method according to claim 16, further comprising recalling the calibration data of the pitch and roll angle measurements from the sensor device to the smart device.

18. The method according to claim 11, wherein the step of determining an initial level position comprises receiving measurements of a length and a width of the vehicle.

19. The method according to claim 10, further comprising providing a conversion function to permit the changing of the system used for measurements c between U.S. Customary System and the Metric System.

20. The method according to claim 10, wherein the step of displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle further comprises displaying the calculated change in the pitch direction and the roll direction of the vehicle in measurements of distance.

21. The method according to claim 10, wherein the step of displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle further comprises displaying the calculated change in the pitch direction and the roll direction of the vehicle as angles.

22. The method according to claim 10, further comprising saving a given pitch angle measurement on at least one of the smart device or the sensor device to permit later

recall for the purpose of returning the vehicle to the given pitch angle position at a later time.

23. The method according to claim 10, further comprising receiving data at the smart device from one or more vehicle control panels.

24. The method according to claim 23, wherein the received data from one or more vehicle control panels comprises at least one of data regarding holding tank levels or data regarding battery power levels.

25. The method according to claim 23, further comprising displaying the data on the smart device that is generated and displayed on the one or more vehicle control panels.

26. The method according to claim 10, further comprising activating one or more systems on the vehicle with the smart device.

27. The method according to claim 26, wherein the one or more systems activated via the software application of the smart device comprise at least one of lighting systems, entertainment systems, power slideouts or a generator.

28. The method according to claim 10, further comprising collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

29. A non-transitory computer readable medium comprising computer executable instructions embodied in a computer readable medium that when executed by a processor of a computer control the computer to perform steps comprising:

receiving on a smart device a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device;

retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position;

calculating any needed change in at least one of a pitch direction or a roll direction of the vehicle using the calibration data of the pitch and roll angle measurements to obtain a level position of the vehicle; and

displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device.

30. The non-transitory computer readable medium according to claim 29, further comprising capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide the calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time.

31. The non-transitory computer readable medium according to claim 30, wherein the step of capturing the pitch and roll angle measurements from the sensor device

comprises receiving data from the sensor device of the pitch and roll angles measured by the sensor device when the vehicle is at the initial level position and saving the pitch and roll angles measured by the sensor device when the vehicle is at the initial level position on the smart device.

32. The non-transitory computer readable medium according to claim 30, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises transmitting instructions from the smart device **to** the sensor device to save and store the calibration data of the pitch and roll angle measurements on the sensor device.

33. The non-transitory computer readable medium according to claim 32, further comprising recalling the calibration data of the pitch and roll angle measurements from the sensor device to the smart device.

34. The non-transitory computer readable medium according to claim 29, further comprising saving a given pitch angle measurement on at least one of the smart device or the sensor device to permit later recall for the purpose of returning the vehicle to the given pitch angle position at a later time.

35. The non-transitory computer readable medium according to claim 29, further comprising providing a conversion function to permit the changing of the system used for measurements c between U.S. Customary System and the Metric System.

36. The non-transitory computer readable medium according to claim 29, wherein the step of displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle further comprises displaying the calculated change in the pitch direction and the roll direction of the vehicle in measurements of distance.

37. The non-transitory computer readable medium according to claim 29, wherein the step of displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle further comprises displaying the calculated change in the pitch direction and the roll direction of the vehicle as angles.

38. The non-transitory computer readable medium according to claim 29, further comprising receiving data at the smart device from one or more vehicle control panels.

39. The non-transitory computer readable medium according to claim 29, wherein the received data from one or more vehicle control panels comprises at least one of data regarding holding tank levels or data regarding battery power levels.

40. The non-transitory computer readable medium according to claim 29, further comprising displaying the data on the smart device that is generated and displayed on the one or more vehicle control panels.

41. The non-transitory computer readable medium according to claim 29, further comprising activating one or more systems on the vehicle with the smart device.

42. The non-transitory computer readable medium according to claim 41, wherein the one or more systems activated via the software application of the smart device comprise at least one of lighting systems, entertainment systems, power slideouts or a generator.

43. The non-transitory computer readable medium according to claim 29, further comprising collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

ABSTRACT

The present subject matter provides leveling systems and processes for leveling vehicles, such as recreational vehicles. The present subject matter also relates to computer program products for leveling vehicles, such as recreational vehicles, using smart devices. The leveling system can include at least one sensor device secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction. The leveling system can include a smart device in communication with the sensor device to allow information received from the sensor device to be processed to provide measurements to a user and to determine the amount of adjustments needed to at least one of the pitch direction or the roll direction to level the vehicle.

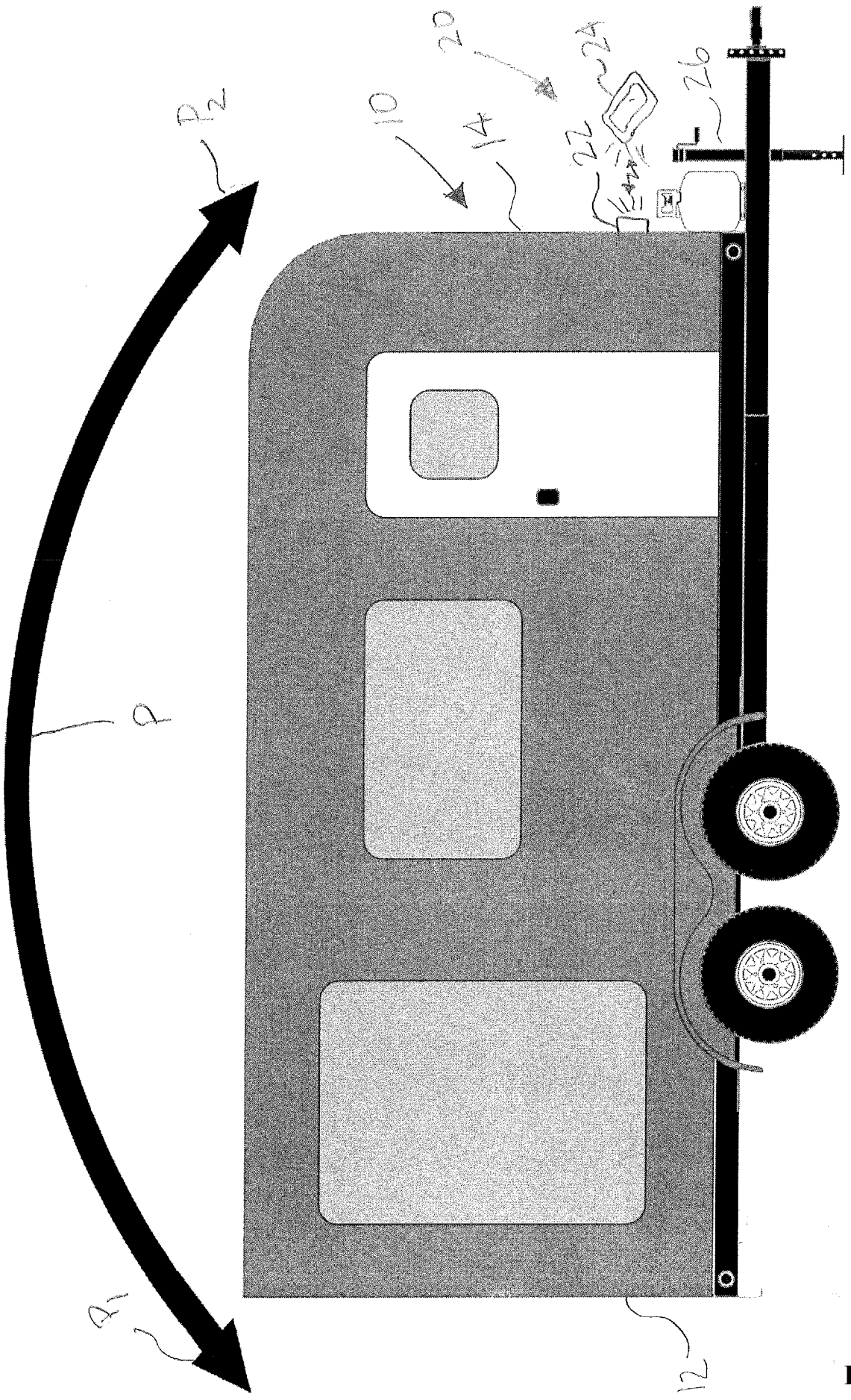


FIG. 1

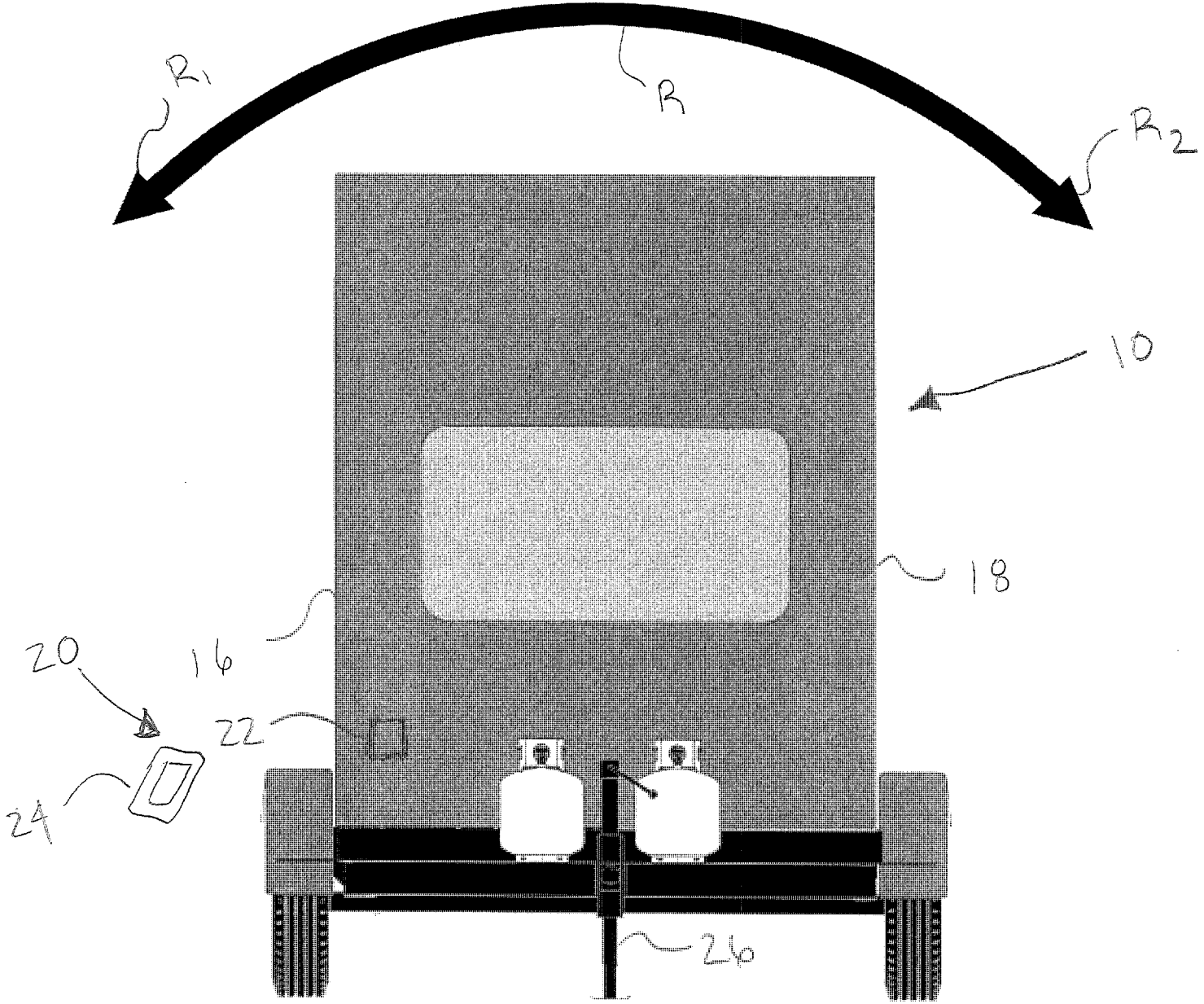


FIG. 2

AT&T
1:45 PM
LevelMateRV
Simplifying Camper Setup...
1 degree at a time.

28

FIG. 3

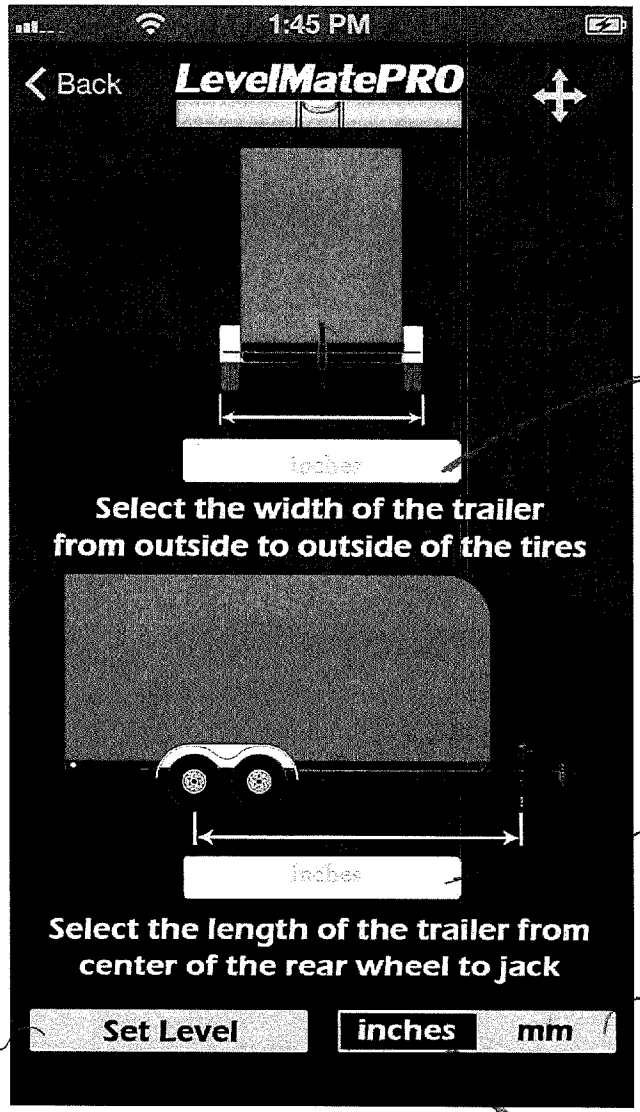

1:45 PM
Back
LevelMatePRO
inches
Select the width of the trailer
from outside to outside of the tires
inches
Select the length of the trailer from
center of the rear wheel to jack
Set Level
inches
mm
32
34
38B
36
38A

FIG. 4

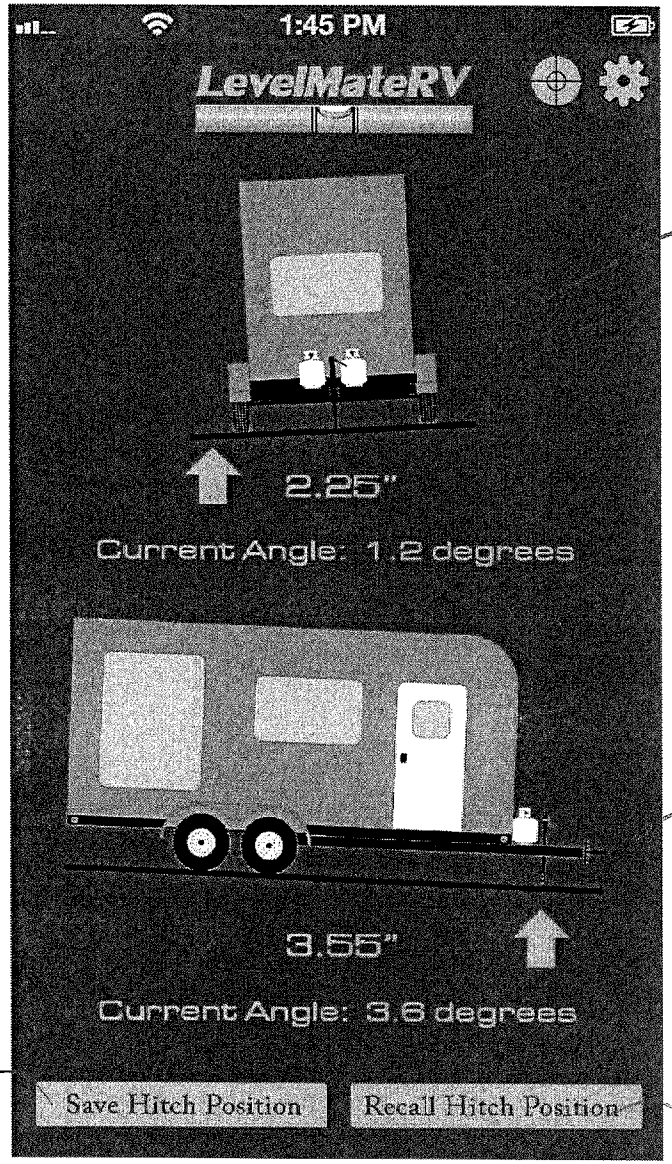

1:45 PM
LevelMateRV
2.25"
Current Angle: 1.2 degrees
3.55"
Current Angle: 3.6 degrees
Save Hitch Position
Recall Hitch Position
42
40
44
48

FIG. 5A

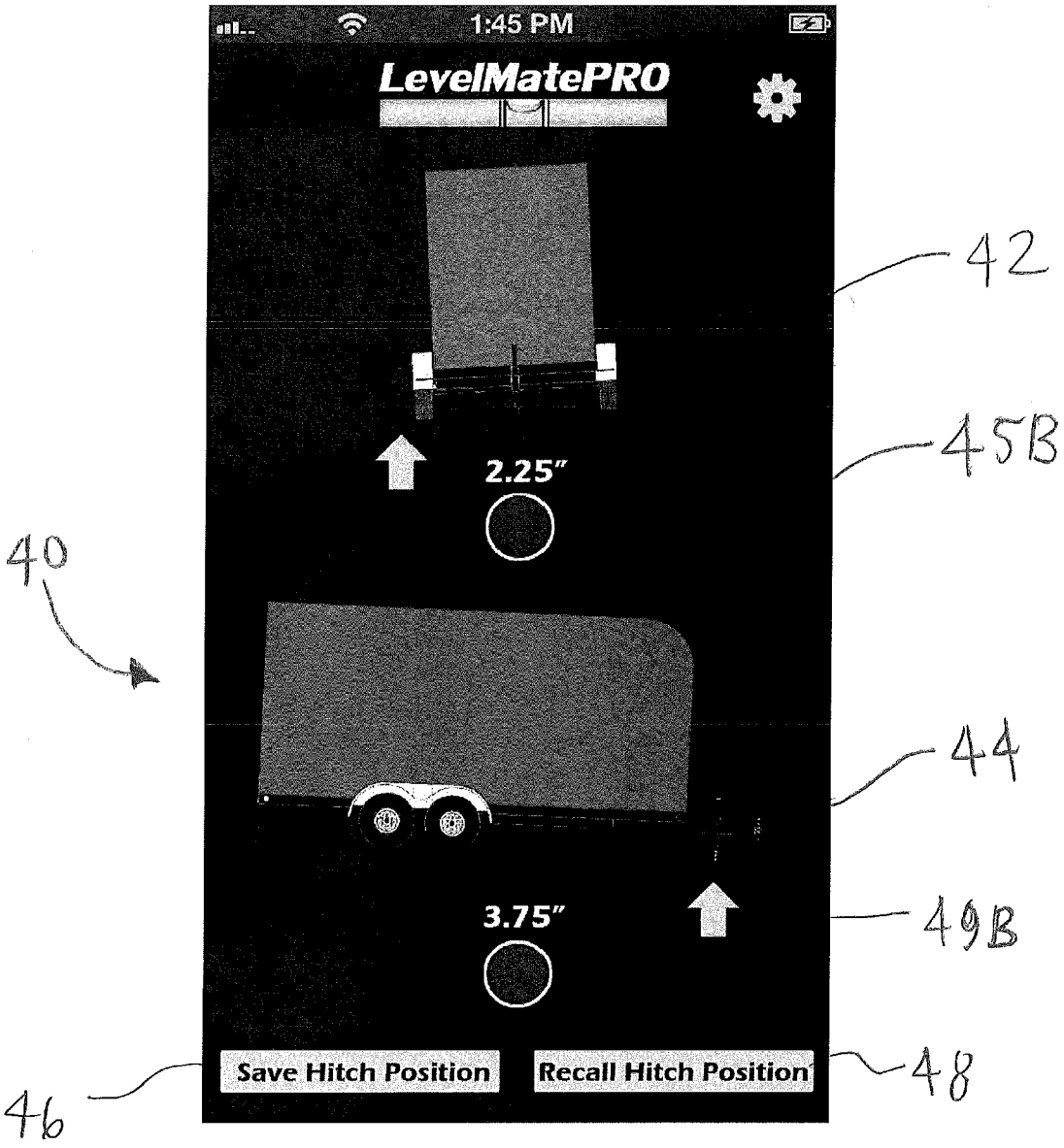

1:45 PM
LevelMatePRO
2.25"
3.75"
Save Hitch Position
Recall Hitch Position
40
42
45B
44
49B
46
48

Fig. 5B

FIG. 6

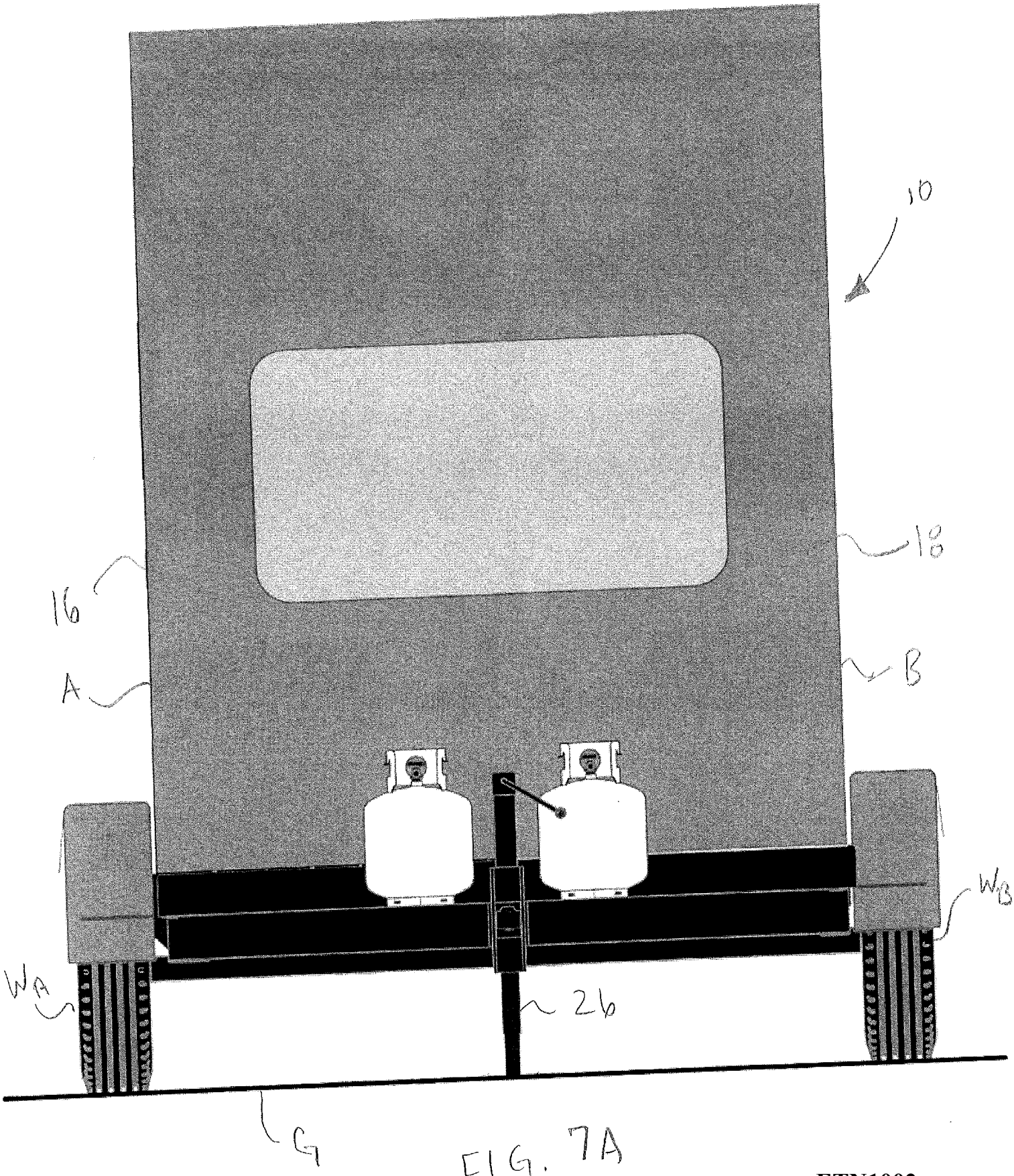


FIG. 7A

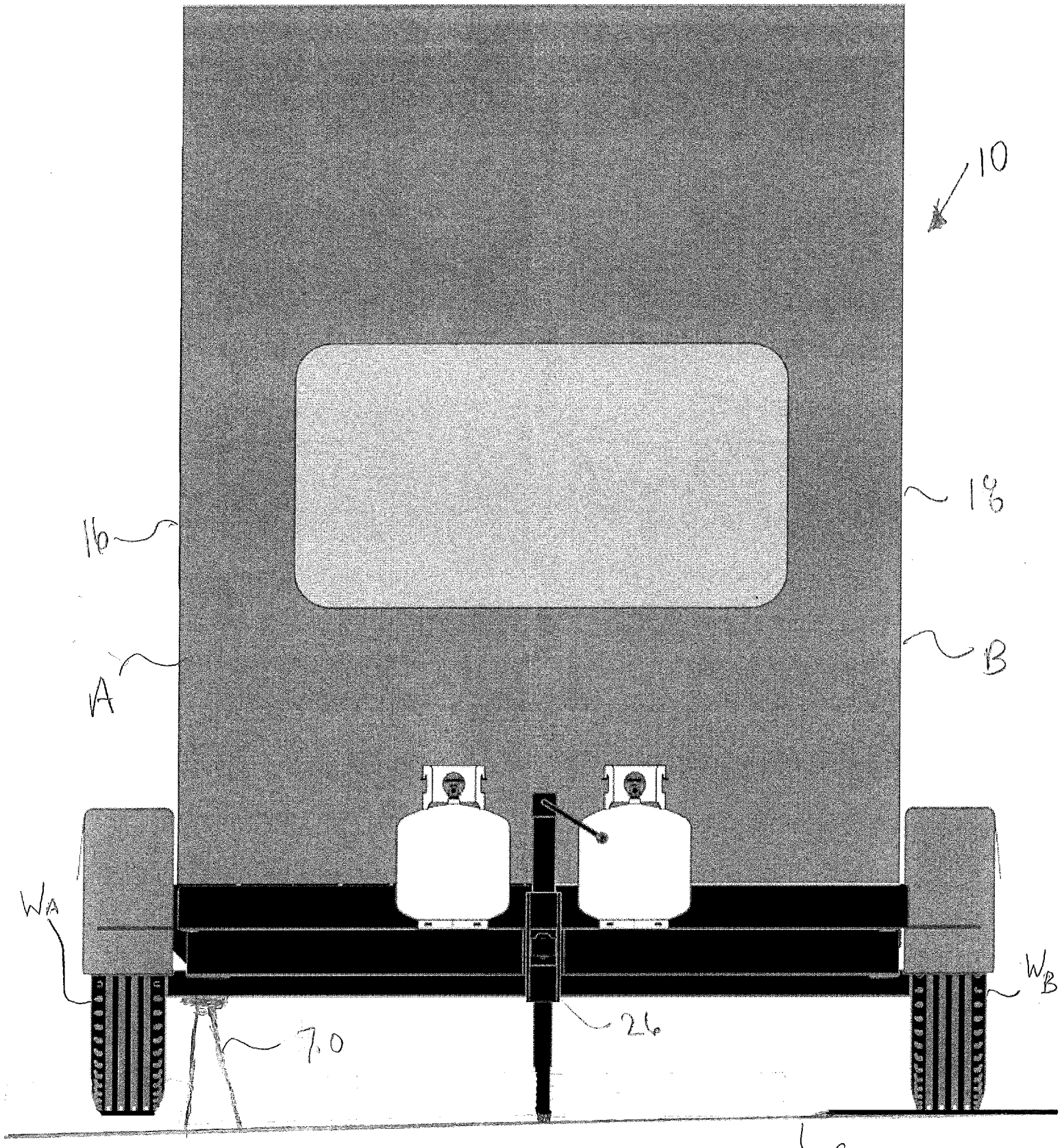


FIG. 7B

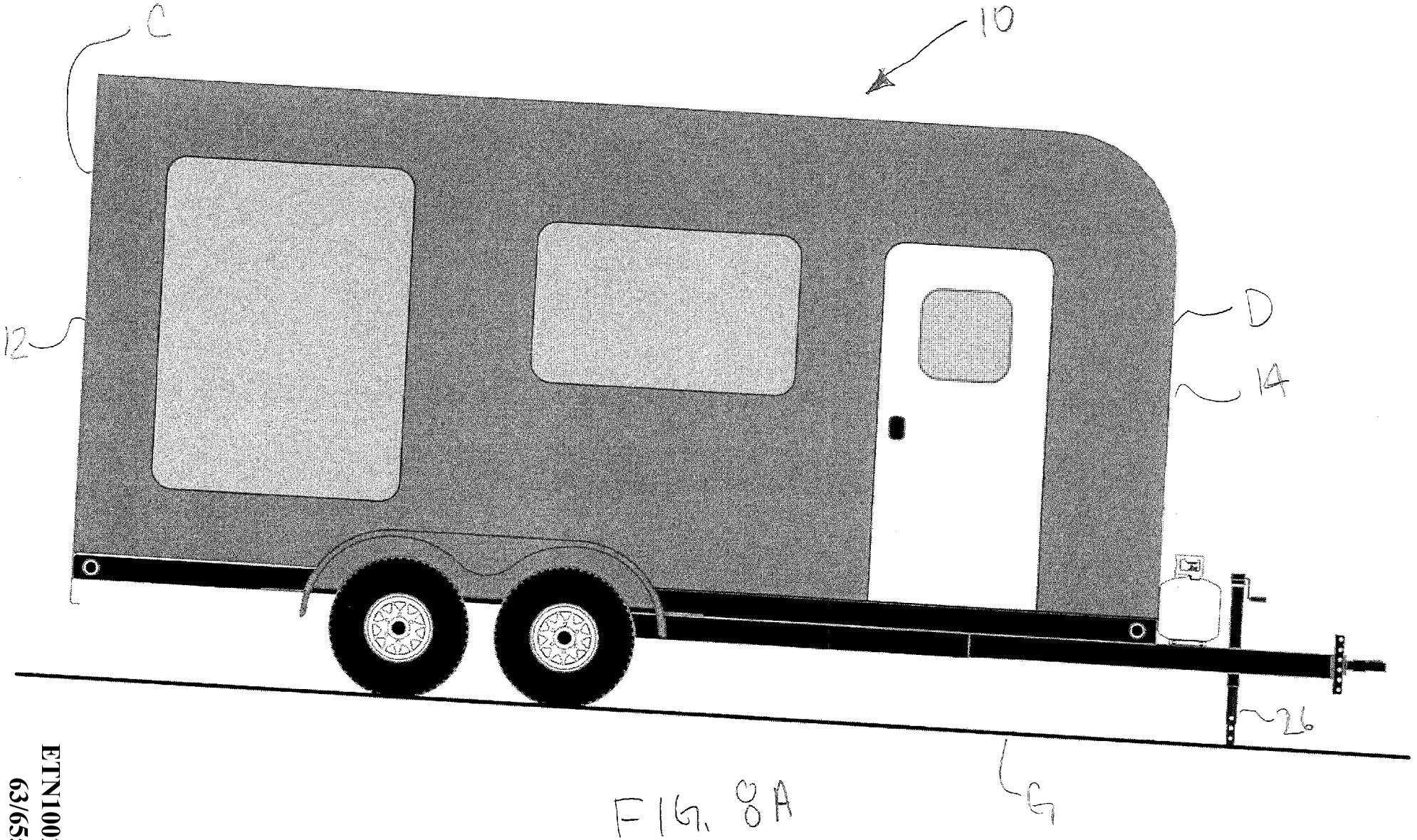


FIG. 8A

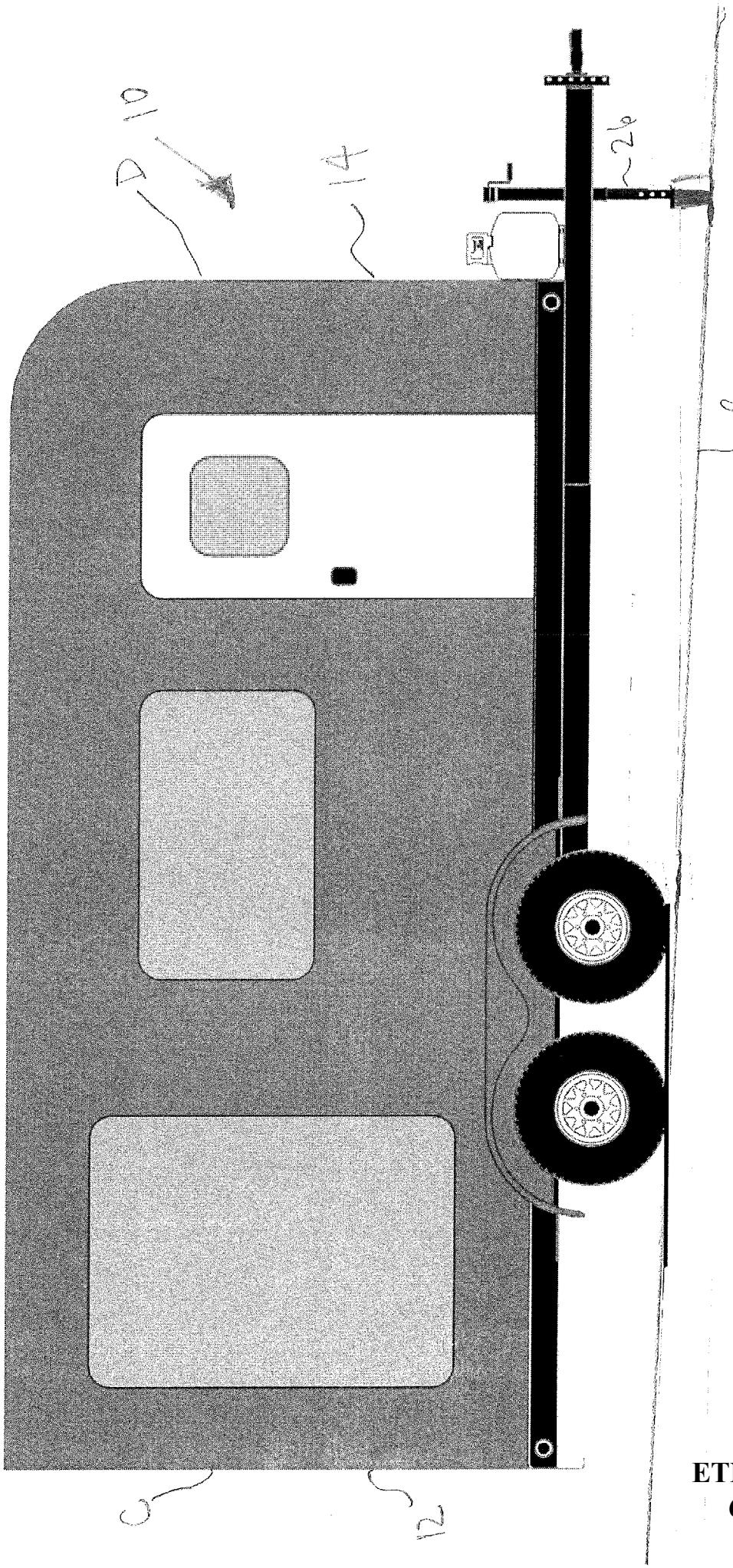


FIG. 2B

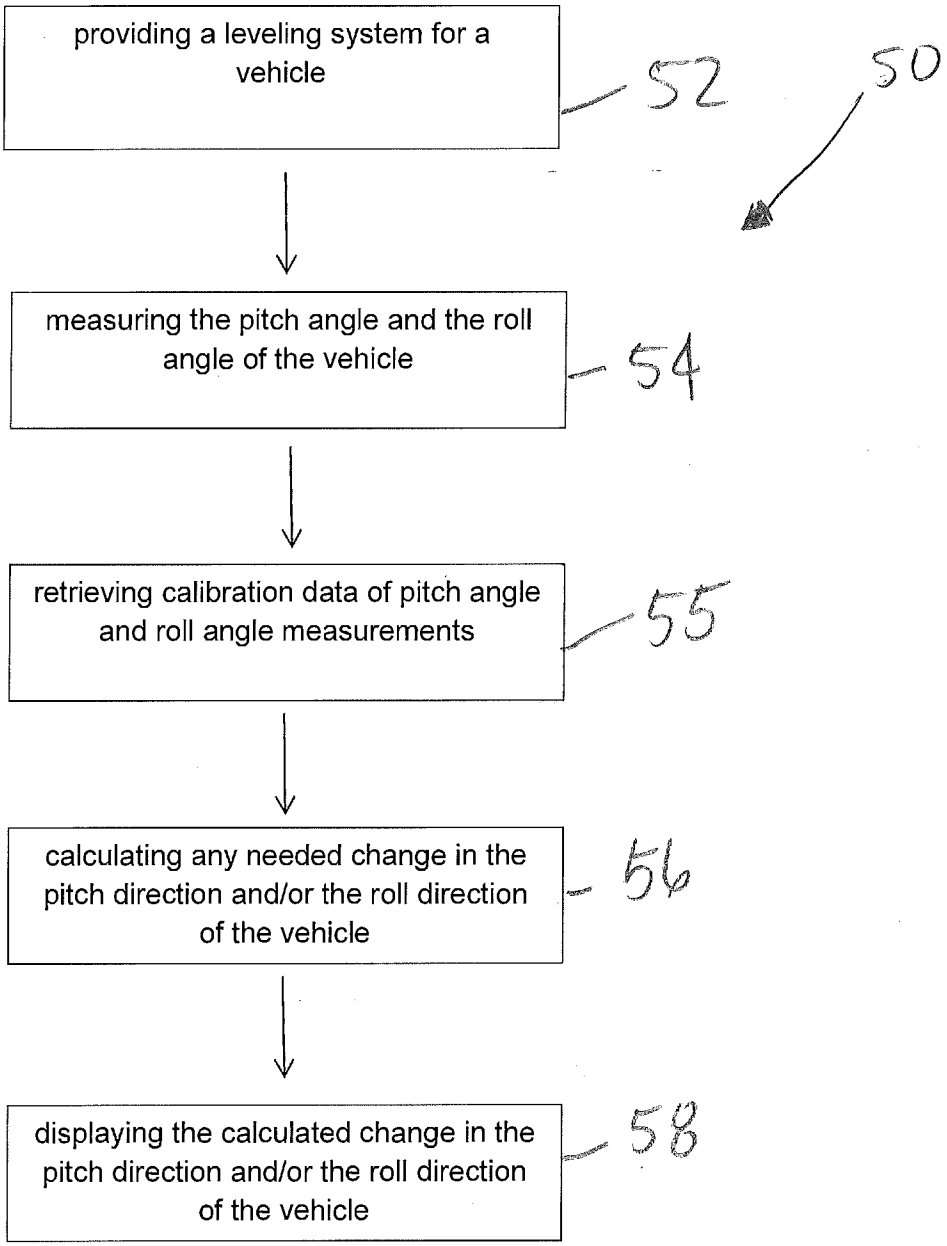

providing a leveling system for a vehicle
52
50
measuring the pitch angle and the roll angle of the vehicle
54
retrieving calibration data of pitch angle and roll angle measurements
55
calculating any needed change in the pitch direction and/or the roll direction of the vehicle
56
displaying the calculated change in the pitch direction and/or the roll direction of the vehicle
58

FIG. 9

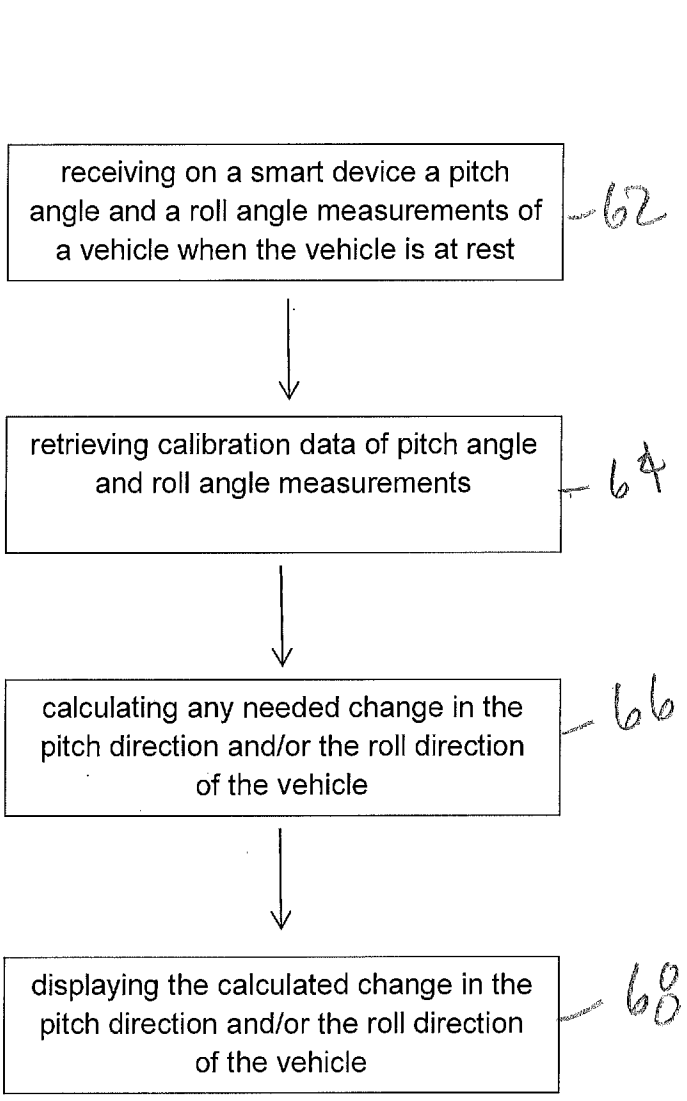

60
receiving on a smart device a pitch angle and a roll angle measurements of a vehicle when the vehicle is at rest
62
retrieving calibration data of pitch angle and roll angle measurements
64
calculating any needed change in the pitch direction and/or the roll direction of the vehicle
66
displaying the calculated change in the pitch direction and/or the roll direction of the vehicle
68

FIG. 10

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Charles A. Leonard

Group Art Unit: Not Yet Assigned

Serial No.: Not Yet Assigned

Examiner: Not Yet Assigned

Filed: December 7, 2015

Docket No.: LEO-2

Confirmation No.: Not Yet Assigned

For: VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES

* *

PRELIMNINARY AMENDMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This first preliminary amendment is being filed with the above-referenced patent application. Please enter the following first preliminary amendment therein.

IN THE CLAIMS:

Please amend the claims as follows:

1. (Original) A leveling system for leveling a vehicle that is at rest, the leveling system comprising:

one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction; and

a smart device in communication with the one or more sensor devices to allow information received from the one or more sensor devices about at least one of the inclination or the orientation of the vehicle in both the pitch direction and the roll direction to be processed to provide measurements to a user and to determine the amount of adjustments needed to at least one of the pitch direction or the roll direction to level the vehicle.

2. (Original) The system according to claim 1, wherein one or more sensor devices comprises a sensor device comprising a printed circuit board that comprises at least one of a digital accelerometer or a digital gyroscope.

3. (Original) The system according to claim 2, wherein the printed circuit board comprises a processor to process of data collected by the one or more sensor devices and to perform calculations related to the determination the amount of adjustments needed to at least one of the pitch direction or the roll direction to level the vehicle.

4. (Original) The system according to claim 3, wherein the sensor device comprises a memory in communication with the processor of the PCB, the sensor device capable of storing information transmitted from the smart device.

5. (Original) The system according to claim 5, wherein the sensor device uses data sensed by the sensor device and stored data obtained from the smart device to perform calculations on the sensor device and transmit the calculated data to the smart device.

6. (Canceled)

7. (Original) The system according to claim 2, wherein the smart device communicates with the printed circuit board of the sensor device.

8-9. (Canceled)

10. (Original) A method for leveling a recreational vehicle, the method comprising:

providing a leveling system comprising one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction and a smart device in communication with the one or more sensor devices;

measuring the pitch angle and the roll angle of the vehicle when the vehicle is at rest using the sensor device;

retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position;

calculating any needed change in at least one of the pitch direction or the roll direction of the vehicle using the calibration data of pitch and roll angle measurements to obtain a level position of the vehicle; and

displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle on the smart device.

11. (Original) The method according to claim 10, further comprising:

determining the initial level position for a vehicle to determine any inconsistencies inherent in the leveling system; and

capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide the calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time.

12. (Original) The method according to claim 11, wherein the step of determining an initial level position comprises using at least one of an accelerometer, gyroscope, or global positioning system sensor on the smart device to achieve the initial level position.

13. (Original) The method according to claim 11, wherein the step of determining an initial level position comprises using at least one of a digital level or spirit level can also be used to achieve the initial level position.

14. (Original) The method according to claim 11, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises communicating calibration data from the sensor device of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position to the smart device and saving the calibration data on the smart device.

15. (Original) The method according to claim 11, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises saving the calibration data of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position on the sensor device.

16. (Currently Amended) The method according to claim 15, wherein the step of saving the calibration data of the pitch and roll angle measurements on the sensor device comprises transmitting instructions from the smart device to the sensor device to save and store the calibration data of the pitch and roll angle measurements on the sensor device and wherein the method further comprises recalling the calibration data of the pitch and roll angle measurements from the sensor device to the smart device.

17. (Canceled)

18. (Original) The method according to claim 11, wherein the step of determining an initial level position comprises receiving measurements of a length and a width of the vehicle.

19. (Canceled)

20. (Original) The method according to claim 10, wherein the step of displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle further comprises displaying the calculated change in the pitch direction and the roll direction of the vehicle in measurements of distance.

21. (Canceled)

22. (Original) The method according to claim 10, further comprising saving a given pitch angle measurement on at least one of the smart device or the sensor device to permit later recall for the purpose of returning the vehicle to the given pitch angle position at a later time.

23. (Original) The method according to claim 10, further comprising receiving data at the smart device from one or more vehicle control panels.

24. (Original) The method according to claim 23, wherein the received data from one or more vehicle control panels comprises at least one of data regarding holding tank levels or data regarding battery power levels.

25. (Original) The method according to claim 23, further comprising displaying the data on the smart device that is generated and displayed on the one or more vehicle control panels.

26. (Original) The method according to claim 10, further comprising activating one or more systems on the vehicle with the smart device.

27. (Original) The method according to claim 26, wherein the one or more systems activated via the software application of the smart device comprise at least one of lighting systems, entertainment systems, power slideouts or a generator.

28. (Original) The method according to claim 10, further comprising collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

29. (Original) A non-transitory computer readable medium comprising computer executable instructions embodied in a computer readable medium that when executed by a processor of a computer control the computer to perform steps comprising:

receiving on a smart device a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device;

retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position;

calculating any needed change in at least one of a pitch direction or a roll direction of the vehicle using the calibration data of the pitch and roll angle measurements to obtain a level position of the vehicle; and

displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device.

30-37. (Canceled)

38. (Original) The non-transitory computer readable medium according to claim 29, further comprising receiving data at the smart device from one or more vehicle control panels.

39-42. (Canceled)

43. (Original) The non-transitory computer readable medium according to claim 29, further comprising collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

REMARKS

The above amendments to the claims are made to reduce the number of claims for fee purposes. With the above amendments, claim 16 has been amended and claims 6,8-9, 17, 19, 21, 30-37, and 39-42 have been canceled.

The Examiner is encouraged to telephone the undersigned at his/her convenience should any minor issues remain after consideration of the present Amendment, to permit early resolution of same.

Please charge any additional fees required by this submission to Deposit Account No. **50-3172**.

Respectfully submitted,
J. BENNETT MULLINAX, LLC

Date: December 7, 2015

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Customer No: 44728

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES
First Named Inventor/Applicant Name:	Charles A. Leonard
Filer:	John Bennett Mullinax/David Sigmon
Attorney Docket Number:	LEO-2

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	70	70
Utility Search Fee	2111	1	300	300
Utility Examination Fee	2311	1	360	360
Pages:				
Claims:				
Claims in excess of 20	2202	5	40	200
Miscellaneous-Filing:				
Late Filing Fee for Oath or Declaration	2051	1	70	70

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1000**

Electronic Acknowledgement Receipt

EFS ID:	24288040
Application Number:	14961787
International Application Number:	
Confirmation Number:	8904
Title of Invention:	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES
First Named Inventor/Applicant Name:	Charles A. Leonard
Customer Number:	44728
Filer:	John Bennett Mullinax/David Sigmon
Filer Authorized By:	John Bennett Mullinax
Attorney Docket Number:	LEO-2
Receipt Date:	07-DEC-2015
Filing Date:	
Time Stamp:	20:55:13
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		PatAppLEO2.pdf	8044810 48ef197535451159a241d6898205f24a9b56efd5	yes	53

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal of New Application	1	1
	Application Data Sheet	2	7
	Specification	8	42
	Claims	43	52
	Abstract	53	53

Warnings:					
Information:					
2	Drawings-only black and white line drawings	FiguresLEO2.pdf	10336037 a43895838164dc33f871bdd563f186af8aeb6772	no	13
Warnings:					
Information:					
3	Preliminary Amendment	PreAmdLEO2.pdf	1020217 13b522fcd9546db1df1cf4ece6c18cf710059cc7	no	10
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	38256 81e85ad026bd25a1664089bca1226e4eb6678472	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	19439320		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
14/961,787	12/07/2015	

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **12/07/2015**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 25	Minus	** 25	= 0	X $40 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/TRINA RIDDICK/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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82/655

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 14/961,787

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	25 minus 20 =	* 5	x 40 =	200	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 210 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	930		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/961,787	12/07/2015	Charles A. Leonard	LEO-2

CONFIRMATION NO. 8904

44728
J. BENNETT MULLINAX, LLC
P. O. BOX 26029
GREENVILLE, SC 29616-1029

FORMALITIES LETTER

OC000000079426068

Date Mailed: 12/16/2015

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
- The application search fee must be submitted.
- The application examination fee must be submitted.

The application is informal since it does not comply with the regulations for the reason(s) indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Replacement drawings in compliance with 37 CFR 1.84 and 37 CFR 1.121(d) are required. The drawings submitted are not acceptable because:
  - The drawings submitted to the Office are not electronically reproducible because portions of figures 4 - 5B are missing and/or blurry.

Applicant is cautioned that correction of the above items may cause the specification and drawings page count to exceed 100 pages. If the specification and drawings exceed 100 pages, applicant will need to submit the required application size fee.

- Additional claim fees of $ **200** as a small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.
  The surcharge is due for any one of:
  - late submission of the basic filing fee, search fee, or examination fee,
  - late submission of inventor's oath or declaration,
  - filing an application that does not contain at least one claim on filing, or
  - submission of an application filed by reference to a previously filed application.

ETN1002
84/655

SUMMARY OF FEES DUE:

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. Small entity discount is in effect. If applicant is qualified for micro entity status, an acceptable Certification of Micro Entity Status must be submitted to establish micro entity status. (See 37 CFR 1.29 and forms PTO/SB/15A and 15B.)

- $ **70** basic filing fee.
- $ **70** surcharge.
- $ **300** search fee.
- $ **360** examination fee.
- $ **200** for **5** total claims over 20.
- $(**0**) previous unapplied payment amount.
- $ **1000** TOTAL FEE BALANCE DUE.

Items Required To Avoid Processing Delays:

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
  Charles A. Leonard

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice". https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/hteffera/

ETN1002
85/655

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
14/961,787	12/07/2015	3616	0.00	LEO-2	25	3

CONFIRMATION NO. 8904

FILING RECEIPT

44728
J. BENNETT MULLINAX, LLC
P. O. BOX 26029
GREENVILLE, SC 29616-1029

OC000000079426087

Date Mailed: 12/16/2015

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Charles A. Leonard, Hickory, NC;

Applicant(s)

Charles A. Leonard, Hickory, NC;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 62/088,115 12/05/2014
and claims benefit of 62/101,109 01/08/2015

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: No

Permission to Access Search Results: No

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 12/15/2015

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/961,787**

ETN1002
86/655

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES

Preliminary Class

280

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Charles A. Leonard	
Application No.: 14/961,787	
Filed: 12/7/2015	Art Unit: Unknown
Title: VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM FOR LEVELING VEHICLES USING SMART DEVICES	Confirmation No.: 8904
Attorney Docket No.: LEO-2	

RESPONSE TO NOTICE TO FILE MISSING PARTS OF APPLICATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is in response to a Notice to File Missing Parts of Application under 37 CFR 1.53(f). Enclosed is a copy of said Notice and the following documents and fees to complete the filing requirements of the above-identified application.

(X) Replacement Drawings.

(X) Statutory basic filing fee $930.00 (x) Utility ( ) Design

(X) Missing Parts Surcharge $70.00

Respectfully submitted,

By _____
David M. Sigmon, Attorney

Reg No. 52224

Date: February 16, 2016

Telephone No. 864-987-9696

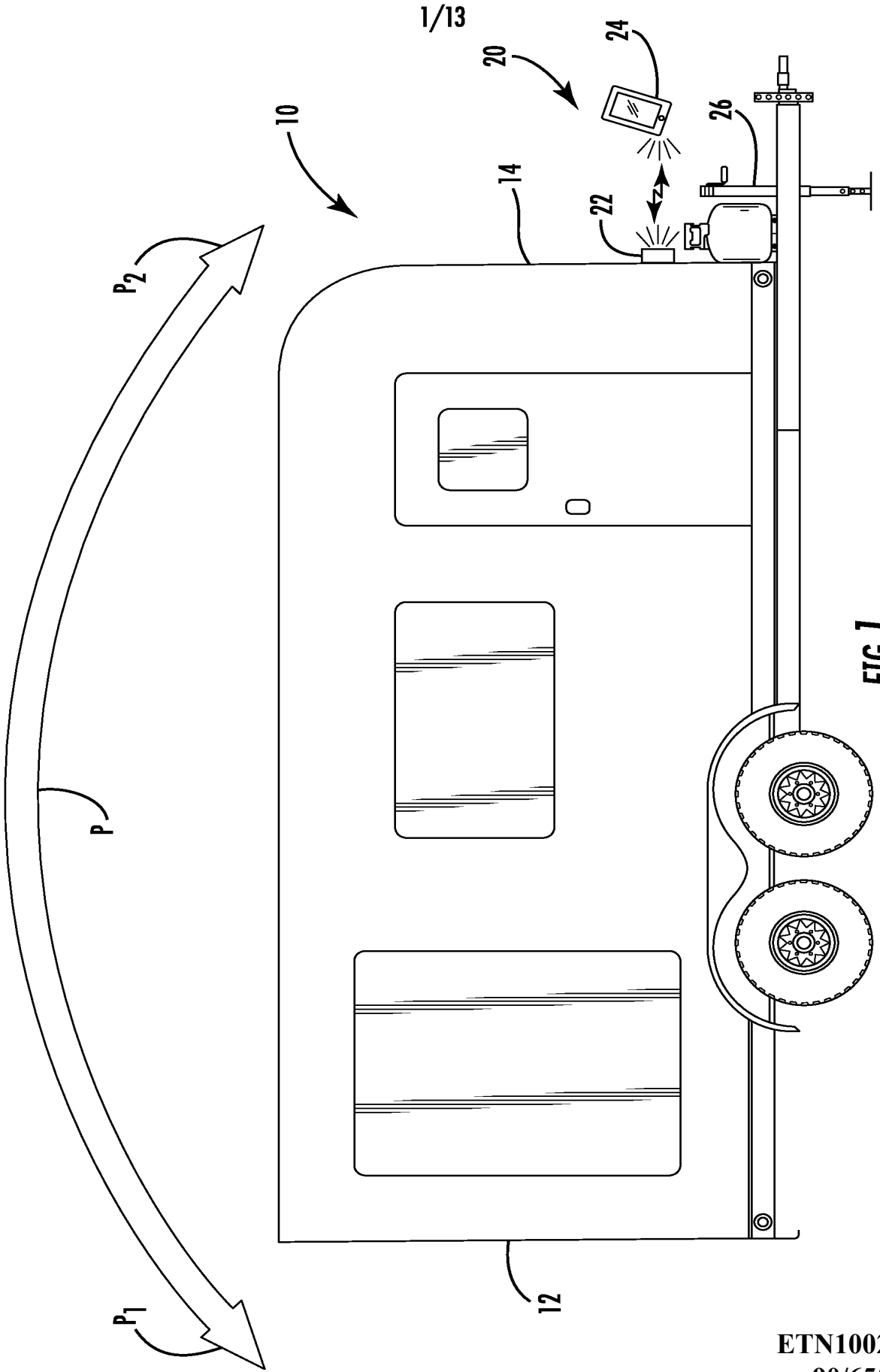


FIG. 1

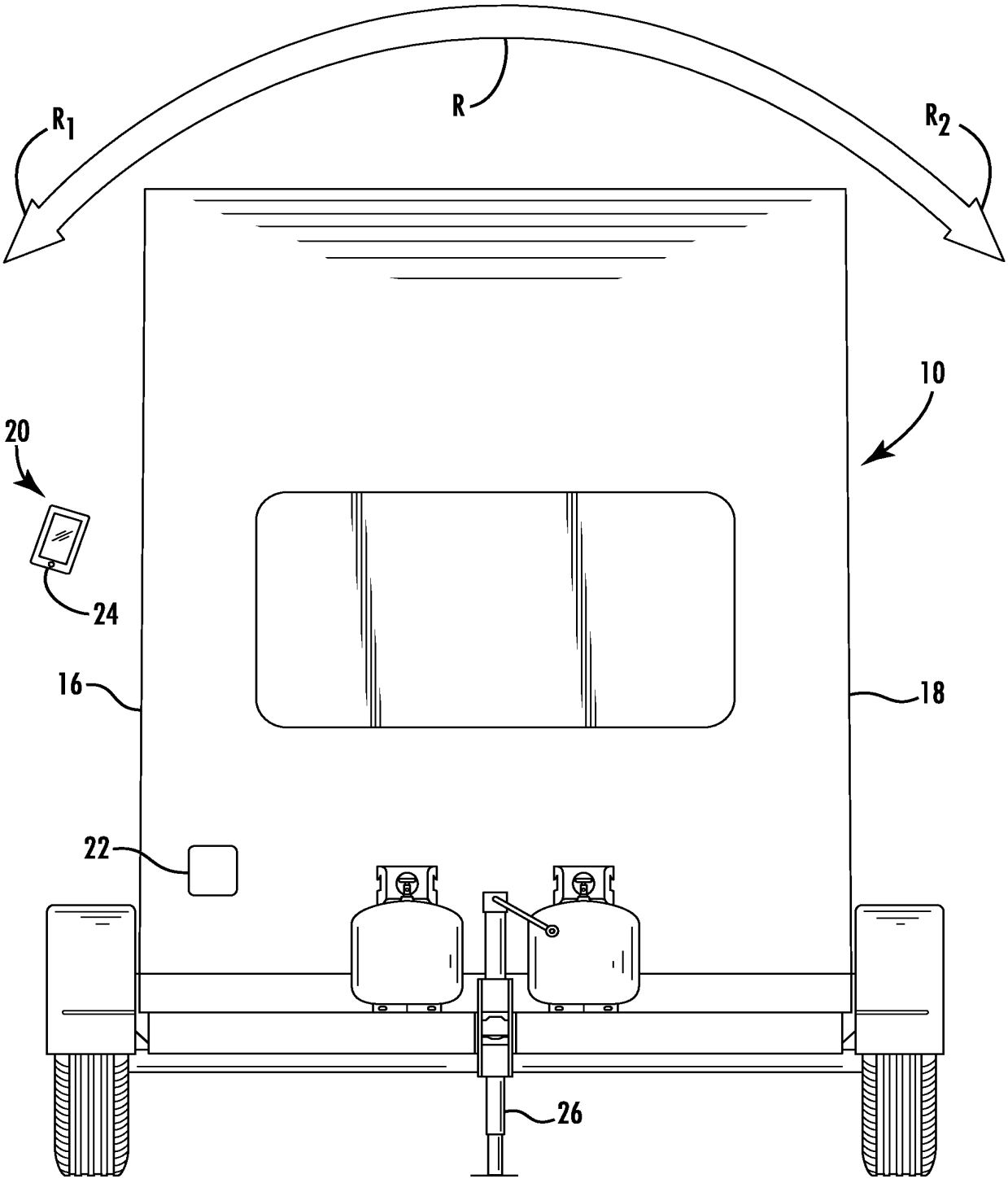


FIG. 2

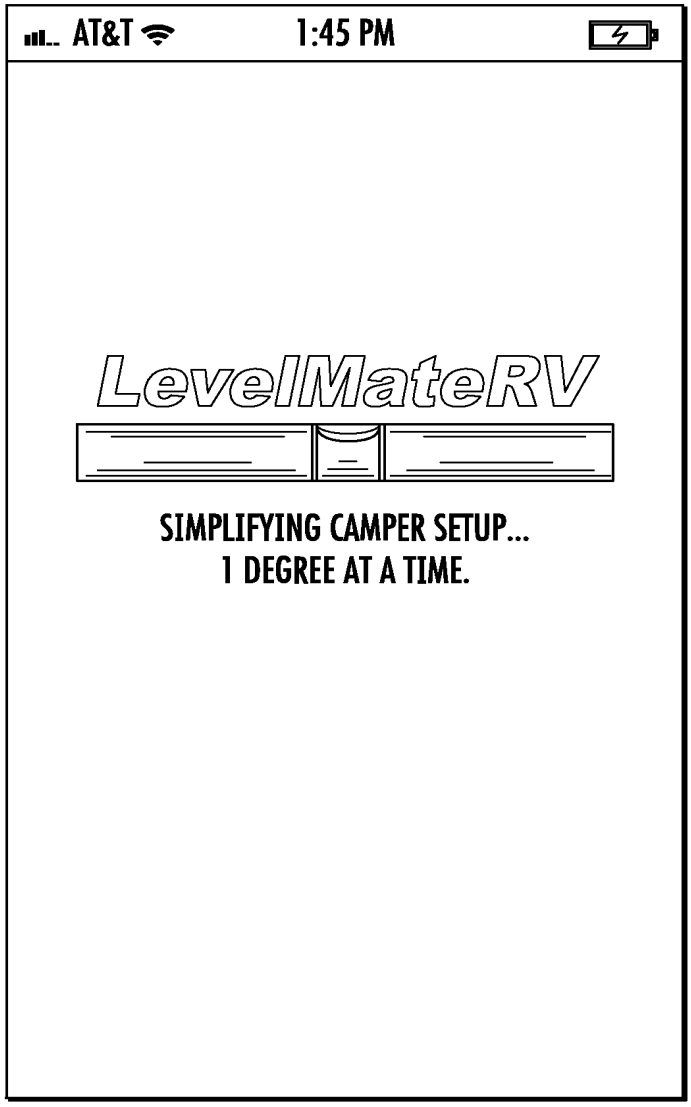

AT&T
1:45 PM
LevelMateRV
SIMPLIFYING CAMPER SETUP...
1 DEGREE AT A TIME.
28

FIG. 3

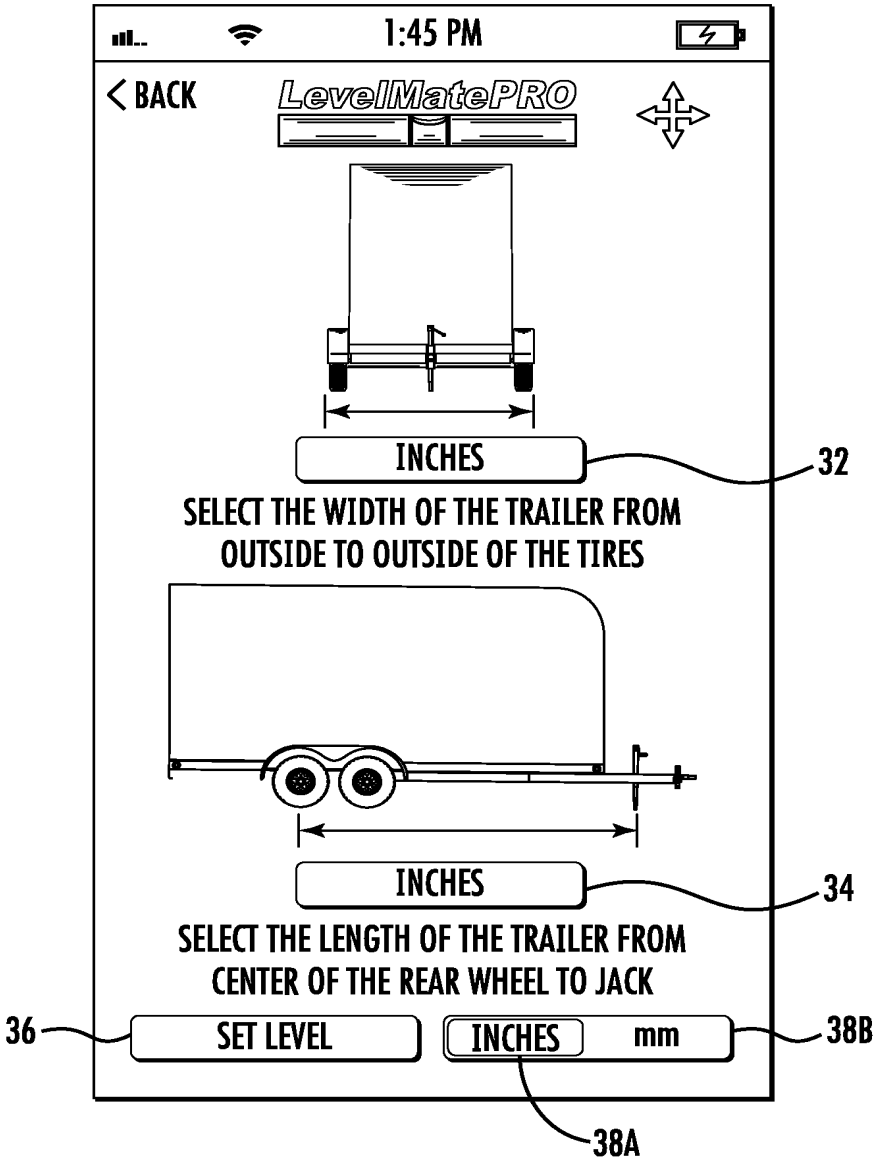

1:45 PM
BACK
LevelMatePRO
INCHES
32
SELECT THE WIDTH OF THE TRAILER FROM
OUTSIDE TO OUTSIDE OF THE TIRES
INCHES
34
SELECT THE LENGTH OF THE TRAILER FROM
CENTER OF THE REAR WHEEL TO JACK
36
SET LEVEL
INCHES
mm
38B
38A

FIG. 4

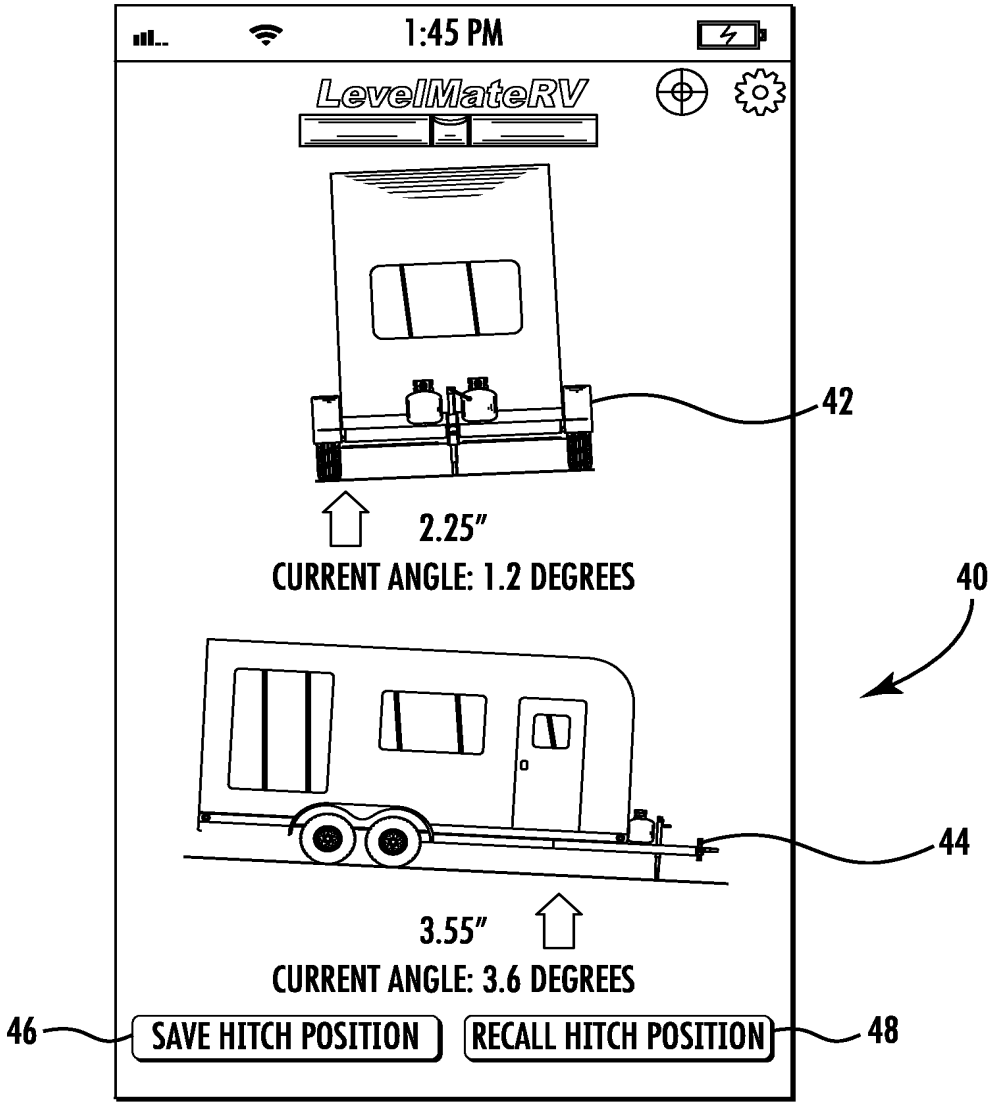

1:45 PM
LevelMateRV
42
2.25"
CURRENT ANGLE: 1.2 DEGREES
40
44
3.55"
CURRENT ANGLE: 3.6 DEGREES
46
SAVE HITCH POSITION
RECALL HITCH POSITION
48

FIG. 5A

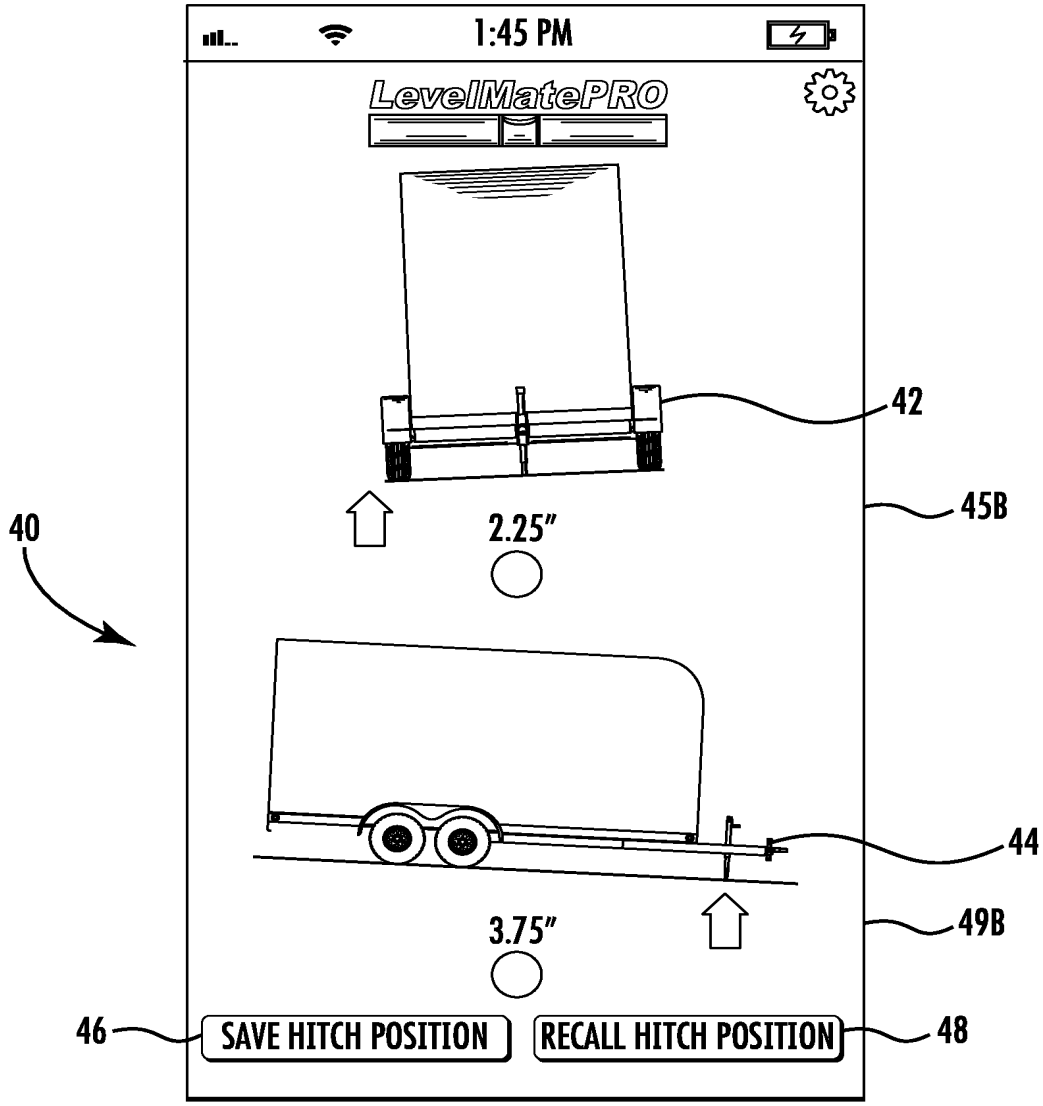

1:45 PM
LevelMatePRO
42
40
45B
2.25″
44
3.75″
49B
46
SAVE HITCH POSITION
RECALL HITCH POSITION
48

FIG. 5B

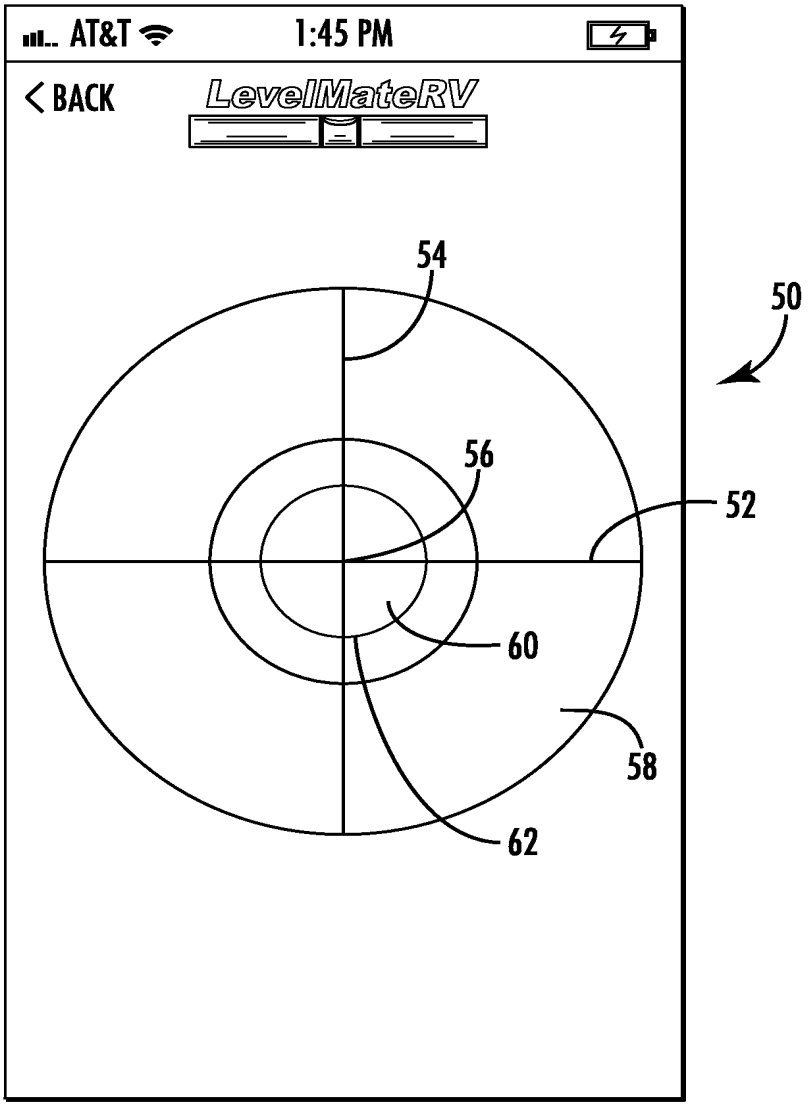


FIG. 6

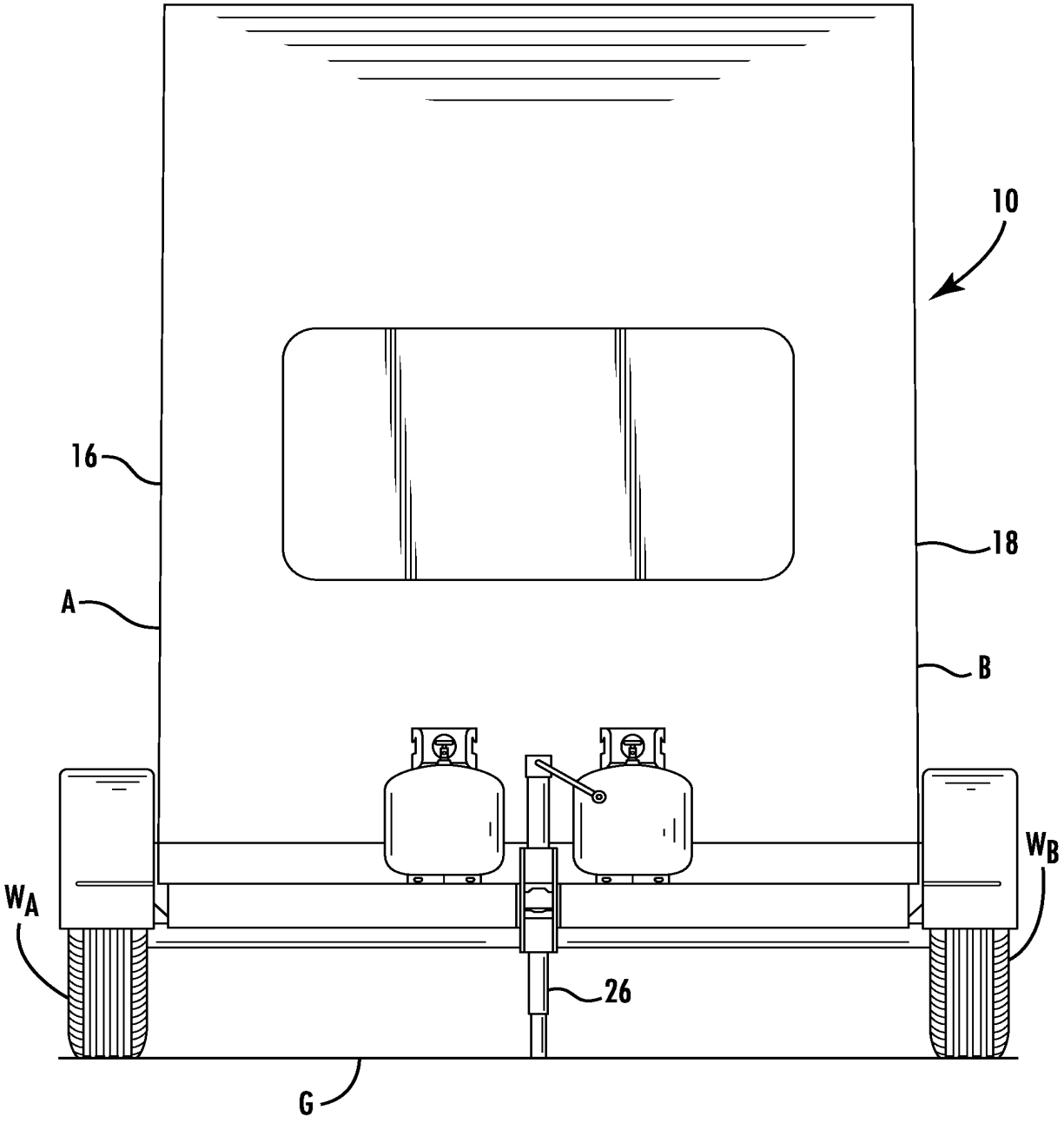


FIG. 7A

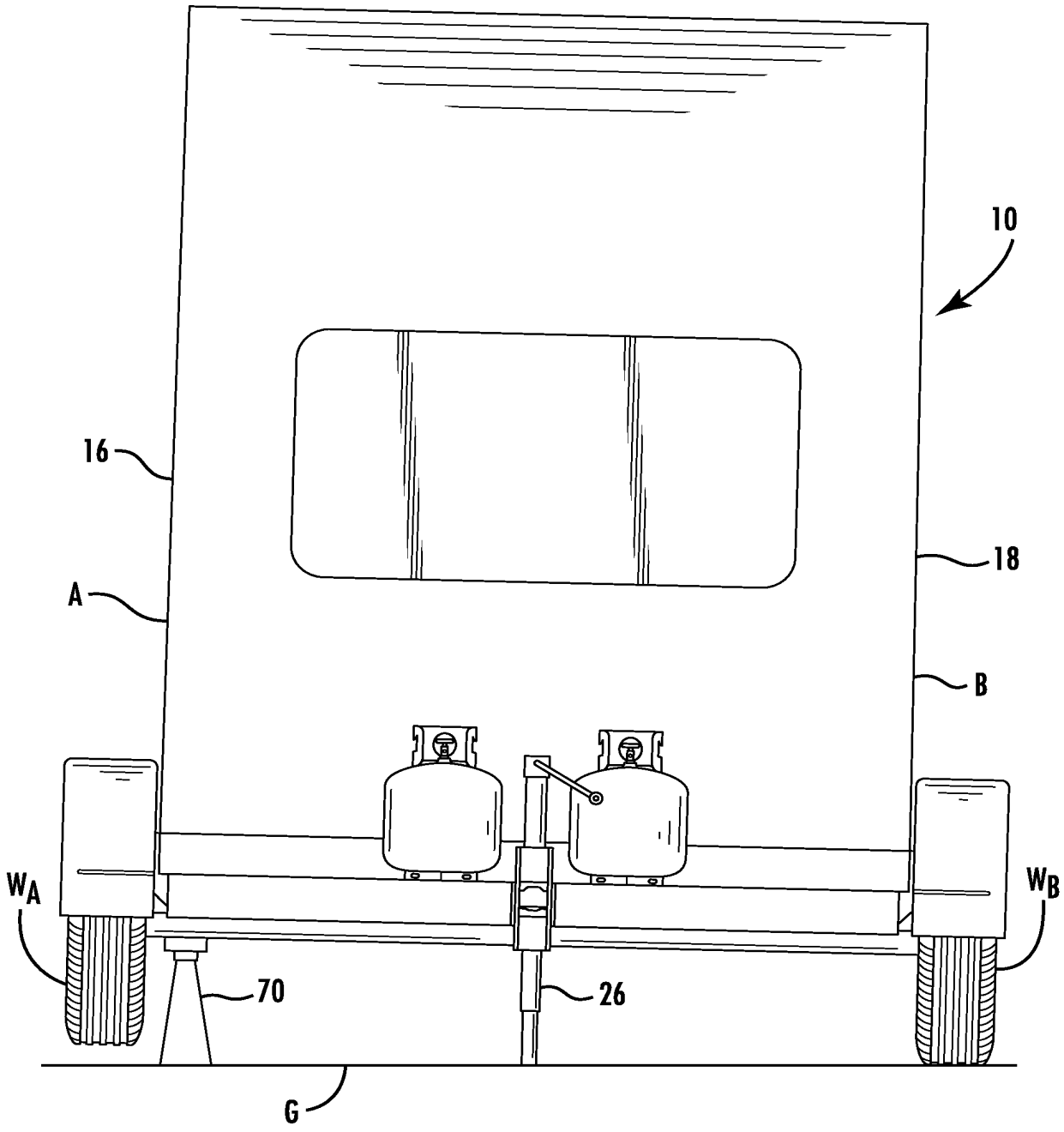


FIG. 7B

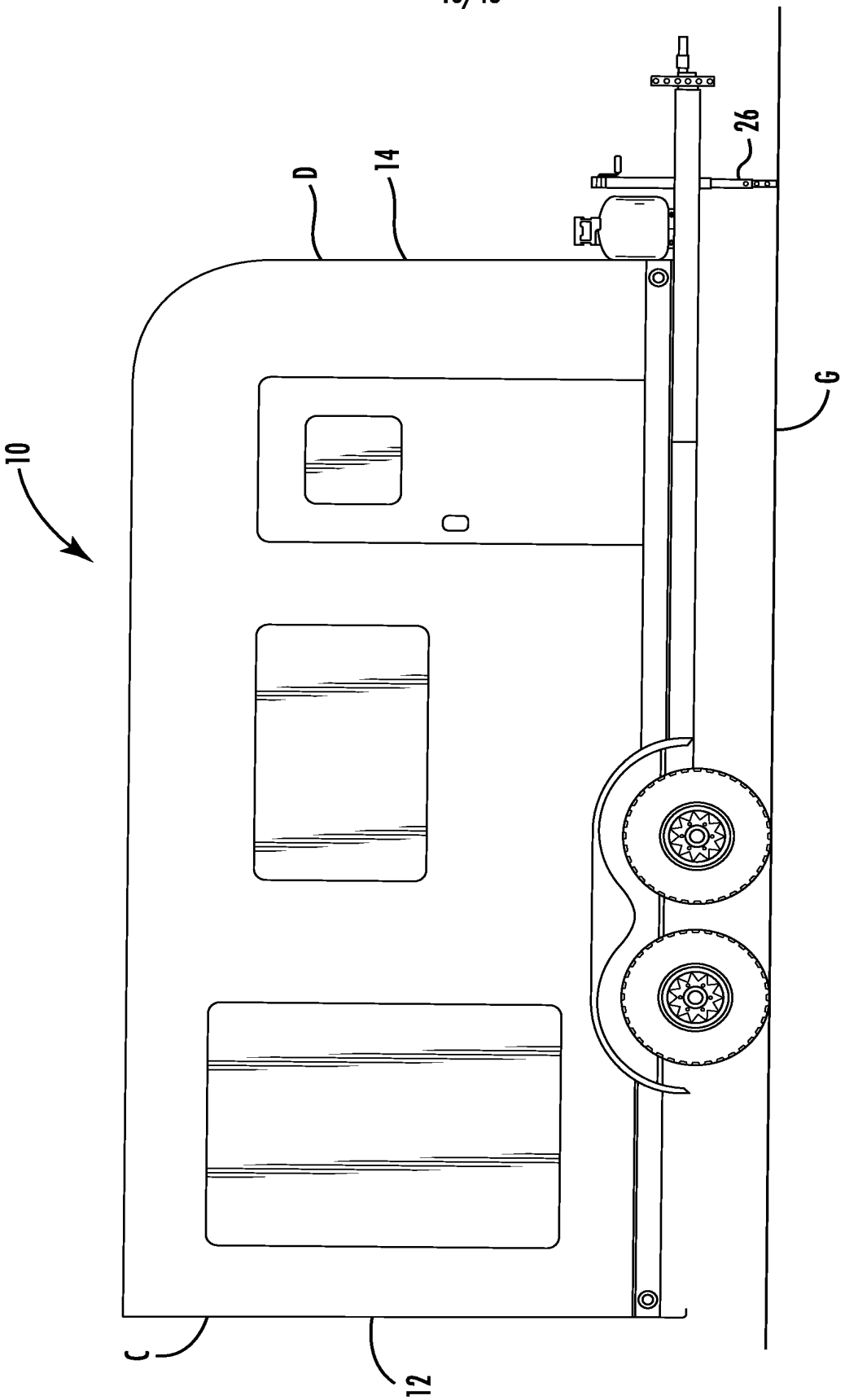


FIG. 8A

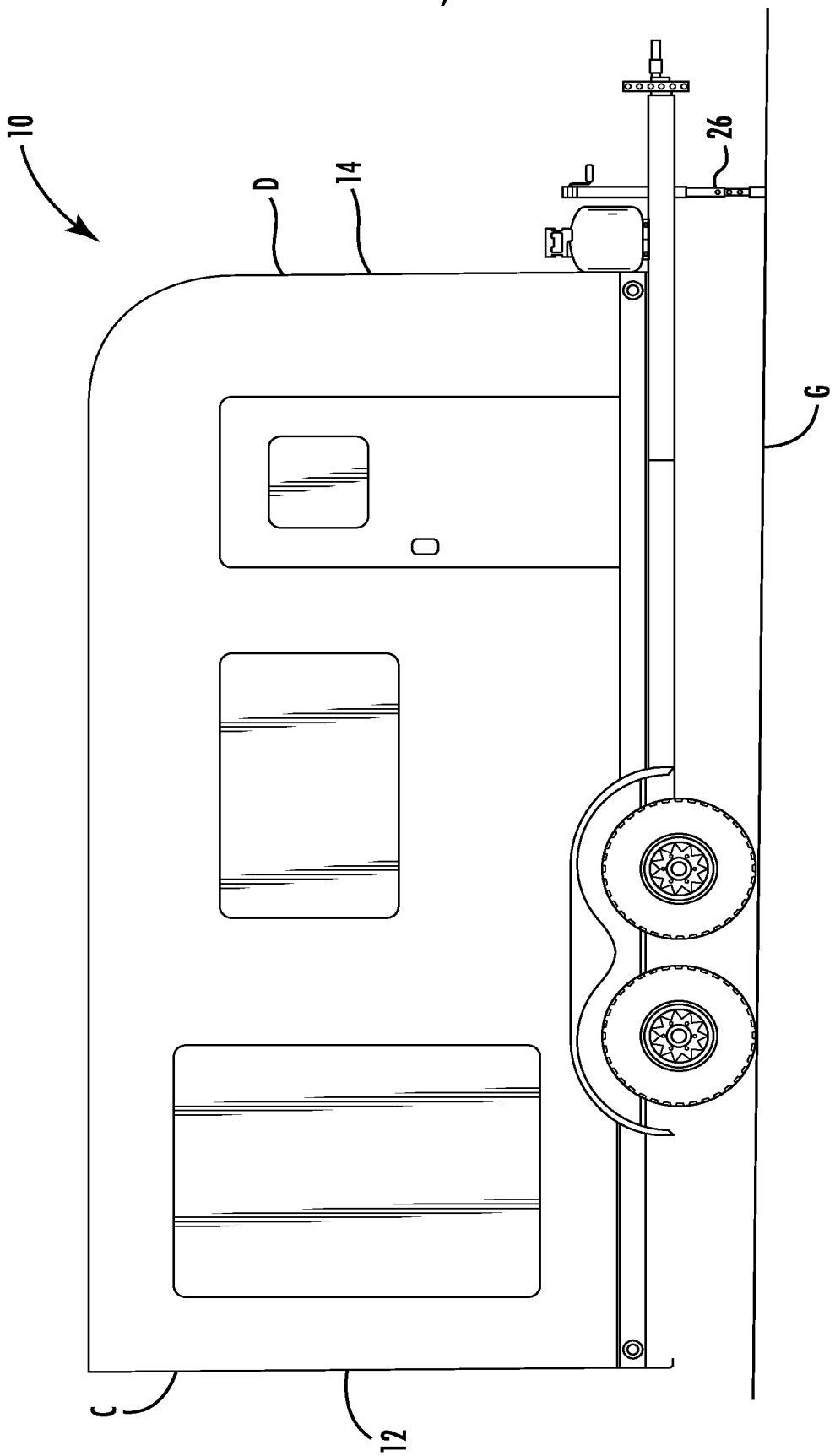


FIG. 8B

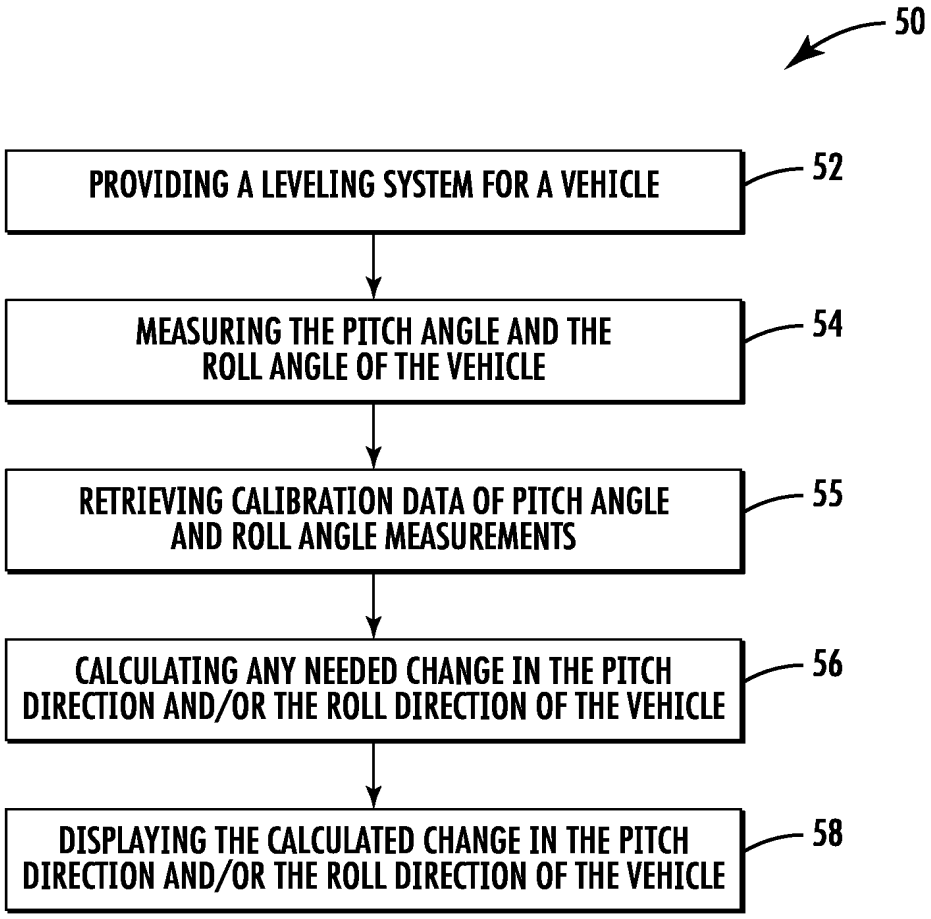

50
PROVIDING A LEVELING SYSTEM FOR A VEHICLE
52
MEASURING THE PITCH ANGLE AND THE ROLL ANGLE OF THE VEHICLE
54
RETRIEVING CALIBRATION DATA OF PITCH ANGLE AND ROLL ANGLE MEASUREMENTS
55
CALCULATING ANY NEEDED CHANGE IN THE PITCH DIRECTION AND/OR THE ROLL DIRECTION OF THE VEHICLE
56
DISPLAYING THE CALCULATED CHANGE IN THE PITCH DIRECTION AND/OR THE ROLL DIRECTION OF THE VEHICLE
58

FIG. 9

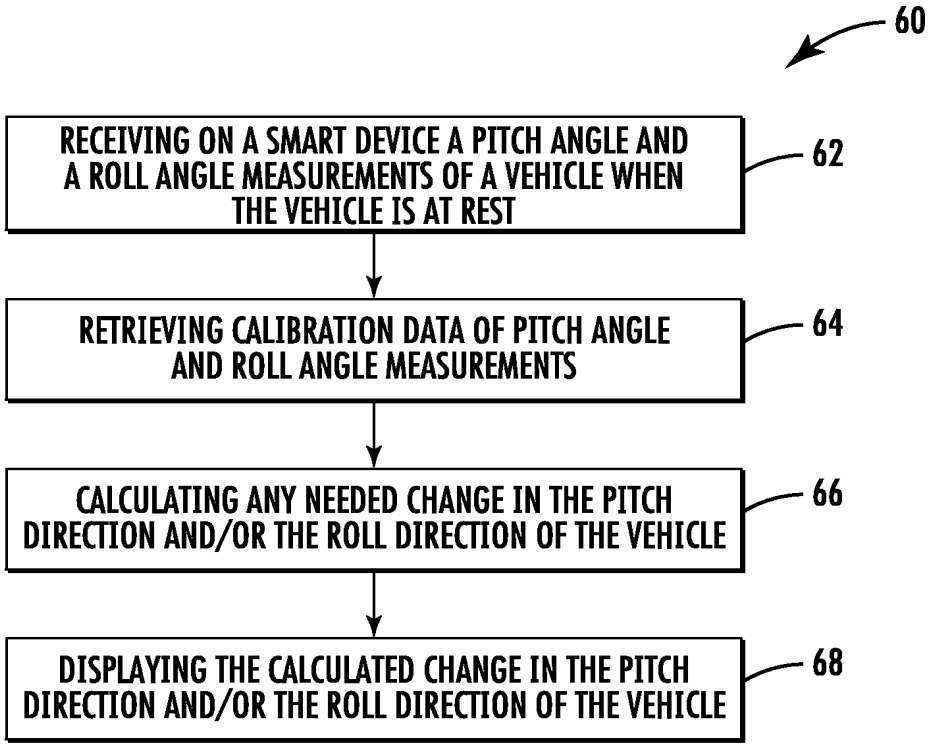

60
RECEIVING ON A SMART DEVICE A PITCH ANGLE AND A ROLL ANGLE MEASUREMENTS OF A VEHICLE WHEN THE VEHICLE IS AT REST
62
RETRIEVING CALIBRATION DATA OF PITCH ANGLE AND ROLL ANGLE MEASUREMENTS
64
CALCULATING ANY NEEDED CHANGE IN THE PITCH DIRECTION AND/OR THE ROLL DIRECTION OF THE VEHICLE
66
DISPLAYING THE CALCULATED CHANGE IN THE PITCH DIRECTION AND/OR THE ROLL DIRECTION OF THE VEHICLE
68

FIG. 10

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/961,787	12/07/2015	Charles A. Leonard	LEO-2

CONFIRMATION NO. 8904

44728
J. BENNETT MULLINAX, LLC
P. O. BOX 26029
GREENVILLE, SC 29616-1029

DOCKETING
Action Date 12/16/15
Due Date 2/16/16
Entered CN
Reviewed

FORMALITIES LETTER

OC000000079426068

Date Mailed: 12/16/2015

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
- The application search fee must be submitted.
- The application examination fee must be submitted.

The application is informal since it does not comply with the regulations for the reason(s) indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Replacement drawings in compliance with 37 CFR 1.84 and 37 CFR 1.121(d) are required. The drawings submitted are not acceptable because:
  - The drawings submitted to the Office are not electronically reproducible because portions of figures 4 - 5B are missing and/or blurry.

Applicant is cautioned that correction of the above items may cause the specification and drawings page count to exceed 100 pages. If the specification and drawings exceed 100 pages, applicant will need to submit the required application size fee.

- Additional claim fees of $ **200** as a small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.
  The surcharge is due for any one of:
  - late submission of the basic filing fee, search fee, or examination fee,
  - late submission of inventor's oath or declaration,
  - filing an application that does not contain at least one claim on filing, or
  - submission of an application filed by reference to a previously filed application.

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SUMMARY OF FEES DUE:

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. Small entity discount is in effect. If applicant is qualified for micro entity status, an acceptable Certification of Micro Entity Status must be submitted to establish micro entity status. (See 37 CFR 1.29 and forms PTO/SB/15A and 15B.)

- $ **70** basic filing fee.
- $ **70** surcharge.
- $ **300** search fee.
- $ **360** examination fee.
- $ **200** for **5** total claims over 20.
- $(**0**) previous unapplied payment amount.
- $ **1000** TOTAL FEE BALANCE DUE.

Items Required To Avoid Processing Delays:

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
  Charles A. Leonard

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice". https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101.**

/hteffera/

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
14/961,787	12/07/2015	3616	0.00	LEO-2	25	3

CONFIRMATION NO. 8904

FILING RECEIPT

44728
J. BENNETT MULLINAX, LLC
P. O. BOX 26029
GREENVILLE, SC 29616-1029

OC000000079426087

Date Mailed: 12/16/2015

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)
Charles A. Leonard, Hickory, NC;

Applicant(s)
Charles A. Leonard, Hickory, NC;

Power of Attorney: None

Domestic Priority data as claimed by applicant
This appln claims benefit of 62/088,115 12/05/2014
and claims benefit of 62/101,109 01/08/2015

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: No

Permission to Access Search Results: No

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 12/15/2015
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/961,787**

ETN1002
105/655

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES

Preliminary Class

280

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

ETN1002
107/655

Electronic Patent Application Fee Transmittal

Application Number:	14961787
Filing Date:	07-Dec-2015
Title of Invention:	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES
First Named Inventor/Applicant Name:	Charles A. Leonard
Filer:	John Bennett Mullinax/David Sigmon
Attorney Docket Number:	LEO-2

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	70	70
Utility Search Fee	2111	1	300	300
Utility Examination Fee	2311	1	360	360
Pages:				
Claims:				
Claims in excess of 20	2202	5	40	200
Miscellaneous-Filing:				
Late Filing Fee for Oath or Declaration	2051	1	70	70

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1000**

Electronic Acknowledgement Receipt

EFS ID:	24930614
Application Number:	14961787
International Application Number:	
Confirmation Number:	8904
Title of Invention:	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES
First Named Inventor/Applicant Name:	Charles A. Leonard
Customer Number:	44728
Filer:	John Bennett Mullinax/David Sigmon
Filer Authorized By:	John Bennett Mullinax
Attorney Docket Number:	LEO-2
Receipt Date:	16-FEB-2016
Filing Date:	07-DEC-2015
Time Stamp:	23:14:02
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Electronic Funds Transfer
Payment was successfully received in RAM	$1000
RAM confirmation Number	8793
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

ETN1002
110/655

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Response to Pre-Exam Formalities Notice	RNTMPLEO2.pdf	365938 efc4937aabe78cdc3607d499c72514bb38ab6db1	no	1
Warnings:					
Information:					
2	Drawings-only black and white line drawings	RepFiguresLEO2.pdf	314754 766ea4c49953731aee093dbaf8549521036fc07a	no	13
Warnings:					
Information:					
3	Certification and Request for Missing Parts	LEO2FILINGRECEIPTANDNTFMP.pdf	2519322 cf078a7d99448db995172ed78d10a3c40b9fb29b	no	5
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	38729 306bd193cd8b5671daf9d69720db4e17eae8d535	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	3238743		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 14/961,787

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	25 minus 20 =	* 5	x 40 =	200	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 210 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	930		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/961,787	12/07/2015	Charles A. Leonard	LEO-2

CONFIRMATION NO. 8904

44728
J. BENNETT MULLINAX, LLC
P. O. BOX 26029
GREENVILLE, SC 29616-1029

INFORMAL NOTICE

OC000000080967066

Date Mailed: 02/26/2016

INFORMATIONAL NOTICE TO APPLICANT

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
  Charles A. Leonard

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/eruga/

ETN1002
113/655

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
14/961,787	12/07/2015	3616	1000	LEO-2	25	3

CONFIRMATION NO. 8904

UPDATED FILING RECEIPT

44728
J. BENNETT MULLINAX, LLC
P. O. BOX 26029
GREENVILLE, SC 29616-1029

OC000000080967085

Date Mailed: 02/26/2016

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Charles A. Leonard, Hickory, NC;

Applicant(s)

Charles A. Leonard, Hickory, NC;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 62/088,115 12/05/2014
and claims benefit of 62/101,109 01/08/2015

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: No

Permission to Access Search Results: No

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 12/15/2015

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/961,787**

ETN1002
114/655

Projected Publication Date: 06/09/2016

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES

Preliminary Class

280

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

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116/655

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/961,787	12/07/2015	Charles A. Leonard	LEO-2

CONFIRMATION NO. 8904

44728
J. BENNETT MULLINAX, LLC
P. O. BOX 26029
GREENVILLE, SC 29616-1029

PUBLICATION NOTICE

OC000000083538081

Title:VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES

Publication No.US-2016-0161944-A1
Publication Date:06/09/2016

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/961,787	12/07/2015	Charles A. Leonard	LEO-2	8904

44728 7590 12/09/2016

J. BENNETT MULLINAX, LLC
P. O. BOX 26029
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EXAMINER
MARTINEZ BORRERO, LUIS A

ART UNIT	PAPER NUMBER
3668	

MAIL DATE	DELIVERY MODE
12/09/2016	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 14/961,787	Applicant(s) LEONARD, CHARLES A.	
	Examiner LUIS A. MARTINEZ BORRERO	Art Unit 3668	AIA (First Inventor to File) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12/07/2015*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-5,7,10-16,18,20,22-29,38 and 43* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-5,7,10-16,18,20,22-29,38 and 43* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *02/16/2016* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

ETN1002

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Notice on Prior Art Rejections

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

Status of Claims

1. This office action is in response to claims filed 7 December 2015. Claims **1-5, 7, 10-16, 18, 20, 22-29, 38, and 43** are presently pending and are presented for examination.

Judicial Exception Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims **10-16, 18, 20, 22-29, 38, and 43** are rejected under 35 U.S.C. 101 because the claimed invention is directed to a judicial exception (i.e., a law of nature, a natural phenomenon, or an abstract idea) without significantly more.

The claimed invention is directed to a judicial exception (i.e., a law of nature, a natural phenomenon, or an abstract idea) without significantly more. Claim(s) 10-16, 18, 20, 22-29, 38, and 43 is/are directed to an abstract idea. An abstract idea can be identified by comparison to similar concepts found abstract by the courts. The July 2015 Update Quick Reference Sheet (page 2) contains a categorized list of some court-identified abstract ideas. In this case, the abstract idea identified is an idea standing alone such as a mental process (thinking) that can be performed in the human mind or by a human using pen and paper. Specifically; this application is directed to an idea of itself for Obtaining and comparing intangible data, and Comparing new and stored information and using rules to identify options. Some of the Court Identified Abstract Ideas found in this application include Collecting and comparing known information (Classen), and Obtaining and comparing intangible data (Cybersource). The limitations that set forth the abstract idea are: providing a leveling system comprising one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction and a smart device in communication with the one or more sensor devices; measuring the pitch angle and the roll angle of the vehicle when the vehicle is at rest using the sensor device; retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position; calculating any needed change in at least one of the pitch direction or the roll direction of the vehicle using the calibration data of pitch and roll angle measurements to obtain a level position of the vehicle; and displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle on the smart device. These steps can be performed mentally, and are similar to the

concepts identified as abstract ideas by the courts (e.g., using categories to organize and store information for transmission or comparing new and stored information and using rules to identify options in. Further; when evaluating the significance of the additional elements, the claim as a whole does not amount to significantly more than the abstract idea because the additional elements simply perform the generic computer functions of sending, receiving, storing, manipulating and transmitting information to and from a mobile computer device. The claims recite the additional elements of "one or more sensors" to sense an inclination or orientation of a vehicle, "a processor" used to execute instructions, and a "non-transitory computer-readable medium" in which program instructions are stored. The claims and the disclosure do not recite any further elements that could be added to the claims that may make it eligible when evaluating elements individually and in combination to determine whether the claim as a whole amounts to significantly more than the abstract idea identified above. The "one or more sensors", "processor," and "non-transitory computer-readable medium" are recited at a high level of generality and are recited as performing generic computer functions routinely used in computer applications. Generic computers performing generic computer functions, alone, do not amount to significantly more than the abstract idea with a computerized system. The use of generic computer components to transmit information through an interface does not impose any meaningful limit on the computer implementation of the abstract idea. Viewing the elements as a combination does not add anything further than the individual elements. The claim(s) does/do not include additional elements that are sufficient to amount to significantly more than the judicial exception because the method/system consists solely of transmitting/receiving data to/from a computer without any significant purpose. There is no indication that the combination

of elements improves the functioning of a computer or improves any other technology. Their collective functions merely provide conventional computer implementation. As viewed by the examiner, the claims are generalized formulation for a program to implement the idea on a computer, and/or recitation of generic computer structure that serves to perform generic computer functions that are well-understood, routine, and conventional activities previously known to the pertinent industry. Further, data gathering and transfer can be carried out in existing computers long in use or can be performed without a computer. The present claims have no substantial practical application except in connection with a digital computer, and thus the claim is ineligible as it would in effect be a patent on the algorithm itself. Therefore, there is no inventive concept sufficient to transform the claimed subject matter into a patent eligible application.

See 2014 Interim Guidance on Patent Subject Matter Eligibility (79 FR 74618), at:

http://www.uspto.gov/patents/law/exam/interim_guidance_subject_matter_eligibility.jsp

Claim Rejections - 35 USC § 112

4. The following is a quotation of 35 U.S.C. 112(b):

> (B) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims **1-5, 7, 10-16, 18, 20, 22-29, 38, and 43** are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being incomplete for omitting essential steps,

such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are:

a. In claim **1**, the smart device merely provides an output of the measurements to the user. There is no indication of what is done with those measurements or if there is any leveling taking place. Further, it is unclear what are "the amount of adjustments needed" or what are they based on? Are the adjustments based on the inclination of the floor? Are they based on the user preferences?

b. In claims **10 and 29**, the steps performed stated that "calculating any needed change…" and then "displaying the calculated change…". There is no indication of what would happen if no change is needed. Further, in "displaying the calculated change", it is unclear what is being display and what is the user doing with that measurement information. Further, what is the reason to determine the needed change? Is there a threshold of leveling required for the vehicle? Or it is just user preference how the vehicle is leveled?

Appropriate correction is required.

6. Claim **1** is rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as reciting or depending upon a claim that recites limitations for which there are no antecedent basis. In particular:

Claim 1 recite "The amount of adjustment needed". There is insufficient antecedent basis for this limitation in the claim.

7. Claims **1-5, 7, 10-16, 18, 20, 22-29, 38, and 43** are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

Regarding claim **1, 10 and 29**, the claim recites "the amount of adjustment needed" and "calculating any needed change". It is unclear what are the requirements for the system/method to be level and in what condition it is determined that an adjustment is needed. The examiner assumes any adjustment for continued examination.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> (a)(2) the claimed invention was described in a patent issued under section 151, or in an application for patent published or deemed published under section 122(b), in which the patent or application, as the case may be, names another inventor and was effectively filed before the effective filing date of the claimed invention.
> .

9. Claims **1-5, 7, 10-16, 18, 20, 22-29, 38, and 43** are rejected under 35 U.S.C. 102(a) (2) as being anticipated by Thorpe et al, US 2008/0142768, hereinafter referred to as Thorpe.

As per Claim 1. Thorpe discloses a leveling system for leveling a vehicle that is at rest, the leveling system comprising:

- one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction (¶ 0038, via Level sensing means 38 comprises one or more tilt sensors that are configured to detect the amount of pitch and roll of recreational vehicle), (¶ 0038, via In one configuration, level sensing means 38 comprises two separate tilt sensors, one positioned in the front/back direction for determining the pitch and one positioned in the left/right direction for determining the roll).
- a smart device in communication with the one or more sensor devices to allow information received from the one or more sensor devices about at least one of the inclination or the orientation of the vehicle in both the pitch direction and the roll direction to be processed to provide measurements to a user and to determine the amount of adjustments needed to at least one of the pitch direction or the roll direction to level the vehicle (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator), (See at least fig 2. ¶ 0040, via control unit 14 has a front cover 68 and back cover 70 that define control housing 72 enclosing a control chamber 74 in which is disposed the components that allow the user to control leveling system 10 and communicate with the spaced apart

level unit), (¶ 0040, via, Preferably, any such attachment mechanism is removable from the location where it is stored to allow the operator to utilize control unit 14 as a hand-held device so that he or she may stand outside recreational vehicle 16 during use of leveling system 10 to level recreational vehicle), (¶ 0040, via, control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition).

As per Claim 2. Thorpe discloses the system according to claim 1, wherein one or more sensor devices comprises a sensor device comprising a printed circuit board that comprises at least one of a digital accelerometer or a digital gyroscope (¶ 0012, via Although separate tilt sensors can be utilized, in the preferred embodiment the level sensing means is a dual-axis accelerometer that is configured to determine the tilt of the recreational vehicle in both the front-to-back and side-to-side directions), (¶ 0038, via In a preferred embodiment of the present invention, however, level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 lowpower two-axis linear accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle).

As per Claim 3. Thorpe discloses the system according to claim 2, wherein the printed circuit board comprises a processor to process of data collected by the one or more sensor devices and to perform calculations related to the determination the amount of adjustments needed to at least one of the pitch direction or the roll direction to level the vehicle (¶ 0037, via These components

include a circuit board 34, shown in FIGS. 9through12, having a controller 36 which is operatively connected to a level sensing means 38, power supply 40 and transmitter/ receiver or transceiver 42, including antenna 44. In a preferred embodiment, shown in the figures, the controller 36 includes transceiver 42), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).

As per Claim 4. Thorpe discloses the system according to claim 3, wherein the sensor device comprises a memory in communication with the processor of the PCB, the sensor device capable of storing information transmitted from the smart device (¶ 0039, via As shown on FIG. 9, the circuit boards 34 of level 12 and control 14 units also include a flash memory chip 60 to store data useful for the operation of leveling system), (¶ 0039, via The circuit board 34 shown in the figures also includes a memory chip connector 62 for programming the flash memory chip 60 with the manufacturer's computer control code and a diagnostic chip).

As per Claim 5. Thorpe discloses the system according to claim 5, wherein the sensor device uses data sensed by the sensor device and stored data obtained from the smart device to perform calculations on the sensor device and transmit the calculated data to the smart device (¶ 0038, via

As shown in FIG. 11, the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information), (¶ 0011, via In the preferred embodiment of the present invention, the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle).

As per Claim 7. Thorpe discloses the system according to claim 2, wherein the smart device communicates with the printed circuit board of the sensor device (¶ 0012, via In the preferred embodiment, the controller and the transceiver is a single integrated unit that wireless transmits the data from the level sensing means to the control unit The level unit has having a level housing that encloses a controller, a level sensing means, a power supply and a transceiver mounted on a circuit board.), (¶ 0038, via As shown in FIG. 11, the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information).

As per Claim 10. Thorpe discloses a method for leveling a recreational vehicle, the method comprising:

- providing a leveling system comprising one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction and a smart device in communication with the one or more sensor devices (¶ 0038, via Level sensing means 38 comprises one or more tilt sensors that are configured to detect the amount of pitch and roll of recreational vehicle), (¶ 0038, via In one configuration, level sensing means 38 comprises two separate tilt sensors, one positioned in the front/back direction for determining the pitch and one positioned in the left/right direction for determining the roll).
- measuring the pitch angle and the roll angle of the vehicle when the vehicle is at rest using the sensor device (¶ 0036, via allow the components disposed in interior chamber 28 of level unit 12 to measure the pitch and roll tilt so that leveling system 10 can determine the adjustment necessary to neutralize that tilting), (¶ 0012, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition), (¶ 0044, via To level a recreational vehicle 16 having leveling system 10 after parking recreational vehicle 16 where desired).
- retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position (¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to

determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).

- calculating any needed change in at least one of the pitch direction or the roll direction of the vehicle using the calibration data of pitch and roll angle measurements to obtain a level position of the vehicle (¶ 0011, via the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition 20).

- displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle on the smart device (¶ 0040, via on FIG. 9, is used to switch control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition), (¶ 0038, via controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).

As per Claim 11. Thorpe discloses the method according to claim 10, further comprising: determining the initial level position for a vehicle to determine any inconsistencies inherent in the leveling system; and capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide the calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time (¶ 0011, via the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll

(left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition).

As per Claim 12. Thorpe discloses the method according to claim 11, wherein the step of determining an initial level position comprises using at least one of an accelerometer, gyroscope, or global positioning system sensor on the smart device to achieve the initial level position (¶ 0012, via Although separate tilt sensors can be utilized, in the preferred embodiment the level sensing means is a dual-axis accelerometer that is configured to determine the tilt of the recreational vehicle in both the front-to-back and side-to-side directions), (¶ 0038, via In a preferred embodiment of the present invention, however, level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 lowpower two-axis linear accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle).

As per Claim 13. Thorpe discloses the method according to claim 11, wherein the step of determining an initial level position comprises using at least one of a digital level or spirit level can also be used to achieve the initial level position (¶ 0032, via control units of the leveling system of the present invention showing the circuitry utilized with the level unit to determine the levelness of the recreational vehicle), (¶ 0035, via A leveling system for recreational vehicles manufactured out of the materials and pursuant to the system of the present invention, shown as 10 in FIG. 2, generally comprises a level unit 12 and a separate control unit).

As per Claim 14. Thorpe discloses the method according to claim 11, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises communicating calibration data from the sensor device of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position to the smart device and saving the calibration data on the smart device (¶ 0011, via the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition 20).

As per Claim 15. Thorpe discloses the method according to claim 11, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises saving the calibration data of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position on the sensor device (¶ 0038, via As shown in FIG. 11, the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information), (¶ 0011, via In the preferred embodiment of the present

invention, the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle).

As per Claim 16. Thorpe discloses the method according to claim 15, wherein the step of saving the calibration data of the pitch and roll angle measurements on the sensor device comprises transmitting instructions from the smart device to the sensor device to save and store the calibration data of the pitch and roll angle measurements on the sensor device and wherein the method further comprises recalling the calibration data of the pitch and roll angle measurements from the sensor device to the smart device (¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into

operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).

As per Claim 18. Thorpe discloses the method according to claim 11, wherein the step of determining an initial level position comprises receiving measurements of a length and a width of the vehicle (¶ 0040, via As shown in FIG. 6, display panel 90 can display the amount of pitch or roll in degrees and the amount in inches or other measurement units, based on a known length or width of recreational vehicle 16, that one end or side of the recreational vehicle 16 must be raised to place recreational vehicle 16 in level condition), (¶ 0044, via If desired, leveling system 10 can be adapted to include the length information for specific lengths of recreational vehicles 16 and/or to allow the operator to input the length into its operating system, such as at flash memory 60, by entering the data at control unit).

As per Claim 20. Thorpe discloses the method according to claim 10, wherein the step of displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle further comprises displaying the calculated change in the pitch direction and the roll direction of the vehicle in measurements of distance (¶ 0040, via on FIG. 9, is used to switch control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition), (¶ 0038, via controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).

As per Claim 22. Thorpe discloses the method according to claim 10, further comprising saving a given pitch angle measurement on at least one of the smart device or the sensor device to permit later recall for the purpose of returning the vehicle to the given pitch angle position at a later time (¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).

As per Claim 23. Thorpe discloses the method according to claim 10, further comprising receiving data at the smart device from one or more vehicle control panels (¶ 0036, via In an alternative configuration, not shown, user accessible buttons and/or a display panel can be used with level unit 12 to allow the operator to directly access the operation of level unit), (¶ 0044, via In the preferred embodiment, battery monitoring circuit 61 of level 12 and control 14 units is

configured to transmit battery level information to display panel 90 when the amount of power in batteries 40 or 86 reach a certain low level. Alternatively, leveling system 10 can also be configured to such that the operator can access the battery level information by pushing the mode button 80 on control unit 14 when he or she desires to check the battery levels).

As per Claim 24. Thorpe discloses the method according to claim 23, wherein the received data from one or more vehicle control panels comprises at least one of data regarding holding tank levels or data regarding battery power levels (¶ 0036, via In an alternative configuration, not shown, user accessible buttons and/or a display panel can be used with level unit 12 to allow the operator to directly access the operation of level unit), (¶ 0044, via In the preferred embodiment, battery monitoring circuit 61 of level 12 and control 14 units is configured to transmit battery level information to display panel 90 when the amount of power in batteries 40 or 86 reach a certain low level. Alternatively, leveling system 10 can also be configured to such that the operator can access the battery level information by pushing the mode button 80 on control unit 14 when he or she desires to check the battery levels).

As per Claim 25. Thorpe discloses the method according to claim 23, further comprising displaying the data on the smart device that is generated and displayed on the one or more vehicle control panels (¶ 0036, via In an alternative configuration, not shown, user accessible buttons and/or a display panel can be used with level unit 12 to allow the operator to directly access the operation of level unit), (¶ 0044, via In the preferred embodiment, battery monitoring circuit 61 of level 12 and control 14 units is configured to transmit battery level information to

display panel 90 when the amount of power in batteries 40 or 86 reach a certain low level. Alternatively, leveling system 10 can also be configured to such that the operator can access the battery level information by pushing the mode button 80 on control unit 14 when he or she desires to check the battery levels).

As per Claim 26. Thorpe discloses the method according to claim 10, further comprising activating one or more systems on the vehicle with the smart device (¶ 0012, via The control unit also has a display panel for displaying the pitch and roll information received from the level unit and one or more operator accessible control buttons for activating and operating the leveling system.), (¶ 0044, via The operator first activates the control unit 14 by pushing the power button 78 to tum leveling system 10 to its on condition).

As per Claim 29. Thorpe discloses a non-transitory computer readable medium comprising computer executable instructions embodied in a computer readable medium that when executed by a processor of a computer control the computer to perform steps comprising:

- receiving on a smart device a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device (¶ 0036, via allow the components disposed in interior chamber 28 of level unit 12 to measure the pitch and roll tilt so that leveling system 10 can determine the adjustment necessary to neutralize that tilting), (¶ 0012, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place

the recreational vehicle in its level condition), (¶ 0044, via To level a recreational vehicle 16 having leveling system 10 after parking recreational vehicle 16 where desired).

- retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position (¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).
- calculating any needed change in at least one of a pitch direction or a roll direction of the vehicle using the calibration data of the pitch and roll angle measurements to obtain a level position of the vehicle (¶ 0011, via the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control

unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition 20).

- displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device (¶ 0040, via on FIG. 9, is used to switch control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition), (¶ 0038, via controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims **27, 28, 38, and 43** are rejected under 35 U.S.C 103 as being unpatentable over Thorpe, in view of Howarter et al. US 2012/0208520, hereinafter referred to as Howarter, respectively.

As per Claim 27. Thorpe discloses the method according to claim 26, wherein the one or more systems activated via the software application of the smart device (¶ 0012, via The control unit also has a display panel for displaying the pitch and roll information received from the level unit and one or more operator accessible control buttons for activating and operating the leveling system.), (¶ 0044, via The operator first activates the control unit 14 by pushing the power button 78 to tum leveling system 10 to its on condition).

Thorpe fails to explicitly disclose comprise at least one of lighting systems, entertainment systems, power slide outs or a generator.

However, Howarter teaches comprise at least one of lighting systems, entertainment systems, power slide outs or a generator (¶ 0019 via The vehicle 106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0031, via The user interface 208 may include the other controls or systems for managing systems of the vehicle which may include the stereo, entertainment system, temperature controls, driving controls, and other elements of the vehicle).

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify wherein the one or more systems activated via the software application of the smart device of Thorpe and include comprise at least one of lighting systems, entertainment systems, power slide outs or a generator as taught by Howarter because it would allow the method to provide support to the user to configure and

control the different features and elements managed by the vehicle control systems via a cell phone.

As per Claim 28. Thorpe discloses the method according to claim 10.

Thorpe fails to explicitly disclose collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

However, Howarter teaches collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device (¶ 0019 via The vehicle 106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0020, via the vehicle system includes a GPS or other navigation systems. The GPS may be utilized to determine the location of the vehicle 106. The GPS may also receive data or information from the cell phone 104 in order to determine the location and direction of travel of the cell phone and an associated user).

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle on the smart device of Thorpe and include collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device as taught by Howarter because it would allow the method to provide information to the user with respect to the location of the vehicle and the location and direction of travel of the cell phone and an associated user to determine the exact or approximate distance between the cell phone and the vehicle.

As per Claim 38. Thorpe discloses the non-transitory computer readable medium according to claim 29.

Thorpe fails to explicitly disclose receiving data at the smart device from one or more vehicle control panels.

However, Howarter teaches receiving data at the smart device from one or more vehicle control panels (¶ 0019 via The vehicle 106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0031, via The user interface 208 may include the other controls or systems for managing systems of the vehicle which may include the stereo, entertainment system, temperature controls, driving controls, and other elements of the vehicle).

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device of Thorpe and include receiving data at the smart device from one or more vehicle control panels as taught by Howarter because it would allow the method to provide support to the user to configure and control the different features and elements managed by the vehicle control systems via a cell phone.

As per Claim 43. Thorpe discloses the non-transitory computer readable medium according to claim 29.

Thorpe fails to explicitly disclose collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

However, Howarter teaches collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device (¶ 0019 via The vehicle 106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0020, via the vehicle system includes a GPS or other navigation systems. The GPS may be utilized to determine the location of the vehicle 106. The GPS may also receive data or information from the cell phone 104 in order to determine the location and direction of travel of the cell phone and an associated user).

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device of Thorpe and include collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device as taught by Howarter because it would allow the method to provide information to the user with respect to the location of the vehicle and the location and direction of travel of the cell phone and an associated user to determine the exact or approximate distance between the cell phone and the vehicle.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUIS A. MARTINEZ BORRERO whose telephone number is (571)272-4577. The examiner can normally be reached on Mon thru Thur 7:30 am to 5:00 pm Eastern time, with 1st Fri off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fadey Jabr can be reached on 571-272-1516. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L. A. M./
Examiner, Art Unit 3668

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NON-PATENT DOCUMENTS

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	W	
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Notice of References Cited	Application/Control No. 14/961,787	Applicant(s)/Patent Under Reexamination LEONARD, CHARLES A.	
	Examiner LUIS A. MARTINEZ BORRERO	Art Unit 3668	Page 2 of 3

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-2009/0200782 A1	08-2009	Albrecht; Jeffrey	B60S9/04	280/763.1
*	B	US-7,590,481 B2	09-2009	Lu; Jianbo	B60T8/172	340/440
*	C	US-7,584,026 B2	09-2009	Siemer; Edward D.	G07C5/008	342/357.57
*	D	US-7,786,883 B1	08-2010	Davison, III; George M.	B60P3/36	33/366.11
*	E	US-2011/0169231 A1	07-2011	Tiedge; Robert	B60S9/10	280/6.153
*	F	US-2012/0208520 A1	08-2012	Howarter; Jamie C.	B60R25/2009	455/420
*	G	US-8,538,408 B2	09-2013	Howarter; Jamie C.	B60R25/2009	455/420
*	H	US-2014/0142783 A1	05-2014	Grimm; Donald K.	H04W4/008	701/2
*	I	US-8,757,637 B2	06-2014	Tiedge; Robert	B60S9/12	280/6.153
*	J	US-2014/0200765 A1	07-2014	WAELLER; Christoph	H04L12/282	701/36
*	K	US-8,840,144 B2	09-2014	Armstrong; Rocky E	B60S9/04	280/764.1
*	L	US-9,004,454 B1	04-2015	Faure; Luis Enrique	B65D90/0033	254/89H
*	M	US-2015/0210287 A1	07-2015	Penilla; Angel A.	B60W40/08	701/49

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

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Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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	Examiner LUIS A. MARTINEZ BORRERO	Art Unit 3668	Page 3 of 3

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-9,073,516 B2	07-2015	Schwindaman; Michael A.	B60S9/12	1/1
*	B	US-9,223,302 B2	12-2015	Maurer; Garrett	H02P29/00	1/1
*	C	US-9,421,907 B2	08-2016	Carpani; Anthony	G01C9/00	1/1
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
14/961,787	12/07/2015	701	3668	LEO-2

APPLICANTS

INVENTORS

Charles A. Leonard, Hickory, NC;

**** CONTINUING DATA ***************************

This appln claims benefit of 62/088,115 12/05/2014
and claims benefit of 62/101,109 01/08/2015

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **** ** SMALL ENTITY **
12/15/2015

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /LUIS A MARTINEZ BORRERO/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		NC	13	25	3

ADDRESS

J. BENNETT MULLINAX, LLC
P. O. BOX 26029
GREENVILLE, SC 29616-1029
UNITED STATES

TITLE

VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES

FILING FEE RECEIVED		
1000	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14961787	LEONARD, CHARLES A.
	Examiner	**Art Unit**
	LUIS A MARTINEZ BORRERO	3668

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/06/2016								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	-								
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	8	-								
	9	-								
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	33	-								
	34	-								
	35	-								
	36	-								

ETN1002
151/655

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14961787	LEONARD, CHARLES A.
	Examiner	Art Unit
	LUIS A MARTINEZ BORRERO	3668

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
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☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/06/2016								
	37	-								
	38	✓								
	39	-								
	40	-								
	41	-								
	42	-								
	43	✓								

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	776	((smart adj device) or phone or cell or cellphone or pda or (personal adj computer) or (mobile adj device) or (mobile near3 phone)) near10 ((activat$3 or turnon or control$4) near5 ((vehicle or car or automobile) adj (systems or navigation or gps)))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 13:53
L2	30	1 and (suspension near4 Control$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 13:54
L3	41	(((smart adj device) or phone or cell or cellphone or pda or (personal adj computer) or (mobile adj device) or (mobile near3 phone)) near10 ((activat$3 or turnon or control$4) near5 ((vehicle or car or automobile) adj (systems or navigation or gps)))) with application	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 13:58
L4	17	3 and gps and (position or location)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 15:08
L5	3	"20120208520"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 15:10
L6	1	"20120208520"	US-PGPUB	OR	ON	2016/12/06 15:10
S1	0	((vehicle or car or automobile) near4 (lavel$3)) with ((sens$4 or detect$3) near5 (inclinat$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 10:57
S2	0	((vehicle or car or automobile) near4 (lavel$4)) and ((sens$4 or detect$3) near5 (inclinat$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 10:57
S3	1252	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 10:58
S4	25	S3 AND ((B60T8/172 OR B60T2201/04 OR B60T2210/14 OR B60T2210/16 OR B60T2220/04 OR B60T2260/06 OR B60T7/12 OR B60T8/175 OR B60T11/22	US-PGPUB; USPAT; EPO; JPO; DERWENT;	OR	ON	2016/12/05 11:00

		OR B60T11/26 OR B60T13/741 OR B60T2210/12 OR B60T2230/00 OR B60T2250/06 OR B60T7/085 OR B60T7/107 OR B60T7/122 OR B60T8/32 OR G05D1/0088 OR G05D1/0257 OR G05D1/0891 OR G05D1/0016 OR G05D1/0061 OR G05D1/0231 OR G05D1/0236 OR G05D1/024 OR G05D1/0251 OR G05D1/0255 OR G05D1/027 OR G05D1/048 OR G05D2201/0213 OR G05D2201/0216).CPC. AND (701/22 OR 701/37 OR 701/112 OR 701/2 OR 701/23 OR 701/21 OR 701/29.1 OR 701/49 OR 701/70 OR 701/93 OR 701/96 OR 701/99 OR 701/1 OR 701/101 OR 701/102 OR 701/123 OR 701/300 OR 701/30.8 OR 701/32.4 OR 701/33.1 OR 701/36 OR 701/41 OR 701/468 OR 701/48 OR 701/50 OR 701/519 OR 701/54 OR 701/60 OR 701/65 OR 701/71 OR 701/82 OR 701/91 OR 701/94).CCLS. AND (G05D1/00 OR G05D1/02 OR G05D1/04 OR G05D1/08 OR B60T7/12 OR B60T8/172 OR B60T11/22 OR B60T11/26 OR B60T8/32).IPCR.)	IBM_TDB			
S5	5	S4 and inclinat$3 and sensor and pitch and roll	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:02
S6	145	S3 and inclinat$3 and sensor and pitch and roll	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:07
S7	66	("6554293").URPN.	USPAT	OR	ON	2016/12/05 11:09
S8	2	((vehicle or car or automobile) near4 (level$4)) with ((sens$4 or detect$3) near5 (inclinat$4)) with (accelerometer or gyroscope)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:25
S9	2	((vehicle or car or automobile) near4 (level$4)) with ((sens$4 or detect$3) near5 (inclinat$4)) with (accelerometer or gyroscope) with ((smart adj device) or device or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:32
S10	278	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:33
S11	134	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone) and wireless	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:35
S12	19	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3)	US-PGPUB; USPAT;	OR	ON	2016/12/05

		near5 (inclinat$4)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone) and wireless and roll and pitch and adjust$3 and display$3	EPO; JPO; DERWENT; IBM_TDB			
S13	518	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclination or orientation)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone) and roll and pitch and adjust$3 and display$3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:42
S14	29	S13 AND ((B60W40/09 OR B60W50/08 OR B60W2540/18 OR B60W2040/0809 OR B60W2540/00 OR B60W2540/12 OR B60W2540/30 OR B60W50/10 OR B60W50/14 OR B60W2050/146 OR B60W2520/16 OR B60W2520/18 OR B60W40/06 OR B60W40/076 OR B60W2420/54 OR B60W2520/10 OR B60W2550/14 OR B60W2550/142 OR B60W2550/147 OR B60W2520/26 OR B60W10/10 OR B60W10/18 OR B60W10/20 OR B60W2050/0077 OR B60W2520/04 OR B60W2540/20 OR B60W2540/28 OR B60W2550/12 OR B60W2550/141 OR B60W2550/20 OR B60W2550/402 OR B60W2550/406 OR B60W2710/30 OR B60W2720/10 OR B60W2720/28 OR B60W2720/30 OR B60W30/143 OR B60W30/18009 OR B60W30/18172 OR B60W40/02 OR B60W40/08 OR B60W40/10 OR B60W40/101 OR B60W40/103 OR B60W50/0098 OR G05D1/0891 OR G05D1/0027 OR G05D1/0212 OR G05D23/1917 OR G05D1/0274 OR G05D1/027 OR G05D1/0278 OR G05D1/0287 OR G05D2201/02 OR G05D2201/0201 OR G05D2201/0202 OR G05D1/0227 OR G05D1/0088 OR G05D1/0011 OR G05D1/0016 OR G05D1/0061 OR G05D1/0038 OR G05D1/0225 OR G05D1/0238 OR G05D1/024 OR G05D1/0242 OR G05D1/0251 OR G05D1/0255 OR G05D1/028 OR G05D1/102 OR G05D2201/0211 OR G05D2201/0213 OR B60T2201/04 OR B60T2210/14 OR B60T2210/16 OR B60T2220/04 OR B60T2230/00 OR B60T2260/06 OR B60T8/175).CPC. AND (701/2 OR 701/36 OR 701/1 OR 701/408 OR 701/41 OR 701/25 OR 701/29.1 OR 701/31.9 OR 701/32.4 OR 701/37 OR 701/400 OR 701/50 OR 701/93 OR 701/21 OR 701/22 OR 701/23 OR 701/26 OR 701/3 OR 701/31.5 OR 701/33.2 OR 701/34.4 OR 701/409 OR 701/420 OR 701/469 OR 701/500 OR 701/534 OR 701/537 OR 701/70 OR 701/91).CCLS. AND (G05D1/08 OR G05D1/02 OR G05D1/00 OR G05D1/04 OR G05D23/19 OR B60W30/14 OR B60W40/06 OR B60W40/09 OR	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:44

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S16	3	("7294797").URPN.	USPAT	OR	ON	2016/12/05 12:13
S17	1	("8757637").URPN.	USPAT	OR	ON	2016/12/05 12:14
S18	16	("20110024706" | "3332669" | "3454251" | "3825279" | "3857582" | "4061309" | "4216939" | "4940110" | "5176391" | "5727767" | "6142488" | "8690128" | "8757637" | "8840144").PN. OR ("9156441").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:14
S19	1	("8840144").URPN.	USPAT	OR	ON	2016/12/05 12:16
S20	44	("20050127341" | "20060017241" | "20060081755" | "20070114734" | "20070284499" | "20070289439" | "20080217898" | "20090102176" | "20090200782" | "20110163523" | "20110169231" | "20120299279" | "20130074377" | "2924463" | "2979304" | "3253839" | "3367614" | "3475008" | "3558092" | "3642242" | "3690694" | "3801128" | "3823958" | "3933372" | "3989277" | "4268066" | "4461491" | "4708362" | "5575492" | "5628521" | "6089603" | "6142488" | "6224102" | "6331016" | "6494487" | "6827335" | "7226057" | "7338052").PN. OR ("8840144").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:16
S21	31	("3454251" | "3475008" | "3656778" | "3709518" | "3767226").PN. OR ("3933372").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:17
S22	38	("1540753" | "3186570" | "3324613" | "3367614").PN. OR ("4268066").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:17
S23	45	("2924463" | "3306629" | "3933372" | "4231044" | "4429851" | "4708362" | "4905953").PN. OR ("5575492").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:17
S24	47	("1539974" | "20020053794" | "2747836" | "3310181" | "3345038" | "3475008" | "3565396" | "3767226" | "3826470" | "3854750" | "3870276" | "3989277" | "4103869" | "4146250" | "4148461" | "4515520" | "4955450" | "5042779" | "5205586" | "5348330" | "5488788" | "5501428" | "5547220" | "5901980" | "6089603" | "6102438" | "6224102").PN. OR ("6494487").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:19
S25	94	((vehicle or car or automobile) near4 (level$4 or stabilizat$3)) with ((sens$4 or	US-PGPUB; USPAT;	OR	ON	2016/12/05 12:20

		detect$3) near5 (inclination or orientation)) with ((smart adj device) or device or phone cell or cellphone)	EPO; JPO; DERWENT; IBM_TDB			
S26	6132	((vehicle or car or automobile) near4 (level$4 or stabilizat$3)) same ((smart adj device) or phone or cell or cellphone or mobile)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:26
S27	2491	((vehicle or car or automobile) near4 (level$4 or stabilizat$3)) near10 ((smart adj device) or phone or cell or cellphone or mobile)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:26
S28	49	S27 and sensor and pitch and roll	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:27
S29	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:33
S30	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone or cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:33
S31	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone or cell or cellphone or pda)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:33
S32	11	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) same ((sens$4 or detect$3) near5 (inclination or orientation)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:36
S33	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:39
S34	43	((vehicle or car or automobile) near6 (level$4 or stabilizat$3 or inclinat$4)) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:41
S35	2	(vehicle or car or automobile) same (park$3 near8 (level$4 or stabilizat$3 or inclinat$4)) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:45
S36	15	(vehicle or car or automobile) same (adjust$5) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart	US-PGPUB; USPAT; EPO; JPO;	OR	ON	2016/12/05 12:48

		adj device) or phone or cell or cellphone or pda or (personal adj computer))	DERWENT; IBM_TDB			
S37	23284	(vehicle or car or automobile) same ((adjust$5) near5(level$3 or inclination or tilt$3))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:52
S38	4438	S37 and ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:52
S39	130	S38 and (sens$3 near5 (pitch and roll))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:53
S40	92815	S39 and accelerometer or gyroscope	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:54
S41	51	S39 and accelerometer and gyroscope	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:54
S42	271	(vehicle or car or automobile) same ((adjust$5) near5 (level$3 or inclination or tilt$3)) same parking	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:57
S43	5	("2008/0142768").URPN.	USPAT	OR	ON	2016/12/05 13:05
S44	22	"6921100"	USPAT	OR	ON	2016/12/05 13:11
S45	5	"20070103289"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 13:15
S46	27	("4353565" | "5167289" | "5476277" | "5780782" | "5863057" | "6203045").PN. OR ("6921100").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:32
S47	36	("20020038193" | "4103752" | "4639872" | "4651838" | "4706768" | "4836308" | "4852674" | "4854407" | "4941365" | "5040826" | "5167289" | "5314201" | "5526702" | "5606516" | "5617072" | "5626356" | "5803502" | "5915713" | "6032090" | "6037550" | "6157889" | "6242701" | "6252497" | "6307164" | "6308131" | "6357777" | "6363331" | "6459367" | "6921100").PN. OR ("7072763").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:32
S48	33	("20060100979" | "20070180719" | "20070245579" | "20080142768" | "2155876" | "3181203" | "3258884" |	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:34

		"3260564" | "3417518" | "3866365" | "4232488" | "4568096" | "4572527" | "4743037" | "4746133" | "4784400" | "5078442" | "5136784" | "5159989" | "5176391" | "5188379" | "5676385" | "5806196" | "6176495" | "6526668" | "7025361").PN. OR ("7786883").URPN.				
S49	16	("20020027346" | "20020030592" | "20030191568" | "20030231118" | "20060064223" | "20080142768" | "5008647" | "6009356" | "6326613" | "6356812" | "6366840" | "6408232" | "6472979" | "6629032" | "6662642").PN. OR ("7584026").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:35
S50	17	("2454896" | "3219972" | "3820065" | "3835279" | "3922638" | "4101868" | "4145681").PN. OR ("4288777").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:37
S51	1	"20060113783"	US-PGPUB	OR	ON	2016/12/05 13:39
S52	3	"20150025789"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:03
S53	0	S52 and (trajectory near5 comparison)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:04
S54	2	S52 and (trajectory near10 comparison)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:05
S55	3	"20120206597"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:08

EAST Search History (Interference)

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12/6/2016 3:18:06 PM
C:\Users\lmartinezborrero\Documents\EAST\Workspaces\14961787.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14961787	LEONARD, CHARLES A.
	Examiner	Art Unit
	LUIS A MARTINEZ BORRERO	3668

CPC- SEARCHED		
Symbol	Date	Examiner
G05D1/0891, 1/0016, 1/0236, 1/0251, 1/0255, 1/027,	12/7/2016	/L.A.M./
B60W2540/28, 2550/141, 2550/402, 2710/30, 2550/406, 2720/30,	12/7/2016	/L.A.M./

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
701	22, 37, 112, 2, 23, 21, 123, 1, 101, 102, 50, 60,	12/7/2016	/L.A.M./

SEARCH NOTES		
Search Notes	Date	Examiner
East Search	12/7/2016	/L.A.M./
Google Patent Search	12/7/2016	/L.A.M./

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

/LUIS A MARTINEZ BORRERO/ Examiner.Art Unit 3668	

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/961,787	12/07/2015	Charles A. Leonard	LEO-2	8904

44728 7590 04/17/2017
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EXAMINER
MARTINEZ BORRERO, LUIS A

ART UNIT	PAPER NUMBER
3668	

MAIL DATE	DELIVERY MODE
04/17/2017	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	14/961,787	LEONARD, CHARLES A.	
	Examiner	Art Unit	
	LUIS A. MARTINEZ BORRERO	3668	

All participants (applicant, applicant's representative, PTO personnel):

(1) *LUIS A. MARTINEZ BORRERO*. (3)_____.

(2) *David M. Sigmon*. (4)_____.

Date of Interview: *04 April 2017*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☐ No.
If Yes, brief description: _____.

Issues Discussed ☒101 ☒112 ☐102 ☐103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1*.

Identification of prior art discussed: _____.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

The Applicant discussed the 35 USC sections 101, 112 rejections and prior art rejections. Applicant suggested some potential amendments to overcome such rejections. No agreement was reached. .

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☒ Attachment

/LUIS A MARTINEZ BORRERO/ Examiner, Art Unit 3668	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Leonard

Group Art Unit: 3668

Serial No.: 14/961,787

Examiner: Martinez Borrero, Luis A.

Filed: December 7, 2015

Docket No.: LEO-2

Confirmation No.: 8904

For: VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES

* *

AMENDMENT A

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is responsive to the Office Action dated December 9, 2016 for which a shortened statutory period for reply has been extended up to and including May 9, 2017. A petition for a Two-month Extension of Time is attached hereto. Favorable consideration is respectfully requested in view of the following Amendments and Remarks.

IN THE CLAIMS:

Please amend the claims as follows:

1. (Currently Amended) A leveling system for leveling a vehicle that is at rest, the leveling system comprising:

one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction, each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured; and

a smart device in communication with the one or more sensor devices to allow information received from the one or more sensor devices about at least one of the inclination or the orientation of the vehicle in both the pitch direction and the roll direction to be processed to provide measurements to a user and to determine ~~the~~ an amount of adjustments in height to at least one of a rear or front section or first or second side sections of the vehicle needed ~~to at least one of the pitch direction or the roll direction~~ to level the vehicle, so that the vehicle is adjusted to obtain a level position based on the calculated change.

2. (Currently Amended) The system according to claim 1, wherein the ~~one or more sensor devices comprises a sensor device comprising~~ a printed circuit board that further comprises at ~~least one of a digital accelerometer or~~ a digital gyroscope.

3. (Original) The system according to claim 2, wherein the printed circuit board comprises a processor to process of data collected by the one or more sensor devices and to perform calculations related to the determination the amount of adjustments needed to at least one of the pitch direction or the roll direction to level the vehicle.

4. (Original) The system according to claim 3, wherein the sensor device comprises a memory in communication with the processor of the PCB, the sensor device capable of storing information transmitted from the smart device.

5. (Original) The system according to claim 5, wherein the sensor device uses data sensed by the sensor device and stored data obtained from the smart device to perform calculations on the sensor device and transmit the calculated data to the smart device.

6. (Canceled)

7. (Original) The system according to claim 2, wherein the smart device communicates with the printed circuit board of the sensor device.

8-9. (Canceled)

10. (Currently Amended) A method for leveling a recreational vehicle, the method comprising:

providing a leveling system comprising one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction and a smart device in communication with the one or more sensor devices, each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured;

measuring the pitch angle and the roll angle of the vehicle when the vehicle is at rest using the sensor device;

retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position;

calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle using the calibration data of pitch and roll angle measurements ~~to obtain a level position of the vehicle~~; [[and]]

displaying the calculated change in the height to the at least one of the rear or front section or the first or second side sections of the vehicle in at least one of the pitch direction or the roll direction of the vehicle on the smart device; and

adjusting the height to the at least one of the rear or front section or the first or second side sections of the vehicle to obtain the level position of the vehicle based on the calculated change.

11. (Original) The method according to claim 10, further comprising:

determining the initial level position for a vehicle to determine any inconsistencies inherent in the leveling system; and

capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide the calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time.

12. (Original) The method according to claim 11, wherein the step of determining an initial level position comprises using at least one of an accelerometer, gyroscope, or global positioning system sensor on the smart device to achieve the initial level position.

13. (Original) The method according to claim 11, wherein the step of determining an initial level position comprises using at least one of a digital level or spirit level can also be used to achieve the initial level position.

14. (Original) The method according to claim 11, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises communicating calibration data from the sensor device of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position to the smart device and saving the calibration data on the smart device.

15. (Original) The method according to claim 11, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises saving the calibration data of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position on the sensor device.

16. (Previously Presented) The method according to claim 15, wherein the step of saving the calibration data of the pitch and roll angle measurements on the sensor device comprises transmitting instructions from the smart device to the sensor device to save and store the calibration data of the pitch and roll angle measurements on the sensor device and wherein the method further comprises recalling the calibration data of the pitch and roll angle measurements from the sensor device to the smart device.

17. (Canceled)

18. (Original) The method according to claim 11, wherein the step of determining an initial level position comprises receiving measurements of a length and a width of the vehicle.

19. (Canceled)

20. (Original) The method according to claim 10, wherein the step of displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle further comprises displaying the calculated change in the pitch direction and the roll direction of the vehicle in measurements of distance.

21. (Canceled)

22. (Original) The method according to claim 10, further comprising saving a given pitch angle measurement on at least one of the smart device or the sensor device to permit later recall for the purpose of returning the vehicle to the given pitch angle position at a later time.

23. (Original) The method according to claim 10, further comprising receiving data at the smart device from one or more vehicle control panels.

24. (Original) The method according to claim 23, wherein the received data from one or more vehicle control panels comprises at least one of data regarding holding tank levels or data regarding battery power levels.

25. (Original) The method according to claim 23, further comprising displaying the data on the smart device that is generated and displayed on the one or more vehicle control panels.

26. (Original) The method according to claim 10, further comprising activating one or more systems on the vehicle with the smart device.

27. (Original) The method according to claim 26, wherein the one or more systems activated via the software application of the smart device comprise at least one of lighting systems, entertainment systems, power slideouts or a generator.

28. (Original) The method according to claim 10, further comprising collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

29. (Currently Amended) A non-transitory computer readable medium comprising computer executable instructions embodied in a computer readable medium that when

executed by a processor of a computer control the computer to perform steps comprising:

receiving on a smart device a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device secured to the vehicle, the sensor device comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective device relative to the vehicle to which the one or more sensor devices are secured;

retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position;

calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of a pitch direction or a roll direction of the vehicle using the calibration data of the pitch and roll angle measurements ~~to obtain a level position of the vehicle~~; and

displaying the calculated change in height to at least one of the rear or front section or one of the first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device so that the height to at least one of the rear or front section or the first or second side sections of the vehicle is adjusted to obtain the level position of the vehicle based on the calculated change.

30-37. (Canceled)

38. (Original) The non-transitory computer readable medium according to claim 29, further comprising receiving data at the smart device from one or more vehicle control panels.

39-42. (Canceled)

43. (Original) The non-transitory computer readable medium according to claim 29, further comprising collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

REMARKS

Status Summary

Claims 1-5, 7, 10-16, 18, 20, 22-29, 38, and 43 are pending in the present application. Claims 1-5, 7, 10-16, 18, 20, 22-29, 38, and 43 presently stand rejected. With this Amendment, claims 1, 2, 10, and 29 have been amended. Thus, upon entry of this Amendment, claims 1-5, 7, 10-16, 18, 20, 22-29, 38, and 43 will be pending. Reconsideration of the application in view of the arguments below is respectfully requested.

Claim Rejections - 35 U.S.C. § 101

According to the Office Action dated December 9, 2016, (hereinafter the "Office Action"), claims 10-16, 18, 20, 22-29, 38, and 43 stand reject under 35 U.S.C. § 101 as being directed to non-statutory subject matter based on a judicial exception of an abstract idea without significantly more. Applicant respectfully disagrees. However, to further prosecution of the present application, the claims have been amended.

As set forth in the patent application as originally filed, the recreational vehicle leveling systems and devices constitute special purpose devices that improve the technological field of providing guidance for and/or mechanisms for leveling recreational vehicles. (See the patent application as originally filed, p. 4.) Since claim 10 is directed to a process and claim and claim 29 is directed to an article of manufacture, these claims fall within in of the statutory categories of invention. Even assuming that a portion of these claims may be viewed as including calculations that may be considered

abstract ideas, when taking the claims as a whole, the additional recited elements are sufficient to ensure that the claims amount to significantly more that the possible exceptions. The mere act of retrieving data, performing calculations and displaying information by themselves can be considered basic functions of a computer. However, when viewing the claim as a whole, the combination of the specific steps, including the providing of a leveling system that comprises a sensor comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative the vehicle to which the one or more sensor devices are secured and the displaying of specific adjustments relative to the vehicle that need to be made.

The additional steps specifically relate to the particular variable used, how the variables are gathered and the process by which the adjustment to specific vehicles are determined and used. The totality of the steps in claim 10 act in concert to improve another technical field, specifically the field of vehicle, particularly recreational vehicle, use and maintenance, by allowing a level position of the vehicle to be obtained during use of the vehicle for stationary recreational purposes. Similarly, the totality of the steps governed by the claimed instructions provides software as recited in claim 29 that improves same technical field recited above, namely, the field of vehicle, particularly recreational vehicle, use and maintenance, by allowing a level position of the vehicle to be obtained during use of the vehicle for stationary recreational purposes. Thus, the claims 10 and 29 recite patent eligible subject matter

Applicant respectfully submits that, with the amendments above, the concerns expressed in the Office Action regarding claims 10-16, 18, 20, 22-29, 38, and 43 have been addressed. Therefore, Applicant respectfully requests that the Examiner withdraw the rejection of claims 10-16, 18, 20, 22-29, 38, and 43 under 35 U.S.C. §101.

Claim Rejection - 35 U.S.C. § 112

Claims 1-5, 7, 10-16, 18, 20, 22-29, 38, and 43 stand rejected under 35 U.S.C. §112(b) as being incomplete for omitting essential steps and as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant respectfully submits that, with the amendments above, the concerns expressed in the Office Action regarding claims 1-5, 7, 10-16, 18, 20, 22-29, 38, and 43 have been addressed. Therefore, Applicant respectfully requests that the Examiner withdraw the rejection of claims 1-5, 7, 10-16, 18, 20, 22-29, 38, and 43 under 35 U.S.C. §112(b).

Claim Rejection - 35 U.S.C. § 102

Claims 1-5, 7, 10-16, 18, 20, 22-29, 38, and 43 are rejected under 35 U.S.C. § 102(a)(1) as being anticipated by U.S. Patent Publication No. 2008/0142768 to Thorpe, et al. (hereinafter, "Thorpe"). Applicant respectfully submits that this rejection is traversed.

Independent claim 1 recites a leveling system for leveling a vehicle that is at rest. The leveling system comprises one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch

direction and a roll direction. Each of the one or more sensor devices comprises a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured. The leveling system also comprises a smart device in communication with the one or more sensor devices to allow information received from the one or more sensor devices about at least one of the inclination or the orientation of the vehicle in both the pitch direction and the roll direction to be processed to provide measurements to a user and to determine an amount of adjustments in height to at least one of a rear or front section or first or second side sections of the vehicle needed to level the vehicle, so that the vehicle is adjusted to obtain a level position based on the calculated change.

Independent claim 10 recites a method for leveling a recreational vehicle, the method comprising the step of providing a leveling system comprising one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction and a smart device in communication with the one or more sensor devices. Each of the one or more sensor devices comprises a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured. The method also comprises the steps of measuring the pitch angle and the roll angle of the vehicle when

the vehicle is at rest using the sensor device and retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position. Further the method comprises the step of calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle using the calibration data of pitch and roll angle measurements. Additionally, the method comprises the steps of displaying the calculated change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle on the smart device. Further, the method comprises the steps of adjusting the height to the at least one of the rear or front section or the first or second side sections of the vehicle to obtain the level position of the vehicle based on the calculated change.

Independent claim 29 recites a non-transitory computer readable medium comprising computer executable instructions embodied in a computer readable medium that when executed by a processor of a computer control the computer to perform steps comprising receiving on a smart device a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device secured to the vehicle. The sensor device comprises a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective device relative to the vehicle to which the one or more sensor devices are secured. The computer

executable instructions embodied in a computer readable medium also comprise retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position and calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of a pitch direction or a roll direction of the vehicle using the calibration data of the pitch and roll angle measurements. Further, the computer executable instructions embodied in a computer readable medium comprises displaying the calculated change in height to at least one of the rear or front section or one of the first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device so that the height to at least one of the rear or front section or the first or second side sections of the vehicle is adjusted to obtain the level position of the vehicle as needed based on the calculated change.

Applicant respectfully submits that Thorpe does not anticipate independent claims 1, 10, and 29 or the claims that depend therefrom. In particular, Thorpe does/do not disclose all the features of independent claims 1, 10, and 29. For example, Thorpe does not disclose one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction where each of the one or more sensor devices comprises a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the

respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured as recited in claims 1, 10 and 29.

Thorpe discloses a leveling system for use with recreational vehicles having one or more leveling mechanisms to level the vehicle in the side-to-side and front-to-back directions. The system comprises a level unit that is placed on a generally horizontal surface inside the vehicle and a control unit which is in spaced apart relation to the level unit. Both units have a controller and transceiver for wireless communication with the other unit and one or more batteries as the power supply. The level unit has one or more level sensing mechanisms to determine the pitch and roll of the vehicle. Preferably, a single dual-axis tilt measuring mechanism is utilized. The control unit has one or more control buttons to allow the operator to activate and operate the system and a display panel that displays the amount of pitch and roll correction necessary to place the recreational vehicle in its level condition.

The leveling system as taught in Thorpe uses a dual-axis accelerometer that requires the level unit to be secured to a horizontal surface. (See Thorpe, p. 2, Para. [0012].) As taught by Thorpe, because of two-axis accelerometers, such leveling units need to be placed on horizontal surface of the recreational vehicle. Due to size and space constraints, horizontal surfaces are of premium value in recreational vehicles. Therefore, the leveling unit as disclosed and taught in Thorpe requires the owner/operator to use value flat horizontal surface space on a recreational vehicle.

By using a three axis accelerometer as recited above in claims 1, 10, and 29 of the present application, the owner/operator of a vehicle, such as recreational vehicle is

free to install the sensor on any surface. For example, because the sensor device as recited claims 1 and 10 comprise a 3-axis accelerometer allows for an installation orientation that is unrestricted, the sensor can be secured on a vertical surface in the vehicle that is available and unintrusive while still operating to provide proper measurements for adjustments to be made to the vehicle to obtain a level position. Thorpe does not disclose, teach, or suggest such a sensor, leveling system, method, or computer readable medium.

Therefore, for the reasons set forth above, independent claims 1, 10, and 29 are not anticipated by the Thorpe. Claims 2-5 and 7 depend from claim 1, and claims 11-16, 18, 20, and 22-28 depend from claim 10. Further, claims 38 and 43 depend from claim 29. Therefore, claims 2-5, 7, 11-16, 18, 20, 22-28, 38, and 43 are also not anticipated by the cited references. Accordingly, Applicant respectfully submits that the rejections of claims 1-5, 7, 10-16, 18, 20, 22-29, 38, and 43 under 35 U.S.C. § 102 (a)(1) should be withdrawn and the claims allowed at this time.

Claim Rejection - 35 U.S.C. § 103

Claims 27, 28, 38, and 43 stand rejected under 35 U.S.C. § 103 as being unpatentable over Thorpe in view of U.S. Patent Publication No. 2012/0208520 to Howarter (hereinafter, "Howarter"). These rejections are respectfully traversed.

Claims 27 and 28 depend from claim 10 and claims 38 and 43 depend from claim 29. Howarter does not overcome the significant deficiencies outlined above with regard to Thorpe. Howarter discloses a system and method for controlling systems of a vehicle

with a cell phone. The cell phone is associated with the vehicle through a user interface. User preferences are received through the user interface for sending commands from the cell phone to the vehicle for controlling the systems of the vehicle. A wireless connection is established between the vehicle and the cell phone. A distance is determined between the cell phone and the vehicle. One or more commands are sent to the vehicle to control the systems based on the user preferences. While Howarter discloses an accelerometer in a cell phone, Howarter does not disclose, teach, or suggest that a sensor device should be placed on a vehicle that utilizes a 3-axis accelerometer as recited in claims 10 and 29.

Thorpe and/or Howarter, alone or in combination, do not disclose one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction where each of the one or more sensor devices comprises a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured as recited in claims 10 and 29.

Therefore, for at least the reasons set forth above, independent claims 27, 28, 38, and 43 are not rendered obvious by Thorpe and Howarter, either alone or in combination. Accordingly, applicant respectfully submits that the rejections of claims 27, 28, 38, and 43 under 35 U.S.C. § 103 should be withdrawn and the claims allowed at this time.

CONCLUSION

In light of the above amendments and remarks, it is respectfully submitted that the present application is now in proper condition for allowance, and an early notice to such effect is earnestly solicited.

If any small matter should remain outstanding after the Patent Examiner has had an opportunity to review the above Remarks, the Patent Examiner is respectfully requested to telephone the undersigned patent attorney in order to resolve these matters and avoid the issuance of another Official Action.

DEPOSIT ACCOUNT

The Commissioner is hereby authorized to charge any fees associated with the filing of this correspondence to Deposit Account No. **50-3172**.

Respectfully submitted,
J. BENNETT MULLINAX, LLC

Date: May 9, 2017

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(864) 987-9686 (fax)

LEO-2

Electronic Patent Application Fee Transmittal

Application Number:	14961787
Filing Date:	07-Dec-2015
Title of Invention:	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES
First Named Inventor/Applicant Name:	Charles A. Leonard
Filer:	John Bennett Mullinax/David Sigmon
Attorney Docket Number:	LEO-2

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 2 months with $0 paid	2252	1	300	300
Miscellaneous:				
			Total in USD ($)	**300**

Electronic Acknowledgement Receipt

EFS ID:	29164811
Application Number:	14961787
International Application Number:	
Confirmation Number:	8904
Title of Invention:	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES
First Named Inventor/Applicant Name:	Charles A. Leonard
Customer Number:	44728
Filer:	John Bennett Mullinax/David Sigmon
Filer Authorized By:	John Bennett Mullinax
Attorney Docket Number:	LEO-2
Receipt Date:	09-MAY-2017
Filing Date:	07-DEC-2015
Time Stamp:	22:56:09
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	EFT
Payment was successfully received in RAM	$300
RAM confirmation Number	051017INTEFSW22575900
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

ETN1002
186/655

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		AmdALEO2.pdf	3548743 39e70fcacc57051de15cd2887f73671f26299404	yes	21

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Extension of Time	1	1
	Amendment/Req. Reconsideration-After Non-Final Reject	2	21

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	31110 0bab37cb403bb5e377581c7073b80454156f2667	no	2

Warnings:

Information:

Total Files Size (in bytes):	3579853

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/AIA/22 (03-13)
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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)

Docket Number (Optional): LEO-2

Application Number: 14/961,787 | Filed: 12/7/2015

For: VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM FOR LEVELING VEHICLES USING SMART DEVICES

Art Unit | Examiner

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	Fee	Small Entity Fee	Micro Entity Fee	
☐ One month (37 CFR 1.17(a)(1))	$ 200	$ 100	$ 50	$
☒ Two months (37 CFR 1.17(a)(2))	$ 600	$ 300	$ 150	$ 300.00
☐ Three months (37 CFR 1.17(a)(3))	$ 1400	$ 700	$ 350	$
☐ Four months (37 CFR 1.17(a)(4))	$ 2200	$ 1100	$ 550	$
☐ Five months (37 CFR 1.17(a)(5))	$ 3000	$ 1500	$ 750	$

☒ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 50-3172.

☒ Payment made via EFS-Web.

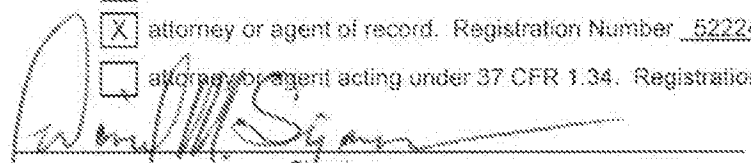
WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant.

☒ attorney or agent of record. Registration Number 52224.

☐ attorney or agent acting under 37 CFR 1.34. Registration number _____.



Signature

May 2, 2017
Date

David M. Sigmon
Typed or printed name

864-987-9696
Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below.*

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
14/961,787	12/07/2015	

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **05/09/2017**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 25	Minus	** 25	= 0	X $40 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
HALLEY MASSEY

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
14/961,787	12/07/2015	

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **05/09/2017**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 25	Minus	** 25	= 0	X $40 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $210 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
HALLEY MASSEY

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/961,787	12/07/2015	Charles A. Leonard	LEO-2	8904

44728 7590 08/07/2017
J. BENNETT MULLINAX, LLC
P. O. BOX 26029
GREENVILLE, SC 29616-1029

EXAMINER
MARTINEZ BORRERO, LUIS A

ART UNIT	PAPER NUMBER
3668	

MAIL DATE	DELIVERY MODE
08/07/2017	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 14/961,787	Applicant(s) LEONARD, CHARLES A.	
	Examiner LUIS A. MARTINEZ BORRERO	Art Unit 3668	AIA (First Inventor to File) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05/09/2017*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-5,7,10-16,18,20,22-29,38 and 43* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-5,7,10-16,18,20,22-29,38 and 43* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *02/16/2016* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

ETN1002

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DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Notice on Prior Art Rejections

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

Status of Claims

This Office Action is in response to the Applicant's amendments/remarks filed May 9, 2017. Claims 1, 2, 10, and 29 have been amended. Claims **1-5, 7, 10-16, 18, 20, 22-29, 38, and 43** are presently pending and are presented for examination.

Response to Arguments/Remarks

1. **Judicial Exception Claim Rejections - 35 USC § 101.** Applicant's arguments filed on May 9, 2017 with regard to the previous Judicial Exception Claim Rejections - 35 USC § 101 rejection have been fully considered. Applicant's arguments/amendments are persuasive. Accordingly, Judicial Exception Claim Rejections - 35 USC § 101 Rejection is withdrawn.

2. **Claim Rejections - 35 USC § 112**. Applicant's arguments filed on May 9, 2017 with regard to the previous Claim Rejections 35 USC § 112 as being incomplete for omitting essential steps, as reciting or depending upon a claim that recites limitations for which there are no antecedent basis, and as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor for claims 1-5, 7, 10-16, 18, 20, 22-29, 38, and 43 have been fully considered. Applicant's arguments/amendments are persuasive. Accordingly, Claim Rejections 35 USC § 112 as being incomplete for omitting essential steps Rejection is withdrawn.

3. **35 USC § 102 Rejection**. Applicant's arguments filed on May 9, 2017 with regard to the previous 35 USC § 102 rejection have been fully considered. Applicant's arguments, with respect to the previous 35 USC § 102 rejection are moot. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Solbrack et al, US 2015/0021866, presented in this Final Office Action.

Claim Rejections - 35 USC § 112

4. The following is a quotation of 35 U.S.C. 112(b):

> (B) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim **1** is rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as reciting or depending upon a claim that recites limitations for which there are no antecedent basis. In particular:

Claim 1 recite "the calculated change". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims **1-5, 7, 10-16, 18, 20, 22-29, 38, and 43** are rejected under 35 U.S.C 103 as being unpatentable over Thorpe et al, US 2008/0142768, in view of Solbrack et al, US 2015/0021866, hereinafter referred to as Thorpe and Solbrack, respectively.

As per Claim 1. Thorpe discloses a leveling system for leveling a vehicle that is at rest, the leveling system comprising:

- one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction (¶ 0038, via Level sensing means 38 comprises one or more tilt sensors that are configured to detect

the amount of pitch and roll of recreational vehicle), (¶ 0038, via In one configuration, level sensing means 38 comprises two separate tilt sensors, one positioned in the front/back direction for determining the pitch and one positioned in the left/right direction for determining the roll).

- a smart device in communication with the one or more sensor devices to allow information received from the one or more sensor devices about at least one of the inclination or the orientation of the vehicle in both the pitch direction and the roll direction to be processed to provide measurements to a user and to determine the amount of adjustments in height to at least one of a rear or front section or first or second side directions of the vehicle needed to level the vehicle, so that the vehicle is adjusted to obtain a level position based on the calculated change (¶ 8, via The foregoing patents are representative of leveling systems that require manual, independent determination of the amount of height adjustment needed to place the vehicle in the level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator), (See at least fig 2. ¶ 0040, via control unit 14 has a front cover 68 and back cover 70 that define control housing 72 enclosing a control chamber 74 in which is disposed the components that allow the user to control leveling

system 10 and communicate with the spaced apart level unit), (¶ 0040, via, Preferably, any such attachment mechanism is removable from the location where it is stored to allow the operator to utilize control unit 14 as a hand-held device so that he or she may stand outside recreational vehicle 16 during use of leveling system 10 to level recreational vehicle), (¶ 0040, via, control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition).

Thorpe fails to explicitly disclose each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensors devices relative to the vehicle to which the one or more sensor devices are secured.

However, Solbrack teaches each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensors devices relative to the vehicle to which the one or more sensor devices are secured (¶ 3, via Common techniques for sensing a slope include the use of accelerometers, liquid capacitive devices, electronic devices, electrolytic devices, devices that include a gas bubble in a liquid, and pendulum devices), (¶ 34, via the vehicle sensors 206, 208 are clinometers (inclinometers) configured to indicate a tilt (e.g., pitch, roll, etc.) of the vehicle 104. In other embodiments, the vehicle sensors 206, 208 may comprise one or more of an accelerometer, a

gyroscope, a liquid capacitive device, an electrolytic level device, a gas bubble in liquid device, a pendulum device, and the like), (¶ 29, via a vehicle 104 may be leveled by a leveling system 102 based on a first signal 202 representing a lateral force (i.e., tilt, roll) acting on the vehicle 104 and a second signal 204 representing a longitudinal force (i.e., pitch) acting on the vehicle 104. The first 202 and second 204 signals may be sent by one or more vehicle sensors (206, 208) associated with the vehicle 104, and received by a processing or control portion 210 of the leveling system).

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction of Thorpe and include each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensors devices relative to the vehicle to which the one or more sensor devices are secured as taught by Solbrack because it would allow the system to provide an independent leveling signal based on one or more of the multiple signals received from the leveling sensors to adjust a height of an individual wheel or a combination of wheels.

As per Claim 2. Thorpe discloses the system according to claim 1, wherein the circuit board further comprises a digital gyroscope (¶ 0012, via Although separate tilt sensors can be utilized, in the preferred embodiment the level sensing means is a dual-axis accelerometer that is configured to determine the tilt of the recreational vehicle in both the front-to-back and side-to-

side directions), (¶ 0038, via In a preferred embodiment of the present invention, however, level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 lowpower two-axis linear accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle).

As per Claim 3. Thorpe discloses the system according to claim 2, wherein the printed circuit board comprises a processor to process of data collected by the one or more sensor devices and to perform calculations related to the determination the amount of adjustments needed to at least one of the pitch direction or the roll direction to level the vehicle (¶ 0037, via These components include a circuit board 34, shown in FIGS. 9through12, having a controller 36 which is operatively connected to a level sensing means 38, power supply 40 and transmitter/ receiver or transceiver 42, including antenna 44. In a preferred embodiment, shown in the figures, the controller 36 includes transceiver 42), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).

As per Claim 4. Thorpe discloses the system according to claim 3, wherein the sensor device comprises a memory in communication with the processor of the PCB, the sensor device capable of storing information transmitted from the smart device (¶ 0039, via As shown on FIG. 9, the circuit boards 34 of level 12 and control 14 units also include a flash memory chip 60 to store data useful for the operation of leveling system), (¶ 0039, via The circuit board 34 shown in the figures also includes a memory chip connector 62 for programming the flash memory chip 60 with the manufacturer's computer control code and a diagnostic chip).

As per Claim 5. Thorpe discloses the system according to claim 5, wherein the sensor device uses data sensed by the sensor device and stored data obtained from the smart device to perform calculations on the sensor device and transmit the calculated data to the smart device (¶ 0038, via As shown in FIG. 11, the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information), (¶ 0011, via In the preferred embodiment of the present invention, the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle).

As per Claim 7. Thorpe discloses the system according to claim 2, wherein the smart device communicates with the printed circuit board of the sensor device (¶ 0012, via In the preferred embodiment, the controller and the transceiver is a single integrated unit that wireless transmits the data from the level sensing means to the control unit The level unit has having a level housing that encloses a controller, a level sensing means, a power supply and a transceiver mounted on a circuit board.), (¶ 0038, via As shown in FIG. 11, the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information).

As per Claim 10. Thorpe discloses a method for leveling a recreational vehicle, the method comprising:

- providing a leveling system comprising one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction and a smart device in communication with the one or more sensor devices (¶ 0038, via Level sensing means 38 comprises one or more tilt sensors that are configured to detect the amount of pitch and roll of recreational vehicle), (¶ 0038, via In one configuration, level sensing means 38 comprises two separate tilt sensors, one positioned in the front/back direction for determining the pitch and one positioned in the left/right direction for determining the roll).

- measuring the pitch angle and the roll angle of the vehicle when the vehicle is at rest using the sensor device (¶ 0036, via allow the components disposed in interior chamber 28 of level unit 12 to measure the pitch and roll tilt so that leveling system 10 can determine the adjustment necessary to neutralize that tilting), (¶ 0012, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition), (¶ 0044, via To level a recreational vehicle 16 having leveling system 10 after parking recreational vehicle 16 where desired).
- retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position (¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12

can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).

- calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle using the calibration data of pitch and roll angle measurements (¶ 8, via The foregoing patents are representative of leveling systems that require manual, independent determination of the amount of height adjustment needed to place the vehicle in the level condition), (¶ 0011, via the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition 20).
- displaying the calculated change in height to at least one of a rear or front section or first or second side sections of the vehicle in at least one of the pitch direction or the roll direction of the vehicle on the smart device (¶ 0040, via on FIG. 9, is used to switch control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition), (¶ 0038, via controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).

- adjusting the height to the at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle based on the calculated change (¶ 8, via The foregoing patents are representative of leveling systems that require manual, independent determination of the amount of height adjustment needed to place the vehicle in the level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator), (See at least fig 2. ¶ 0040, via control unit 14 has a front cover 68 and back cover 70 that define control housing 72 enclosing a control chamber 74 in which is disposed the components that allow the user to control leveling system 10 and communicate with the spaced apart level unit).

Thorpe fails to explicitly disclose each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensors devices relative to the vehicle to which the one or more sensor devices are secured.

However, Solbrack teaches each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensors devices relative to the vehicle to which the one or more sensor devices are secured (¶ 3, via Common techniques for sensing a slope include the use of accelerometers, liquid capacitive devices, electronic devices, electrolytic devices, devices that include a gas bubble in a liquid, and pendulum devices), (¶ 34, via the vehicle sensors 206, 208 are clinometers (inclinometers) configured to indicate a tilt (e.g., pitch, roll, etc.) of the vehicle 104. In other embodiments, the vehicle sensors 206, 208 may comprise one or more of an accelerometer, a gyroscope, a liquid capacitive device, an electrolytic level device, a gas bubble in liquid device, a pendulum device, and the like), (¶ 29, via a vehicle 104 may be leveled by a leveling system 102 based on a first signal 202 representing a lateral force (i.e., tilt, roll) acting on the vehicle 104 and a second signal 204 representing a longitudinal force (i.e., pitch) acting on the vehicle 104. The first 202 and second 204 signals may be sent by one or more vehicle sensors (206, 208) associated with the vehicle 104, and received by a processing or control portion 210 of the leveling system).

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction of Thorpe and include each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and Z-axis that permits calculation in both the pitch or roll direction regardless of

positioning of the respective one or more sensors devices relative to the vehicle to which the one or more sensor devices are secured as taught by Solbrack because it would allow the method to provide an independent leveling signal based on one or more of the multiple signals received from the leveling sensors to adjust a height of an individual wheel or a combination of wheels.

As per Claim 11. Thorpe discloses the method according to claim 10, further comprising: determining the initial level position for a vehicle to determine any inconsistencies inherent in the leveling system; and capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide the calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time (¶ 0011, via the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition).

As per Claim 12. Thorpe discloses the method according to claim 11, wherein the step of determining an initial level position comprises using at least one of an accelerometer, gyroscope, or global positioning system sensor on the smart device to achieve the initial level position (¶ 0012, via Although separate tilt sensors can be utilized, in the preferred embodiment the level sensing means is a dual-axis accelerometer that is configured to determine the tilt of the recreational vehicle in both the front-to-back and side-to-side directions), (¶ 0038, via In a preferred embodiment of the present invention, however, level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 lowpower two-axis linear accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle).

As per Claim 13. Thorpe discloses the method according to claim 11, wherein the step of determining an initial level position comprises using at least one of a digital level or spirit level can also be used to achieve the initial level position (¶ 0032, via control units of the leveling system of the present invention showing the circuitry utilized with the level unit to determine the levelness of the recreational vehicle), (¶ 0035, via A leveling system for recreational vehicles manufactured out of the materials and pursuant to the system of the present invention, shown as 10 in FIG. 2, generally comprises a level unit 12 and a separate control unit).

As per Claim 14. Thorpe discloses the method according to claim 11, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises communicating calibration data from the sensor device of the pitch and roll angle measurements

measured by the sensor device when the vehicle is at the initial level position to the smart device and saving the calibration data on the smart device (¶ 0011, via the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition 20).

As per Claim 15. Thorpe discloses the method according to claim 11, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises saving the calibration data of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position on the sensor device (¶ 0038, via As shown in FIG. 11, the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information), (¶ 0011, via In the preferred embodiment of the present invention, the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the

amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle).

As per Claim 16. Thorpe discloses the method according to claim 15, wherein the step of saving the calibration data of the pitch and roll angle measurements on the sensor device comprises transmitting instructions from the smart device to the sensor device to save and store the calibration data of the pitch and roll angle measurements on the sensor device and wherein the method further comprises recalling the calibration data of the pitch and roll angle measurements from the sensor device to the smart device (¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).

As per Claim 18. Thorpe discloses the method according to claim 11, wherein the step of determining an initial level position comprises receiving measurements of a length and a width of the vehicle (¶ 0040, via As shown in FIG. 6, display panel 90 can display the amount of pitch or roll in degrees and the amount in inches or other measurement units, based on a known length or width of recreational vehicle 16, that one end or side of the recreational vehicle 16 must be raised to place recreational vehicle 16 in level condition), (¶ 0044, via If desired, leveling system 10 can be adapted to include the length information for specific lengths of recreational vehicles 16 and/or to allow the operator to input the length into its operating system, such as at flash memory 60, by entering the data at control unit).

As per Claim 20. Thorpe discloses the method according to claim 10, wherein the step of displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle further comprises displaying the calculated change in the pitch direction and the roll direction of the vehicle in measurements of distance (¶ 0040, via on FIG. 9, is used to switch control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition), (¶ 0038, via controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).

As per Claim 22. Thorpe discloses the method according to claim 10, further comprising saving a given pitch angle measurement on at least one of the smart device or the sensor device to permit later recall for the purpose of returning the vehicle to the given pitch angle position at a

later time (¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).

As per Claim 23. Thorpe discloses the method according to claim 10, further comprising receiving data at the smart device from one or more vehicle control panels (¶ 0036, via In an alternative configuration, not shown, user accessible buttons and/or a display panel can be used with level unit 12 to allow the operator to directly access the operation of level unit), (¶ 0044, via In the preferred embodiment, battery monitoring circuit 61 of level 12 and control 14 units is configured to transmit battery level information to display panel 90 when the amount of power in batteries 40 or 86 reach a certain low level. Alternatively, leveling system 10 can also be

configured to such that the operator can access the battery level information by pushing the mode button 80 on control unit 14 when he or she desires to check the battery levels).

As per Claim 24. Thorpe discloses the method according to claim 23, wherein the received data from one or more vehicle control panels comprises at least one of data regarding holding tank levels or data regarding battery power levels (¶ 0036, via In an alternative configuration, not shown, user accessible buttons and/or a display panel can be used with level unit 12 to allow the operator to directly access the operation of level unit), (¶ 0044, via In the preferred embodiment, battery monitoring circuit 61 of level 12 and control 14 units is configured to transmit battery level information to display panel 90 when the amount of power in batteries 40 or 86 reach a certain low level. Alternatively, leveling system 10 can also be configured to such that the operator can access the battery level information by pushing the mode button 80 on control unit 14 when he or she desires to check the battery levels).

As per Claim 25. Thorpe discloses the method according to claim 23, further comprising displaying the data on the smart device that is generated and displayed on the one or more vehicle control panels (¶ 0036, via In an alternative configuration, not shown, user accessible buttons and/or a display panel can be used with level unit 12 to allow the operator to directly access the operation of level unit), (¶ 0044, via In the preferred embodiment, battery monitoring circuit 61 of level 12 and control 14 units is configured to transmit battery level information to display panel 90 when the amount of power in batteries 40 or 86 reach a certain low level. Alternatively, leveling system 10 can also be configured to such that the operator can access the

battery level information by pushing the mode button 80 on control unit 14 when he or she desires to check the battery levels).

As per Claim 26. Thorpe discloses the method according to claim 10, further comprising activating one or more systems on the vehicle with the smart device (¶ 0012, via The control unit also has a display panel for displaying the pitch and roll information received from the level unit and one or more operator accessible control buttons for activating and operating the leveling system.), (¶ 0044, via The operator first activates the control unit 14 by pushing the power button 78 to tum leveling system 10 to its on condition).

As per Claim 29. Thorpe discloses a non-transitory computer readable medium comprising computer executable instructions embodied in a computer readable medium that when executed by a processor of a computer control the computer to perform steps comprising:

- receiving on a smart device a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device (¶ 0036, via allow the components disposed in interior chamber 28 of level unit 12 to measure the pitch and roll tilt so that leveling system 10 can determine the adjustment necessary to neutralize that tilting), (¶ 0012, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition), (¶ 0044, via To level a recreational vehicle 16 having leveling system 10 after parking recreational vehicle 16 where desired).

- retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position (¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).
- calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle using the calibration data of pitch and roll angle measurements (¶ 8, via The foregoing patents are representative of leveling systems that require manual, independent determination of the amount of height adjustment needed to place the vehicle in the level condition), (¶ 0011, via the leveling

system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition 20).

- displaying the calculated change in height to at least one of the rear or front section or one or one of the first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device so that the height to at least one of the rear or front section or the first or second side sections of the vehicle is adjusted to obtain the level position of the vehicle based on the calculated change (¶ 0040, via on FIG. 9, is used to switch control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition), (¶ 0038, via controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).

Thorpe fails to explicitly disclose secured to the vehicle, the sensor devices comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective

one or more sensors devices relative to the vehicle to which the one or more sensor devices are secured.

However, Solbrack teaches secured to the vehicle, the sensor devices comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensors devices relative to the vehicle to which the one or more sensor devices are secured (¶ 3, via Common techniques for sensing a slope include the use of accelerometers, liquid capacitive devices, electronic devices, electrolytic devices, devices that include a gas bubble in a liquid, and pendulum devices), (¶ 34, via the vehicle sensors 206, 208 are clinometers (inclinometers) configured to indicate a tilt (e.g., pitch, roll, etc.) of the vehicle 104. In other embodiments, the vehicle sensors 206, 208 may comprise one or more of an accelerometer, a gyroscope, a liquid capacitive device, an electrolytic level device, a gas bubble in liquid device, a pendulum device, and the like), (¶ 29, via a vehicle 104 may be leveled by a leveling system 102 based on a first signal 202 representing a lateral force (i.e., tilt, roll) acting on the vehicle 104 and a second signal 204 representing a longitudinal force (i.e., pitch) acting on the vehicle 104. The first 202 and second 204 signals may be sent by one or more vehicle sensors (206, 208) associated with the vehicle 104, and received by a processing or control portion 210 of the leveling system).

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify receiving on a smart device a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device of Thorpe and include each of the one or more sensor devices comprising a printed circuit

board that comprises a digital accelerometer that uses an X-axis, Y-axis, and Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensors devices relative to the vehicle to which the one or more sensor devices are secured as taught by Solbrack because it would allow the medium to provide an independent leveling signal based on one or more of the multiple signals received from the leveling sensors to adjust a height of an individual wheel or a combination of wheels.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims **27, 28, 38, and 43** are rejected under 35 U.S.C 103 as being unpatentable over Thorpe in view of Solbrack as presented in claims 1, 10 and 29, further in view of Howarter et al. US 2012/0208520, hereinafter referred to as Howarter, respectively.

As per Claim 27. Thorpe discloses the method according to claim 26, wherein the one or more systems activated via the software application of the smart device (¶ 0012, via The control unit also has a display panel for displaying the pitch and roll information received from the level unit and one or more operator accessible control buttons for activating and operating the leveling

system.), (¶ 0044, via The operator first activates the control unit 14 by pushing the power button 78 to tum leveling system 10 to its on condition).

Thorpe fails to explicitly disclose comprise at least one of lighting systems, entertainment systems, power slide outs or a generator.

However, Howarter teaches comprise at least one of lighting systems, entertainment systems, power slide outs or a generator (¶ 0019 via The vehicle 106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0031, via The user interface 208 may include the other controls or systems for managing systems of the vehicle which may include the stereo, entertainment system, temperature controls, driving controls, and other elements of the vehicle).

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify wherein the one or more systems activated via the software application of the smart device of Thorpe and include comprise at least one of lighting systems, entertainment systems, power slide outs or a generator as taught by Howarter because it would allow the method to provide support to the user to configure and control the different features and elements managed by the vehicle control systems via a cell phone.

As per Claim 28. Thorpe discloses the method according to claim 10.

Thorpe fails to explicitly disclose collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

However, Howarter teaches collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device (¶ 0019 via The vehicle 106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0020, via the vehicle system includes a GPS or other navigation systems. The GPS may be utilized to determine the location of the vehicle 106. The GPS may also receive data or information from the cell phone 104 in order to determine the location and direction of travel of the cell phone and an associated user).

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle on the smart device of Thorpe and include collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device as taught by Howarter because it would allow the method to provide information to the user with respect to the location of the vehicle and the location and direction of travel of the cell phone and an associated user to determine the exact or approximate distance between the cell phone and the vehicle.

As per Claim 38. Thorpe discloses the non-transitory computer readable medium according to claim 29.

Thorpe fails to explicitly disclose receiving data at the smart device from one or more vehicle control panels.

However, Howarter teaches receiving data at the smart device from one or more vehicle control panels (¶ 0019 via The vehicle 106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0031, via The user interface 208 may include the other controls or systems for managing systems of the vehicle which may include the stereo, entertainment system, temperature controls, driving controls, and other elements of the vehicle).

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device of Thorpe and include receiving data at the smart device from one or more vehicle control panels as taught by Howarter because it would allow the method to provide support to the user to configure and control the different features and elements managed by the vehicle control systems via a cell phone.

As per Claim 43. Thorpe discloses the non-transitory computer readable medium according to claim 29.

Thorpe fails to explicitly disclose collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

However, Howarter teaches collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device (¶ 0019 via The vehicle

106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0020, via the vehicle system includes a GPS or other navigation systems. The GPS may be utilized to determine the location of the vehicle 106. The GPS may also receive data or information from the cell phone 104 in order to determine the location and direction of travel of the cell phone and an associated user).

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device of Thorpe and include collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device as taught by Howarter because it would allow the method to provide information to the user with respect to the location of the vehicle and the location and direction of travel of the cell phone and an associated user to determine the exact or approximate distance between the cell phone and the vehicle.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUIS A. MARTINEZ BORRERO whose telephone number is (571)272-4577. The examiner can normally be reached on Mon thru Thur 7:30 am to 5:00 pm Eastern time, with 1st Fri off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fadey S. Jabr can be reached on 571-272-1516. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L. A. M./
Examiner, Art Unit 3668

/JELANI SMITH/
Primary Examiner, Art Unit 3662

Notice of References Cited	Application/Control No. 14/961,787	Applicant(s)/Patent Under Reexamination LEONARD, CHARLES A.	
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Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14961787	LEONARD, CHARLES A.
	Examiner	**Art Unit**
	LUIS A MARTINEZ BORRERO	3668

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/06/2016	08/01/2017							
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	2	✓	✓							
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CLAIM		DATE								
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1841	(vehicle or car or automobile) with (inclination or orientation) with accelerometer	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:13
L2	1054	1 and ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:14
L3	80	1 with ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:14
L4	22	3 and ((adjust$3 or alter$3 or chang$3 or modif$4) near3 (level$3 or orientation or inclination))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:17
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L6	0	lavel$3 with vehicle with tilt	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:21
L7	1259	level$3 with vehicle with tilt	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:22
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L16	14	("2001/0005803").URPN.	USPAT	OR	ON	2017/08/01 08:32
L17	11	(pitch near3 roll) with level$3 with balance	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:36
L18	27	("20020050699" | "20050098975" | "20050116437" | "20050206149" | "20090057048" | "20120166043" | "20130147140" | "20130147141" | "20130147142" | "20150001829" | "20150291233" | "4266627" | "4397473" | "4600069" | "4760686" | "4850786" | "5018453" | "5288101" | "5700025" |	US-PGPUB; USPAT; USOCR	OR	ON	2017/08/01 08:39

		"5865444" | "5896731" | "6367831" | "7416201" | "7866671" | "7914020" | "8408559" | "9168940").PN. OR ("9409459").URPN.				
L19	20	("5062658" | "5071157" | "5119297" | "5322318" | "5322320" | "5377107" | "5438514" | "5442554" | "5475593" | "5488562" | "5510986" | "5563789").PN. OR ("5864768").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2017/08/01 08:58
L20	315	(("LEONARD") near3 ("Charles")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/08/01 08:58
L21	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone or cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 09:04
L22	2336	(pitch near3 roll) with level$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:05
L23	351	22 and (axis near3 accelerometer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:05
L24	204	23 and ((adjust$3 or alter$3 or chang$3 or modif$4) near3 (level$3 or orientation or inclination))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:06
L25	98	24 and (z near3 axis)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:06
L26	7	25 and ((adjust$3 or alter$3 or chang$3 or modif$4) near3 (height))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:08
L27	20	((pitch near3 roll) near6 (axis near3 accelerometer)) with (vehicle car or automobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:11
L28	110	(vehicle car or automobile) with (level$3) with ((all or multi or three) near3 axis)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:21

L29	2	28 and ((adjust$3 or alter$3 or chang$3 or modif$4) near3 (height))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:21
L30	0	28 and ((adjust$3 or alter$3 or chang$3 or modif$4) near5 ((vehicle car or automobile) adj (height)))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:23
L31	26	(vehicle car or automobile) and (level$3) and ((all or multi or three) near3 axis) and ((adjust$3 or alter$3 or chang$3 or modif$4) near5 ((vehicle car or automobile) adj (height)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:24
L32	15	(vehicle or car or automobile) same (adjust$5) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 15:06
S1	0	((vehicle or car or automobile) near4 (lavel$3)) with ((sens$4 or detect$3) near5 (inclinat$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 10:57
S2	0	((vehicle or car or automobile) near4 (lavel$4)) and ((sens$4 or detect$3) near5 (inclinat$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 10:57
S3	1252	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 10:58
S4	25	S3 AND ((B60T8/172 OR B60T2201/04 OR B60T2210/14 OR B60T2210/16 OR B60T2220/04 OR B60T2260/06 OR B60T7/12 OR B60T8/175 OR B60T11/22 OR B60T11/26 OR B60T13/741 OR B60T2210/12 OR B60T2230/00 OR B60T2250/06 OR B60T7/085 OR B60T7/107 OR B60T7/122 OR B60T8/32 OR G05D1/0088 OR G05D1/0257 OR G05D1/0891 OR G05D1/0016 OR G05D1/0061 OR G05D1/0231 OR G05D1/0236 OR G05D1/024 OR G05D1/0251 OR G05D1/0255 OR G05D1/027 OR G05D1/048 OR G05D2201/0213 OR G05D2201/0216).CPC. AND (701/22 OR 701/37 OR 701/112 OR 701/2 OR 701/23 OR 701/21 OR 701/29.1 OR 701/49 OR 701/70 OR 701/93 OR 701/96 OR 701/99 OR 701/1 OR 701/101 OR 701/102 OR 701/123 OR 701/300 OR 701/30.8 OR 701/32.4 OR 701/33.1 OR 701/36 OR 701/41 OR 701/468 OR 701/48 OR 701/50 OR 701/519 OR 701/54 OR 701/60 OR 701/65 OR 701/71 OR 701/82	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:00

		OR 701/91 OR 701/94).CCLS. AND (G05D1/00 OR G05D1/02 OR G05D1/04 OR G05D1/08 OR B60T7/12 OR B60T8/172 OR B60T11/22 OR B60T11/26 OR B60T8/32).IPCR.)				
S5	5	S4 and inclinat$3 and sensor and pitch and roll	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:02
S6	145	S3 and inclinat$3 and sensor and pitch and roll	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:07
S7	66	("6554293").URPN.	USPAT	OR	ON	2016/12/05 11:09
S8	2	((vehicle or car or automobile) near4 (level$4)) with ((sens$4 or detect$3) near5 (inclinat$4)) with (accelerometer or gyroscope)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:25
S9	2	((vehicle or car or automobile) near4 (level$4)) with ((sens$4 or detect$3) near5 (inclinat$4)) with (accelerometer or gyroscope) with ((smart adj device) or device or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:32
S10	278	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:33
S11	134	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone) and wireless	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:35
S12	19	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone) and wireless and roll and pitch and adjust$3 and display$3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:36
S13	518	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclination or orientation)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone) and roll and pitch and adjust$3 and display$3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:42
S14	29	S13 AND ((B60W40/09 OR B60W50/08 OR B60W2540/18 OR B60W2040/0809 OR B60W2540/00 OR B60W2540/12 OR B60W2540/30 OR B60W50/10 OR B60W50/14 OR B60W2050/146 OR B60W2520/16 OR B60W2520/18 OR B60W40/06 OR B60W40/076 OR B60W2420/54 OR B60W2520/10 OR	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:44

		B60W2550/14 OR B60W2550/142 OR B60W2550/147 OR B60W2520/26 OR B60W10/10 OR B60W10/18 OR B60W10/20 OR B60W2050/0077 OR B60W2520/04 OR B60W2540/20 OR B60W2540/28 OR B60W2550/12 OR B60W2550/141 OR B60W2550/20 OR B60W2550/402 OR B60W2550/406 OR B60W2710/30 OR B60W2720/10 OR B60W2720/28 OR B60W2720/30 OR B60W30/143 OR B60W30/18009 OR B60W30/18172 OR B60W40/02 OR B60W40/08 OR B60W40/10 OR B60W40/101 OR B60W40/103 OR B60W50/0098 OR G05D1/0891 OR G05D1/0027 OR G05D1/0212 OR G05D23/1917 OR G05D1/0274 OR G05D1/027 OR G05D1/0278 OR G05D1/0287 OR G05D2201/02 OR G05D2201/0201 OR G05D2201/0202 OR G05D1/0227 OR G05D1/0088 OR G05D1/0011 OR G05D1/0016 OR G05D1/0061 OR G05D1/0038 OR G05D1/0225 OR G05D1/0238 OR G05D1/024 OR G05D1/0242 OR G05D1/0251 OR G05D1/0255 OR G05D1/028 OR G05D1/102 OR G05D2201/0211 OR G05D2201/0213 OR B60T2201/04 OR B60T2210/14 OR B60T2210/16 OR B60T2220/04 OR B60T2230/00 OR B60T2260/06 OR B60T8/175).CPC. AND (701/2 OR 701/36 OR 701/1 OR 701/408 OR 701/41 OR 701/25 OR 701/29.1 OR 701/31.9 OR 701/32.4 OR 701/37 OR 701/400 OR 701/50 OR 701/93 OR 701/21 OR 701/22 OR 701/23 OR 701/26 OR 701/3 OR 701/31.5 OR 701/33.2 OR 701/34.4 OR 701/409 OR 701/420 OR 701/469 OR 701/500 OR 701/534 OR 701/537 OR 701/70 OR 701/91).CCLS. AND (G05D1/08 OR G05D1/02 OR G05D1/00 OR G05D1/04 OR G05D23/19 OR B60W30/14 OR B60W40/06 OR B60W40/09 OR B60W10/10 OR B60W10/18 OR B60W10/20 OR B60W30/18 OR B60W40/02 OR B60W40/076 OR B60W40/08 OR B60W40/10 OR B60W40/101 OR B60W40/103 OR B60W50/00).IPCR.)				
S15	27	"4216939"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:51
S16	3	("7294797").URPN.	USPAT	OR	ON	2016/12/05 12:13
S17	1	("8757637").URPN.	USPAT	OR	ON	2016/12/05 12:14
S18	16	("20110024706" | "3332669" | "3454251" | "3825279" | "3857582" | "4061309" | "4216939" | "4940110" | "5176391" | "5727767" | "6142488" | "8690128" |	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:14

		"8757637" | "8840144").PN. OR ("9156441").URPN.				
S19	1	("8840144").URPN.	USPAT	OR	ON	2016/12/05 12:16
S20	44	("20050127341" | "20060017241" | "20060081755" | "20070114734" | "20070284499" | "20070289439" | "20080217898" | "20090102176" | "20090200782" | "20110163523" | "20110169231" | "20120299279" | "20130074377" | "2924463" | "2979304" | "3253839" | "3367614" | "3475008" | "3558092" | "3642242" | "3690694" | "3801128" | "3823958" | "3933372" | "3989277" | "4268066" | "4461491" | "4708362" | "5575492" | "5628521" | "6089603" | "6142488" | "6224102" | "6331016" | "6494487" | "6827335" | "7226057" | "7338052").PN. OR ("8840144").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:16
S21	31	("3454251" | "3475008" | "3656778" | "3709518" | "3767226").PN. OR ("3933372").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:17
S22	38	("1540753" | "3186570" | "3324613" | "3367614").PN. OR ("4268066").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:17
S23	45	("2924463" | "3306629" | "3933372" | "4231044" | "4429851" | "4708362" | "4905953").PN. OR ("5575492").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:17
S24	47	("1539974" | "20020053794" | "2747836" | "3310181" | "3345038" | "3475008" | "3565396" | "3767226" | "3826470" | "3854750" | "3870276" | "3989277" | "4103869" | "4146250" | "4148461" | "4515520" | "4955450" | "5042779" | "5205586" | "5348330" | "5488788" | "5501428" | "5547220" | "5901980" | "6089603" | "6102438" | "6224102").PN. OR ("6494487").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:19
S25	94	((vehicle or car or automobile) near4 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or device or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:20
S26	6132	((vehicle or car or automobile) near4 (level$4 or stabilizat$3)) same ((smart adj device) or phone or cell or cellphone or mobile)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:26
S27	2491	((vehicle or car or automobile) near4 (level$4 or stabilizat$3)) near10 ((smart adj device) or phone or cell or cellphone or mobile)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:26
S28	49	S27 and sensor and pitch and roll	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:27
S29	3	((vehicle or car or automobile) near6	US-PGPUB;	OR	ON	2016/12/05

		(level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone cell or cellphone)	USPAT; EPO; JPO; DERWENT; IBM_TDB			12:33
S30	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone or cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:33
S31	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone or cell or cellphone or pda)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:33
S32	11	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) same ((sens$4 or detect$3) near5 (inclination or orientation)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:36
S33	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:39
S34	43	((vehicle or car or automobile) near6 (level$4 or stabilizat$3 or inclinat$4)) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:41
S35	2	(vehicle or car or automobile) same (park$3 near8 (level$4 or stabilizat$3 or inclinat$4)) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:45
S36	15	(vehicle or car or automobile) same (adjust$5) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:48
S37	23284	(vehicle or car or automobile) same ((adjust$5) near5(level$3 or inclination or tilt$3))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:52
S38	4438	S37 and ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:52
S39	130	S38 and (sens$3 near5 (pitch and roll))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:53
S40	92815	S39 and accelerometer or gyroscope	US-PGPUB; USPAT;	OR	ON	2016/12/05 12:54

			EPO; JPO; DERWENT; IBM_TDB			
S41	51	S39 and accelerometer and gyroscope	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:54
S42	271	(vehicle or car or automobile) same ((adjust$5) near5 (level$3 or inclination or tilt$3)) same parking	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:57
S43	5	("2008/0142768").URPN.	USPAT	OR	ON	2016/12/05 13:05
S44	22	"6921100"	USPAT	OR	ON	2016/12/05 13:11
S45	5	"20070103289"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 13:15
S46	27	("4353565" | "5167289" | "5476277" | "5780782" | "5863057" | "6203045").PN. OR ("6921100").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:32
S47	36	("20020038193" | "4103752" | "4639872" | "4651838" | "4706768" | "4836308" | "4852674" | "4854407" | "4941365" | "5040826" | "5167289" | "5314201" | "5526702" | "5606516" | "5617072" | "5626356" | "5803502" | "5915713" | "6032090" | "6037550" | "6157889" | "6242701" | "6252497" | "6307164" | "6308131" | "6357777" | "6363331" | "6459367" | "6921100").PN. OR ("7072763").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:32
S48	33	("20060100979" | "20070180719" | "20070245579" | "20080142768" | "2155876" | "3181203" | "3258884" | "3260564" | "3417518" | "3866365" | "4232488" | "4568096" | "4572527" | "4743037" | "4746133" | "4784400" | "5078442" | "5136784" | "5159989" | "5176391" | "5188379" | "5676385" | "5806196" | "6176495" | "6526668" | "7025361").PN. OR ("7786883").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:34
S49	16	("20020027346" | "20020030592" | "20030191568" | "20030231118" | "20060064223" | "20080142768" | "5008647" | "6009356" | "6326613" | "6356812" | "6366840" | "6408232" | "6472979" | "6629032" | "6662642").PN. OR ("7584026").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:35
S50	17	("2454896" | "3219972" | "3820065" | "3835279" | "3922638" | "4101868" | "4145681").PN. OR ("4288777").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:37
S51	1	"20060113783"	US-PGPUB	OR	ON	2016/12/05 13:39

S52	3	"20150025789"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:03
S53	0	S52 and (trajectory near5 comparison)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:04
S54	2	S52 and (trajectory near10 comparison)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:05
S55	3	"20120206597"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:08
S56	776	((smart adj device) or phone or cell or cellphone or pda or (personal adj computer) or (mobile adj device) or (mobile near3 phone)) near10 ((activat$3 or turnon or control$4) near5 ((vehicle or car or automobile) adj (systems or navigation or gps)))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 13:53
S57	30	S56 and (suspension near4 Control$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 13:54
S58	41	(((smart adj device) or phone or cell or cellphone or pda or (personal adj computer) or (mobile adj device) or (mobile near3 phone)) near10 ((activat$3 or turnon or control$4) near5 ((vehicle or car or automobile) adj (systems or navigation or gps)))) with application	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 13:58
S59	17	S58 and gps and (position or location)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 15:08
S60	3	"20120208520"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 15:10
S61	1	"20120208520"	US-PGPUB	OR	ON	2016/12/06 15:10

EAST Search History (Interference)

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8/1/2017 3:08:30 PM
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ETN1002
241/655

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14961787	LEONARD, CHARLES A.
	Examiner	Art Unit
	LUIS A MARTINEZ BORRERO	3668

CPC- SEARCHED		
Symbol	Date	Examiner
G05D1/0891, 1/0016, 1/0236, 1/0251, 1/0255, 1/027,	12/7/2016	/L.A.M./
B60W2540/28, 2550/141, 2550/402, 2710/30, 2550/406, 2720/30,	12/7/2016	/L.A.M./
G05D1/0274, 1/0278, 1/0287, 2201/0201, 1/0858,	8/1/2017	/L.A.M./
B60G2204/127, 2204/4232, 2204/83022, 2500/30, 2600/73,	8/1/2017	/L.A.M./

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
701	22, 37, 112, 2, 23, 21, 123, 1, 101, 102, 50, 60,	12/7/2016	/L.A.M./
701	2, 49, 1, 19, 23, 25, 3, 41, 50,	8/1/2017	/L.A.M./

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES		
Search Notes	Date	Examiner
East Search	12/7/2016	/L.A.M./
Google Patent Search	12/7/2016	/L.A.M./
East Search	8/1/2017	/L.A.M./
Consulted with primary Jelani smith (101, 112, patentability),	8/1/2017	/L.A.M./

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

/LUIS A MARTINEZ BORRERO/ Examiner.Art Unit 3668	

PTO/SB/30 (07-09)
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Request for Continued Examination (RCE) Transmittal

Address to:
Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	14/961,787
Filing Date	12/7/2015
First Named Inventor	Leonard
Art Unit	3668
Examiner Name	Martinez Borrero, Luis A.
Attorney Docket Number	LEO-2

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.

Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

1. Submission required under 37 CFR 1.114 Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).
   a. [ ] Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.
      i. [ ] Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
      ii. [ ] Other _____
   b. [X] Enclosed
      i. [X] Amendment/Reply
      ii. [ ] Affidavit(s)/Declaration(s)
      iii. [ ] Information Disclosure Statement (IDS)
      iv. [ ] Other _____

2. Miscellaneous
   a. [ ] Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)
   b. [ ] Other _____

3. Fees The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.
   a. [X] The Director is hereby authorized to charge the following fees, any underpayment of fees, or credit any overpayments, to Deposit Account No. 50-3172.
      i. [ ] RCE fee required under 37 CFR 1.17(e)
      ii. [ ] Extension of time fee (37 CFR 1.136 and 1.17)
      iii. [ ] Other _____
   b. [X] Check in the amount of $ 600.00 enclosed
   c. [ ] Payment by credit card (Form PTO-2038 enclosed)

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Signature		Date	6.2.016
Name (Print/Type)	David M. Saimon	Registration No.	62224

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I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner For Patents, P.O. Box 1450, Alexandria, VA 22313-1450 or facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

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This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Leonard

Group Art Unit: 3668

Serial No.: 14/961,787

Examiner: Martínez Borrero, Luis A.

Filed: December 7, 2015

Docket No.: LEO-2

Confirmation No.: 8904

For: VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES

* *

AMENDMENT B

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is responsive to the Office Action dated August 7, 2017, 2016 for which a shortened statutory period for reply has been extended until January 8, 2018. Favorable consideration is respectfully requested in view of the following Amendments and Remarks.

IN THE CLAIMS:

Please amend the claims as follows:

1. (Currently Amended) A leveling system for leveling a vehicle that is at rest, the leveling system comprising:

one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction, each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured and a processor to process data collected by the respective sensor device; and

a smart device in communication with the one or more sensor devices to allow information received from the one or more sensor devices about at least one of the inclination or the orientation of the vehicle in both the pitch direction and the roll direction to be processed to provide measurements to a user and to determine an amount of adjustments in height to at least one of a rear or front section or first or second side sections of the vehicle needed to level the vehicle, so that the vehicle is adjusted to obtain a level position based on [[the]] a calculated change from the determination of the amount of adjustments in height.

2. (Previously Presented) The system according to claim 1, wherein the printed circuit board further comprises a digital gyroscope.

3. (Currently Amended) The system according to claim [[2]] 1, wherein the ~~printed circuit board comprises a~~ processor ~~to process of data collected by the one or more sensor devices and to perform~~ performs calculations related to the determination the amount of adjustments needed to at least one of the pitch direction or the roll direction to level the vehicle.

4. (Original) The system according to claim 3, wherein the sensor device comprises a memory in communication with the processor of the PCB, the sensor device capable of storing information transmitted from the smart device.

5. (Currently Amended) The system according to claim [[5]] 4, wherein the sensor device uses data sensed by the sensor device and stored data obtained from the smart device to perform calculations on the sensor device and transmit the calculated data to the smart device.

6. (Canceled)

7. (Currently Amended) The system according to claim [[2]] 1, wherein the smart device communicates with the printed circuit board of the sensor device.

8-9. (Canceled)

10. (Previously Presented) A method for leveling a recreational vehicle, the method comprising:

providing a leveling system comprising one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction and a smart device in communication with the one or more sensor devices, each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured;

measuring the pitch angle and the roll angle of the vehicle when the vehicle is at rest using the sensor device;

retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position;

calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle using the calibration data of pitch and roll angle measurements;

displaying the calculated change in the height to the at least one of the rear or front section or the first or second side sections of the vehicle in at least one of the pitch direction or the roll direction of the vehicle on the smart device; and

adjusting the height to the at least one of the rear or front section or the first or second side sections of the vehicle to obtain the level position of the vehicle based on the calculated change.

11. (Original) The method according to claim 10, further comprising:

determining the initial level position for a vehicle to determine any inconsistencies inherent in the leveling system; and

capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide the calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time.

12. (Original) The method according to claim 11, wherein the step of determining an initial level position comprises using at least one of an accelerometer, gyroscope, or global positioning system sensor on the smart device to achieve the initial level position.

13. (Canceled)

14. (Original) The method according to claim 11, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises communicating calibration data from the sensor device of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position to the smart device and saving the calibration data on the smart device.

15. (Original) The method according to claim 11, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises saving the calibration data of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position on the sensor device.

16. (Previously Presented) The method according to claim 15, wherein the step of saving the calibration data of the pitch and roll angle measurements on the sensor device comprises transmitting instructions from the smart device to the sensor device to save and store the calibration data of the pitch and roll angle measurements on the sensor device and wherein the method further comprises recalling the calibration data of the pitch and roll angle measurements from the sensor device to the smart device.

17. (Canceled)

18. (Original) The method according to claim 11, wherein the step of determining an initial level position comprises receiving measurements of a length and a width of the vehicle.

19. (Canceled)

20. (Original) The method according to claim 10, wherein the step of displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle

further comprises displaying the calculated change in the pitch direction and the roll direction of the vehicle in measurements of distance.

21. (Canceled)

22. (Original) The method according to claim 10, further comprising saving a given pitch angle measurement on at least one of the smart device or the sensor device to permit later recall for the purpose of returning the vehicle to the given pitch angle position at a later time.

23. (Original) The method according to claim 10, further comprising receiving data at the smart device from one or more vehicle control panels.

24. (Original) The method according to claim 23, wherein the received data from one or more vehicle control panels comprises at least one of data regarding holding tank levels or data regarding battery power levels.

25. (Original) The method according to claim 23, further comprising displaying the data on the smart device that is generated and displayed on the one or more vehicle control panels.

26. (Original) The method according to claim 10, further comprising activating one or more systems on the vehicle with the smart device.

27. (Original) The method according to claim 26, wherein the one or more systems activated via the software application of the smart device comprise at least one of lighting systems, entertainment systems, power slideouts or a generator.

28. (Original) The method according to claim 10, further comprising collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

29. (Previously Presented) A non-transitory computer readable medium comprising computer executable instructions embodied in a computer readable medium that when executed by a processor of a computer control the computer to perform steps comprising:

receiving on a smart device a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device secured to the vehicle, the sensor device comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective device relative to the vehicle to which the one or more sensor devices are secured;

retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position;

calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in

at least one of a pitch direction or a roll direction of the vehicle using the calibration data of the pitch and roll angle measurements; and

displaying the calculated change in height to at least one of the rear or front section or one of the first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device so that the height to at least one of the rear or front section or the first or second side sections of the vehicle is adjusted to obtain the level position of the vehicle based on the calculated change.

30-37. (Canceled)

38. (Original) The non-transitory computer readable medium according to claim 29, further comprising receiving data at the smart device from one or more vehicle control panels.

39-42. (Canceled)

43. (Original) The non-transitory computer readable medium according to claim 29, further comprising collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

44. (New) The system according to claim 1, wherein the printed circuit board further comprises a digital temperature sensor to collect temperature data to be used by the processor of the printed circuit board to correct irregularities in the data obtained by the respective sensor device based on temperature variations.

REMARKS

Status Summary

Claims 1-5, 7, 10-16, 18, 20, 22-29, 38, and 43 are pending in the present application. Claims 1-5, 7, 10-16, 18, 20, 22-29, 38, and 43 presently stand rejected. With this Amendment, claims 1, 3, 5 and 7 have been amended. Claim 13 has been canceled and claim 44 has been added. Support for new claim 44 can be found throughout the application as originally filed, including pages 12-13, 17 and 25. Thus, upon entry of this Amendment, claims 1-5, 7, 10-12, 14-16, 18, 20, 22-29, 38, and 43-44 will be pending. Reconsideration of the application in view of the arguments below is respectfully requested.

Claim Rejection - 35 U.S.C. § 112

Claim 1 stands rejected under 35 U.S.C. §112(b) as being as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant respectfully submits that, with the amendments above, the concerns expressed in the Office Action regarding claim 1 has been addressed. Therefore, Applicant respectfully requests that the Examiner withdraw the rejection of claim 1 under 35 U.S.C. §112(b).

Claim Rejection - 35 U.S.C. § 103

Claims 1-5, 7, 10-16, 18, 20, 22-29, 38, and 43 stand rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent Publication No. 2008/0142768 to Thorpe, et al. (hereinafter, "Thorpe") in view of U.S. Patent Publication No. 2015/021866 to

Solbrack, et al. (hereinafter, "Solbrack"). Claims 27, 28, 38, and 43 stand rejected under 35 U.S.C. § 103 as being unpatentable over Thorpe and Solbrack in view of U.S. Patent Publication No. 2012/0208520 to Howarter (hereinafter, "Howarter"). These rejections are respectfully traversed.

Independent claim 1 recites a leveling system for leveling a vehicle that is at rest. The leveling system comprises one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction. Each of the one or more sensor devices comprises a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured. The leveling system also comprises a smart device in communication with the one or more sensor devices to allow information received from the one or more sensor devices about at least one of the inclination or the orientation of the vehicle in both the pitch direction and the roll direction to be processed to provide measurements to a user and to determine an amount of adjustments in height to at least one of a rear or front section or first or second side sections of the vehicle needed to level the vehicle, so that the vehicle is adjusted to obtain a level position based on the calculated change.

Independent claim 10 recites a method for leveling a recreational vehicle, the method comprising the step of providing a leveling system comprising one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction and a smart device

in communication with the one or more sensor devices. Each of the one or more sensor devices comprises a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured. The method also comprises the steps of measuring the pitch angle and the roll angle of the vehicle when the vehicle is at rest using the sensor device and retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position. Further the method comprises the step of calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle using the calibration data of pitch and roll angle measurements. Additionally, the method comprises the steps of displaying the calculated change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle on the smart device. Further, the method comprises the steps of adjusting the height to the at least one of the rear or front section or the first or second side sections of the vehicle to obtain the level position of the vehicle based on the calculated change.

Independent claim 29 recites a non-transitory computer readable medium comprising computer executable instructions embodied in a computer readable medium that when executed by a processor of a computer control the computer to perform steps comprising receiving on a smart device a pitch angle measurement and a roll angle

measurement of a vehicle when the vehicle is at rest from a sensor device secured to the vehicle. The sensor device comprises a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective device relative to the vehicle to which the one or more sensor devices are secured. The computer executable instructions embodied in a computer readable medium also comprise retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position and calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of a pitch direction or a roll direction of the vehicle using the calibration data of the pitch and roll angle measurements. Further, the computer executable instructions embodied in a computer readable medium comprises displaying the calculated change in height to at least one of the rear or front section or one of the first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device so that the height to at least one of the rear or front section or the first or second side sections of the vehicle is adjusted to obtain the level position of the vehicle as needed based on the calculated change.

Applicant respectfully submits that Thorpe and Solbrack, either alone or combination, do not render obvious independent claims 1, 10, and 29 or the claims that depend therefrom. In particular, Thorpe and/or Solbrack do not disclose, teach, or suggest all the features of independent claims 1, 10, and 29. For example, Thorpe and

Solbrack do not disclose, teach, or suggest one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction where each of the one or more sensor devices comprises a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured as recited in claims 1, 10 and 29.

Thorpe discloses a leveling system for use with recreational vehicles having one or more leveling mechanisms to level the vehicle in the side-to-side and front-to-back directions. The system comprises a level unit that is placed on a generally horizontal surface inside the vehicle and a control unit which is in spaced apart relation to the level unit. Both units have a controller and transceiver for wireless communication with the other unit and one or more batteries as the power supply. The level unit has one or more level sensing mechanisms to determine the pitch and roll of the vehicle. Preferably, a single dual-axis tilt measuring mechanism is utilized. The control unit has one or more control buttons to allow the operator to activate and operate the system and a display panel that displays the amount of pitch and roll correction necessary to place the recreational vehicle in its level condition.

The leveling system as taught in Thorpe uses a dual-axis accelerometer that requires the level unit to be secured to a horizontal surface. (See Thorpe, p. 2, Para. [0012].) As taught by Thorpe, because of two-axis accelerometers, such leveling units need to be placed on horizontal surface of the recreational vehicle. Due to size and

space constraints, horizontal surfaces are of premium value in recreational vehicles. Therefore, the leveling unit as disclosed and taught in Thorpe requires the owner/operator to use value flat horizontal surface space on a recreational vehicle.

Solbrack does not overcome the significant deficiencies outlined above with regard to Thorpe. Solbrack discloses devices and techniques for providing leveling for a vehicle, such as an overland vehicle. A leveling signal is received by a leveling arrangement coupled to the vehicle at a wheel position. The leveling arrangement rotates a rocker plate with respect to the body of the vehicle, changing a location of a wheel coupled to the rocker plate with respect to the body of the vehicle. In an aspect, the leveling signal is based on a first vehicle sensor signal representing a lateral tilt of the vehicle and/or a second vehicle sensor signal representing a pitch angle of the vehicle.

Thus, Solbrack teaches a system that requires the use of two sensors: a first sensor for the lateral tilt of the vehicle and a second sensor for the pitch angle of the vehicle. While Solbrack discloses the use of the use of accelerometers, liquid capacitive devices, electronic devices, electrolytic devices, devices that include a gas bubble in a liquid, and pendulum devices for sensors, Solbrack does not disclose, teach, or suggest the use of a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices. Otherwise, the system in Solbrack would not require or need two sensors with one sensor for the lateral tilt of the vehicle and the other sensor for the pitch angle of the vehicle. It appears that the accelerometers referenced in Solbrack are no different from

the dual accelerometers set forth in Thorpe. Therefore, Solbrack does not overcome the significant shortcomings of Thorpe as set forth above.

By using a three axis accelerometer as recited above in claims 1, 10, and 29 of the present application, the owner/operator of a vehicle, such as recreational vehicle is free to install the sensor on any surface. For example, because the sensor device as recited claims 1 and 10 comprise a 3-axis accelerometer allows for an installation orientation that is unrestricted, the sensor can be secured on a vertical surface in the vehicle that is available and unintrusive while still operating to provide proper measurements for adjustments to be made to the vehicle to obtain a level position. Thorpe and Solbrack do not disclose, teach, or suggest such a sensor, leveling system, method, or computer readable medium.

Further, regarding claim 1, Solbrack teaches that the sensors **206**, **208** are separate and positioned away (preferable at or near the wheels) from leveling module **212** that is a part of or in communication with the processor/controller **210**. Signals **202**, **204** from sensors **206**, **208** travel via a controller area network bus structure or some other bus structure to from the sensors **206**, **208** to the leveling module **212** and the processor/controller **210**. Thus, Solbrack disclose, teach or suggest, and actually teach away from a printed circuit board as recited in claim 1.

Regarding claims 27, 28, 38, and 43, claims 27 and 28 depend from claim 10 and claims 38 and 43 depend from claim 29. Howarter does not overcome the significant deficiencies outlined above with regard to Thorpe and Solbrack. Howarter discloses a system and method for controlling systems of a vehicle with a cell phone. The cell phone is associated with the vehicle through a user interface. User preferences

are received through the user interface for sending commands from the cell phone to the vehicle for controlling the systems of the vehicle. A wireless connection is established between the vehicle and the cell phone. A distance is determined between the cell phone and the vehicle. One or more commands are sent to the vehicle to control the systems based on the user preferences. While Howarter discloses an accelerometer in a cell phone, Howarter does not disclose, teach, or suggest that a sensor device should be placed on a vehicle that utilizes a 3-axis accelerometer as recited in claims 10 and 29.

Thorpe, Solbrack and/or Howarter, alone or in combination, do not disclose one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction where each of the one or more sensor devices comprises a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured as recited in claims 10 and 29.

Therefore, for at least the reasons set forth above, independent claims 1, 10, and 29 are not rendered obvious by Thorpe, Solbrack and/or Howarter, either alone or in combination. Claims 2-5 and 7 depend from claim 1 and claims 11, 12, 14-16, 18, 20, and 22-28 depend from claim 10. Further, claims 38 and 43 depend from claim 29. Thus, the cited references also do not render obvious claims 2-5, 7, 11, 12, 14-16, 18, 20, 22-28, 38, and 43. Accordingly, applicant respectfully submits that the rejections of

claims 1-5, 7, 10- 12, 14-16, 18, 20, 22-29, 38, and 43 under 35 U.S.C. § 103 should be withdrawn and the claims allowed at this time.

New Claims

New claim 44 has been added by this amendment as indicated above. Claim 44 depends from claim 1. It is respectfully submitted that new claim 44 is allowable over the cited reference(s) for at least the reasons given above with regards to claim 1. Further, Thorpe, Solbrack and/or Howarter do not disclose, teach, or suggest a printed circuit board that further comprises a digital temperature sensor to collect temperature data to be used by the processor of the printed circuit board to correct irregularities in the data obtained by the respective sensor device based on temperature variations. It is respectfully submitted that new claims 44 is thus in condition for allowance. No new matter is considered to have been added.

CONCLUSION

In light of the above amendments and remarks, it is respectfully submitted that the present application is now in proper condition for allowance, and an early notice to such effect is earnestly solicited.

If any small matter should remain outstanding after the Patent Examiner has had an opportunity to review the above Remarks, the Patent Examiner is respectfully requested to telephone the undersigned patent attorney in order to resolve these matters and avoid the issuance of another Official Action.

DEPOSIT ACCOUNT

The Commissioner is hereby authorized to charge any fees associated with the filing of this correspondence to Deposit Account No. **50-3172**.

Respectfully submitted,
J. BENNETT MULLINAX, LLC

Date: January 8, 2018

David M. Sigmon
Registration Number: 52,224
P.O. Box 26029
Greenville, SC 29616-1029
(864) 987-9696 (phone)
(864) 987-9686 (fax)

LEO-2

Electronic Patent Application Fee Transmittal

Application Number:	14961787
Filing Date:	07-Dec-2015
Title of Invention:	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES
First Named Inventor/Applicant Name:	Charles A. Leonard
Filer:	John Bennett Mullinax/David Sigmon
Attorney Docket Number:	LEO-2

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 2 months with $0 paid	2252	1	300	300
Miscellaneous:				
RCE- 1st Request	2801	1	600	600
		Total in USD ($)		**900**

Electronic Acknowledgement Receipt

EFS ID:	31440293
Application Number:	14961787
International Application Number:	
Confirmation Number:	8904
Title of Invention:	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES
First Named Inventor/Applicant Name:	Charles A. Leonard
Customer Number:	44728
Filer:	John Bennett Mullinax/David Sigmon
Filer Authorized By:	John Bennett Mullinax
Attorney Docket Number:	LEO-2
Receipt Date:	08-JAN-2018
Filing Date:	07-DEC-2015
Time Stamp:	18:49:30
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	EFT
Payment was successfully received in RAM	$900
RAM confirmation Number	010918INTEFSW18510600
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

ETN1002
266/655

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		AmdBLEO2.pdf	4008544 8ca4c3cb485fcdc18ed7070e2e7729f1a188878f	yes	22

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Extension of Time	1	1
	Request for Continued Examination (RCE)	2	2
	Amendment Submitted/Entered with Filing of CPA/RCE	3	22

Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32883 921f739b631c6fdcf9dd39357f94194677037156	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	4041427		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/AIA/22 (03-13)
Approved for use through 03/31/2013. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)	Docket Number (Optional) LEO-2
Application Number 14/961,787	Filed 12/7/2015
For VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM FOR LEVELING VEHICLES USING SMART DEVICES	
Art Unit	Examiner

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	Fee	Small Entity Fee	Micro Entity Fee	
☐ One month (37 CFR 1.17(a)(1))	$ 200	$ 100	$ 50	$
☒ Two months (37 CFR 1.17(a)(2))	$ 600	$ 300	$ 150	$ 300.00
☐ Three months (37 CFR 1.17(a)(3))	$ 1400	$ 700	$ 350	$
☐ Four months (37 CFR 1.17(a)(4))	$ 2200	$ 1100	$ 550	$
☐ Five months (37 CFR 1.17(a)(5))	$ 3000	$ 1500	$ 750	$

☒ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 50-3172.

☒ Payment made via EFS-Web.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant.

☒ attorney or agent of record. Registration Number 52224.

☐ attorney or agent acting under 37 CFR 1.34. Registration number _____.

/David M. Sigmon/ — Signature

January 8, 2016 — Date

David M. Sigmon — Typed or printed name

864-987-9696 — Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below.*

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
14/961,787	12/07/2015	

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	01/08/2018	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 25	Minus	** 25	= 0	X $40 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $210 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
JUDY SWAYNE

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/961,787	12/07/2015	Charles A. Leonard	LEO-2	8904

44728 7590 02/15/2018

J. BENNETT MULLINAX, LLC
P. O. BOX 26029
GREENVILLE, SOUTH CAROLINA 29616-1029

EXAMINER	
MARTINEZ BORRERO, LUIS A	

ART UNIT	PAPER NUMBER
3668	

MAIL DATE	DELIVERY MODE
02/15/2018	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Applicant-Initiated Interview Summary	Application No. 14/961,787	Applicant(s) Leonard, Charles A.		
	Examiner LUIS A MARTINEZ BORRERO	Art Unit 3668	AIA (First Inventor to File) Status Yes	Page 1 of 1

All participants (applicant, applicants representative, PTO personnel):

1. LUIS A MARTINEZ BORRERO(Examiner); Telephonic 2. David M. Sigmon(Attorney); Telephonic

Date of Interview: 09 February 2018

Claims Discussed: Claim 1

Prior Art Discussed: Thorpe and Solbrack

Brief Description of the main topic(s) of discussion: Applicant discussed potential amendments to overcome prior art rejection. No agreement was reached.

Issues Discussed:

Item(s) under 35 U.S.C. 103:

/JELANI A SMITH/ Primary Examiner, Art Unit 3662	/L.A.M/ Examiner, Art Unit 3668

Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04
Please further see:
MPEP 713.04
Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b)
37 CFR § 1.2 Business to be transacted in writing

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/961,787	Leonard, Charles A.
	Examiner	**Art Unit**
	LUIS A MARTINEZ BORRERO	3668

CPC - Searched*		
Symbol	**Date**	**Examiner**
G05D1/0891, 1/0016, 1/0236, 1/0251, 1/0255, 1/027,	12/7/2016	/L.A.M./
B60W2540/28, 2550/141, 2550/402, 2710/30, 2550/406, 2720/30,	12/7/2016	/L.A.M./
G05D1/0274, 1/0278, 1/0287, 2201/0201, 1/0858,	8/1/2017	/L.A.M./
B60G2204/127, 2204/4232, 2204/83022, 2500/30, 2600/73,	8/1/2017	/L.A.M./
G05D1/0094, 1/0231, 1/0246,	03/15/2018	LAM
B60G17/08, 13/08, 2600/20, 2500/10, 2800/162,	03/15/2018	LAM

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**
701	22, 37, 112, 2, 23, 21, 123, 1, 101, 102, 50, 60,	12/7/2016	/L.A.M./
701	2, 49, 1, 19, 23, 25, 3, 41, 50,	8/1/2017	/L.A.M./

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	**Date**	**Examiner**
East Search	12/7/2016	/L.A.M./
Google Patent Search	12/7/2016	/L.A.M./
East Search	8/1/2017	/L.A.M./
Consulted with primary Jelani smith (101, 112, patentability),	8/1/2017	/L.A.M./
Consulted with primary Jelani Smith	03/15/2018	LAM
East Search	03/15/2018	LAM

	/LUIS A MARTINEZ BORRERO/ Examiner.Art Unit 3668

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/961,787	Leonard, Charles A.
	Examiner	**Art Unit**
	LUIS A MARTINEZ BORRERO	3668

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**

	/LUIS A MARTINEZ BORRERO/ Examiner.Art Unit 3668

ETN1002

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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/961,787	Leonard, Charles A.
	Examiner	**Art Unit**
	LUIS A MARTINEZ BORRERO	3668

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/06/2016	08/01/2017	03/15/2018						
	1	✓	✓	✓						
	2	✓	✓	✓						
	3	✓	✓	✓						
	4	✓	✓	✓						
	5	✓	✓	✓						
	6	-	-	-						
	7	✓	✓	✓						
	8	-	-	-						
	9	-	-	-						
	10	✓	✓	✓						
	11	✓	✓	✓						
	12	✓	✓	✓						
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	33	-	-	-						
	34	-	-	-						
	35	-	-	-						
	36	-	-	-						
	37	-	-	-						
	38	✓	✓	✓						
	39	-	-	-						
	40	-	-	-						
	41	-	-	-						
	42	-	-	-						

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/961,787	Leonard, Charles A.
	Examiner	**Art Unit**
	LUIS A MARTINEZ BORRERO	3668

CLAIM		DATE								
Final	Original	12/06/2016	08/01/2017	03/15/2018						
	43	✓	✓	✓						
	44			✓						

Notice of References Cited	Application/Control No. 14/961,787	Applicant(s)/Patent Under Reexamination Leonard, Charles A.	
	Examiner LUIS A MARTINEZ BORRERO	Art Unit 3668	Page 1 of 4

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-6554293-B1	04-2003	Fennel; Helmut	B60T8/1708	280/5.502
*	B	US-7590481-B2	09-2009	Lu; Jianbo	B60T8/172	340/440
*	C	US-7029014-B2	04-2006	Hamm; Alton B.	B60G7/006	267/265
*	D	US-9421907-B2	08-2016	Carpani; Anthony	G01C9/00	1/1
*	E	US-8757637-B2	06-2014	Tiedge; Robert	B60S9/10	280/6.153
*	F	US-9073516-B2	07-2015	Schwindaman; Michael A.	B60S9/12	1/1
*	G	US-7294797-B2	11-2007	Erickson; John Scott	B60S9/02	200/18
*	H	US-6848693-B2	02-2005	Schneider; Robert H.	B60S9/12	280/6.153
*	I	US-4216939-A	08-1980	Valdespino; Joseph M.	B60S9/12	254/423
*	J	US-9004454-B1	04-2015	Faure; Luis Enrique	B65D90/14	254/89H
*	K	US-8840144-B2	09-2014	Armstrong; Rocky E	B60S9/04	280/764.1
*	L	US-20080217898-A1	09-2008	Hanscom; Paul	B60P3/36	280/763.1
*	M	US-20110169231-A1	07-2011	Tiedge; Robert	B60S9/12	280/6.153

FOREIGN PATENT DOCUMENTS

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NON-PATENT DOCUMENTS

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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Notice of References Cited	Application/Control No. 14/961,787	Applicant(s)/Patent Under Reexamination Leonard, Charles A.	
	Examiner LUIS A MARTINEZ BORRERO	Art Unit 3668	Page 2 of 4

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*	B	US-20080142768-A1	06-2008	Thorpe; Jim	B60S9/12	254/423
*	C	US-9223302-B2	12-2015	Maurer; Garrett	H02P29/60	1/1
*	D	US-20070103289-A1	05-2007	Dagci; Oguz H.	G08B25/007	340/521
*	E	US-6921100-B2	07-2005	Mantini; John	B60G17/005	177/137
*	F	US-7786883-B1	08-2010	Davison, III; George M.	B60P3/36	33/366.11
*	G	US-7584026-B2	09-2009	Siemer; Edward D.	G07C5/008	342/357.57
*	H	US-20050161891-A1	07-2005	Trudeau, Curtis A.	B60G17/0155	280/5.507
*	I	US-20070192002-A1	08-2007	Iyoda; Ikuhide	B60G17/0164	701/37
*	J	US-20050212225-A1	09-2005	Suzuki, Shigeki	B60G17/0155	280/5.514
*	K	US-20060113783-A1	06-2006	Erickson; John Scott	B60S9/02	280/766.1
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	Examiner LUIS A MARTINEZ BORRERO	Art Unit 3668	Page 3 of 4

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*	A	US-20140142783-A1	05-2014	Grimm; Donald K.	G06F17/00	701/2
*	B	US-20120208520-A1	08-2012	Howarter; Jamie C.	B60R25/2009	455/420
*	C	US-8538408-B2	09-2013	Howarter; Jamie C.	B60R25/2009	455/420
*	D	US-20150021866-A1	01-2015	Solbrack; Dennis R.	B60G15/067	280/6.155
*	E	US-9409459-B2	08-2016	Solbrack; Dennis R.	B60G15/067	1/1
*	F	US-5864768-A	01-1999	Bieber; Martin	B60G17/0182	280/5.506
*	G	US-7463953-B1	12-2008	Lee; Jonathan	B60W40/12	701/1
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*	I	US-20040178587-A1	09-2004	Hiebert, Grant W.	B60G17/0155	280/5.507
*	J	US-20020035423-A1	03-2002	Shank, David	B60G17/0185	701/37
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Notice of References Cited	Application/Control No. 14/961,787	Applicant(s)/Patent Under Reexamination Leonard, Charles A.	
	Examiner LUIS A MARTINEZ BORRERO	Art Unit 3668	Page 4 of 4

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*	B	US-20110202225-A1	08-2011	Willis; Richard Ernest	G01C21/165	701/31.4
*	C	US-20180045753-A1	02-2018	Sun; Chen	G01P15/18	1/1
*	D	US-20150354951-A1	12-2015	Ali; Abdelrahman	G01C21/16	702/141
*	E	US-20140338452-A1	11-2014	Sun; Chen	G01P15/125	73/514.32
*	F	US-9829504-B2	11-2017	Sun; Chen	G01P15/125	1/1
*	G	US-20120330497-A1	12-2012	De Tommasi; Claudio	G01C21/165	701/33.1
*	H	US-20120209502-A1	08-2012	Nichols; Boyd M.	B62D53/021	701/124
*	I	US-5231583-A	07-1993	Lizell; Magnus B.	B60G17/015	280/5.506
*	J	US-4935883-A	06-1990	Hulsing II; Rand H.	G01V7/00	175/45
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14/961,787	12/07/2015	Charles A. Leonard	LEO-2	8904

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EXAMINER	
MARTINEZ BORRERO, LUIS A	

ART UNIT	PAPER NUMBER
3668	

MAIL DATE	DELIVERY MODE
03/22/2018	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 14/961,787	Applicant(s) Leonard, Charles A.	
	Examiner LUIS A MARTINEZ BORRERO	Art Unit 3668	AIA Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on RCE filed 01/08/2018.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-5,7,10-12,14-16,18,20,22-29,38 and 43-44 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-5,7,10-12,14-16,18,20,22-29,38 and 43-44 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 02/16/2016 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Notice on Prior Art Rejections

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8 January 2018 has been entered.

Status of Claims

This Office Action is in response to the Applicant's RCE filed January 8, 2018. Claim 13 has been cancelled while claim 44 has been added. Claims 1, 3, 5, and 7 have been amended. Claims 1-5, 7, 10-12, 14-16, 18, 20, 22-29, 38, and 43-44 are presently pending and are presented for examination.

Response to Arguments/Remarks

1. **Judicial Exception Claim Rejections - 35 USC § 112**. Applicant's amendments/remarks filed on January 8, 2018 with regard to the previous 35 USC § 112 Rejection have been fully considered. Applicant's remarks and/or amendments, with respect to the previous 35 USC § 112 Rejection are persuasive. Therefore, the 35 USC § 112 rejection has been withdrawn.

2. **35 USC § 103 Rejection**. Applicant's amendments filed on January 8, 2018 with regard to the previous 35 USC § 103 Rejection have been fully considered. However, Applicant's arguments/amendments are not persuasive to overcome the previous 35 USC § 103 rejection. Applicant argues that Thorpe and/or Solbrack do not disclose, teach, or suggest all the features of independent claims 1, 10, and 29. "Thorpe and Solbrack do not disclose, teach, or suggest one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction where each of the one or more sensor devices comprises a printed circuit board that comprises a digital accelerometer that uses an X- axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured as recited In claims 1,10 and 29". With respect to these arguments the examiner respectfully disagrees. The combination of Thorpe and Solbrack clearly discloses all the limitations of claims 1,10 and 29. For example, Thorpe discloses one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction ***(¶ 12, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can***

operate the leveling mechanism to place the recreational vehicle in its level condition… the level sensing means is a dual-axis accelerometer that is configured to determine the tilt of the recreational vehicle in both the front-to-back and side-to-side directions), (¶ 36, via level unit 12 is placed on a flat surface inside recreational vehicle 16), (¶ 38, via level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 low-power two-axis linear accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle 16 relative to a calibrated reference position (i.e., the level condition 20). The level sensing means 38 includes an integrated circuit interface that takes the information from the sensing element of sensing means 28 to deliver an analog signal for conversion and then use by control unit 14). From the disclosure of these paragraphs, it could be determined that the sensor device is secured to a vehicle, that the system at least sense one of an inclination or an orientation in both pitch and role, and that the sensor is a dual-axis (X and Y by looking at the specification of the serial number) accelerometer printed in a circuit board that sends signals from the accelerometer to a control unit. Further, in the limitations, there are no requirements about how the sensor should be secure to the vehicle. Therefore, the applicant is arguing a limitation that does not exist when referring about how or where the sensor device should be secure to the vehicle. Solbrack complements the disclosure of Thorpe in the fact that it can have an additional accelerometer to compensate for the missing axis since the limitation requires a 3-axis accelerometer and Thorpe has a dual axis accelerometer. Solbrack states that ***(¶ 34, via In other embodiments, the vehicle sensors 206, 208 may comprise one or more of an accelerometer, a gyroscope, a liquid capacitive device, an electrolytic level device, a gas bubble in liquid device, a pendulum device, and the like), (¶ 29, via a vehicle 104 may be leveled by a***

leveling system 102 based on a first signal 202 representing a lateral force (i.e., tilt, roll) acting on the vehicle 104 and a second signal 204 representing a longitudinal force (i.e., pitch) acting on the vehicle 104. The first 202 and second 204 signals may be sent by one or more vehicle sensors (206, 208) associated with the vehicle 104, and received by a processing or control portion 210 of the leveling system). According with these teachings, Solbrack states or at least suggest that more than one accelerometer could be used to obtain signals representative of additional forces acting on the vehicle. Further, in the limitations, the requirement is that the calculation is performed in at least one of the inclination or orientation of the vehicle for which Thorpe and Solbrack already present evidence of this calculation. Therefore, the applicant is arguing a limitation that well performed by both references. However, the examiner understands the arguments of the applicant and in view of such, a new reference is added to provide a clearer example of the examiner's response. Therefore, for the above reasons, the examiner maintains rejection over independent claims 1, 10, and 29. Because pending claims 2-5, 7, 11, 12, 14-16, 18, 20, 22-28, 38, 43, and 44 depend, either directly or indirectly, from rejected independent claims 1, 10, and 29 these claims are also rejected for at least these reasons.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims **1-5, 7, 10-16, 18, 20, 22-29, 38, and 43** are rejected under 35 U.S.C 103 as being unpatentable over Thorpe et al, US 2008/0142768, in view of Luk et al, US 2012/0197587, hereinafter referred to as Thorpe and Luk, respectively.

As per Claim 1. Thorpe discloses a leveling system for leveling a vehicle that is at rest, the leveling system comprising: one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction ***(See at least ¶ 12, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition… the level sensing means is a dual-axis accelerometer that is configured to determine the tilt of the recreational vehicle in both the front-to-back and side-to-side directions), (¶ 0038, via Level sensing means 38 comprises one or more tilt sensors that are configured to detect the amount of pitch and roll of recreational vehicle), (¶ 0038, via In one configuration, level sensing means 38 comprises two separate tilt sensors, one positioned in the front/back direction for determining the pitch and one positioned in the left/right direction for determining the roll)***, each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured and a processor to process data collected by the respective sensor device ***(See at least ¶ 34, via In other embodiments, the vehicle sensors 206, 208 may comprise one or more of an accelerometer, a gyroscope, a liquid capacitive device, an electrolytic level device, a gas bubble in liquid device, a pendulum device, and the like), (¶ 29, via a vehicle 104 may be leveled by a***

leveling system 102 based on a first signal 202 representing a lateral force (i.e., tilt, roll) acting on the vehicle 104 and a second signal 204 representing a longitudinal force (i.e., pitch) acting on the vehicle 104. The first 202 and second 204 signals may be sent by one or more vehicle sensors (206, 208) associated with the vehicle 104, and received by a processing or control portion 210 of the leveling system), (¶ 36, via level unit 12 is placed on a flat surface inside recreational vehicle 16), (¶ 38, via level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 low-power two-axis linear accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle 16 relative to a calibrated reference position (i.e., the level condition 20). The level sensing means 38 includes an integrated circuit interface that takes the information from the sensing element of sensing means 28 to deliver an analog signal for conversion and then use by control unit 14); a smart device in communication with the one or more sensor devices to allow information received from the one or more sensor devices about at least one of the inclination or the orientation of the vehicle in both the pitch direction and the roll direction to be processed to provide measurements to a user and to determine an amount of adjustments in height to at least one of a rear or front section or first or second side sections of the vehicle needed to level the vehicle ***(See at least ¶ 8, via The foregoing patents are representative of leveling systems that require manual, independent determination of the amount of height adjustment needed to place the vehicle in the level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly***

transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator), so that the vehicle is adjusted to obtain a level position based on a calculated change from the determination of the amount of adjustments in height, ***(See at least fig 2. ¶ 0040, via control unit 14 has a front cover 68 and back cover 70 that define control housing 72 enclosing a control chamber 74 in which is disposed the components that allow the user to control leveling system 10 and communicate with the spaced apart level unit), (¶ 0040, via, Preferably, any such attachment mechanism is removable from the location where it is stored to allow the operator to utilize control unit 14 as a hand-held device so that he or she may stand outside recreational vehicle 16 during use of leveling system 10 to level recreational vehicle), (¶ 0040, via, control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition).***

Thorpe fails to explicitly disclose a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis.

However, Luk teaches a digital accelerometer that uses an X-axis, Y-axis, and Z-axis ***(See at least ¶ 11, via wherein said device is securely attached to said wheeled vehicle in a manner that sensed tri-axial directional accelerations by said device are tri-axial directional accelerations of the moving vehicle), (See at least ¶ 13, via sense (e.g. by the built-in accelerometer) and measure the moving wheeled vehicle's individual accelerations in each of said tri-axial fore-aft, lateral and vertical directions).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured and a processor to process data collected by the respective sensor device of Thorpe and include a digital accelerometer that uses an X-axis, Y-axis, and Z-axis as taught by Luk because it would allow the system to measure the pitch and roll tilt in multiple axis so that leveling system can determine the adjustment necessary to neutralize that tilting.

As per Claim 2. Thorpe discloses the system according to claim 1, wherein the circuit board further comprises a digital gyroscope ***(¶ 0012, via Although separate tilt sensors can be utilized, in the preferred embodiment the level sensing means is a dual-axis accelerometer that is configured to determine the tilt of the recreational vehicle in both the front-to-back and side-to-side directions), (¶ 0038, via In a preferred embodiment of the present invention, however, level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 lowpower two-axis linear accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle).***

As per Claim 3. Thorpe discloses the system according to claim 1, wherein the processor performs calculations related to the determination the amount of adjustments needed to at least one of the pitch direction or the roll direction to level the vehicle ***(¶ 0037, via These components***

include a circuit board 34, shown in FIGS. 9through12, having a controller 36 which is operatively connected to a level sensing means 38, power supply 40 and transmitter/ receiver or transceiver 42, including antenna 44. In a preferred embodiment, shown in the figures, the controller 36 includes transceiver 42), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).

As per Claim 4. Thorpe discloses the system according to claim 3, wherein the sensor device comprises a memory in communication with the processor of the PCB, the sensor device capable of storing information transmitted from the smart device ***(¶ 0039, via As shown on FIG. 9, the circuit boards 34 of level 12 and control 14 units also include a flash memory chip 60 to store data useful for the operation of leveling system), (¶ 0039, via The circuit board 34 shown in the figures also includes a memory chip connector 62 for programming the flash memory chip 60 with the manufacturer's computer control code and a diagnostic chip).***

As per Claim 5. Thorpe discloses the system according to claim 4, wherein the sensor device uses data sensed by the sensor device and stored data obtained from the smart device to perform calculations on the sensor device and transmit the calculated data to the smart device ***(¶ 0038, via As shown in FIG. 11, the output from level sensing means 38 goes to one or more analog***

conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information), (¶ 0011, via In the preferred embodiment of the present invention, the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle).

As per Claim 7. Thorpe discloses the system according to claim 1, wherein the smart device communicates with the printed circuit board of the sensor device ***(¶ 0012, via In the preferred embodiment, the controller and the transceiver is a single integrated unit that wireless transmits the data from the level sensing means to the control unit The level unit has having a level housing that encloses a controller, a level sensing means, a power supply and a transceiver mounted on a circuit board.), (¶ 0038, via As shown in FIG. 11, the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator-useable information).***

As per Claim 10. Thorpe discloses a method for leveling a recreational vehicle, the method comprising: providing a leveling system comprising one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction and a smart device in communication with the one or more sensor devices ***(¶ 0038, via Level sensing means 38 comprises one or more tilt sensors that are configured to detect the amount of pitch and roll of recreational vehicle), (¶ 0038, via In one configuration, level sensing means 38 comprises two separate tilt sensors, one positioned in the front/back direction for determining the pitch and one positioned in the left/right direction for determining the roll)***, each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured ***(See at least ¶ 34, via In other embodiments, the vehicle sensors 206, 208 may comprise one or more of an accelerometer, a gyroscope, a liquid capacitive device, an electrolytic level device, a gas bubble in liquid device, a pendulum device, and the like), (¶ 29, via a vehicle 104 may be leveled by a leveling system 102 based on a first signal 202 representing a lateral force (i.e., tilt, roll) acting on the vehicle 104 and a second signal 204 representing a longitudinal force (i.e., pitch) acting on the vehicle 104. The first 202 and second 204 signals may be sent by one or more vehicle sensors (206, 208) associated with the vehicle 104, and received by a processing or control portion 210 of the leveling system), (¶ 36, via level unit 12 is placed on a flat surface inside recreational vehicle 16), (¶ 38, via level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 low-power two-axis linear accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to***

determine the attitude of recreational vehicle 16 relative to a calibrated reference position (i.e., the level condition 20). The level sensing means 38 includes an integrated circuit interface that takes the information from the sensing element of sensing means 28 to deliver an analog signal for conversion and then use by control unit 14); measuring the pitch angle and the roll angle of the vehicle when the vehicle is at rest using the sensor device ***(¶ 0036, via allow the components disposed in interior chamber 28 of level unit 12 to measure the pitch and roll tilt so that leveling system 10 can determine the adjustment necessary to neutralize that tilting), (¶ 0012, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition), (¶ 0044, via To level a recreational vehicle 16 having leveling system 10 after parking recreational vehicle 16 where desired)***; retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position ***(¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14***

for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator); calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle using the calibration data of pitch and roll angle measurements ***(¶ 8, via The foregoing patents are representative of leveling systems that require manual, independent determination of the amount of height adjustment needed to place the vehicle in the level condition), (¶ 0011, via the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition 20);*** displaying the calculated change in height to at least one of a rear or front section or first or second side sections of the vehicle in at least one of the pitch direction or the roll direction of the vehicle on the smart device ***(¶ 0040, via on FIG. 9, is used to switch control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition), (¶ 0038, via controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator);*** adjusting the height to the at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle based on the calculated change ***(¶ 8, via The foregoing patents are representative of leveling***

systems that require manual, independent determination of the amount of height adjustment needed to place the vehicle in the level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator), (See at least fig 2. ¶ 0040, via control unit 14 has a front cover 68 and back cover 70 that define control housing 72 enclosing a control chamber 74 in which is disposed the components that allow the user to control leveling system 10 and communicate with the spaced apart level unit).

Thorpe fails to explicitly disclose a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis.

However, Luk teaches a digital accelerometer that uses an X-axis, Y-axis, and Z-axis ***(See at least ¶ 11, via wherein said device is securely attached to said wheeled vehicle in a manner that sensed tri-axial directional accelerations by said device are tri-axial directional accelerations of the moving vehicle), (See at least ¶ 13, via sense (e.g. by the built-in accelerometer) and measure the moving wheeled vehicle's individual accelerations in each of said tri-axial fore-aft, lateral and vertical directions).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify providing a leveling system comprising one or more sensor devices secured to a vehicle to sense at least one of an inclination or an

orientation of the vehicle in both a pitch direction and a roll direction and a smart device in communication with the one or more sensor devices of Thorpe and include a digital accelerometer that uses an X-axis, Y-axis, and Z-axis as taught by Luk because it would allow the system to measure the pitch and roll tilt in multiple axis so that leveling system can determine the adjustment necessary to neutralize that tilting.

As per Claim 11. Thorpe discloses the method according to claim 10, further comprising: determining the initial level position for a vehicle to determine any inconsistencies inherent in the leveling system; and capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide the calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time ***(¶ 0011, via the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition).***

As per Claim 12. Thorpe discloses the method according to claim 11, wherein the step of determining an initial level position comprises using at least one of an accelerometer, gyroscope, or global positioning system sensor on the smart device to achieve the initial level position ***(¶ 0012, via Although separate tilt sensors can be utilized, in the preferred embodiment the level sensing means is a dual-axis accelerometer that is configured to determine the tilt of the recreational vehicle in both the front-to-back and side-to-side directions), (¶ 0038, via In a preferred embodiment of the present invention, however, level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 lowpower two-axis linear accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle).***

As per Claim 14. Thorpe discloses the method according to claim 11, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises communicating calibration data from the sensor device of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position to the smart device and saving the calibration data on the smart device ***(¶ 0011, via the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition 20).***

As per Claim 15. Thorpe discloses the method according to claim 11, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises saving the calibration data of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position on the sensor device ***(¶ 0038, via As shown in FIG. 11, the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information), (¶ 0011, via In the preferred embodiment of the present invention, the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle).***

As per Claim 16. Thorpe discloses the method according to claim 15, wherein the step of saving the calibration data of the pitch and roll angle measurements on the sensor device comprises transmitting instructions from the smart device to the sensor device to save and store the calibration data of the pitch and roll angle measurements on the sensor device and wherein the method further comprises recalling the calibration data of the pitch and roll angle measurements from the sensor device to the smart device ***(¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶***

0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).

As per Claim 18. Thorpe discloses the method according to claim 11, wherein the step of determining an initial level position comprises receiving measurements of a length and a width of the vehicle ***(¶ 0040, via As shown in FIG. 6, display panel 90 can display the amount of pitch or roll in degrees and the amount in inches or other measurement units, based on a known length or width of recreational vehicle 16, that one end or side of the recreational vehicle 16 must be raised to place recreational vehicle 16 in level condition), (¶ 0044, via If desired, leveling system 10 can be adapted to include the length information for specific lengths of recreational vehicles 16 and/or to allow the operator to input the length into its operating system, such as at flash memory 60, by entering the data at control unit).***

As per Claim 20. Thorpe discloses the method according to claim 10, wherein the step of displaying the calculated change in at least one of the pitch direction or the roll direction of the

vehicle further comprises displaying the calculated change in the pitch direction and the roll direction of the vehicle in measurements of distance ***(¶ 0040, via on FIG. 9, is used to switch control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition), (¶ 0038, via controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).***

As per Claim 22. Thorpe discloses the method according to claim 10, further comprising saving a given pitch angle measurement on at least one of the smart device or the sensor device to permit later recall for the purpose of returning the vehicle to the given pitch angle position at a later time ***(¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).***

As per Claim 23. Thorpe discloses the method according to claim 10, further comprising receiving data at the smart device from one or more vehicle control panels ***(¶ 0036, via In an alternative configuration, not shown, user accessible buttons and/or a display panel can be used with level unit 12 to allow the operator to directly access the operation of level unit), (¶ 0044, via In the preferred embodiment, battery monitoring circuit 61 of level 12 and control 14 units is configured to transmit battery level information to display panel 90 when the amount of power in batteries 40 or 86 reach a certain low level. Alternatively, leveling system 10 can also be configured to such that the operator can access the battery level information by pushing the mode button 80 on control unit 14 when he or she desires to check the battery levels).***

As per Claim 24. Thorpe discloses the method according to claim 23, wherein the received data from one or more vehicle control panels comprises at least one of data regarding holding tank levels or data regarding battery power levels ***(¶ 0036, via In an alternative configuration, not shown, user accessible buttons and/or a display panel can be used with level unit 12 to allow the operator to directly access the operation of level unit), (¶ 0044, via In the preferred embodiment, battery monitoring circuit 61 of level 12 and control 14 units is configured to transmit battery level information to display panel 90 when the amount of power in batteries 40 or 86 reach a certain low level. Alternatively, leveling system 10 can also be configured to such that the operator can access the battery level information by pushing the mode button 80 on control unit 14 when he or she desires to check the battery levels).***

As per Claim 25. Thorpe discloses the method according to claim 23, further comprising displaying the data on the smart device that is generated and displayed on the one or more vehicle control panels ***(¶ 0036, via In an alternative configuration, not shown, user accessible buttons and/or a display panel can be used with level unit 12 to allow the operator to directly access the operation of level unit), (¶ 0044, via In the preferred embodiment, battery monitoring circuit 61 of level 12 and control 14 units is configured to transmit battery level information to display panel 90 when the amount of power in batteries 40 or 86 reach a certain low level. Alternatively, leveling system 10 can also be configured to such that the operator can access the battery level information by pushing the mode button 80 on control unit 14 when he or she desires to check the battery levels).***

As per Claim 26. Thorpe discloses the method according to claim 10, further comprising activating one or more systems on the vehicle with the smart device ***(¶ 0012, via The control unit also has a display panel for displaying the pitch and roll information received from the level unit and one or more operator accessible control buttons for activating and operating the leveling system.), (¶ 0044, via The operator first activates the control unit 14 by pushing the power button 78 to tum leveling system 10 to its on condition).***

As per Claim 29. Thorpe discloses a non-transitory computer readable medium comprising computer executable instructions embodied in a computer readable medium that when executed by a processor of a computer control the computer to perform steps comprising: receiving on a smart device a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device secured to the vehicle ***(¶ 0036, via allow the components***

disposed in interior chamber 28 of level unit 12 to measure the pitch and roll tilt so that leveling system 10 can determine the adjustment necessary to neutralize that tilting), (¶ 0012, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition), (¶ 0044, via To level a recreational vehicle 16 having leveling system 10 after parking recreational vehicle 16 where desired), the sensor device comprising a printed circuit board that comprises a digital accelerometer that permits calculation in both the pitch or roll direction regardless of positioning of the respective device relative to the vehicle to which the one or more sensor devices are secured ***(See at least ¶ 34, via In other embodiments, the vehicle sensors 206, 208 may comprise one or more of an accelerometer, a gyroscope, a liquid capacitive device, an electrolytic level device, a gas bubble in liquid device, a pendulum device, and the like), (¶ 29, via a vehicle 104 may be leveled by a leveling system 102 based on a first signal 202 representing a lateral force (i.e., tilt, roll) acting on the vehicle 104 and a second signal 204 representing a longitudinal force (i.e., pitch) acting on the vehicle 104. The first 202 and second 204 signals may be sent by one or more vehicle sensors (206, 208) associated with the vehicle 104, and received by a processing or control portion 210 of the leveling system), (¶ 36, via level unit 12 is placed on a flat surface inside recreational vehicle 16), (¶ 38, via level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 low-power two-axis linear accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle 16 relative to a calibrated reference position (i.e., the level condition 20). The level sensing means 38 includes an integrated circuit interface that takes the information from the sensing element of sensing means 28 to deliver an analog***

signal for conversion and then use by control unit 14); retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position ***(¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator);*** calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle using the calibration data of pitch and roll angle measurements ***(¶ 8, via The foregoing patents are representative of leveling systems that require manual, independent determination of the amount of height adjustment needed to place the vehicle in the level condition), (¶ 0011, via the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in***

degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition 20); displaying the calculated change in height to at least one of the rear or front section or one or one of the first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device so that the height to at least one of the rear or front section or the first or second side sections of the vehicle is adjusted to obtain the level position of the vehicle based on the calculated change ***(¶ 0040, via on FIG. 9, is used to switch control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition), (¶ 0038, via controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).***

Thorpe fails to explicitly disclose a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis.

However, Luk teaches a digital accelerometer that uses an X-axis, Y-axis, and Z-axis ***(See at least ¶ 11, via wherein said device is securely attached to said wheeled vehicle in a manner that sensed tri-axial directional accelerations by said device are tri-axial directional accelerations of the moving vehicle), (See at least ¶ 13, via sense (e.g. by the built-in accelerometer) and measure the moving wheeled vehicle's individual accelerations in each of said tri-axial fore-aft, lateral and vertical directions).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify receiving on a smart device a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device secured to the vehicle of Thorpe and include a digital accelerometer that uses an X-axis, Y-axis, and Z-axis as taught by Luk because it would allow the system to measure the pitch and roll tilt in multiple axis so that leveling system can determine the adjustment necessary to neutralize that tilting.

5. Claims **27, 28, 38, and 43** are rejected under 35 U.S.C 103 as being unpatentable over Thorpe in view of Luk as presented in independent claims 1, 10 and 29, further in view of Howarter et al. US 2012/0208520, hereinafter referred to as Howarter, respectively.

As per Claim 27. Thorpe discloses the method according to claim 26, wherein the one or more systems activated via the software application of the smart device ***(¶ 0012, via The control unit also has a display panel for displaying the pitch and roll information received from the level unit and one or more operator accessible control buttons for activating and operating the leveling system.), (¶ 0044, via The operator first activates the control unit 14 by pushing the power button 78 to tum leveling system 10 to its on condition).***

Thorpe in view of Luk fail to explicitly disclose comprise at least one of lighting systems, entertainment systems, power slide outs or a generator.

However, Howarter teaches comprise at least one of lighting systems, entertainment systems, power slide outs or a generator ***(¶ 0019 via The vehicle 106 may include a computer,***

global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0031, via The user interface 208 may include the other controls or systems for managing systems of the vehicle which may include the stereo, entertainment system, temperature controls, driving controls, and other elements of the vehicle).

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify wherein the one or more systems activated via the software application of the smart device of Thorpe and include comprise at least one of lighting systems, entertainment systems, power slide outs or a generator as taught by Howarter because it would allow the method to provide support to the user to configure and control the different features and elements managed by the vehicle control systems via a cell phone.

As per Claim 28. Thorpe discloses the method according to claim 10.

Thorpe in view of Luk fail to explicitly disclose collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

However, Howarter teaches collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device ***(¶ 0019 via The vehicle 106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0020, via the vehicle system includes a GPS or other navigation systems. The GPS may be utilized to determine the location of the vehicle 106. The GPS may also receive data or***

information from the cell phone 104 in order to determine the location and direction of travel of the cell phone and an associated user).

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle on the smart device of Thorpe and include collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device as taught by Howarter because it would allow the method to provide information to the user with respect to the location of the vehicle and the location and direction of travel of the cell phone and an associated user to determine the exact or approximate distance between the cell phone and the vehicle.

As per Claim 38. Thorpe discloses the non-transitory computer readable medium according to claim 29.

Thorpe in view of Luk fail to explicitly disclose receiving data at the smart device from one or more vehicle control panels.

However, Howarter teaches receiving data at the smart device from one or more vehicle control panels ***(¶ 0019 via The vehicle 106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0031, via The user interface 208 may include the other controls or systems for managing systems of the vehicle which may include the stereo, entertainment system, temperature controls, driving controls, and other elements of the vehicle).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device of Thorpe and include receiving data at the smart device from one or more vehicle control panels as taught by Howarter because it would allow the method to provide support to the user to configure and control the different features and elements managed by the vehicle control systems via a cell phone.

As per Claim 43. Thorpe discloses the non-transitory computer readable medium according to claim 29.

Thorpe in view of Luk fail to explicitly disclose collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

However, Howarter teaches collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device ***(¶ 0019 via The vehicle 106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0020, via the vehicle system includes a GPS or other navigation systems. The GPS may be utilized to determine the location of the vehicle 106. The GPS may also receive data or information from the cell phone 104 in order to determine the location and direction of travel of the cell phone and an associated user).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level

position of the vehicle on the smart device of Thorpe and include collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device as taught by Howarter because it would allow the method to provide information to the user with respect to the location of the vehicle and the location and direction of travel of the cell phone and an associated user to determine the exact or approximate distance between the cell phone and the vehicle.

6. Claim **44** is rejected under 35 U.S.C 103 as being unpatentable over Thorpe in view of Luk as presented in independent claims 1, 10 and 29, further in view of Howarter, further in view of Hulsing et al. US 4,935,883, hereinafter referred to as Hulsing, respectively.

As per Claim 44. Thorpe discloses the system according to claim 1.

Thorpe in view of Luk further in view of Howarter fail to explicitly disclose wherein the printed circuit board further comprises a digital temperature sensor to collect temperature data to be used by the processor of the printed circuit board to correct irregularities in the data obtained by the respective sensor device based on temperature variations.

However, Hulsing teaches wherein the printed circuit board further comprises a digital temperature sensor to collect temperature data to be used by the processor of the printed circuit board to correct irregularities in the data obtained by the respective sensor device based on temperature variations ***(See at least Column 9, lines 35-45, via The output from temperature sensors 174 is converted from an analog signal to a digital signal by an A to D converter (not separately shown), and transmitted to CPU 142 over leads 175. The temperature within the enclosure is controlled by temperature control 176 in response to the signals produced by***

temperature sensors 174 and transmitted over leads 173. CPU 142 applies appropriate temperature correction factors in modeling the acceleration data derived from accelerometer 68, correcting for errors in the control of temperature by temperature control 176), (Column 9, lines 49-51, via In addition, a more critical temperature control is provided for accelerometer 68, which is preferably maintained at 100° ±0. l C).

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify a digital accelerometer that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured of Thorpe and include a digital temperature sensor to collect temperature data to be used by the processor of the printed circuit board to correct irregularities in the data obtained by the respective sensor device based on temperature variations as taught by Hulsing because it would allow the method to provide temperature control for the accelerometer to ensure correction of errors from due to temperature changes.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUIS A MARTINEZ BORRERO whose email is luis.martinezborrero@uspto.gov and telephone number is (571)272-4577. The examiner can normally be reached on M-F 8:00-5:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, FADEY JABR can be reached on 5712721516. The fax phone number for the organization where this application or proceeding is assigned is 571-273-

8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L.A.M/
Examiner, Art Unit 3668

/JELANI A SMITH/
Primary Examiner, Art Unit 3662

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	16190	accelerometer with (temperature adj sensor)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 16:03
L2	93	(tri-axial) with accelerometer with (temperature adj sensor)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 16:04
L3	0	avoid$ with error with accelerometer with (temperature adj sensor)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 16:07
L4	5	avoid$ with error with accelerometer with temperature	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 16:07
L5	51	((tri-axial) near3 accelerometer) near6 (temperature adj sensor)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 17:10
L6	46	5 AND ((G05D1/0038 OR G05D1/0061 OR G05D1/0094 OR G05D1/0297 OR G05D1/0231 OR G05D1/0278 OR G05D1/0022 OR G05D1/0246 OR G05D1/0289).CPC. OR (1/1 OR 455/456.1 OR 455/404.1 OR 455/404.2 OR 455/414.2 OR 455/422.1 OR 455/457 OR 280/5.515 OR 360/5 OR 701/14 OR 701/21 OR 701/3 OR 701/37 OR 701/532 OR 702/127 OR 702/130 OR 702/138 OR 702/141 OR 702/150 OR 702/151 OR 702/176 OR 702/187 OR 702/189 OR 702/191 OR 702/92).CCLS. OR (G05D1/00 OR G05D1/02).IPCR.)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 17:11
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L12	326	(("LEONARD") near3 ("Charles")).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/03/15 17:13
S1	0	((vehicle or car or automobile) near4 (lavel$3)) with ((sens$4 or detect$3) near5 (inclinat$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 10:57
S2	0	((vehicle or car or automobile) near4 (lavel$4)) and ((sens$4 or detect$3) near5 (inclinat$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 10:57
S3	1252	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 10:58
S4	25	S3 AND ((B60T8/172 OR B60T2201/04 OR B60T2210/14 OR B60T2210/16 OR B60T2220/04 OR B60T2260/06 OR B60T7/12 OR B60T8/175 OR B60T11/22 OR B60T11/26 OR B60T13/741 OR B60T2210/12 OR B60T2230/00 OR B60T2250/06 OR B60T7/085 OR B60T7/107 OR B60T7/122 OR B60T8/32 OR G05D1/0088 OR G05D1/0257 OR G05D1/0891 OR G05D1/0016 OR G05D1/0061 OR G05D1/0231 OR	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:00

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S5	5	S4 and inclinat$3 and sensor and pitch and roll	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:02
S6	145	S3 and inclinat$3 and sensor and pitch and roll	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:07
S7	66	("6554293").URPN.	USPAT	OR	ON	2016/12/05 11:09
S8	2	((vehicle or car or automobile) near4 (level$4)) with ((sens$4 or detect$3) near5 (inclinat$4)) with (accelerometer or gyroscope)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:25
S9	2	((vehicle or car or automobile) near4 (level$4)) with ((sens$4 or detect$3) near5 (inclinat$4)) with (accelerometer or gyroscope) with ((smart adj device) or device or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:32
S10	278	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:33
S11	134	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone) and wireless	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:35
S12	19	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone) and wireless and roll and pitch and adjust$3 and display$3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:36
S13	518	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3)	US-PGPUB; USPAT;	OR	ON	2016/12/05 11:42

		near5 (inclination or orientation)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone) and roll and pitch and adjust$3 and display$3	EPO; JPO; DERWENT; IBM_TDB			
S14	29	S13 AND ((B60W40/09 OR B60W50/08 OR B60W2540/18 OR B60W2040/0809 OR B60W2540/00 OR B60W2540/12 OR B60W2540/30 OR B60W50/10 OR B60W50/14 OR B60W2050/146 OR B60W2520/16 OR B60W2520/18 OR B60W40/06 OR B60W40/076 OR B60W2420/54 OR B60W2520/10 OR B60W2550/14 OR B60W2550/142 OR B60W2550/147 OR B60W2520/26 OR B60W10/10 OR B60W10/18 OR B60W10/20 OR B60W2050/0077 OR B60W2520/04 OR B60W2540/20 OR B60W2540/28 OR B60W2550/12 OR B60W2550/141 OR B60W2550/20 OR B60W2550/402 OR B60W2550/406 OR B60W2710/30 OR B60W2720/10 OR B60W2720/28 OR B60W2720/30 OR B60W30/143 OR B60W30/18009 OR B60W30/18172 OR B60W40/02 OR B60W40/08 OR B60W40/10 OR B60W40/101 OR B60W40/103 OR B60W50/0098 OR G05D1/0891 OR G05D1/0027 OR G05D1/0212 OR G05D23/1917 OR G05D1/0274 OR G05D1/027 OR G05D1/0278 OR G05D1/0287 OR G05D2201/02 OR G05D2201/0201 OR G05D2201/0202 OR G05D1/0227 OR G05D1/0088 OR G05D1/0011 OR G05D1/0016 OR G05D1/0061 OR G05D1/0038 OR G05D1/0225 OR G05D1/0238 OR G05D1/024 OR G05D1/0242 OR G05D1/0251 OR G05D1/0255 OR G05D1/028 OR G05D1/102 OR G05D2201/0211 OR G05D2201/0213 OR B60T2201/04 OR B60T2210/14 OR B60T2210/16 OR B60T2220/04 OR B60T2230/00 OR B60T2260/06 OR B60T8/175).CPC. AND (701/2 OR 701/36 OR 701/1 OR 701/408 OR 701/41 OR 701/25 OR 701/29.1 OR 701/31.9 OR 701/32.4 OR 701/37 OR 701/400 OR 701/50 OR 701/93 OR 701/21 OR 701/22 OR 701/23 OR 701/26 OR 701/3 OR 701/31.5 OR 701/33.2 OR 701/34.4 OR 701/409 OR 701/420 OR 701/469 OR 701/500 OR 701/534 OR 701/537 OR 701/70 OR 701/91).CCLS. AND (G05D1/08 OR G05D1/02 OR G05D1/00 OR G05D1/04 OR G05D23/19 OR B60W30/14 OR B60W40/06 OR B60W40/09 OR B60W10/10 OR B60W10/18 OR B60W10/20 OR B60W30/18 OR B60W40/02 OR B60W40/076 OR B60W40/08 OR B60W40/10 OR B60W40/101 OR B60W40/103 OR B60W50/00).IPCR.)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:44
S15	27	"4216939"	US-PGPUB;	OR	ON	2016/12/05

			USPAT; EPO; JPO; DERWENT; IBM_TDB			11:51
S16	3	("7294797").URPN.	USPAT	OR	ON	2016/12/05 12:13
S17	1	("8757637").URPN.	USPAT	OR	ON	2016/12/05 12:14
S18	16	("20110024706" | "3332669" | "3454251" | "3825279" | "3857582" | "4061309" | "4216939" | "4940110" | "5176391" | "5727767" | "6142488" | "8690128" | "8757637" | "8840144").PN. OR ("9156441").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:14
S19	1	("8840144").URPN.	USPAT	OR	ON	2016/12/05 12:16
S20	44	("20050127341" | "20060017241" | "20060081755" | "20070114734" | "20070284499" | "20070289439" | "20080217898" | "20090102176" | "20090200782" | "20110163523" | "20110169231" | "20120299279" | "20130074377" | "2924463" | "2979304" | "3253839" | "3367614" | "3475008" | "3558092" | "3642242" | "3690694" | "3801128" | "3823958" | "3933372" | "3989277" | "4268066" | "4461491" | "4708362" | "5575492" | "5628521" | "6089603" | "6142488" | "6224102" | "6331016" | "6494487" | "6827335" | "7226057" | "7338052").PN. OR ("8840144").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:16
S21	31	("3454251" | "3475008" | "3656778" | "3709518" | "3767226").PN. OR ("3933372").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:17
S22	38	("1540753" | "3186570" | "3324613" | "3367614").PN. OR ("4268066").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:17
S23	45	("2924463" | "3306629" | "3933372" | "4231044" | "4429851" | "4708362" | "4905953").PN. OR ("5575492").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:17
S24	47	("1539974" | "20020053794" | "2747836" | "3310181" | "3345038" | "3475008" | "3565396" | "3767226" | "3826470" | "3854750" | "3870276" | "3989277" | "4103869" | "4146250" | "4148461" | "4515520" | "4955450" | "5042779" | "5205586" | "5348330" | "5488788" | "5501428" | "5547220" | "5901980" | "6089603" | "6102438" | "6224102").PN. OR ("6494487").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:19
S25	94	((vehicle or car or automobile) near4 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or device or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:20
S26	6132	((vehicle or car or automobile) near4 (level$4 or stabilizat$3)) same ((smart adj device) or phone or cell or cellphone or mobile)	US-PGPUB; USPAT; EPO; JPO; DERWENT;	OR	ON	2016/12/05 12:26

			IBM_TDB			
S27	2491	((vehicle or car or automobile) near4 (level$4 or stabilizat$3)) near10 ((smart adj device) or phone or cell or cellphone or mobile)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:26
S28	49	S27 and sensor and pitch and roll	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:27
S29	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:33
S30	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone or cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:33
S31	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone or cell or cellphone or pda)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:33
S32	11	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) same ((sens$4 or detect$3) near5 (inclination or orientation)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:36
S33	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:39
S34	43	((vehicle or car or automobile) near6 (level$4 or stabilizat$3 or inclinat$4)) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:41
S35	2	(vehicle or car or automobile) same (park$3 near8 (level$4 or stabilizat$3 or inclinat$4)) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:45
S36	15	(vehicle or car or automobile) same (adjust$5) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:48
S37	23284	(vehicle or car or automobile) same ((adjust$5) near5(level$3 or inclination or tilt$3))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:52

S38	4438	S37 and ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:52
S39	130	S38 and (sens$3 near5 (pitch and roll))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:53
S40	92815	S39 and accelerometer or gyroscope	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:54
S41	51	S39 and accelerometer and gyroscope	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:54
S42	271	(vehicle or car or automobile) same ((adjust$5) near5 (level$3 or inclination or tilt$3)) same parking	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:57
S43	5	("2008/0142768").URPN.	USPAT	OR	ON	2016/12/05 13:05
S44	22	"6921100"	USPAT	OR	ON	2016/12/05 13:11
S45	5	"20070103289"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 13:15
S46	27	("4353565" | "5167289" | "5476277" | "5780782" | "5863057" | "6203045").PN. OR ("6921100").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:32
S47	36	("20020038193" | "4103752" | "4639872" | "4651838" | "4706768" | "4836308" | "4852674" | "4854407" | "4941365" | "5040826" | "5167289" | "5314201" | "5526702" | "5606516" | "5617072" | "5626356" | "5803502" | "5915713" | "6032090" | "6037550" | "6157889" | "6242701" | "6252497" | "6307164" | "6308131" | "6357777" | "6363331" | "6459367" | "6921100").PN. OR ("7072763").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:32
S48	33	("20060100979" | "20070180719" | "20070245579" | "20080142768" | "2155876" | "3181203" | "3258884" | "3260564" | "3417518" | "3866365" | "4232488" | "4568096" | "4572527" | "4743037" | "4746133" | "4784400" | "5078442" | "5136784" | "5159989" | "5176391" | "5188379" | "5676385" | "5806196" | "6176495" | "6526668" | "7025361").PN. OR ("7786883").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:34

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S51	1	"20060113783"	US-PGPUB	OR	ON	2016/12/05 13:39
S52	3	"20150025789"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:03
S53	0	S52 and (trajectory near5 comparison)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:04
S54	2	S52 and (trajectory near10 comparison)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:05
S55	3	"20120206597"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:08
S56	776	((smart adj device) or phone or cell or cellphone or pda or (personal adj computer) or (mobile adj device) or (mobile near3 phone)) near10 ((activat$3 or turnon or control$4) near5 ((vehicle or car or automobile) adj (systems or navigation or gps)))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 13:53
S57	30	S56 and (suspension near4 Control$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 13:54
S58	41	(((smart adj device) or phone or cell or cellphone or pda or (personal adj computer) or (mobile adj device) or (mobile near3 phone)) near10 ((activat$3 or turnon or control$4) near5 ((vehicle or car or automobile) adj (systems or navigation or gps)))) with application	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 13:58
S59	17	S58 and gps and (position or location)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 15:08
S60	3	"20120208520"	US-PGPUB; USPAT; EPO; JPO; DERWENT;	OR	ON	2016/12/06 15:10

			IBM_TDB			
S61	1	"20120208520"	US-PGPUB	OR	ON	2016/12/06 15:10
S62	1841	(vehicle or car or automobile) with (inclination or orientation) with accelerometer	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:13
S63	1054	S62 and ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:14
S64	80	S62 with ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:14
S65	22	S64 and ((adjust$3 or alter$3 or chang$3 or modif$4) near3 (level$3 or orientation or inclination))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:17
S66	0	lavel$3 with vehicle with sensor with tilt	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:21
S67	0	lavel$3 with vehicle with tilt	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:21
S68	1259	level$3 with vehicle with tilt	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:22
S69	15	S68 AND ((G05D1/0891 OR G05D1/027 OR G05D1/0274 OR G05D1/0278 OR G05D1/0287 OR G05D2201/02 OR G05D2201/0201 OR G05D2201/0202 OR G05D1/0016 OR G05D1/0816 OR G05D1/0858 OR B60G2204/62 OR B60G17/0163 OR B60G17/0165 OR B60G17/018 OR B60G17/01908 OR B60G17/0195 OR B60G2200/44 OR B60G2200/46 OR B60G2200/464 OR B60G2204/127 OR B60G2204/128 OR B60G2204/4232 OR B60G2204/83022 OR B60G2300/24 OR B60G2300/37 OR B60G2300/40 OR B60G2400/204 OR B60G2500/30 OR B60G2600/73 OR B60G2800/24 OR B60G2800/962 OR B60G3/01 OR B60G3/02).CPC. AND (701/49 OR 701/2 OR 701/1 OR 701/19 OR 701/23 OR 701/25 OR 701/3 OR 701/32.4 OR 701/33.1 OR 701/36 OR 701/41 OR 701/45 OR 701/50 OR 701/519 OR 180/65.1 OR 180/65.8 OR 180/9.32 OR 280/228 OR 280/30 OR	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:25

		280/657 OR 280/86.751).CCLS. AND (G05D1/08 OR G05D1/02 OR G05D1/00 OR B60G17/0165 OR B60G17/019 OR B60G21/055 OR B60G3/01).IPCR.)				
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S73	11	(pitch near3 roll) with level$3 with balance	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:36
S74	27	("20020050699" | "20050098975" | "20050116437" | "20050206149" | "20090057048" | "20120166043" | "20130147140" | "20130147141" | "20130147142" | "20150001829" | "20150291233" | "4266627" | "4397473" | "4600069" | "4760686" | "4850786" | "5018453" | "5288101" | "5700025" | "5865444" | "5896731" | "6367831" | "7416201" | "7866671" | "7914020" | "8408559" | "9168940").PN. OR ("9409459").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2017/08/01 08:39
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S76	315	(("LEONARD") near3 ("Charles")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/08/01 08:58
S77	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone or cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 09:04
S78	2336	(pitch near3 roll) with level$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:05
S79	351	S78 and (axis near3 accelerometer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:05
S80	204	S79 and ((adjust$3 or alter$3 or chang$3 or modif$4) near3 (level$3 or orientation or inclination))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:06
S81	98	S80 and (z near3 axis)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:06
S82	7	S81 and ((adjust$3 or alter$3 or chang$3 or modif$4) near3 (height))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:08
S83	20	((pitch near3 roll) near6 (axis near3 accelerometer)) with (vehicle car or automobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:11
S84	110	(vehicle car or automobile) with (level$3) with ((all or multi or three) near3 axis)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:21
S85	2	S84 and ((adjust$3 or alter$3 or chang$3 or modif$4) near3 (height))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:21
S86	0	S84 and ((adjust$3 or alter$3 or chang$3 or modif$4) near5 ((vehicle car or automobile) adj (height)))	US-PGPUB; USPAT; EPO; JPO;	OR	ON	2017/08/01 12:23

			DERWENT; IBM_TDB			
S87	26	(vehicle car or automobile) and (level$3) and ((all or multi or three) near3 axis) and ((adjust$3 or alter$3 or chang$3 or modif$4) near5 ((vehicle car or automobile) adj (height)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:24
S88	15	(vehicle or car or automobile) same (adjust$5) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 15:06
S89	78	((pitch near3 roll) near6 (axis near3 accelerometer)) with (LEVEL$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/14 16:37
S90	77	S89 AND MEMS	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/14 16:37
S91	2	S90 AND (CIRCUIT near4 accelerometer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/14 16:38
S92	117	(tri-axial) with accelerometer with vehicle	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/15 12:16
S93	1	"20110202225"	US-PGPUB	OR	ON	2018/03/15 12:46
S94	51	(tri-axial) with accelerometer with level$3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/15 12:48
S95	73	S92 AND ((B60G17/08 OR B60G13/08 OR B60G2202/24 OR B60G2500/11 OR B60G2600/20 OR B60G13/06 OR B60G2500/10 OR B60G2800/162 OR G06F7/00 OR G06F21/44).CPC. OR (280/735 OR 280/736 OR 280/738 OR 280/731 OR 280/740 OR 280/728.2 OR 280/730.2 OR 280/734 OR 280/728.3 OR 280/741 OR 280/742 OR 280/400 OR 280/728.1 OR 280/743.1 OR 280/79.11 OR 701/45 OR 701/301 OR 701/2 OR 701/300 OR 701/124 OR 701/22 OR 701/31.4 OR 701/31.5 OR 701/33.1 OR 701/33.4 OR 701/70 OR 701/1 OR 701/11	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/15 13:16

		OR 701/117 OR 701/119 OR 701/29.1 OR 701/3 OR 701/31.1 OR 701/36 OR 701/41 OR 701/46 OR 701/472 OR 701/65 OR 701/7 OR 180/282 OR 702/141 OR 702/150 OR 702/104 OR 702/173 OR 702/175 OR 702/179 OR 702/188 OR 702/33 OR 702/39 OR 702/85 OR 702/95).CCLS. OR (G06F17/10 OR G06F19/00 OR G06F7/00 OR G06F17/00 OR G06F11/00 OR G06F15/00 OR G06F17/18 OR G06F17/40 OR G06F21/44 OR G06F3/048 OR B60G17/08 OR B60G13/06 OR B60G13/08).IPCR.)				

EAST Search History (Interference)

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Leonard

Group Art Unit: 3668

Serial No.: 14/961,787

Examiner: Martinez Borrero, Luis A.

Filed: December 7, 2015

Docket No.: LEO-2

Confirmation No.: 8904

For: VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES

* *

AMENDMENT C

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is responsive to the Office Action dated March 22, 2018, for which a shortened statutory period for reply has been extended until August 22, 2018. Favorable consideration is respectfully requested in view of the following Amendments and Remarks.

IN THE CLAIMS:

Please amend the claims as follows:

1. (Currently Amended) A leveling system for leveling a vehicle that is at rest, the leveling system comprising:

one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction, each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured and a processor to process data collected by the respective sensor device; and

a smart device in communication with the one or more sensor devices to allow information received from the one or more sensor devices about at least one of the inclination or the orientation of the vehicle in both the pitch direction and the roll direction to be processed to provide measurements to a user and to determine an amount of adjustments in height to at least one of a rear or front section or first or second side sections of the vehicle needed to level the vehicle, so that the vehicle is adjusted to obtain a level position based on a calculated change from the determination of the amount of adjustments in height, the smart device configured to determine an initial level position for a vehicle to determine any inconsistencies inherent in the leveling system by capturing pitch and roll angle measurements from the sensor device

taken at the initial level position to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies when determining the amount of adjustment in height.

2. (Previously Presented) The system according to claim 1, wherein the printed circuit board further comprises a digital gyroscope.

3. (Previously Presented) The system according to claim 1, wherein the processor performs calculations related to the determination the amount of adjustments needed to at least one of the pitch direction or the roll direction to level the vehicle.

4. (Original) The system according to claim 3, wherein the sensor device comprises a memory in communication with the processor of the PCB, the sensor device capable of storing information transmitted from the smart device.

5. (Previously Presented) The system according to claim 4, wherein the sensor device uses data sensed by the sensor device and stored data obtained from the smart device to perform calculations on the sensor device and transmit the calculated data to the smart device.

6. (Canceled)

7. (Previously Presented) The system according to claim 1, wherein the smart device communicates with the printed circuit board of the sensor device.

8-9. (Canceled)

10. (Currently Amended) A method for leveling a recreational vehicle, the method comprising:

providing a leveling system comprising one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction and a smart device in communication with the one or more sensor devices, each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured;

determining an initial level position for the vehicle using the smart device to determine any inconsistencies inherent in the leveling system; and

capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time;

measuring the pitch angle and the roll angle of the vehicle when the vehicle is at rest using the sensor device;

retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position;

calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle using the calibration data of pitch and roll angle measurements;

displaying the calculated change in the height to the at least one of the rear or front section or the first or second side sections of the vehicle in at least one of the pitch direction or the roll direction of the vehicle on the smart device; and

adjusting the height to the at least one of the rear or front section or the first or second side sections of the vehicle to obtain the level position of the vehicle based on the calculated change.

11. (Canceled)

12. (Currently Amended) The method according to claim [[11]] 10, wherein the step of determining an initial level position comprises using at least one of an accelerometer, gyroscope, or global positioning system sensor on the smart device to achieve the initial level position.

13. (Canceled)

14. (Currently Amended) The method according to claim [[11]] 10, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises communicating calibration data from the sensor device of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position to the smart device and saving the calibration data on the smart device.

15. (Currently Amended) The method according to claim [[11]] 10, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises saving the calibration data of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position on the sensor device.

16. (Previously Presented) The method according to claim 15, wherein the step of saving the calibration data of the pitch and roll angle measurements on the sensor device comprises transmitting instructions from the smart device to the sensor device to save and store the calibration data of the pitch and roll angle measurements on the sensor device and wherein the method further comprises recalling the calibration data of the pitch and roll angle measurements from the sensor device to the smart device.

17. (Canceled)

18. (Currently Amended) The method according to claim [[11]] 10, wherein the step of determining an initial level position comprises receiving measurements of a length and a width of the vehicle.

19. (Canceled)

20. (Original) The method according to claim 10, wherein the step of displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle further comprises displaying the calculated change in the pitch direction and the roll direction of the vehicle in measurements of distance.

21. (Canceled)

22. (Original) The method according to claim 10, further comprising saving a given pitch angle measurement on at least one of the smart device or the sensor device to permit later recall for the purpose of returning the vehicle to the given pitch angle position at a later time.

23. (Original) The method according to claim 10, further comprising receiving data at the smart device from one or more vehicle control panels.

24. (Original) The method according to claim 23, wherein the received data from one or more vehicle control panels comprises at least one of data regarding holding tank levels or data regarding battery power levels.

25. (Original) The method according to claim 23, further comprising displaying the data on the smart device that is generated and displayed on the one or more vehicle control panels.

26. (Original) The method according to claim 10, further comprising activating one or more systems on the vehicle with the smart device.

27. (Original) The method according to claim 26, wherein the one or more systems activated via the software application of the smart device comprise at least one of lighting systems, entertainment systems, power slideouts or a generator.

28. (Original) The method according to claim 10, further comprising collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

29. (Currently Amended) A non-transitory computer readable medium comprising computer executable instructions embodied in a computer readable medium that when executed by a processor of a computer control the computer to perform steps comprising:

receiving on a smart device a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device secured to the vehicle, the sensor device comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both

the pitch or roll direction regardless of positioning of the respective device relative to the vehicle to which the one or more sensor devices are secured;

capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device after determining an initial level position for the vehicle using the smart device to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time;

retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at [[an]] the initial level position;

calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of a pitch direction or a roll direction of the vehicle using the calibration data of the pitch and roll angle measurements; and

displaying the calculated change in height to at least one of the rear or front section or one of the first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device so that the height to at least one of the rear or front section or the first or second side sections of the vehicle is adjusted to obtain the level position of the vehicle based on the calculated change.

30-37. (Canceled)

38. (Original) The non-transitory computer readable medium according to claim 29, further comprising receiving data at the smart device from one or more vehicle control panels.

39-42. (Canceled)

43. (Original) The non-transitory computer readable medium according to claim 29, further comprising collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

44. (New) The system according to claim 1, wherein the printed circuit board further comprises a digital temperature sensor to collect temperature data to be used by the processor of the printed circuit board to correct irregularities in the data obtained by the respective sensor device based on temperature variations.

REMARKS

Status Summary

Claims 1-5, 7, 10-16, 18, 20, 22-29, 38, and 43 are pending in the present application. Claims 1-5, 7, 10-16, 18, 20, 22-29, 38, and 43 presently stand rejected. With this Amendment, claims 1, 10, 12, 14, 15, and 18 have been amended. Claim 11 has been canceled. Support for the amendment can be found throughout the application as originally filed, including pages 15-17 19-22 and 28-29. Thus, upon entry of this Amendment, claims 1-5, 7, 10, 12, 14-16, 18, 20, 22-29, 38, and 43-44 will be pending. Reconsideration of the application in view of the arguments below is respectfully requested.

Claim Rejection - 35 U.S.C. § 103

Claims 1-5, 7, 10-16, 18, 20, 22-29, 38, and 43 stand rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent Publication No. 2008/0142768 to Thorpe, et al. (hereinafter, "Thorpe") in view of U.S. Patent Publication No. 2012/0197587 to Luk, et al. (hereinafter, "Luk"). Claims 27, 28, 38, and 43 stand rejected under 35 U.S.C. § 103 as being unpatentable over Thorpe and Luk in view of U.S. Patent Publication No. 2012/0208520 to Howarter (hereinafter, "Howarter"). Claims 27, 28, 38, and 43 stand rejected under 35 U.S.C. § 103 as being unpatentable over Thorpe and Luk , Howarter in view of U.S. Patent No. 4,935,883 to Hulsing (hereinafter, "Hulsing"). These rejections are respectfully traversed.

Independent claim 1 recites a leveling system for leveling a vehicle that is at rest. The leveling system comprises one or more sensor devices secured to a vehicle to

sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction. Each of the one or more sensor devices comprises a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured. The leveling system also comprises a smart device in communication with the one or more sensor devices to allow information received from the one or more sensor devices about at least one of the inclination or the orientation of the vehicle in both the pitch direction and the roll direction to be processed to provide measurements to a user and to determine an amount of adjustments in height to at least one of a rear or front section or first or second side sections of the vehicle needed to level the vehicle, so that the vehicle is adjusted to obtain a level position based on a calculated change from the determination of the amount of adjustments in height. The smart device configured to determine an initial level position for a vehicle to determine any inconsistencies inherent in the leveling system by capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies when determining the amount of adjustment in height.

Independent claim 10 recites a method for leveling a recreational vehicle, the method comprising the step of providing a leveling system comprising one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction and a smart device

in communication with the one or more sensor devices. Each of the one or more sensor devices comprises a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured. The method comprises the steps of determining an initial level position for the vehicle using the smart device to determine any inconsistencies inherent in the leveling system and capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time. The method also comprises the steps of measuring the pitch angle and the roll angle of the vehicle when the vehicle is at rest using the sensor device and retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position. Further the method comprises the step of calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle using the calibration data of pitch and roll angle measurements. Additionally, the method comprises the steps of displaying the calculated change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle on the smart device. Further, the method comprises the steps of adjusting the height to the at least one of the rear or

front section or the first or second side sections of the vehicle to obtain the level position of the vehicle based on the calculated change.

Independent claim 29 recites a non-transitory computer readable medium comprising computer executable instructions embodied in a computer readable medium that when executed by a processor of a computer control the computer to perform steps comprising receiving on a smart device a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device secured to the vehicle. The sensor device comprises a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective device relative to the vehicle to which the one or more sensor devices are secured. The computer executable instructions embodied in a computer readable medium also comprise capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device after determining an initial level position for the vehicle using the smart device to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time. The computer executable instructions embodied in a computer readable medium also comprise retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position and calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of a pitch direction or a roll direction of the vehicle using the calibration data of the pitch and roll angle measurements. Further, the

computer executable instructions embodied in a computer readable medium comprises

displaying the calculated change in height to at least one of the rear or front section or one of the first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device so that the height to at least one of the rear or front section or the first or second side sections of the vehicle is adjusted to obtain the level position of the vehicle as needed based on the calculated change.

Applicant respectfully submits that Thorpe and Luk, either alone or combination, do not render obvious independent claims 1, 10, and 29 or the claims that depend therefrom. In particular, Thorpe and/or Luk do not disclose, teach, or suggest all the features of independent claims 1, 10, and 29. For example, Thorpe and Lukk do not disclose, teach, or suggest the smart device configured to determine an initial level position for a vehicle to determine any inconsistencies inherent in the leveling system by capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies when determining the amount of adjustment in height, as recited in claim 1. Further, Thorpe and/or Luk do not disclose, teach, or suggest all the features of independent claims 1, 10, and 29. For example, Thorpe and Luk do not disclose, teach, or suggest determining an initial level position for the vehicle using the smart device to determine any inconsistencies inherent in the leveling system and capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device to provide a calibration data of the pitch and roll

angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time as recited in claim 10 and 29.

Thorpe discloses a leveling system for use with recreational vehicles having one or more leveling mechanisms to level the vehicle in the side-to-side and front-to-back directions. The system comprises a level unit that is placed on a generally horizontal surface inside the vehicle and a control unit which is in spaced apart relation to the level unit. Both units have a controller and transceiver for wireless communication with the other unit and one or more batteries as the power supply. The level unit has one or more level sensing mechanisms to determine the pitch and roll of the vehicle. Preferably, a single dual-axis tilt measuring mechanism is utilized. The control unit has one or more control buttons to allow the operator to activate and operate the system and a display panel that displays the amount of pitch and roll correction necessary to place the recreational vehicle in its level condition.

Luk does not overcome the significant deficiencies outlined above with regard to Thorpe. Luk discloses vehicle ride evaluation and, more particularly, to a method of information sensing and transformation to assist a vehicle operator to make an informed evaluation for vehicular ride quality and a composite comprised of said vehicle and portable device secured to said vehicle for said information sensing and transformation. Neither Thorpe nor Luk teaches a system that requires the use of two sensors: a first sensor for the lateral tilt of the vehicle and a second sensor for the pitch angle of the vehicle. While

Regarding claims 27, 28, 38, and 43, claims 27 and 28 depend from claim 10 and claims 38 and 43 depend from claim 29. Howarter does not overcome the

significant deficiencies outlined above with regard to Thorpe and Solbrack. Howarter discloses a system and method for controlling systems of a vehicle with a cell phone. The cell phone is associated with the vehicle through a user interface. User preferences are received through the user interface for sending commands from the cell phone to the vehicle for controlling the systems of the vehicle. A wireless connection is established between the vehicle and the cell phone. A distance is determined between the cell phone and the vehicle. One or more commands are sent to the vehicle to control the systems based on the user preferences. While Howarter discloses an accelerometer in a cell phone, Howarter does not disclose, teach, or suggest that a sensor device should be placed on a vehicle that utilizes a 3-axis accelerometer as recited in claims 10 and 29.

Thorpe, Luk and/or Howarter, alone or in combination, do not disclose one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction where each of the one or more sensor devices comprises a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured as recited in claims 10 and 29.

Regarding claim 44, which depends from claim 1, Hulsing does not overcome the significant deficiencies outlined above with regard to Thorpe, Luk, Howarter. Hulsing discloses Apparatus and method for establishing a level plane and with respect to the level plane, vertically aligning an acceleration sensitive axis of a gravity measurement

device (10). The gravity measurement device includes an accelerometer (68), which is rotatably mounted on a gimbal shaft (62) within a gimbal frame (54). The gimbal frame is also rotatable about a longitudinal axis that is preferably oriented at a right angle to the longitudinal axis of the gimbal shaft. A stepping motor (20) is connected through an antibacklash gear (30), an idler gear (32) and an antibacklash gear (48) to a drive shaft (50). Rotation of this drive shaft causes the accelerometer to rotate about the gimbal shaft. In a similar fashion, a stepping motor (22) is drivingly connected to a drive shaft (56), used to rotate the gimbal frame. A control (140) selectively energizes the stepping motors, so that the acceleration sensitive axis of the accelerometer is rotated until an output signal from the acceleometer indicates that the acceleration of gravity is zero and thus that the sensitive axis is level at two cross axis positions, thereby determining a level reference plane. The control then causes the accelerometer to be rotated 90.degree. relative to the reference plane, so that the acceleration sensitive axis is vertically aligned, thereby enabling the accelerometer to measure the local acceleration of gravity with minimal error due to vertical alignment. Hulsing does not disclose, teach, or suggest that a sensor device should be placed on a vehicle that utilizes a 3-axis accelerometer as recited in claims 10 and 29.

Thorpe, Lukk, Howarter and/or Hulsing, alone or in combination, do not disclose one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction where each of the one or more sensor devices comprises a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more

sensor devices relative to the vehicle to which the one or more sensor devices are secured as recited in claims 10 and 29

Therefore, for at least the reasons set forth above, independent claims 1, 10, and 29 are not rendered obvious by Thorpe, Solbrack, Howarter and/or Hulsing, either alone or in combination. Claims 2-5 and 7 depend from claim 1 and claims 11, 12, 14-16, 18, 20, and 22-28 depend from claim 10. Further, claims 38 and 43 depend from claim 29. Thus, the cited references also do not render obvious claims 2-5, 7, 11, 12, 14-16, 18, 20, 22-28, 38, and 43. Accordingly, applicant respectfully submits that the rejections of claims 1-5, 7, 10- 12, 14-16, 18, 20, 22-29, 38, and 43 under 35 U.S.C. § 103 should be withdrawn and the claims allowed at this time.

CONCLUSION

In light of the above amendments and remarks, it is respectfully submitted that the present application is now in proper condition for allowance, and an early notice to such effect is earnestly solicited.

If any small matter should remain outstanding after the Patent Examiner has had an opportunity to review the above Remarks, the Patent Examiner is respectfully requested to telephone the undersigned patent attorney in order to resolve these matters and avoid the issuance of another Official Action.

DEPOSIT ACCOUNT

The Commissioner is hereby authorized to charge any fees associated with the filing of this correspondence to Deposit Account No. **50-3172**.

Respectfully submitted,
J. BENNETT MULLINAX, LLC

Date: August 22, 2018

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LEO-2

PTO/AIA/22 (03-13)
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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)

Docket Number (Optional): LEO-2

Application Number 14/961,787 | Filed 12/7/2015

For VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM FOR LEVELING VEHICLES USING SMART DEVICES

Art Unit | Examiner

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	Fee	Small Entity Fee	Micro Entity Fee	
☐ One month (37 CFR 1.17(a)(1))	$ 200	$ 100	$ 50	$
☒ Two months (37 CFR 1.17(a)(2))	$ 600	$ 300	$ 150	$ 300.00
☐ Three months (37 CFR 1.17(a)(3))	$ 1400	$ 700	$ 350	$
☐ Four months (37 CFR 1.17(a)(4))	$ 2200	$ 1100	$ 550	$
☐ Five months (37 CFR 1.17(a)(5))	$ 3000	$ 1500	$ 750	$

☒ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 50-3172.

☒ Payment made via EFS-Web.

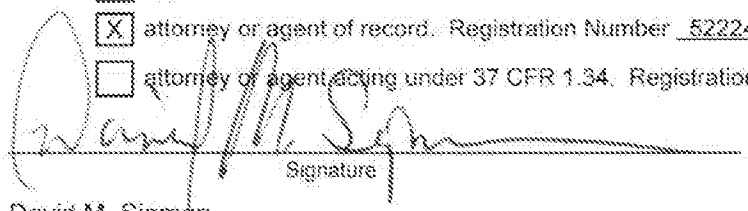
WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant.

☒ attorney or agent of record. Registration Number 52224

☐ attorney or agent acting under 37 CFR 1.34. Registration number _____



Signature

April 27 2018

Date

David M. Sigmon

Typed or printed name

864-987-9696

Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below.*

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 8 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Patent Application Fee Transmittal

Application Number:	14961787
Filing Date:	07-Dec-2015
Title of Invention:	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES
First Named Inventor/Applicant Name:	Charles A. Leonard
Filer:	John Bennett Mullinax/David Sigmon
Attorney Docket Number:	LEO-2

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 2 months with $0 paid	2252	1	300	300
Miscellaneous:				
			Total in USD ($)	**300**

Electronic Acknowledgement Receipt

EFS ID:	33513144
Application Number:	14961787
International Application Number:	
Confirmation Number:	8904
Title of Invention:	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES
First Named Inventor/Applicant Name:	Charles A. Leonard
Customer Number:	44728
Filer:	John Bennett Mullinax/David Sigmon
Filer Authorized By:	John Bennett Mullinax
Attorney Docket Number:	LEO-2
Receipt Date:	22-AUG-2018
Filing Date:	07-DEC-2015
Time Stamp:	23:58:25
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	EFT
Payment was successfully received in RAM	$300
RAM confirmation Number	082318INTEFSW23592200
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

ETN1002
353/655

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		scan0003.pdf	3835620 7f70ec6b0a996abba800e3ac88b7bed04e1e874c	yes	21
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment/Req. Reconsideration-After Non-Final Reject		2	21	
	Extension of Time		1	1	
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	31110 ed39d02fe6e318a3e37109841737f51398b17666	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	3866730		

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Leonard

Group Art Unit: 3668

Serial No.: 14/961,787

Examiner: Martinez Borrero, Luis A.

Filed: December 7, 2015

Docket No.: LEO-2

Confirmation No.: 8904

For: VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES

* *

SUPPLEMENTAL AMENDMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This is supplemental amendment to the amendment filed August 22, 2018. Favorable consideration is respectfully requested in view of the following Amendments and Remarks.

IN THE CLAIMS:

Please amend the claims as follows:

1. (Currently Amended) A leveling system for leveling a vehicle that is at rest, the leveling system comprising:

one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction, each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured and a processor to process data collected by the respective sensor device; and

a smart device in communication with the one or more sensor devices to allow information received from the one or more sensor devices about at least one of the inclination or the orientation of the vehicle in both the pitch direction and the roll direction to be processed to provide measurements to a user and to determine an amount of adjustments in height to at least one of a rear or front section or first or second side sections of the vehicle needed to level the vehicle, so that the vehicle is adjusted to obtain a level position based on a calculated change from the determination of the amount of adjustments in height, the smart device configured to determine an initial level position for a vehicle to determine any inconsistencies inherent in the leveling system by capturing pitch and roll angle measurements from the sensor device

taken at the initial level position to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies when determining the amount of adjustment in height.

2. (Previously Presented) The system according to claim 1, wherein the printed circuit board further comprises a digital gyroscope.

3. (Previously Presented) The system according to claim 1, wherein the processor performs calculations related to the determination the amount of adjustments needed to at least one of the pitch direction or the roll direction to level the vehicle.

4. (Original) The system according to claim 3, wherein the sensor device comprises a memory in communication with the processor of the PCB, the sensor device capable of storing information transmitted from the smart device.

5. (Previously Presented) The system according to claim 4, wherein the sensor device uses data sensed by the sensor device and stored data obtained from the smart device to perform calculations on the sensor device and transmit the calculated data to the smart device.

6. (Canceled)

7. (Previously Presented) The system according to claim 1, wherein the smart device communicates with the printed circuit board of the sensor device.

8-9. (Canceled)

10. (Currently Amended) A method for leveling a recreational vehicle, the method comprising:

providing a leveling system comprising one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction and a smart device in communication with the one or more sensor devices, each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured;

determining an initial level position for the vehicle using the smart device to determine any inconsistencies inherent in the leveling system; and

capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time;

measuring the pitch angle and the roll angle of the vehicle when the vehicle is at rest using the sensor device;

retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position;

calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle using the calibration data of pitch and roll angle measurements;

displaying the calculated change in the height to the at least one of the rear or front section or the first or second side sections of the vehicle in at least one of the pitch direction or the roll direction of the vehicle on the smart device; and

adjusting the height to the at least one of the rear or front section or the first or second side sections of the vehicle to obtain the level position of the vehicle based on the calculated change.

11. (Canceled)

12. (Currently Amended) The method according to claim [[11]] 10, wherein the step of determining an initial level position comprises using at least one of an accelerometer, gyroscope, or global positioning system sensor on the smart device to achieve the initial level position.

13. (Canceled)

14. (Currently Amended) The method according to claim [[11]] 10, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises communicating calibration data from the sensor device of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position to the smart device and saving the calibration data on the smart device.

15. (Currently Amended) The method according to claim [[11]] 10, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises saving the calibration data of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position on the sensor device.

16. (Previously Presented) The method according to claim 15, wherein the step of saving the calibration data of the pitch and roll angle measurements on the sensor device comprises transmitting instructions from the smart device to the sensor device to save and store the calibration data of the pitch and roll angle measurements on the sensor device and wherein the method further comprises recalling the calibration data of the pitch and roll angle measurements from the sensor device to the smart device.

17. (Canceled)

18. (Currently Amended) The method according to claim [[11]] 10, wherein the step of determining an initial level position comprises receiving measurements of a length and a width of the vehicle.

19. (Canceled)

20. (Original) The method according to claim 10, wherein the step of displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle further comprises displaying the calculated change in the pitch direction and the roll direction of the vehicle in measurements of distance.

21. (Canceled)

22. (Original) The method according to claim 10, further comprising saving a given pitch angle measurement on at least one of the smart device or the sensor device to permit later recall for the purpose of returning the vehicle to the given pitch angle position at a later time.

23. (Original) The method according to claim 10, further comprising receiving data at the smart device from one or more vehicle control panels.

24. (Original) The method according to claim 23, wherein the received data from one or more vehicle control panels comprises at least one of data regarding holding tank levels or data regarding battery power levels.

25. (Original) The method according to claim 23, further comprising displaying the data on the smart device that is generated and displayed on the one or more vehicle control panels.

26. (Original) The method according to claim 10, further comprising activating one or more systems on the vehicle with the smart device.

27. (Original) The method according to claim 26, wherein the one or more systems activated via the software application of the smart device comprise at least one of lighting systems, entertainment systems, power slideouts or a generator.

28. (Original) The method according to claim 10, further comprising collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

29. (Currently Amended) A non-transitory computer readable medium comprising computer executable instructions embodied in a computer readable medium that when executed by a processor of a computer control the computer to perform steps comprising:

receiving on a smart device a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device secured to the vehicle, the sensor device comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both

the pitch or roll direction regardless of positioning of the respective device relative to the vehicle to which the one or more sensor devices are secured;

capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device after determining an initial level position for the vehicle using the smart device to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time;

retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at [[an]] the initial level position;

calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of a pitch direction or a roll direction of the vehicle using the calibration data of the pitch and roll angle measurements; and

displaying the calculated change in height to at least one of the rear or front section or one of the first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device so that the height to at least one of the rear or front section or the first or second side sections of the vehicle is adjusted to obtain the level position of the vehicle based on the calculated change.

30-37. (Canceled)

38. (Original) The non-transitory computer readable medium according to claim 29, further comprising receiving data at the smart device from one or more vehicle control panels.

39-42. (Canceled)

43. (Original) The non-transitory computer readable medium according to claim 29, further comprising collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

44. (Previously Presented) The system according to claim 1, wherein the printed circuit board further comprises a digital temperature sensor to collect temperature data to be used by the processor of the printed circuit board to correct irregularities in the data obtained by the respective sensor device based on temperature variations.

REMARKS

Status Summary

Claims 1-5, 7, 10-12, 14-16, 18, 20, 22-29, 38, and 43-44 are pending in the present application. Claims 1-5, 7, 10-12, 14-16, 18, 20, 22-29, 38, and 43-44 presently stand rejected. With this Amendment, claims 1, 10, 12, 14, 15, 18 and 29 have been amended. Claim 11 has been canceled. Support for the amendment can be found throughout the application as originally filed, including pages 15-17, 19-22, and 28-29. Thus, upon entry of this Amendment, claims 1-5, 7, 10, 12, 14-16, 18, 20, 22-29, 38, and 43-44 will be pending. Reconsideration of the application in view of the arguments below is respectfully requested.

Claim Rejection - 35 U.S.C. § 103

Claims 1-5, 7, 10-16, 18, 20, 22-29, 38, and 43 stand rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent Publication No. 2008/0142768 to Thorpe, et al. (hereinafter, "Thorpe") in view of U.S. Patent Publication No. 2012/0197587 to Luk, et al. (hereinafter, "Luk"). Claims 27, 28, 38, and 43 stand rejected under 35 U.S.C. § 103 as being unpatentable over Thorpe and Luk in view of U.S. Patent Publication No. 2012/0208520 to Howarter (hereinafter, "Howarter"). Claims 27, 28, 38, and 43 stand rejected under 35 U.S.C. § 103 as being unpatentable over Thorpe and Luk, Howarter in view of U.S. Patent No. 4,935,883 to Hulsing (hereinafter, "Hulsing"). These rejections are respectfully traversed.

Independent claim 1 recites a leveling system for leveling a vehicle that is at rest. The leveling system comprises one or more sensor devices secured to a vehicle to

sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction. Each of the one or more sensor devices comprises a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured. The leveling system also comprises a smart device in communication with the one or more sensor devices to allow information received from the one or more sensor devices about at least one of the inclination or the orientation of the vehicle in both the pitch direction and the roll direction to be processed to provide measurements to a user and to determine an amount of adjustments in height to at least one of a rear or front section or first or second side sections of the vehicle needed to level the vehicle, so that the vehicle is adjusted to obtain a level position based on a calculated change from the determination of the amount of adjustments in height. The smart device configured to determine an initial level position for a vehicle to determine any inconsistencies inherent in the leveling system by capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies when determining the amount of adjustment in height.

Independent claim 10 recites a method for leveling a recreational vehicle, the method comprising the step of providing a leveling system comprising one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction and a smart device

in communication with the one or more sensor devices. Each of the one or more sensor devices comprises a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured. The method comprises the steps of determining an initial level position for the vehicle using the smart device to determine any inconsistencies inherent in the leveling system and capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time. The method also comprises the steps of measuring the pitch angle and the roll angle of the vehicle when the vehicle is at rest using the sensor device and retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position. Further the method comprises the step of calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle using the calibration data of pitch and roll angle measurements. Additionally, the method comprises the steps of displaying the calculated change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle on the smart device. Further, the method comprises the steps of adjusting the height to the at least one of the rear or

front section or the first or second side sections of the vehicle to obtain the level position of the vehicle based on the calculated change.

Independent claim 29 recites a non-transitory computer readable medium comprising computer executable instructions embodied in a computer readable medium that when executed by a processor of a computer control the computer to perform steps comprising receiving on a smart device a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device secured to the vehicle. The sensor device comprises a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective device relative to the vehicle to which the one or more sensor devices are secured. The computer executable instructions embodied in a computer readable medium also comprise capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device after determining an initial level position for the vehicle using the smart device to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time. The computer executable instructions embodied in a computer readable medium also comprise retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position and calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of a pitch direction or a roll direction of the vehicle using the calibration data of the pitch and roll angle measurements. Further, the

computer executable instructions embodied in a computer readable medium comprises displaying the calculated change in height to at least one of the rear or front section or one of the first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device so that the height to at least one of the rear or front section or the first or second side sections of the vehicle is adjusted to obtain the level position of the vehicle as needed based on the calculated change.

Applicant respectfully submits that Thorpe and Luk, either alone or combination, do not render obvious independent claims 1, 10, and 29 or the claims that depend therefrom. In particular, Thorpe and/or Luk do not disclose, teach, or suggest all the features of independent claims 1, 10, and 29. For example, Thorpe and Luk do not disclose, teach, or suggest the smart device configured to determine an initial level position for a vehicle to determine any inconsistencies inherent in the leveling system by capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies when determining the amount of adjustment in height as recited in claim 1. Further, Thorpe and Luk do not disclose, teach, or suggest determining an initial level position for the vehicle using the smart device to determine any inconsistencies inherent in the leveling system and capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device to provide a calibration data of the pitch and roll angle measurements to

permit consideration of any inconsistencies determined when taking measurement readings at a future time as recited in claim 10 and 29.

Thorpe discloses a leveling system for use with recreational vehicles having one or more leveling mechanisms to level the vehicle in the side-to-side and front-to-back directions. The system comprises a level unit that is placed on a generally horizontal surface inside the vehicle and a control unit which is in spaced apart relation to the level unit. Both units have a controller and transceiver for wireless communication with the other unit and one or more batteries as the power supply. The level unit has one or more level sensing mechanisms to determine the pitch and roll of the vehicle. Preferably, a single dual-axis tilt measuring mechanism is utilized. The control unit has one or more control buttons to allow the operator to activate and operate the system and a display panel that displays the amount of pitch and roll correction necessary to place the recreational vehicle in its level condition. Thorpe states that the leveling system taught therein has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle.

As pointed out in the Office Action, Thorpe clearly teaches that the level unit 12 has to be secured in place in the vehicle in a specific manner to operate properly. As set forth in paragraph [0036] cited by the Office Action, Thorpe teaches that the top cover **22** of level unit **12** has one or more top side indicating means **30**, such as the "THIS SIDE UP" indicator shown in Figure 3, to indicate to the operator which side he or she should place facing upward when level unit **12** is installed inside the recreational

vehicle **16**. The top cover **22** of level unit **12** also has one or more position indicating means **32**, such as the "FRONT" and "REAR" indicators shown in FIG. 3, that indicate to the operator which sides of the level unit **12** should be placed toward the direction of the front and rear of the vehicle, also indicating by default the left and right side directed positions. Proper placement of level unit **12** is necessary for the operation of level unit **12** (emphasis added) to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle **16** relative to a calibrated reference position or predetermined attitude at level condition **20**. The level unit **12** is placed on a flat surface inside recreational vehicle **16**, such as on a cabinet shelf or on top of a counter or the like, to allow the components disposed in interior chamber **28** of level unit **12** to measure the pitch and roll tilt so that leveling system **10** can determine the adjustment necessary to neutralize that tilting.

Further, as set forth in paragraph [0043], Thorpe discloses to set leveling system **10** for future use, it is preferred to place the recreational vehicle **16** in its level condition **20** based on the operator's preference and the smooth functioning of the cabinet and appliance doors and the levelness of the table, counter, floor and other surfaces. Once the recreational vehicle is set, the operator utilizes the control unit **14** to set the base reference position at level condition **20**. Thorpe teaches that this is accomplished by pushing and holding the mode button **80** for a predetermined amount of time, such as twenty seconds. This activity will set the reference position to zero from which the amount of out-of-level will be determined. Once leveling system **10** is calibrated, this step should not have to be performed again unless level unit **12** is moved. The control

unit **14** can then be placed on a visor or like object inside the tow vehicle or the driving compartment of the recreational vehicle.

Firstly, Thorpe teaches that a proper placement of the level unit in the vehicle is necessary and thus requires a specific orientation of the level unit. Thus, Thorpe cannot teach and/or suggest the use of a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured as recited in claims 1, 10 and 29. (Emphasis added.) Such an element is not like where a reference teaches one number within a range of numbers. This element recited in claims 1, 10 and 29 provides a freedom to the user to not have to worry about exact alignment of the level unit or the occupation within the vehicle of a flat horizontal surface. Thorpe does not recognize and thus does not teach or suggest a level unit that provides this freedom to a user and thus does not recognize the extend ease and utility of the leveling system method and computer program, respectively recited in claims 1, 10, and 29.

Further, while Thorpe states that the operator can set the level measurement on the level unit by hand, for example by pushing the mode button on the control unit for a certain amount of time to reset that measurement to zero, the control unit is not used to determine inconsistencies, but is only used to reset the measure of zero to identify level in the Thorpe's leveling system. Thorpe does not disclose, teach or suggest the smart device configured to determine an initial level position for a vehicle to determine any inconsistencies inherent in the leveling system by capturing pitch and roll angle

measurements from the sensor device taken at the initial level position to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies when determining the amount of adjustment in height, as recited in claim 1. Further, Thorpe does not disclose, teach or suggest determining an initial level position for the vehicle using the smart device to determine any inconsistencies inherent in the leveling system and capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time as recited in claim 10 and 29.

Luk does not overcome the significant deficiencies outlined above with regard to Thorpe. Luk discloses vehicle ride evaluation and, more particularly, to a method of information sensing and transformation to assist a vehicle operator to make an informed evaluation for vehicular ride quality and a composite comprised of said vehicle and portable device secured to said vehicle for said information sensing and transformation. Luk does not provide a smart device and further does not provide a manner in which to determine inconsistencies in initial level measurements. Neither Thorpe nor Luk disclose, teach or suggest the smart device configured to determine an initial level position for a vehicle to determine any inconsistencies inherent in the leveling system by capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies when determining the amount of adjustment in height, as recited in claim 1. Further, Thorpe and Luk, either alone or in combination,

do not disclose, teach or suggest determining an initial level position for the vehicle using the smart device to determine any inconsistencies inherent in the leveling system and capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time as recited in claim 10 and 29.

Regarding claims 27, 28, 38, and 43, claims 27 and 28 depend from claim 10 and claims 38 and 43 depend from claim 29. Howarter does not overcome the significant deficiencies outlined above with regard to Thorpe and Luk. Howarter discloses a system and method for controlling systems of a vehicle with a cell phone. The cell phone is associated with the vehicle through a user interface. User preferences are received through the user interface for sending commands from the cell phone to the vehicle for controlling the systems of the vehicle. A wireless connection is established between the vehicle and the cell phone. A distance is determined between the cell phone and the vehicle. One or more commands are sent to the vehicle to control the systems based on the user preferences. While Howarter discloses an accelerometer in a cell phone, Howarter does not disclose, teach, or suggest a smart device and/or a manner in which to determine inconsistencies in initial level measurements using the smart device as recited in claims 10 and 29.

Thorpe, Luk and/or Howarter, either alone or in combination, do not disclose, teach or suggest determining an initial level position for the vehicle using the smart device to determine any inconsistencies inherent in the leveling system and capturing pitch and roll angle measurements from the sensor device taken at the initial level

position on the smart device to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time as recited in claim 10 and 29.

Regarding claim 44, which depends from claim 1, Hulsing does not overcome the significant deficiencies outlined above with regard to Thorpe, Luk, Howarter. Hulsing discloses an apparatus and method for establishing a level plane and with respect to the level plane, vertically aligning an acceleration sensitive axis of a gravity measurement device (10). The gravity measurement device includes an accelerometer (68), which is rotatably mounted on a gimbal shaft (62) within a gimbal frame (54). The gimbal frame is also rotatable about a longitudinal axis that is preferably oriented at a right angle to the longitudinal axis of the gimbal shaft. A stepping motor (20) is connected through an antibacklash gear (30), an idler gear (32) and an antibacklash gear (48) to a drive shaft (50). Rotation of this drive shaft causes the accelerometer to rotate about the gimbal shaft. In a similar fashion, a stepping motor (22) is drivingly connected to a drive shaft (56), used to rotate the gimbal frame. A control (140) selectively energizes the stepping motors, so that the acceleration sensitive axis of the accelerometer is rotated until an output signal from the accelerometer indicates that the acceleration of gravity is zero and thus that the sensitive axis is level at two cross axis positions, thereby determining a level reference plane. The control then causes the accelerometer to be rotated 90° relative to the reference plane, so that the acceleration sensitive axis is vertically aligned, thereby enabling the accelerometer to measure the local acceleration of gravity with minimal error due to vertical alignment. Hulsing does

not teach or suggest a smart device that provides a manner in which to determine inconsistencies in initial level measurements as recited in claim1.

Thorpe, Luk, Howarter and/or Hulsing, alone or in combination, do not disclose, teach or suggest the smart device configured to determine an initial level position for a vehicle to determine any inconsistencies inherent in the leveling system by capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies when determining the amount of adjustment in height, as recited in claim 1.

Therefore, for at least the reasons set forth above, independent claims 1, 10, and 29 are not rendered obvious by Thorpe, Luk, Howarter and/or Hulsing, either alone or in combination. Claims 2-5 and 7 depend from claim 1 and claims 12, 14-16, 18, 20, and 22-28 depend from claim 10. Further, claims 38 and 43 depend from claim 29. Thus, the cited references also do not render obvious claims 2-5, 7, 12, 14-16, 18, 20, 22-28, 38, and 43. Accordingly, applicant respectfully submits that the rejections of claims 1-5, 7, 10- 12, 14-16, 18, 20, 22-29, 38, and 43 under 35 U.S.C. § 103 should be withdrawn and the claims allowed at this time.

CONCLUSION

In light of the above amendments and remarks, it is respectfully submitted that the present application is now in proper condition for allowance, and an early notice to such effect is earnestly solicited.

If any small matter should remain outstanding after the Patent Examiner has had an opportunity to review the above Remarks, the Patent Examiner is respectfully requested to telephone the undersigned patent attorney in order to resolve these matters and avoid the issuance of another Official Action.

DEPOSIT ACCOUNT

The Commissioner is hereby authorized to charge any fees associated with the filing of this correspondence to Deposit Account No. **50-3172**.

Respectfully submitted,
J. BENNETT MULLINAX, LLC

Date: October 16, 2018

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LEO-2

Electronic Acknowledgement Receipt

EFS ID:	34017828
Application Number:	14961787
International Application Number:	
Confirmation Number:	8904
Title of Invention:	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES
First Named Inventor/Applicant Name:	Charles A. Leonard
Customer Number:	44728
Filer:	John Bennett Mullinax/David Sigmon
Filer Authorized By:	John Bennett Mullinax
Attorney Docket Number:	LEO-2
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Supplemental Response or Supplemental Amendment	SupAmdLEO2.pdf	4243527 602fcfa59d3379f74bfa5cc9f4d944376c234620	no	23

Warnings:

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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MARTINEZ BORRERO, LUIS A	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 14/961,787	Applicant(s) Leonard, Charles A.	
	Examiner LUIS A MARTINEZ BORRERO	Art Unit 3668	AIA Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 10/16/2018.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☑ This action is **FINAL.** 2b) ☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-5,7,10,12,14-16,18,20,22-29,38 and 43-44 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-5,7,10,12,14-16,18,20,22-29,38 and 43-44 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on See Continuation Sheet is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

Continuation of Application Papers 11): 02/16/2016

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Notice on Prior Art Rejections

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

Status of Claims

This Office Action is in response to the Applicant's amendments/remarks filed October 16, 2018. Claim 11 has been cancelled. Claims 1, 10, 12, 14, 15, 18 and 29 have been amended. Claims 1-5, 7, 10, 12, 14-16, 18, 20, 22-29, 38, and 43-44 are presently pending and are presented for examination.

Response to Arguments/Remarks

1. **35 USC § 103 Rejection**. Applicant's amendments filed on October 16, 2018 with regard to the previous 35 USC § 103 Rejection have been fully considered. However, Applicant's arguments/amendments are not persuasive to overcome the previous 35 USC § 103 rejection. Applicant argues that Thorpe and Luk either alone or combination, do not render obvious

independent claims 1. 10, and 29 or the claims that depend therefrom. In particular, Thorpe and/or Luk do not disclose, teach. or suggest all the features of independent claims 1, 10, and 29. "Thorpe and Luk do not disclose, teach, or suggest the smart device configured to determine an initial level position for a vehicle to determine any inconsistencies inherent in the leveling system by capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies when determining the amount of adjustment in height as recited in claim 1. Further, Thorpe and Luk do not disclose, teach, or suggest determining an initial level position for the vehicle using the smart device to determine any inconsistencies inherent in the leveling system and capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time as recited in claim 10 and 29". With respect to these arguments the examiner respectfully disagrees. The combination of Thorpe and Luk clearly discloses all the limitations of claims 1, 10 and 29. The examiner believes that the amendments presented by the applicant are solely directed towards an initial calibration of the system which is also described by Thorpe. For example, Thorpe discloses the smart device configured to determine an initial level position for a vehicle ***(See at least ¶ 43, via To set leveling system 10 for future use, it is preferred to place the recreational vehicle 16 in its level condition 20 based on the operator's preference…This activity will set the reference position, from which the amount of out-of-level will be determined, to zero. This calibration step should be done even if the initial placement of level unit 12 indicates recreational vehicle 16 is level***

to ensure the surface on which level unit 12 is placed is not compensating for an incorrect level of recreational vehicle) to determine any inconsistencies inherent in the leveling system ***(See at least ¶ 11, via The leveling system of the present invention includes a calibration procedure to allow the operator to selectively calibrate the zero or level condition), (the examiner interprets inconsistencies as an example of miscalculations during calibration. For example, reference level position not equal to zero.)*** by capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies when determining the amount of adjustment in height ***(¶ 12, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition)***. Thorpe Further discloses determining an initial level position for the vehicle using the smart device to determine any inconsistencies inherent in the leveling system ***(See at least ¶ 11, via The leveling system of the present invention includes a calibration procedure to allow the operator to selectively calibrate the zero or level condition), (the examiner interprets inconsistencies as an example of misreadings or miscalculations during calibration)*** and capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device to provide a calibration data of the pitch and roll angle measurements ***(¶ 12, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition)*** to permit consideration of any inconsistencies determined when taking measurement readings at a future time ***(¶ 19, via provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the***

amount a side and/or an end of the vehicle must be raised to place it in the preset level condition). Accordingly; Thorpe discloses that his level unit can be place on any flat surface inside the recreational vehicle to calculate both pitch and roll directions regardless of positioning of the sensor as recited in claims 1, 10, and 29 ***(¶ 36, via level unit 12 is placed on a flat surface inside recreational vehicle 16, such as on a cabinet shelf or on top of a counter or the like, to allow the components disposed in interior chamber 28 of level unit 12 to measure the pitch and roll tilt)***. Thorpe fails to explicitly disclose a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis. However, Luk teaches a digital accelerometer that uses an X-axis, Y-axis, and Z-axis ***(See at least ¶ 11, via wherein said device is securely attached to said wheeled vehicle in a manner that sensed tri-axial directional accelerations by said device are tri-axial directional accelerations of the moving vehicle), (See at least ¶ 13, via sense (e.g. by the built-in accelerometer) and measure the moving wheeled vehicle's individual accelerations in each of said tri-axial fore-aft, lateral and vertical directions).*** Further, Thorpe also discloses the smart device configured to determine an initial level position for a vehicle to determine any inconsistencies inherent in the leveling system by capturing pitch and roll angle measurements of claims 1, 10, and 29, because Thorpe calibrates his leveling system by setting a reference position indicating that the recreational vehicle is level to ensure the surface on which level unit is placed is not compensating for an incorrect level of recreational vehicle which is a clear example of determining any inconsistencies inherent in the leveling system ***(See at least ¶ 43, via To set leveling system 10 for future use, it is preferred to place the recreational vehicle 16 in its level condition 20 based on the operator's preference…This activity will set the reference position, from which the amount of out-of-level will be determined, to zero. This calibration step should be done even if the initial placement of level unit 12 indicates recreational vehicle***

16 is level to ensure the surface on which level unit 12 is placed is not compensating for an incorrect level of recreational vehicle). Therefore, for the above reasons, the examiner maintains rejection over independent claims **1, 10, and 29**. Because pending claims **2-5, 7, 12, 14-16, 18, 20, 22-28, 38, 43, and 44** depend, either directly or indirectly, from rejected independent claims **1, 10, and 29** these claims are also rejected for at least these reasons.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims **1-5, 7, 10, 12-16, 18, 20, 22-29, 38, and 43** are rejected under 35 U.S.C 103 as being unpatentable over Thorpe et al, US 2008/0142768, in view of Luk et al, US 2012/0197587, hereinafter referred to as Thorpe and Luk, respectively.

As per Claim 1. Thorpe discloses a leveling system for leveling a vehicle that is at rest, the leveling system comprising: one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction ***(See at least ¶ 12, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition… the level sensing means is a dual-axis accelerometer that is configured to determine the tilt of the recreational vehicle in both the***

front-to-back and side-to-side directions), (¶ 0038, via Level sensing means 38 comprises one or more tilt sensors that are configured to detect the amount of pitch and roll of recreational vehicle), (¶ 0038, via In one configuration, level sensing means 38 comprises two separate tilt sensors, one positioned in the front/back direction for determining the pitch and one positioned in the left/right direction for determining the roll), each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured and a processor to process data collected by the respective sensor device ***(See at least ¶ 34, via In other embodiments, the vehicle sensors 206, 208 may comprise one or more of an accelerometer, a gyroscope, a liquid capacitive device, an electrolytic level device, a gas bubble in liquid device, a pendulum device, and the like), (¶ 29, via a vehicle 104 may be leveled by a leveling system 102 based on a first signal 202 representing a lateral force (i.e., tilt, roll) acting on the vehicle 104 and a second signal 204 representing a longitudinal force (i.e., pitch) acting on the vehicle 104. The first 202 and second 204 signals may be sent by one or more vehicle sensors (206, 208) associated with the vehicle 104, and received by a processing or control portion 210 of the leveling system), (¶ 36, via level unit 12 is placed on a flat surface inside recreational vehicle 16), (¶ 38, via level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 low-power two-axis linear accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle 16 relative to a calibrated reference position (i.e., the level condition 20). The level sensing means 38 includes an integrated circuit interface that takes the information from the sensing element of sensing***

means 28 to deliver an analog signal for conversion and then use by control unit 14); a smart device in communication with the one or more sensor devices to allow information received from the one or more sensor devices about at least one of the inclination or the orientation of the vehicle in both the pitch direction and the roll direction to be processed to provide measurements to a user and to determine an amount of adjustments in height to at least one of a rear or front section or first or second side sections of the vehicle needed to level the vehicle ***(See at least ¶ 8, via The foregoing patents are representative of leveling systems that require manual, independent determination of the amount of height adjustment needed to place the vehicle in the level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator)***, so that the vehicle is adjusted to obtain a level position based on a calculated change from the determination of the amount of adjustments in height, ***(See at least fig 2. ¶ 0040, via control unit 14 has a front cover 68 and back cover 70 that define control housing 72 enclosing a control chamber 74 in which is disposed the components that allow the user to control leveling system 10 and communicate with the spaced apart level unit), (¶ 0040, via, Preferably, any such attachment mechanism is removable from the location where it is stored to allow the operator to utilize control unit 14 as a hand-held device so that he or she may stand outside recreational vehicle 16 during use of leveling system 10 to level recreational vehicle), (¶ 0040, via, control unit 14 between its various display***

and function modes, such as showing the pitch or roll adjustments needed to obtain level condition), the smart device configured to determine an initial level position for a vehicle ***(See at least ¶ 43, via To set leveling system 10 for future use, it is preferred to place the recreational vehicle 16 in its level condition 20 based on the operator's preference…This activity will set the reference position, from which the amount of out-of-level will be determined, to zero. This calibration step should be done even if the initial placement of level unit 12 indicates recreational vehicle 16 is level to ensure the surface on which level unit 12 is placed is not compensating for an incorrect level of recreational vehicle)*** to determine any inconsistencies inherent in the leveling system ***(See at least ¶ 11, via The leveling system of the present invention includes a calibration procedure to allow the operator to selectively calibrate the zero or level condition), (the examiner interprets inconsistencies as an example of miscalculations during calibration. For example, reference level position not equal to zero.)*** by capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies when determining the amount of adjustment in height ***(¶ 12, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition).***

Thorpe fails to explicitly disclose a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis.

However, Luk teaches a digital accelerometer that uses an X-axis, Y-axis, and Z-axis ***(See at least ¶ 11, via wherein said device is securely attached to said wheeled vehicle in a***

manner that sensed tri-axial directional accelerations by said device are tri-axial directional accelerations of the moving vehicle), (See at least ¶ 13, via sense (e.g. by the built-in accelerometer) and measure the moving wheeled vehicle's individual accelerations in each of said tri-axial fore-aft, lateral and vertical directions).

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured and a processor to process data collected by the respective sensor device of Thorpe and include a digital accelerometer that uses an X-axis, Y-axis, and Z-axis as taught by Luk because it would allow the system to measure the pitch and roll tilt in multiple axis so that leveling system can determine the adjustment necessary to neutralize that tilting.

As per Claim 2. Thorpe discloses the system according to claim 1, wherein the circuit board further comprises a digital gyroscope ***(¶ 0012, via Although separate tilt sensors can be utilized, in the preferred embodiment the level sensing means is a dual-axis accelerometer that is configured to determine the tilt of the recreational vehicle in both the front-to-back and side-to-side directions), (¶ 0038, via In a preferred embodiment of the present invention, however, level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 lowpower two-axis linear accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle).***

As per Claim 3. Thorpe discloses the system according to claim 1, wherein the processor performs calculations related to the determination the amount of adjustments needed to at least one of the pitch direction or the roll direction to level the vehicle ***(¶ 0037, via These components include a circuit board 34, shown in FIGS. 9through12, having a controller 36 which is operatively connected to a level sensing means 38, power supply 40 and transmitter/ receiver or transceiver 42, including antenna 44. In a preferred embodiment, shown in the figures, the controller 36 includes transceiver 42), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).***

As per Claim 4. Thorpe discloses the system according to claim 3, wherein the sensor device comprises a memory in communication with the processor of the PCB, the sensor device capable of storing information transmitted from the smart device ***(¶ 0039, via As shown on FIG. 9, the circuit boards 34 of level 12 and control 14 units also include a flash memory chip 60 to store data useful for the operation of leveling system), (¶ 0039, via The circuit board 34 shown in the figures also includes a memory chip connector 62 for programming the flash memory chip 60 with the manufacturer's computer control code and a diagnostic chip).***

As per Claim 5. Thorpe discloses the system according to claim 4, wherein the sensor device uses data sensed by the sensor device and stored data obtained from the smart device to perform calculations on the sensor device and transmit the calculated data to the smart device ***(¶ 0038, via As shown in FIG. 11, the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information), (¶ 0011, via In the preferred embodiment of the present invention, the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle).***

As per Claim 7. Thorpe discloses the system according to claim 1, wherein the smart device communicates with the printed circuit board of the sensor device ***(¶ 0012, via In the preferred embodiment, the controller and the transceiver is a single integrated unit that wireless transmits the data from the level sensing means to the control unit The level unit has having a level housing that encloses a controller, a level sensing means, a power supply and a transceiver mounted on a circuit board.), (¶ 0038, via As shown in FIG. 11, the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference***

50. This data is then wirelessly transmitted to control unit 14 for processing into operator-useable information).

As per Claim 10. Thorpe discloses a method for leveling a recreational vehicle, the method comprising: providing a leveling system comprising one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction and a smart device in communication with the one or more sensor devices ***(¶ 0038, via Level sensing means 38 comprises one or more tilt sensors that are configured to detect the amount of pitch and roll of recreational vehicle), (¶ 0038, via In one configuration, level sensing means 38 comprises two separate tilt sensors, one positioned in the front/back direction for determining the pitch and one positioned in the left/right direction for determining the roll)***, each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured ***(See at least ¶ 34, via In other embodiments, the vehicle sensors 206, 208 may comprise one or more of an accelerometer, a gyroscope, a liquid capacitive device, an electrolytic level device, a gas bubble in liquid device, a pendulum device, and the like), (¶ 29, via a vehicle 104 may be leveled by a leveling system 102 based on a first signal 202 representing a lateral force (i.e., tilt, roll) acting on the vehicle 104 and a second signal 204 representing a longitudinal force (i.e., pitch) acting on the vehicle 104. The first 202 and second 204 signals may be sent by one or more vehicle sensors (206, 208) associated with the vehicle 104, and received by a processing or control portion 210 of the leveling system), (¶ 36, via level unit 12 is placed on a flat surface inside recreational vehicle***

16), (¶ 38, via level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 low-power two-axis linear accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle 16 relative to a calibrated reference position (i.e., the level condition 20). The level sensing means 38 includes an integrated circuit interface that takes the information from the sensing element of sensing means 28 to deliver an analog signal for conversion and then use by control unit 14); determining an initial level position for the vehicle using the smart device to determine any inconsistencies inherent in the leveling system ***(See at least ¶ 11, via The leveling system of the present invention includes a calibration procedure to allow the operator to selectively calibrate the zero or level condition), (the examiner interprets inconsistencies as an example of misreadings or miscalculations during calibration)*** and capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device to provide a calibration data of the pitch and roll angle measurements ***(¶ 12, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition)*** to permit consideration of any inconsistencies determined when taking measurement readings at a future time ***(¶ 19, via provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition)***; measuring the pitch angle and the roll angle of the vehicle when the vehicle is at rest using the sensor device ***(¶ 0036, via allow the components disposed in interior chamber 28 of level unit 12 to measure the pitch and roll tilt so that leveling system 10 can determine the adjustment necessary to neutralize that tilting), (¶ 0012,***

via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition), (¶ 0044, via To level a recreational vehicle 16 having leveling system 10 after parking recreational vehicle 16 where desired); retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position ***(¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator);*** calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle using the calibration data of pitch and roll angle measurements ***(¶ 8, via The foregoing patents are representative of leveling systems that require manual, independent determination of the amount of height adjustment needed to***

place the vehicle in the level condition), (¶ 0011, via the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition 20); displaying the calculated change in height to at least one of a rear or front section or first or second side sections of the vehicle in at least one of the pitch direction or the roll direction of the vehicle on the smart device ***(¶ 0040, via on FIG. 9, is used to switch control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition), (¶ 0038, via controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator);*** adjusting the height to the at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle based on the calculated change ***(¶ 8, via The foregoing patents are representative of leveling systems that require manual, independent determination of the amount of height adjustment needed to place the vehicle in the level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the***

final tilt adjustment data to control unit 14 for display to the operator), (See at least fig 2. ¶ 0040, via control unit 14 has a front cover 68 and back cover 70 that define control housing 72 enclosing a control chamber 74 in which is disposed the components that allow the user to control leveling system 10 and communicate with the spaced apart level unit).

Thorpe fails to explicitly disclose a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis.

However, Luk teaches a digital accelerometer that uses an X-axis, Y-axis, and Z-axis ***(See at least ¶ 11, via wherein said device is securely attached to said wheeled vehicle in a manner that sensed tri-axial directional accelerations by said device are tri-axial directional accelerations of the moving vehicle), (See at least ¶ 13, via sense (e.g. by the built-in accelerometer) and measure the moving wheeled vehicle's individual accelerations in each of said tri-axial fore-aft, lateral and vertical directions).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify providing a leveling system comprising one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction and a smart device in communication with the one or more sensor devices of Thorpe and include a digital accelerometer that uses an X-axis, Y-axis, and Z-axis as taught by Luk because it would allow the system to measure the pitch and roll tilt in multiple axis so that leveling system can determine the adjustment necessary to neutralize that tilting.

As per Claim 12. Thorpe discloses the method according to claim 11, wherein the step of determining an initial level position comprises using at least one of an accelerometer, gyroscope, or global positioning system sensor on the smart device to achieve the initial level position ***(¶ 0012, via Although separate tilt sensors can be utilized, in the preferred embodiment the level sensing means is a dual-axis accelerometer that is configured to determine the tilt of the recreational vehicle in both the front-to-back and side-to-side directions), (¶ 0038, via In a preferred embodiment of the present invention, however, level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 lowpower two-axis linear accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle).***

As per Claim 14. Thorpe discloses the method according to claim 10, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises communicating calibration data from the sensor device of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position to the smart device and saving the calibration data on the smart device ***(¶ 0011, via the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition 20).***

As per Claim 15. Thorpe discloses the method according to claim 10, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises saving the calibration data of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position on the sensor device ***(¶ 0038, via As shown in FIG. 11, the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information), (¶ 0011, via In the preferred embodiment of the present invention, the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle).***

As per Claim 16. Thorpe discloses the method according to claim 15, wherein the step of saving the calibration data of the pitch and roll angle measurements on the sensor device comprises transmitting instructions from the smart device to the sensor device to save and store the calibration data of the pitch and roll angle measurements on the sensor device and wherein the method further comprises recalling the calibration data of the pitch and roll angle measurements from the sensor device to the smart device ***(¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶***

0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).

As per Claim 18. Thorpe discloses the method according to claim 10, wherein the step of determining an initial level position comprises receiving measurements of a length and a width of the vehicle ***(¶ 0040, via As shown in FIG. 6, display panel 90 can display the amount of pitch or roll in degrees and the amount in inches or other measurement units, based on a known length or width of recreational vehicle 16, that one end or side of the recreational vehicle 16 must be raised to place recreational vehicle 16 in level condition), (¶ 0044, via If desired, leveling system 10 can be adapted to include the length information for specific lengths of recreational vehicles 16 and/or to allow the operator to input the length into its operating system, such as at flash memory 60, by entering the data at control unit).***

As per Claim 20. Thorpe discloses the method according to claim 10, wherein the step of displaying the calculated change in at least one of the pitch direction or the roll direction of the

vehicle further comprises displaying the calculated change in the pitch direction and the roll direction of the vehicle in measurements of distance ***(¶ 0040, via on FIG. 9, is used to switch control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition), (¶ 0038, via controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).***

As per Claim 22. Thorpe discloses the method according to claim 10, further comprising saving a given pitch angle measurement on at least one of the smart device or the sensor device to permit later recall for the purpose of returning the vehicle to the given pitch angle position at a later time ***(¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).***

As per Claim 23. Thorpe discloses the method according to claim 10, further comprising receiving data at the smart device from one or more vehicle control panels ***(¶ 0036, via In an alternative configuration, not shown, user accessible buttons and/or a display panel can be used with level unit 12 to allow the operator to directly access the operation of level unit), (¶ 0044, via In the preferred embodiment, battery monitoring circuit 61 of level 12 and control 14 units is configured to transmit battery level information to display panel 90 when the amount of power in batteries 40 or 86 reach a certain low level. Alternatively, leveling system 10 can also be configured to such that the operator can access the battery level information by pushing the mode button 80 on control unit 14 when he or she desires to check the battery levels).***

As per Claim 24. Thorpe discloses the method according to claim 23, wherein the received data from one or more vehicle control panels comprises at least one of data regarding holding tank levels or data regarding battery power levels ***(¶ 0036, via In an alternative configuration, not shown, user accessible buttons and/or a display panel can be used with level unit 12 to allow the operator to directly access the operation of level unit), (¶ 0044, via In the preferred embodiment, battery monitoring circuit 61 of level 12 and control 14 units is configured to transmit battery level information to display panel 90 when the amount of power in batteries 40 or 86 reach a certain low level. Alternatively, leveling system 10 can also be configured to such that the operator can access the battery level information by pushing the mode button 80 on control unit 14 when he or she desires to check the battery levels).***

As per Claim 25. Thorpe discloses the method according to claim 23, further comprising displaying the data on the smart device that is generated and displayed on the one or more vehicle control panels ***(¶ 0036, via In an alternative configuration, not shown, user accessible buttons and/or a display panel can be used with level unit 12 to allow the operator to directly access the operation of level unit), (¶ 0044, via In the preferred embodiment, battery monitoring circuit 61 of level 12 and control 14 units is configured to transmit battery level information to display panel 90 when the amount of power in batteries 40 or 86 reach a certain low level. Alternatively, leveling system 10 can also be configured to such that the operator can access the battery level information by pushing the mode button 80 on control unit 14 when he or she desires to check the battery levels).***

As per Claim 26. Thorpe discloses the method according to claim 10, further comprising activating one or more systems on the vehicle with the smart device ***(¶ 0012, via The control unit also has a display panel for displaying the pitch and roll information received from the level unit and one or more operator accessible control buttons for activating and operating the leveling system.), (¶ 0044, via The operator first activates the control unit 14 by pushing the power button 78 to tum leveling system 10 to its on condition).***

As per Claim 29. Thorpe discloses a non-transitory computer readable medium comprising computer executable instructions embodied in a computer readable medium that when executed by a processor of a computer control the computer to perform steps comprising: receiving on a smart device a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device secured to the vehicle ***(¶ 0036, via allow the components***

disposed in interior chamber 28 of level unit 12 to measure the pitch and roll tilt so that leveling system 10 can determine the adjustment necessary to neutralize that tilting), (¶ 0012, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition), (¶ 0044, via To level a recreational vehicle 16 having leveling system 10 after parking recreational vehicle 16 where desired), the sensor device comprising a printed circuit board that comprises a digital accelerometer that permits calculation in both the pitch or roll direction regardless of positioning of the respective device relative to the vehicle to which the one or more sensor devices are secured ***(See at least ¶ 34, via In other embodiments, the vehicle sensors 206, 208 may comprise one or more of an accelerometer, a gyroscope, a liquid capacitive device, an electrolytic level device, a gas bubble in liquid device, a pendulum device, and the like), (¶ 29, via a vehicle 104 may be leveled by a leveling system 102 based on a first signal 202 representing a lateral force (i.e., tilt, roll) acting on the vehicle 104 and a second signal 204 representing a longitudinal force (i.e., pitch) acting on the vehicle 104. The first 202 and second 204 signals may be sent by one or more vehicle sensors (206, 208) associated with the vehicle 104, and received by a processing or control portion 210 of the leveling system), (¶ 36, via level unit 12 is placed on a flat surface inside recreational vehicle 16), (¶ 38, via level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 low-power two-axis linear accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle 16 relative to a calibrated reference position (i.e., the level condition 20). The level sensing means 38 includes an integrated circuit interface that takes the information from the sensing element of sensing means 28 to deliver an analog***

signal for conversion and then use by control unit 14) capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device ***(See at least ¶ 11, via The leveling system of the present invention includes a calibration procedure to allow the operator to selectively calibrate the zero or level condition), (the examiner interprets inconsistencies as an example of misreadings or miscalculations during calibration)*** after determining an initial level position for the vehicle using the smart device to provide a calibration data of the pitch and roll angle measurements ***(¶ 12, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition)*** to permit consideration of any inconsistencies determined when taking measurement readings at a future time ***(¶ 19, via provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition)***; retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position ***(¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that***

convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator); calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle using the calibration data of pitch and roll angle measurements ***(¶ 8, via The foregoing patents are representative of leveling systems that require manual, independent determination of the amount of height adjustment needed to place the vehicle in the level condition), (¶ 0011, via the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition 20);*** displaying the calculated change in height to at least one of the rear or front section or one or one of the first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device so that the height to at least one of the rear or front section or the first or second side sections of the vehicle is adjusted to obtain the level position of the vehicle based on the calculated change ***(¶ 0040, via on FIG. 9, is used to switch control unit***

14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition), (¶ 0038, via controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).

Thorpe fails to explicitly disclose a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis.

However, Luk teaches a digital accelerometer that uses an X-axis, Y-axis, and Z-axis ***(See at least ¶ 11, via wherein said device is securely attached to said wheeled vehicle in a manner that sensed tri-axial directional accelerations by said device are tri-axial directional accelerations of the moving vehicle), (See at least ¶ 13, via sense (e.g. by the built-in accelerometer) and measure the moving wheeled vehicle's individual accelerations in each of said tri-axial fore-aft, lateral and vertical directions).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify receiving on a smart device a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device secured to the vehicle of Thorpe and include a digital accelerometer that uses an X-axis, Y-axis, and Z-axis as taught by Luk because it would allow the system to measure the pitch and roll tilt in multiple axis so that leveling system can determine the adjustment necessary to neutralize that tilting.

4. Claims **27, 28, 38, and 43** are rejected under 35 U.S.C 103 as being unpatentable over Thorpe in view of Luk as presented in independent claims 1, 10 and 29, further in view of Howarter et al. US 2012/0208520, hereinafter referred to as Howarter, respectively.

As per Claim 27. Thorpe discloses the method according to claim 26, wherein the one or more systems activated via the software application of the smart device ***(¶ 0012, via The control unit also has a display panel for displaying the pitch and roll information received from the level unit and one or more operator accessible control buttons for activating and operating the leveling system.), (¶ 0044, via The operator first activates the control unit 14 by pushing the power button 78 to tum leveling system 10 to its on condition).***

Thorpe fails to explicitly disclose comprise at least one of lighting systems, entertainment systems, power slide outs or a generator.

However, Howarter teaches comprise at least one of lighting systems, entertainment systems, power slide outs or a generator ***(¶ 0019 via The vehicle 106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0031, via The user interface 208 may include the other controls or systems for managing systems of the vehicle which may include the stereo, entertainment system, temperature controls, driving controls, and other elements of the vehicle).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify wherein the one or more systems activated via the software application of the smart device of Thorpe and include comprise at least

one of lighting systems, entertainment systems, power slide outs or a generator as taught by Howarter because it would allow the method to provide support to the user to configure and control the different features and elements managed by the vehicle control systems via a cell phone.

As per Claim 28. Thorpe discloses the method according to claim 10.

Thorpe fails to explicitly disclose collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

However, Howarter teaches collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device ***(¶ 0019 via The vehicle 106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0020, via the vehicle system includes a GPS or other navigation systems. The GPS may be utilized to determine the location of the vehicle 106. The GPS may also receive data or information from the cell phone 104 in order to determine the location and direction of travel of the cell phone and an associated user).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle on the smart device of Thorpe and include collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device as taught by Howarter because it would allow the method to provide information to the user with respect to the location of the vehicle and the

location and direction of travel of the cell phone and an associated user to determine the exact or approximate distance between the cell phone and the vehicle.

As per Claim 38. Thorpe discloses the non-transitory computer readable medium according to claim 29.

Thorpe fails to explicitly disclose receiving data at the smart device from one or more vehicle control panels.

However, Howarter teaches receiving data at the smart device from one or more vehicle control panels ***(¶ 0019 via The vehicle 106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0031, via The user interface 208 may include the other controls or systems for managing systems of the vehicle which may include the stereo, entertainment system, temperature controls, driving controls, and other elements of the vehicle).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device of Thorpe and include receiving data at the smart device from one or more vehicle control panels as taught by Howarter because it would allow the method to provide support to the user to configure and control the different features and elements managed by the vehicle control systems via a cell phone.

As per Claim 43. Thorpe discloses the non-transitory computer readable medium according to claim 29.

Thorpe fails to explicitly disclose collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

However, Howarter teaches collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device ***(¶ 0019 via The vehicle 106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0020, via the vehicle system includes a GPS or other navigation systems. The GPS may be utilized to determine the location of the vehicle 106. The GPS may also receive data or information from the cell phone 104 in order to determine the location and direction of travel of the cell phone and an associated user).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device of Thorpe and include collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device as taught by Howarter because it would allow the method to provide information to the user with respect to the location of the vehicle and the location and direction of travel of the cell phone and an associated user to determine the exact or approximate distance between the cell phone and the vehicle.

5. Claim **44** is rejected under 35 U.S.C 103 as being unpatentable over Thorpe in view of Luk as presented in independent claims 1, 10 and 29, further in view of Howarter, further in view of Hulsing et al. US 4,935,883, hereinafter referred to as Hulsing, respectively.

As per Claim 44. Thorpe discloses the system according to claim 1.

Thorpe fails to explicitly disclose wherein the printed circuit board further comprises a digital temperature sensor to collect temperature data to be used by the processor of the printed circuit board to correct irregularities in the data obtained by the respective sensor device based on temperature variations.

However, Hulsing teaches wherein the printed circuit board further comprises a digital temperature sensor to collect temperature data to be used by the processor of the printed circuit board to correct irregularities in the data obtained by the respective sensor device based on temperature variations ***(See at least Column 9, lines 35-45, via The output from temperature sensors 174 is converted from an analog signal to a digital signal by an A to D converter (not separately shown), and transmitted to CPU 142 over leads 175. The temperature within the enclosure is controlled by temperature control 176 in response to the signals produced by temperature sensors 174 and transmitted over leads 173. CPU 142 applies appropriate temperature correction factors in modeling the acceleration data derived from accelerometer 68, correcting for errors in the control of temperature by temperature control 176), (Column 9, lines 49-51, via In addition, a more critical temperature control is provided for accelerometer 68, which is preferably maintained at 100° ±0. l C).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify a digital accelerometer that permits

calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured of Thorpe and include a digital temperature sensor to collect temperature data to be used by the processor of the printed circuit board to correct irregularities in the data obtained by the respective sensor device based on temperature variations as taught by Hulsing because it would allow the method to provide temperature control for the accelerometer to ensure correction of errors from due to temperature changes.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **LUIS MARTINEZ** whose email is luis.martinezborrero@uspto.gov and telephone number is (571)272-4577. The examiner can normally be reached on Monday-Friday 8:30AM-5:00PM EST.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **FADEY JABR** can be reached on (571) 272-1516. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L.A.M/
Examiner, Art Unit 3668

/COURTNEY D HEINLE/
Primary Examiner, Art Unit 3668

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/961,787	Leonard, Charles A.
	Examiner	**Art Unit**
	LUIS A MARTINEZ BORRERO	3668

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/06/2016	08/01/2017	03/15/2018	11/15/2018					
	1	✓	✓	✓	✓					
	2	✓	✓	✓	✓					
	3	✓	✓	✓	✓					
	4	✓	✓	✓	✓					
	5	✓	✓	✓	✓					
	6	-	-	-	-					
	7	✓	✓	✓	✓					
	8	-	-	-	-					
	9	-	-	-	-					
	10	✓	✓	✓	✓					
	11	✓	✓	✓	-					
	12	✓	✓	✓	✓					
	13	✓	✓	-	-					
	14	✓	✓	✓	✓					
	15	✓	✓	✓	✓					
	16	✓	✓	✓	✓					
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	20	✓	✓	✓	✓					
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	22	✓	✓	✓	✓					
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	27	✓	✓	✓	✓					
	28	✓	✓	✓	✓					
	29	✓	✓	✓	✓					
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	34	-	-	-	-					
	35	-	-	-	-					
	36	-	-	-	-					
	37	-	-	-	-					
	38	✓	✓	✓	✓					
	39	-	-	-	-					
	40	-	-	-	-					
	41	-	-	-	-					
	42	-	-	-	-					

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	Examiner	**Art Unit**
	LUIS A MARTINEZ BORRERO	3668

CLAIM		DATE								
Final	Original	12/06/2016	08/01/2017	03/15/2018	11/15/2018					
	43	✓	✓	✓	✓					
	44			✓	✓					

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/961,787	Leonard, Charles A.
	Examiner	Art Unit
	LUIS A MARTINEZ BORRERO	3668

CPC - Searched*		
Symbol	Date	Examiner
G05D1/0891, 1/0016, 1/0236, 1/0251, 1/0255, 1/027,	12/7/2016	/L.A.M./
B60W2540/28, 2550/141, 2550/402, 2710/30, 2550/406, 2720/30,	12/7/2016	/L.A.M./
G05D1/0274, 1/0278, 1/0287, 2201/0201, 1/0858,	8/1/2017	/L.A.M./
B60G2204/127, 2204/4232, 2204/83022, 2500/30, 2600/73,	8/1/2017	/L.A.M./
G05D1/0094, 1/0231, 1/0246,	03/15/2018	LAM
B60G17/08, 13/08, 2600/20, 2500/10, 2800/162,	03/15/2018	LAM
B60T8/172, 2201/04, 7/12,	11/15/2018	LAM
G05D1/0088, 1/0257, 201/0213, 1/00,	11/15/2018	LAM

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
701	22, 37, 112, 2, 23, 21, 123, 1, 101, 102, 50, 60,	12/7/2016	/L.A.M./
701	2, 49, 1, 19, 23, 25, 3, 41, 50,	8/1/2017	/L.A.M./

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

	/L.A.M/ Examiner, Art Unit 3668

ETN1002

418/655

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/961,787	Leonard, Charles A.
	Examiner	Art Unit
	LUIS A MARTINEZ BORRERO	3668

Search Notes		
Search Notes	**Date**	**Examiner**
East Search	12/7/2016	/L.A.M./
Google Patent Search	12/7/2016	/L.A.M./
East Search	8/1/2017	/L.A.M./
Consulted with primary Jelani smith (101, 112, patentability),	8/1/2017	/L.A.M./
Consulted with primary Jelani Smith	03/15/2018	LAM
East Search	03/15/2018	LAM
East Seach	11/15/2018	LAM
Consulted with primary Courtney Heinle	11/15/2018	LAM

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**

	/L.A.M/ Examiner, Art Unit 3668

ETN1002

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	20	((pitch near3 roll) near6 (axis near3 accelerometer)) with (vehicle car or automobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/15 12:25
L2	128	(vehicle car or automobile) with (level$3) with ((all or multi or three) near3 axis)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/15 12:25
L3	22	("20040049059" | "20080103193" | "20080241339" | "20090035396" | "20100216872" | "20110098348" | "20120311744" | "20130109747" | "20140243405" | "20140245494" | "20140245495" | "20140298511" | "4279824" | "6403126" | "6630507" | "7968594").PN. OR ("9095554").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/15 12:26
L4	44	("20020091473" | "20020120374" | "20030236602" | "20040083041" | "20040225557" | "20050116829" | "20050131597" | "20070001831" | "20070010938" | "20070188348" | "5983161" | "6275773" | "6278362" | "6438472" | "6487500" | "6771176" | "6832157" | "6873911" | "6909947" | "6931309" | "6968260" | "6982647" | "7006917").PN. OR ("8170725").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/15 12:26
L5	8	("20010022166" | "20080093137" | "5934395" | "6247437" | "7497285").PN. OR ("8215425").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/15 12:27
L6	39	("0312266" | "20010025426" | "20020174553" | "20030066198" | "20030093909" | "2624118" | "2752692" | "2831264" | "3820249" | "3916531" | "4506408" | "4542592" | "4739561" | "4785544" | "4829676" | "5025568" | "5123768" | "5163229" | "5174034" | "5402579" | "5406713" | "5421094" | "5628521" | "5685083" | "5806196" | "5839200" | "5933919" | "6131298" | "6332277" | "6338203").PN. OR ("6981330").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/15 12:27
L7	27	(vehicle car or automobile) and (level$3) and ((all or multi or three) near3 axis) and ((adjust$3 or alter$3 or chang$3 or modif$4) near5 ((vehicle car or	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2018/11/15 12:28

		automobile) adj (height)))	EPO; JPO; DERWENT; IBM_TDB			
L8	1498	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/15 12:34
L9	26	8 AND ((B60T8/172 OR B60T2201/04 OR B60T2210/14 OR B60T2210/16 OR B60T2220/04 OR B60T2260/06 OR B60T7/12 OR B60T8/175 OR B60T11/22 OR B60T11/26 OR B60T13/741 OR B60T2210/12 OR B60T2230/00 OR B60T2250/06 OR B60T7/085 OR B60T7/107 OR B60T7/122 OR B60T8/32 OR G05D1/0088 OR G05D1/0257 OR G05D1/0891 OR G05D1/0016 OR G05D1/0061 OR G05D1/0231 OR G05D1/0236 OR G05D1/024 OR G05D1/0251 OR G05D1/0255 OR G05D1/027 OR G05D1/048 OR G05D2201/0213 OR G05D2201/0216).CPC. AND (701/22 OR 701/37 OR 701/112 OR 701/2 OR 701/23 OR 701/21 OR 701/29.1 OR 701/49 OR 701/70 OR 701/93 OR 701/96 OR 701/99 OR 701/1 OR 701/101 OR 701/102 OR 701/123 OR 701/300 OR 701/30.8 OR 701/32.4 OR 701/33.1 OR 701/36 OR 701/41 OR 701/468 OR 701/48 OR 701/50 OR 701/519 OR 701/54 OR 701/60 OR 701/65 OR 701/71 OR 701/82 OR 701/91 OR 701/94).CCLS. AND (G05D1/00 OR G05D1/02 OR G05D1/04 OR G05D1/08 OR B60T7/12 OR B60T8/172 OR B60T11/22 OR B60T11/26 OR B60T8/32).IPCR.)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/15 12:34
S1	0	((vehicle or car or automobile) near4 (lavel$3)) with ((sens$4 or detect$3) near5 (inclinat$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 10:57
S2	0	((vehicle or car or automobile) near4 (lavel$4)) and ((sens$4 or detect$3) near5 (inclinat$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 10:57
S3	1252	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 10:58
S4	25	S3 AND ((B60T8/172 OR B60T2201/04 OR B60T2210/14 OR B60T2210/16 OR B60T2220/04 OR B60T2260/06 OR B60T7/12 OR B60T8/175 OR B60T11/22 OR B60T11/26 OR B60T13/741 OR B60T2210/12 OR B60T2230/00 OR B60T2250/06 OR B60T7/085 OR B60T7/107 OR B60T7/122 OR B60T8/32 OR G05D1/0088 OR G05D1/0257 OR	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:00

		G05D1/0891 OR G05D1/0016 OR G05D1/0061 OR G05D1/0231 OR G05D1/0236 OR G05D1/024 OR G05D1/0251 OR G05D1/0255 OR G05D1/027 OR G05D1/048 OR G05D2201/0213 OR G05D2201/0216).CPC. AND (701/22 OR 701/37 OR 701/112 OR 701/2 OR 701/23 OR 701/21 OR 701/29.1 OR 701/49 OR 701/70 OR 701/93 OR 701/96 OR 701/99 OR 701/1 OR 701/101 OR 701/102 OR 701/123 OR 701/300 OR 701/30.8 OR 701/32.4 OR 701/33.1 OR 701/36 OR 701/41 OR 701/468 OR 701/48 OR 701/50 OR 701/519 OR 701/54 OR 701/60 OR 701/65 OR 701/71 OR 701/82 OR 701/91 OR 701/94).CCLS. AND (G05D1/00 OR G05D1/02 OR G05D1/04 OR G05D1/08 OR B60T7/12 OR B60T8/172 OR B60T11/22 OR B60T11/26 OR B60T8/32).IPCR.)				
S5	5	S4 and inclinat$3 and sensor and pitch and roll	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:02
S6	145	S3 and inclinat$3 and sensor and pitch and roll	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:07
S7	66	("6554293").URPN.	USPAT	OR	ON	2016/12/05 11:09
S8	2	((vehicle or car or automobile) near4 (level$4)) with ((sens$4 or detect$3) near5 (inclinat$4)) with (accelerometer or gyroscope)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:25
S9	2	((vehicle or car or automobile) near4 (level$4)) with ((sens$4 or detect$3) near5 (inclinat$4)) with (accelerometer or gyroscope) with ((smart adj device) or device or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:32
S10	278	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:33
S11	134	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone) and wireless	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:35
S12	19	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone) and wireless and roll and pitch and adjust$3 and display$3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:36

S13	518	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclination or orientation)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone) and roll and pitch and adjust$3 and display$3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:42
S14	29	S13 AND ((B60W40/09 OR B60W50/08 OR B60W2540/18 OR B60W2040/0809 OR B60W2540/00 OR B60W2540/12 OR B60W2540/30 OR B60W50/10 OR B60W50/14 OR B60W2050/146 OR B60W2520/16 OR B60W2520/18 OR B60W40/06 OR B60W40/076 OR B60W2420/54 OR B60W2520/10 OR B60W2550/14 OR B60W2550/142 OR B60W2550/147 OR B60W2520/26 OR B60W10/10 OR B60W10/18 OR B60W10/20 OR B60W2050/0077 OR B60W2520/04 OR B60W2540/20 OR B60W2540/28 OR B60W2550/12 OR B60W2550/141 OR B60W2550/20 OR B60W2550/402 OR B60W2550/406 OR B60W2710/30 OR B60W2720/10 OR B60W2720/28 OR B60W2720/30 OR B60W30/143 OR B60W30/18009 OR B60W30/18172 OR B60W40/02 OR B60W40/08 OR B60W40/10 OR B60W40/101 OR B60W40/103 OR B60W50/0098 OR G05D1/0891 OR G05D1/0027 OR G05D1/0212 OR G05D23/1917 OR G05D1/0274 OR G05D1/027 OR G05D1/0278 OR G05D1/0287 OR G05D2201/02 OR G05D2201/0201 OR G05D2201/0202 OR G05D1/0227 OR G05D1/0088 OR G05D1/0011 OR G05D1/0016 OR G05D1/0061 OR G05D1/0038 OR G05D1/0225 OR G05D1/0238 OR G05D1/024 OR G05D1/0242 OR G05D1/0251 OR G05D1/0255 OR G05D1/028 OR G05D1/102 OR G05D2201/0211 OR G05D2201/0213 OR B60T2201/04 OR B60T2210/14 OR B60T2210/16 OR B60T2220/04 OR B60T2230/00 OR B60T2260/06 OR B60T8/175).CPC. AND (701/2 OR 701/36 OR 701/1 OR 701/408 OR 701/41 OR 701/25 OR 701/29.1 OR 701/31.9 OR 701/32.4 OR 701/37 OR 701/400 OR 701/50 OR 701/93 OR 701/21 OR 701/22 OR 701/23 OR 701/26 OR 701/3 OR 701/31.5 OR 701/33.2 OR 701/34.4 OR 701/409 OR 701/420 OR 701/469 OR 701/500 OR 701/534 OR 701/537 OR 701/70 OR 701/91).CCLS. AND (G05D1/08 OR G05D1/02 OR G05D1/00 OR G05D1/04 OR G05D23/19 OR B60W30/14 OR B60W40/06 OR B60W40/09 OR B60W10/10 OR B60W10/18 OR B60W10/20 OR B60W30/18 OR B60W40/02 OR B60W40/076 OR B60W40/08 OR B60W40/10 OR B60W40/101 OR	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:44

		B60W40/103 OR B60W50/00).IPCR.)				
S15	27	"4216939"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:51
S16	3	("7294797").URPN.	USPAT	OR	ON	2016/12/05 12:13
S17	1	("8757637").URPN.	USPAT	OR	ON	2016/12/05 12:14
S18	16	("20110024706" | "3332669" | "3454251" | "3825279" | "3857582" | "4061309" | "4216939" | "4940110" | "5176391" | "5727767" | "6142488" | "8690128" | "8757637" | "8840144").PN. OR ("9156441").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:14
S19	1	("8840144").URPN.	USPAT	OR	ON	2016/12/05 12:16
S20	44	("20050127341" | "20060017241" | "20060081755" | "20070114734" | "20070284499" | "20070289439" | "20080217898" | "20090102176" | "20090200782" | "20110163523" | "20110169231" | "20120299279" | "20130074377" | "2924463" | "2979304" | "3253839" | "3367614" | "3475008" | "3558092" | "3642242" | "3690694" | "3801128" | "3823958" | "3933372" | "3989277" | "4268066" | "4461491" | "4708362" | "5575492" | "5628521" | "6089603" | "6142488" | "6224102" | "6331016" | "6494487" | "6827335" | "7226057" | "7338052").PN. OR ("8840144").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:16
S21	31	("3454251" | "3475008" | "3656778" | "3709518" | "3767226").PN. OR ("3933372").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:17
S22	38	("1540753" | "3186570" | "3324613" | "3367614").PN. OR ("4268066").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:17
S23	45	("2924463" | "3306629" | "3933372" | "4231044" | "4429851" | "4708362" | "4905953").PN. OR ("5575492").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:17
S24	47	("1539974" | "20020053794" | "2747836" | "3310181" | "3345038" | "3475008" | "3565396" | "3767226" | "3826470" | "3854750" | "3870276" | "3989277" | "4103869" | "4146250" | "4148461" | "4515520" | "4955450" | "5042779" | "5205586" | "5348330" | "5488788" | "5501428" | "5547220" | "5901980" | "6089603" | "6102438" | "6224102").PN. OR ("6494487").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:19
S25	94	((vehicle or car or automobile) near4 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or device or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:20
S26	6132	((vehicle or car or automobile) near4 (level$4 or stabilizat$3)) same ((smart	US-PGPUB; USPAT;	OR	ON	2016/12/05 12:26

		adj device) or phone or cell or cellphone or mobile)	EPO; JPO; DERWENT; IBM_TDB			
S27	2491	((vehicle or car or automobile) near4 (level$4 or stabilizat$3)) near10 ((smart adj device) or phone or cell or cellphone or mobile)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:26
S28	49	S27 and sensor and pitch and roll	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:27
S29	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:33
S30	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone or cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:33
S31	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone or cell or cellphone or pda)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:33
S32	11	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) same ((sens$4 or detect$3) near5 (inclination or orientation)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:36
S33	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:39
S34	43	((vehicle or car or automobile) near6 (level$4 or stabilizat$3 or inclinat$4)) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:41
S35	2	(vehicle or car or automobile) same (park$3 near8 (level$4 or stabilizat$3 or inclinat$4)) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:45
S36	15	(vehicle or car or automobile) same (adjust$5) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:48
S37	23284	(vehicle or car or automobile) same ((adjust$5) near5(level$3 or inclination or tilt$3))	US-PGPUB; USPAT; EPO; JPO;	OR	ON	2016/12/05 12:52

			DERWENT; IBM_TDB			
S38	4438	S37 and ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:52
S39	130	S38 and (sens$3 near5 (pitch and roll))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:53
S40	92815	S39 and accelerometer or gyroscope	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:54
S41	51	S39 and accelerometer and gyroscope	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:54
S42	271	(vehicle or car or automobile) same ((adjust$5) near5 (level$3 or inclination or tilt$3)) same parking	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:57
S43	5	("2008/0142768").URPN.	USPAT	OR	ON	2016/12/05 13:05
S44	22	"6921100"	USPAT	OR	ON	2016/12/05 13:11
S45	5	"20070103289"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 13:15
S46	27	("4353565" | "5167289" | "5476277" | "5780782" | "5863057" | "6203045").PN. OR ("6921100").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:32
S47	36	("20020038193" | "4103752" | "4639872" | "4651838" | "4706768" | "4836308" | "4852674" | "4854407" | "4941365" | "5040826" | "5167289" | "5314201" | "5526702" | "5606516" | "5617072" | "5626356" | "5803502" | "5915713" | "6032090" | "6037550" | "6157889" | "6242701" | "6252497" | "6307164" | "6308131" | "6357777" | "6363331" | "6459367" | "6921100").PN. OR ("7072763").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:32
S48	33	("20060100979" | "20070180719" | "20070245579" | "20080142768" | "2155876" | "3181203" | "3258884" | "3260564" | "3417518" | "3866365" | "4232488" | "4568096" | "4572527" | "4743037" | "4746133" | "4784400" | "5078442" | "5136784" | "5159989" | "5176391" | "5188379" | "5676385" |	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:34

		"5806196" | "6176495" | "6526668" | "7025361").PN. OR ("7786883").URPN.				
S49	16	("20020027346" | "20020030592" | "20030191568" | "20030231118" | "20060064223" | "20080142768" | "5008647" | "6009356" | "6326613" | "6356812" | "6366840" | "6408232" | "6472979" | "6629032" | "6662642").PN. OR ("7584026").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:35
S50	17	("2454896" | "3219972" | "3820065" | "3835279" | "3922638" | "4101868" | "4145681").PN. OR ("4288777").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:37
S51	1	"20060113783"	US-PGPUB	OR	ON	2016/12/05 13:39
S52	3	"20150025789"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:03
S53	0	S52 and (trajectory near5 comparison)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:04
S54	2	S52 and (trajectory near10 comparison)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:05
S55	3	"20120206597"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:08
S56	776	((smart adj device) or phone or cell or cellphone or pda or (personal adj computer) or (mobile adj device) or (mobile near3 phone)) near10 ((activat$3 or turnon or control$4) near5 ((vehicle or car or automobile) adj (systems or navigation or gps)))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 13:53
S57	30	S56 and (suspension near4 Control$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 13:54
S58	41	(((smart adj device) or phone or cell or cellphone or pda or (personal adj computer) or (mobile adj device) or (mobile near3 phone)) near10 ((activat$3 or turnon or control$4) near5 ((vehicle or car or automobile) adj (systems or navigation or gps)))) with application	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 13:58
S59	17	S58 and gps and (position or location)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 15:08
S60	3	"20120208520"	US-PGPUB;	OR	ON	2016/12/06

			USPAT; EPO; JPO; DERWENT; IBM_TDB			15:10
S61	1	"20120208520"	US-PGPUB	OR	ON	2016/12/06 15:10
S62	1841	(vehicle or car or automobile) with (inclination or orientation) with accelerometer	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:13
S63	1054	S62 and ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:14
S64	80	S62 with ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:14
S65	22	S64 and ((adjust$3 or alter$3 or chang$3 or modif$4) near3 (level$3 or orientation or inclination))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:17
S66	0	lavel$3 with vehicle with sensor with tilt	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:21
S67	0	lavel$3 with vehicle with tilt	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:21
S68	1259	level$3 with vehicle with tilt	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:22
S69	15	S68 AND ((G05D1/0891 OR G05D1/027 OR G05D1/0274 OR G05D1/0278 OR G05D1/0287 OR G05D2201/02 OR G05D2201/0201 OR G05D2201/0202 OR G05D1/0016 OR G05D1/0816 OR G05D1/0858 OR B60G2204/62 OR B60G17/0163 OR B60G17/0165 OR B60G17/018 OR B60G17/01908 OR B60G17/0195 OR B60G2200/44 OR B60G2200/46 OR B60G2200/464 OR B60G2204/127 OR B60G2204/128 OR B60G2204/4232 OR B60G2204/83022 OR B60G2300/24 OR B60G2300/37 OR B60G2300/40 OR B60G2400/204 OR B60G2500/30 OR B60G2600/73 OR B60G2800/24 OR B60G2800/962 OR B60G3/01 OR B60G3/02).CPC. AND (701/49 OR 701/2 OR 701/1 OR 701/19 OR 701/23 OR 701/25 OR 701/3 OR 701/32.4 OR 701/33.1 OR 701/36 OR	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:25

		701/41 OR 701/45 OR 701/50 OR 701/519 OR 180/65.1 OR 180/65.8 OR 180/9.32 OR 280/228 OR 280/30 OR 280/657 OR 280/86.751).CCLS. AND (G05D1/08 OR G05D1/02 OR G05D1/00 OR B60G17/0165 OR B60G17/019 OR B60G21/055 OR B60G3/01).IPCR.)				
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S71	402	("20020165648" | "20030014171" | "20030187560" | "20030208319" | "20040039514" | "20040212533" | "20050080559" | "20050225955" | "20050265494" | "20060167600" | "20060206246" | "20060215739" | "20070078570" | "20070088447" | "20070121708" | "20070205940" | "20070285308" | "20080129586" | "20080204312" | "20090171583" | "20090174597" | "20090174622" | "20090177395" | "20090177399" | "20090259397" | "20090259707" | "20090262014" | "20090262018" | "20090262974" | "20090265054" | "20090265101" | "20090265104" | "20090265308" | "20090273372" | "20090273513" | "20090274079" | "20090274113" | "20090276155" | "20090295633" | "20090295634" | "20090299550" | "20090322597" | "20090322598" | "20090322600" | "20090322601" | "20090322606" | "20090326809" | "20100013703" | "20100026569" | "20100030470" | "20100039316" | "20100039318" | "20100039320" | "20100039321" | "20100060518" | "20100063649" | "20100084147" | "20100085249" | "20100085253" | "20100103033" | "20100103034" | "20100103038" | "20100103040" | "20100106414" | "20100106445" | "20100109944" | "20100109945" | "20100109947" | "20100109948" | "20100109950" | "20100111372" | "20100114483" | "20100117894" | "20100117899" | "20100117900" | "20100124210" | "20100124212" | "20100134354" | "20100149025" | "20100149030" | "20100149033" | "20100149034" | "20100149037" | "20100150284" | "20100152949" | "20100156709" | "20100156712" | "20100156718" | "20100159943" | "20100161179" |	US-PGPUB; USPAT; USOCR	OR	ON	2017/08/01 08:27

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S72	14	("2001/0005803").URPN.	USPAT	OR	ON	2017/08/01 08:32
S73	11	(pitch near3 roll) with level$3 with balance	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:36
S74	27	("20020050699" | "20050098975" | "20050116437" | "20050206149" | "20090057048" | "20120166043" | "20130147140" | "20130147141" | "20130147142" | "20150001829" | "20150291233" | "4266627" | "4397473" | "4600069" | "4760686" | "4850786" | "5018453" | "5288101" | "5700025" | "5865444" | "5896731" | "6367831" | "7416201" | "7866671" | "7914020" | "8408559" | "9168940").PN. OR ("9409459").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2017/08/01 08:39
S75	20	("5062658" | "5071157" | "5119297" |	US-PGPUB;	OR	ON	2017/08/01

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S76	315	(("LEONARD") near3 ("Charles")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/08/01 08:58
S77	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone or cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 09:04
S78	2336	(pitch near3 roll) with level$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:05
S79	351	S78 and (axis near3 accelerometer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:05
S80	204	S79 and ((adjust$3 or alter$3 or chang$3 or modif$4) near3 (level$3 or orientation or inclination))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:06
S81	98	S80 and (z near3 axis)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:06
S82	7	S81 and ((adjust$3 or alter$3 or chang$3 or modif$4) near3 (height))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:08
S83	20	((pitch near3 roll) near6 (axis near3 accelerometer)) with (vehicle car or automobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:11
S84	110	(vehicle car or automobile) with (level$3) with ((all or multi or three) near3 axis)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:21
S85	2	S84 and ((adjust$3 or alter$3 or chang$3 or modif$4) near3 (height))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:21

S86	0	S84 and ((adjust$3 or alter$3 or chang$3 or modif$4) near5 ((vehicle car or automobile) adj (height)))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:23
S87	26	(vehicle car or automobile) and (level$3) and ((all or multi or three) near3 axis) and ((adjust$3 or alter$3 or chang$3 or modif$4) near5 ((vehicle car or automobile) adj (height)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:24
S88	15	(vehicle or car or automobile) same (adjust$5) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 15:06
S89	78	((pitch near3 roll) near6 (axis near3 accelerometer)) with (LEVEL$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/14 16:37
S90	77	S89 AND MEMS	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/14 16:37
S91	2	S90 AND (CIRCUIT near4 accelerometer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/14 16:38
S92	117	(tri-axial) with accelerometer with vehicle	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/15 12:16
S93	1	"20110202225"	US-PGPUB	OR	ON	2018/03/15 12:46
S94	51	(tri-axial) with accelerometer with level$3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/15 12:48
S95	73	S92 AND ((B60G17/08 OR B60G13/08 OR B60G2202/24 OR B60G2500/11 OR B60G2600/20 OR B60G13/06 OR B60G2500/10 OR B60G2800/162 OR G06F7/00 OR G06F21/44).CPC. OR (280/735 OR 280/736 OR 280/738 OR 280/731 OR 280/740 OR 280/728.2 OR 280/730.2 OR 280/734 OR 280/728.3 OR 280/741 OR 280/742 OR 280/400 OR 280/728.1 OR 280/743.1 OR 280/79.11 OR 701/45 OR 701/301 OR 701/2 OR	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/15 13:16

		701/300 OR 701/124 OR 701/22 OR 701/31.4 OR 701/31.5 OR 701/33.1 OR 701/33.4 OR 701/70 OR 701/1 OR 701/11 OR 701/117 OR 701/119 OR 701/29.1 OR 701/3 OR 701/31.1 OR 701/36 OR 701/41 OR 701/46 OR 701/472 OR 701/65 OR 701/7 OR 180/282 OR 702/141 OR 702/150 OR 702/104 OR 702/173 OR 702/175 OR 702/179 OR 702/188 OR 702/33 OR 702/39 OR 702/85 OR 702/95).CCLS. OR (G06F17/10 OR G06F19/00 OR G06F7/00 OR G06F17/00 OR G06F11/00 OR G06F15/00 OR G06F17/18 OR G06F17/40 OR G06F21/44 OR G06F3/048 OR B60G17/08 OR B60G13/06 OR B60G13/08).IPCR.)				
S96	16190	accelerometer with (temperature adj sensor)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 16:03
S97	93	(tri-axial) with accelerometer with (temperature adj sensor)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 16:04
S98	0	avoid$ with error with accelerometer with (temperature adj sensor)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 16:07
S99	5	avoid$ with error with accelerometer with temperature	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 16:07
S100	51	((tri-axial) near3 accelerometer) near6 (temperature adj sensor)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 17:10
S101	46	S100 AND ((G05D1/0038 OR G05D1/0061 OR G05D1/0094 OR G05D1/0297 OR G05D1/0231 OR G05D1/0278 OR G05D1/0022 OR G05D1/0246 OR G05D1/0289).CPC. OR (1/1 OR 455/456.1 OR 455/404.1 OR 455/404.2 OR 455/414.2 OR 455/422.1 OR 455/457 OR 280/5.515 OR 360/5 OR 701/14 OR 701/21 OR 701/3 OR 701/37 OR 701/532 OR 702/127 OR 702/130 OR 702/138 OR 702/141 OR 702/150 OR 702/151 OR 702/176 OR 702/187 OR 702/189 OR 702/191 OR 702/92).CCLS. OR (G05D1/00 OR G05D1/02).IPCR.)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 17:11
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S103	326	(("LEONARD") near3 ("Charles")).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/03/15 17:13

EAST Search History (Interference)

< This search history is empty>

11/15/2018 12:36:08 PM
C:\Users\lmartinezborrero\Documents\EAST\Workspaces\14961787.wsp

Attorney Docket No.: 7137 PATENT

POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, related to the invention entitled:

VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES

the specification of which is submitted to the U. S. Patent and Trademark Office on December 7, 2015, and assigned U.S. Patent Application No. 14/961,787, I hereby revoke all previous powers of attorney given in the above-identified application, if applicable. I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s) with respect to the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

FIRM NAME: **Customer Number: 22474**
Clements Bernard Walker PLLC
4500 Cameron Valley Parkway, Suite 350
Charlotte, North Carolina 28211 USA

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Carlos M. Herrera	44,762
Jeffrey S. Bernard	50,020
Elizabeth R. Kendall	74,280

I hereby acknowledge that the above listed attorneys/agents and their firm, Clements Bernard Walker PLLC, represent my employer (if I am an employee and this application has been or will be assigned to my employer) or the entity with which I have contracted (if I am an independent contractor and this application has been or will be assigned to such entity) and, in such cases, do not represent me individually.

Please Send Correspondence to: **Customer Number: 22474**
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(704) 790-3600

Sole/First Inventor: Charles A. Leonard Date: 11/15/2018

ETN1002
437/655

Electronic Acknowledgement Receipt

EFS ID:	34360633
Application Number:	14961787
International Application Number:	
Confirmation Number:	8904
Title of Invention:	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES
First Named Inventor/Applicant Name:	Charles A. Leonard
Customer Number:	44728
Filer:	Seth Lee Hudson/Teresa Bush-Dugar
Filer Authorized By:	Seth Lee Hudson
Attorney Docket Number:	LEO-2
Receipt Date:	20-NOV-2018
Filing Date:	07-DEC-2015
Time Stamp:	13:33:03
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	7137_POA.pdf	238783 c8547c5a85039066596 4dd20ceb2902ad1709236	no	1

Warnings:

Information:	
Total Files Size (in bytes):	238783

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/961,787	12/07/2015	Charles A. Leonard	7137

CONFIRMATION NO. 8904

POA ACCEPTANCE LETTER

22474
Clements Bernard Walker PLLC
4500 Cameron Valley Parkway
Suite 350
Charlotte, NC 28211

OC000000104016841

Date Mailed: 11/26/2018

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 11/20/2018.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/rnegga/

ETN1002
440/655

UNITED STATES PATENT AND TRADEMARK OFFICE

USPTO Automated Interview Request (AIR)

Dec 17 2018

This paper requesting to schedule and/or conduct an interview is appropriate because:

I am concurrently submitting an authorization to communicate via the internet. See form SB/0439.

Name(s):
Elizabeth R. Kendall

S-signature:
/Elizabeth R Kendall/

Registration Number:
74280

U.S. Application Number:
14961787

Confirmation Number:
8904

E-mail Address:
ekendall@worldpatents.com

Phone Number:
7047903600

Proposed Time of Interview:
1-9-2019 9:00 AM ET

Alternative Proposed Time(s) of Interview:
1-10-2019 9:00 AM ET

Alternative Proposed Time(s) of Interview:
1-9-2019 10:00 AM ET

Prefered Interview Type:
Telephonic

I am the applicant or applicant's representative for this application.

Topic for Discussion:
Questions about prior art rejections

Doc Code: A.NE.AFCP
Document Description: After Final Consideration Pilot Program Request

PTO/SB/434 (05-13)

CERTIFICATION AND REQUEST FOR CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0

Practitioner Docket No.:	Application No.:	Filing Date:
7137	14/961,787	December 7, 2015
First Named Inventor:	**Title:**	
Charles A. Leonard	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES	

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0 (AFCP 2.0) OF THE ACCOMPANYING RESPONSE UNDER 37 CFR 1.116.

1. The above-identified application is (i) an original utility, plant, or design nonprovisional application filed under 35 U.S.C. 111(a) [a continuing application (*e.g.*, a continuation or divisional application) is filed under 35 U.S.C. 111(a) and is eligible under (i)], or (ii) an international application that has entered the national stage in compliance with 35 U.S.C. 371(c).
2. The above-identified application contains an outstanding final rejection.
3. Submitted herewith is a response under 37 CFR 1.116 to the outstanding final rejection. The response includes an amendment to at least one independent claim, and the amendment does not broaden the scope of the independent claim in any aspect.
4. This certification and request for consideration under AFCP 2.0 is the only AFCP 2.0 certification and request filed in response to the outstanding final rejection.
5. Applicant is willing and available to participate in any interview requested by the examiner concerning the present response.
6. This certification and request is being filed electronically using the Office's electronic filing system (EFS-Web).
7. Any fees that would be necessary consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, extension of time fees, are being concurrently filed herewith. [There is no additional fee required to request consideration under AFCP 2.0.]
8. By filing this certification and request, applicant acknowledges the following:
    - Reissue applications and reexamination proceedings are not eligible to participate in AFCP 2.0.
    - The examiner will verify that the AFCP 2.0 submission is compliant, *i.e.*, that the requirements of the program have been met (see items 1 to 7 above). For compliant submissions:
        - The examiner will review the response under 37 CFR 1.116 to determine if additional search and/or consideration (i) is necessitated by the amendment and (ii) could be completed within the time allotted under AFCP 2.0. If additional search and/or consideration is required but cannot be completed within the allotted time, the examiner will process the submission consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, by mailing an advisory action.
        - If the examiner determines that the amendment does not necessitate additional search and/or consideration, or if the examiner determines that additional search and/or consideration is required and could be completed within the allotted time, then the examiner will consider whether the amendment places the application in condition for allowance (after completing the additional search and/or consideration, if required). If the examiner determines that the amendment does not place the application in condition for allowance, then the examiner will contact the applicant and request an interview.
            - The interview will be conducted by the examiner, and if the examiner does not have negotiation authority, a primary examiner and/or supervisory patent examiner will also participate.
            - If the applicant declines the interview, or if the interview cannot be scheduled within ten (10) calendar days from the date that the examiner first contacts the applicant, then the examiner will proceed consistent with current practice concerning responses after final rejection under 37 CFR 1.116.

Signature	Date
/Elizabeth R. Kendall/	January 16, 2019
Name (Print/Typed) Elizabeth R. Kendall	**Practitioner Registration No.** 74280

***Note**: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.*

[✓] * Total of 1 forms are submitted.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s)	Charles A. Leonard
Application No.	14/961,787
Filing Date	December 07, 2015
Title	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES
Examiner	MARTINEZ BORRERO, LUIS A
Art Unit	3668
Confirmation No.	8904

Commissioner for Patents
Via EFS-Web

AMENDMENT AND RESPONSE TO FINAL OFFICE ACTION

In response to the Final Office Action dated November 16, 2018, rejecting claims 1-5, 7, 10, 12, 14-16, 18, 20, 22-29, 38, and 43-44 of the above-referenced Application, in which claims 1-5, 7, 10, 12, 14-16, 18, 20, 22-29, 38, and 43-44 are pending, and pursuant to the After Final Consideration Pilot (AFCP) 2.0 request filed herewith, Applicant respectfully requests that the following amendments be entered and remarks be considered, without prejudice or disclaimer to continued examination on the merits. In view of these amendments and remarks, Applicant submits that the Application is now in condition for allowance and respectfully requests such action.

SECTION	PAGE(S)
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Remarks	9 – 13
Internet Communications Authorized	14

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CLAIMS

Please amend the claims as follows, without prejudice or disclaimer to continued examination on the merits:

1. (Currently Amended) A leveling system for leveling a vehicle that is at rest, the leveling system comprising:

one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction, each of the one or more sensor devices comprising a printed circuit board that comprises

a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured[[and]],

a processor to process data collected by the respective sensor device, and

a digital temperature sensor that collects and transmits temperature data to the processor, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table to determine how to correct deviations within the collected data; and

a smart device in communication with the one or more sensor devices to allow information received from the one or more sensor devices about at least one of the inclination or the orientation of the vehicle in both the pitch direction and the roll direction to be processed to provide measurements to a user and to determine an amount of adjustments in height to at least one of a rear or front section or first or second side sections of the vehicle needed to level the vehicle, so that the vehicle is adjusted to obtain a level position based on a calculated change from the determination of the amount of adjustments in height, the smart device configured to determine an initial level position for a vehicle to determine any inconsistencies inherent in the leveling system by capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies when determining the amount of adjustment in height.

2. (Previously Presented) The system according to claim 1, wherein the printed circuit board further comprises a digital gyroscope.

3. (Previously Presented) The system according to claim 1, wherein the processor performs calculations related to the determination the amount of adjustments needed to at least one of pitch direction or the roll direction to level the vehicle.

4. (Original) The system according to claim 3, wherein the sensor device comprises a memory in communication with the processor of the PCB, the sensor device capable of storing information transmitted from the smart device.

5. (Previously Presented) The system according to claim 4, wherein the sensor device uses data sensed by the sensor device and stored data obtained from the smart device to perform calculations on the sensor device and transmit the calculated data to the smart device.

6. (Cancelled)

7. (Previously Presented) The system according to claim 1, wherein the smart device communicates with the printed circuit board of the sensor device.

8. – 9. (Cancelled)

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10. (Currently Amended) A method for leveling a recreational vehicle, the method comprising:

providing a leveling system comprising

one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction and a smart device in communication with the one or more sensor devices, each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured, and

a digital temperature sensor that collects and transmits temperature data to a processor, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table to determine how to correct deviations within data collected from the one or more sensor devices;

determining an initial level position for the vehicle using the smart device to determine any inconsistencies inherent in the leveling system; ~~and~~

capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time;

measuring the pitch angle and the roll angle of the vehicle when the vehicle is at rest using the sensor device;

retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position;

calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle using the calibration data of pitch and roll angle measurements;

displaying the calculated change in the height to the at least one of the rear or front section or the first or second side sections of the vehicle in at least one of the pitch direction or the roll direction of the vehicle on the smart device; and

adjusting the height to the at least one of the rear or front section or the first or second side sections of the vehicle to obtain the level position of the vehicle based on the calculated change.

11. (Cancelled)

12. (Previously Presented) The method according to claim 10, wherein the step of determining an initial level position comprises using at least one of an accelerometer, gyroscope, or global positioning system sensor on the smart device to achieve the initial level position.

13. (Cancelled)

14. (Previously Presented) The method according to claim 10, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises communicating calibration data from the sensor device of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position to the smart device and saving the calibration data on the smart device.

15. (Previously Presented) The method according to claim 10, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises saving the calibration data of the pitch and roll angle measurements from the sensor device comprises saving the calibration data of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position on the sensor device.

16. (Previously Presented) The method according to claim 15, wherein the step of saving the calibration data of the pitch and roll angle measurements on the sensor device comprises transmitting instructions from the smart device to the sensor device to save and store the calibration data of the pitch and roll angle measurements on the sensor device and wherein the method further comprises recalling the calibration data of the pitch and roll angle measurements from the sensor device to the smart device.

17. (Cancelled)

18. (Previously Presented) The method according to claim 10, wherein the step of determining an initial level position comprises receiving measurements of a length and a width of the vehicle.

19. (Cancelled)

20. (Original) The method according to claim 10, wherein the step of displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle further comprises displaying the calculated change in the pitch direction and the roll direction of the vehicle in measurements of distance.

21. (Cancelled)

22. (Original) The method according to claim 10, further comprising saving a given pitch angle measurement on at least one of the smart device or the sensor device to permit later recall for the purpose of returning the vehicle to the given pitch angle position at a later time.

23. (Original) The method according to claim 10, further comprising receiving data at the smart device from one or more vehicle control panels.

24. (Original) The method according to claim 23, wherein the received data from one or more vehicle control panels comprises at least one of data regarding holding tank levels or data regarding battery power levels.

25. (Original) The method according to claim 23, further comprising displaying the data on the smart device that is generated and displayed on the one or more vehicle control panels.

26. (Original) The method according to claim 10, further comprising activating one or more systems on the vehicle with the smart device.

27. (Original) The method according to claim 26, wherein the one or more systems activated via the software application of the smart device comprise at least one of lighting systems, entertainment systems, power slideouts or a generator.

28. (Original) The method according to claim 10, further comprising collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

29. (Currently Amended) A non-transitory computer readable medium comprising computer executable instructions embodied in a computer readable medium that when executed by a processor of a computer control the computer to perform steps comprising:

receiving on a smart device a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device secured to the vehicle, the sensor device comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective device relative to the vehicle to which the one or more sensor devices are secured;

capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device after determining an initial level position for the vehicle using the smart device to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time;

retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at the initial level position;

comparing temperature data transmitted from a digital temperature sensor with data stored in a temperature correction table to determine how to correct deviations within the captured measurement data;

calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of a pitch direction or a roll direction of the vehicle using the calibration data of the pitch and roll angle measurements; and

displaying the calculated change in height to at least one of the rear or front section or one of the first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device so that the height to at least one of the rear or front section or the first or second side sections of the vehicle is adjusted to obtain the level position of the vehicle based on the calculated change.

30. – 37. (Cancelled)

38. (Original) The non-transitory computer readable medium according to claim 29, further comprising receiving data at the smart device from one or more vehicle control panels.

39. – 42. (Cancelled)

43. (Original) The non-transitory computer readable medium according to claim 29, further comprising collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

44. (Cancelled)

REMARKS

Applicant respectfully requests reconsideration of the present Application in light of the foregoing amendments and following remarks. This response is filed under AFCP 2.0.

In the Office Action mailed November 16, 2018 ("Office Action"), the Office rejected claims 1-5, 7, 10, 12, 14-16, 18, 20, 22-29, 38, and 43-44 in the instant Application.

Claims 1-5, 7, 10, 12, 14-16, 18, 20, 22-29, 38, and 43 remain pending. Claim 44 is hereby cancelled.

Claims 1, 10, and 29 are currently amended for clarity and to incorporate the elements of cancelled claim 44. Support for these amendments may be found in at least ¶¶ [0036]–[0038] of the Application, as originally filed. No new matter is added.

Telephonic Interview

Applicant would like to thank the Examiner for his time and helpful discussion during the telephonic interview on January 10, 2019.

Claim Rejections under 35 U.S.C. § 103

Independent claims 1, 10, and 29 and dependent claims 2-5, 7, 12-16, 18, 20, 22-28, 38, and 43 stand rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent Publication No. 2008/0142768 to Thorpe *et al.* ("*Thorpe*") in view of U.S. Patent Publication No. 2012/0197587 to Luk *et al.* ("*Luk*"). Additionally, dependent claims 28, 38, and 43 stand rejected under 35 U.S.C. § 103 as being unpatentable over *Thorpe* in view of *Luk* and in further view of U.S. Patent Publication No. 2012/0208520 to Howarter *er al.* ("*Howarter*"). Finally, dependent claim 44 stands rejected under 35 U.S.C. § 103 as being unpatentable over *Thorpe* in view of *Luk* and *Howarter* and in further view of U.S. Patent No. 4,935,883 to Hulsing *et al.* ("*Hulsing*"). These rejections are respectfully traversed for at least the following reasons.

Independent claims 1, 10, and 29 and dependent claims 2-5, 7, 12-16, 18, 20, 22-28, 38, and 43 are patentable over *Thorpe*, *Luk*, *Howarter*, and *Hulsing*, alone or in combination. As explained below, any combination of *Thorpe* in view of *Luk*, *Howarter*, and *Hulsing* fails to teach or suggest every element recited in Applicant's claims 1, 10, and 29.

Independent claim 1, as amended, recites (with emphasis added):

> A leveling system for leveling a vehicle that is at rest, the leveling system comprising:
>
> one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction, each of the one or more sensor devices comprising a printed circuit board that comprises
>
> a digital accelerometer that uses an X-axis, Y axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured,
>
> a processor to process data collected by the respective sensor device, and
>
> ***a digital temperature sensor that collects and transmits temperature data to the processor, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table to determine how to correct deviations within the collected data***; and
>
> a smart device in communication with the one or more sensor devices to allow information received from the one or more sensor devices about at least one of the inclination or the orientation of the vehicle in both the pitch direction and the roll direction to be processed to provide measurements to a user and to determine an amount of adjustments in height to at least one of a rear or front section or first or second side sections of the vehicle needed to level the vehicle, so that the vehicle is adjusted to obtain a level position based on a calculated change from the determination of the amount of adjustments in height, the smart device configured to determine an initial level position for a vehicle to determine any inconsistencies inherent in the leveling system by capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies when determining the amount of adjustment in height.

Independent claims 10 and 29 have similarly been amended to include a digital temperature sensor. The cited references do not teach or suggest, either alone or in combination, a digital temperature sensor that collects and transmits temperature data to a processor, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table to determine how to correct deviations within data collected from a digital accelerometer.

The rejections should be withdrawn because, as admitted in the Office Action, *Thorpe*, *Luk*, and *Howarter* fail to disclose or suggest at least "a digital temperature sensor that collects and transmits temperature data to the processor, wherein the processor compares the transmitted

temperature data with data stored in a temperature correction table to determine how to correct deviations within the collected data", as recited in independent claims 1, 10, and 29, as amended.

The Office Action points to *Hulsing* to cure the deficiencies of *Thorpe*, *Luk*, and *Howarter*. However, *Hulsing* teaches leveling a precision gravity measurement device for use in boreholes when surveying oil or gas wells.[1] Specifically, *Hulsing* teaches using stepper motors in a two-gimbal system to rotate an accelerometer a predetermined amount of steps that equal 90° from

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[1] *See Hulsing*, Background ("The earth's gravitational field varies, depending upon the position at which it is measured, the density of adjacent mass, the altitude or depth of the measurement and the proximity of natural topographical features and man-made artifacts of substantial mass, such as mountains and large buildings. Variations in gravitational field have been measured with precision over a substantial portion of the earth's surface, and maps have been prepared relating gravitational field intensity to position. While these maps are of scientific interest, they also have military applications. Using these maps, for example, a submerged submarine can navigate while on covert missions by monitoring gravity profiles along the ocean floor.

Accurate gravity measurement is also important to the petroleum industry. Precision gravity surveys of depleted oil or gas wells are sometimes made, in which variations in local gravity are monitored in the microgal or nano-g range, to develop data profiling variations in the density of the strata surrounding the well or borehole that may provide an indication of untapped pockets of gas or oil. Gravity measurements at this level of resolution require use of a very high precision gravity sensor, and great care must be taken during the measurements to achieve usable results. For example, the gravity sensor must be oriented so that its sensitive axis is vertically aligned. Deviation from vertical alignment by an angle θ produces an error equal to the value of the gravitational acceleration, g, multiplied by cos θ. Thus, a deviation from vertical, by an angle θ equal to 50 microradians contributes one nano-g (or about one microgal) error.

A conventional gravity measurement device of the type used in gravimetric logging of boreholes, typically includes a sensor fixed to a frame, that is mounted in a two-axis gimbal, so that a reference plane in the frame may be precisely leveled. The sensor is fixed at a precise angle of 90° relative to the reference plane, enabling its sensitive axis to be vertically aligned by leveling the reference plane. Clearly, the angular relationship between the reference plane and the sensitive axis must be correct to avoid alignment errors. Both the lack of precision in properly leveling the reference plane and the difficulty in maintaining the precise 90° angle between the sensitive axis of the gravity measurement device and the reference plane have significantly hindered the speed, resolution, and accuracy of prior art gravity measurement devices. In addition, the two-axis gimbal of such prior art devices has been limited to rotation about each axis through an angle of only about ±12°. The limited angle of gimbal travel has made gravity measurement impossible for use in surveying boreholes having an inclination angle in excess of 12°.

Another approach for determining vertical alignment for gravity measurement uses a wheel rotating about a level axis. A plurality of accelerometers are mounted around the periphery of the wheel and are operative to produce an output signal that periodically cycles through a +1 g, 0 g, -1 g, and 0 g indication as the wheel rotates. The advantage of this approach over the two-axis gimbal device is that data produced by the rotating accelerometers may be processed to determine and cancel bias errors in the output signal. However, it is still necessary to level the axis of rotation of the wheel, so that the plane of the wheel is vertical. Furthermore, the signals output by the accelerometers must be transmitted to a processor through slip rings or other moving electrical connections, likely to introduce noise. Processing the signal output from a rotating accelerometer is also more difficult and potentially a source of error; the result is in part dependent on accurately timing the rotation of the wheel.

The limitations and problems associated with prior art gravity measurement devices described above, particularly with respect to accurately leveling the devices so that the sensitive axis of the gravity sensor is vertically aligned, have greatly inhibited widespread use of precision gravity surveys, particularly with respect to gravimetric borehole logging surveys. The present invention provides a simple, very accurate solution to this problem, which promises to greatly improve the accuracy and speed with which such measurements may be made. These and other advantages of the present invention will be apparent from the attached drawings and the Description of the Preferred Embodiment that follows.").

an initial minimum or maximum measurement of the acceleration of gravity. The gravimetric survey equipment of *Hulsing* requires that heaters within the two-gimbal system be keep the system at a predetermined temperature, 98°±2°C, or even 100°±0.1°C for more accurate accelerometers.[2] The system of *Hulsing* uses temperature sensors to control the operation of the heaters, and the data based on the signal from the accelerometer is then corrected for the predetermined temperature at which the system is kept. The system in *Hulsing* is unlike the claimed system in that the claimed system does not use a temperature feedback loop to control the temperature surrounding the accelerometer. Rather, the claimed system simply uses the measured temperature to cross reference a table lookup for dynamically applying a correction factor to adjust the data collected from the digital accelerometer, no matter what the temperature happens to be. Therefore, it would not be obvious to adapt the statically attached two-axis leveling system of *Thorpe* with the freely rotating accelerometer gravity measurement device of *Hulsing*.

Finally, *Luk* also fails to cure the deficiencies of *Thorpe*, because despite teaching evaluating a vehicle's ride using a 3-axis accelerometer, the system of *Luk* must be operated while the vehicle is in motion and not at rest as specified in the claims or the present Application.[3]

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[2] *See Hulsing*, col. 9, ll. 6–51 ("The signal indicative of acceleration, which is output from accelerometer 68, is conveyed via leads 170 to a digital counter 168. A 400 Hz timer 164 generates a read interrupt signal for the digital counter which is input thereto over leads 166. Digital counter 168 determines the frequency of the output signal, including fractional cycles of the signal (by comparison to the number of cycles of an internal high frequency clock). Data representing the frequency of the signal output from accelerometer 68 and thus the acceleration it is measuring are provided CPU 142 over data lines 150.

Stepping motors 20 and 22 are controlled by CPU 142 in accordance with digital data input to stepping motor drivers 172 over data lines 150. The sequential steps described above for determining level and for aligning the acceleration sensitive axis of accelerometer 68 vertically to measure the acceleration of gravity are carried out by CPU 142, as provided in a software digital program stored within ROM 144. Stepping motor drivers 172 take their commands from the CPU and drive stepping motors 20 and 22 through the required number of steps determined by the CPU, accordingly. CPU 142 ensures that stepping motors 20 and 22 are energized as required.

To achieve maximum precision in measurement of the acceleration of gravity, gravity measurement device 10 includes an internal temperature control circuit, including a plurality of temperature sensors 174, which are disposed at spaced apart positions within tubular enclosure 12. The output from temperature sensors 174 is converted from an analog signal to a digital signal by an A to D converter (not separately shown), and transmitted to CPU 142 over leads 175. The temperature within the enclosure is controlled by temperature control 176 in response to the signals produced by temperature sensors 174 and transmitted over leads 173. CPU 142 applies appropriate temperature correction factors in modeling the acceleration data derived from accelerometer 68, correcting for errors in the control of temperature by temperature control 176.

In the preferred embodiment, temperature control 176 attempts to maintain the temperature within tubular enclosure 12 at approximately 98° ±2° C. by energizing heaters 180 as required. In addition, a more critical temperature control is provided for accelerometer 68, which is preferably maintained at 100° ±0.1° C.").

[3] *See Luk*, ¶¶ [0005]–[0012] ("In accordance with this invention, a method of determining an evaluation of ride quality of a wheeled vehicle includes the steps of: (A) providing a portable device (e.g. instrument such as, for

Accordingly, *Thorpe*, *Luk*, *Howarter*, and *Hulsing* do not teach or suggest, either alone or in combination, the subject matter recited in independent claims 1, 10, and 29. The dependent claims are allowable based on their direct or indirect dependency from an allowable independent claim.[4]

Therefore, because the teachings of *Luk*, *Howarter*, and *Hulsing* do not cure the deficiencies of *Thorpe*, Applicant's claims 1, 10, and 29, and claims 2-5, 7, 12-16, 18, 20, 22-28, 38, and 43 depending thereon, are patentable over the teachings of *Thorpe*, *Luk*, *Howarter*, and *Hulsing*, alone or in combination. For at least these reasons, Applicant respectfully requests that the Office withdraw the rejections of claims1-5, 7, 10, 12, 14-16, 18, 20, 22-29, 38, and 43 and allow these claims.

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example, a smart phone) containing: (1) a built-in tri-axial accelerometer capable of sensing and measuring the device's individual accelerations in each of tri-axial fore-aft, lateral and vertical directions, and, (2) conversion analytical software capable of calculating and displaying the Root-Mean-Square (RMS) value of accelerations acquired in each of said three tri-axial directions and a summation of said tri-axial accelerations (e.g. by means of vector sum analysis); (B) ***operating said wheeled vehicle over the ground at a constant rate of vehicular speed*** to thereby create a moving wheeled vehicle, wherein the wheels of said wheeled vehicle are comprised of rigid wheels with circumferential ground-contacting rubber tires; wherein said device is securely attached to said wheeled vehicle in a manner that sensed tri-axial directional accelerations by said device are tri-axial directional accelerations of the moving vehicle, (C) activating said device secured to said wheeled vehicle to: (1) sense (e.g. by the built-in accelerometer) and measure the moving wheeled vehicle's individual accelerations in each of said tri-axial fore-aft, lateral and vertical directions, and, (2) calculate and display the Root-Mean-Square (RMS) values (*e.g.* by the analytical software) of accelerations acquired in each of said three tri-axial directions, and (3) calculate and display a summation (e.g. vector summation by the analytical software) of said tri-axial accelerations.") (emphasis added).

[4] MPEP § 2143.03.

AUTHORIZATION FOR E-MAIL COMMUNICATION - MPEP § 502.03

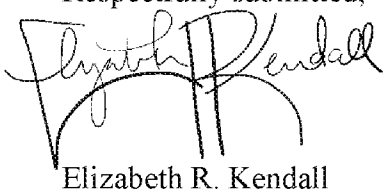
Recognizing that Internet communications are not secure, we hereby authorize the USPTO to communicate with any authorized representative concerning any subject matter of this Application by electronic mail. We understand that a copy of these communications will be made of record in the Application file.

CONCLUSION

Applicant would like to thank the Examiner for the attention and consideration accorded the present Application. It is submitted that the Application is in good and proper form for allowance. A favorable action on the part of the Examiner is respectfully solicited. The Examiner is encouraged to call the undersigned at (704) 790-3600 for any questions or if it appears that an interview would be helpful in advancing the case. Should the Examiner determine that any further action is necessary to place the Application in condition for allowance, the Examiner is encouraged to contact the undersigned at the telephone number, facsimile number, address, or email address provided below. It is not believed that any fees for additional claims, extensions of time, or the like are required beyond those that may otherwise be indicated in the documents accompanying this paper. However, if such additional fees are required, the Examiner is encouraged to notify the undersigned at the Examiner's earliest convenience.

January 16, 2019

Respectfully submitted,



Elizabeth R. Kendall
Registration No. 74,280
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Electronic Acknowledgement Receipt

EFS ID:	34872208
Application Number:	14961787
International Application Number:	
Confirmation Number:	8904
Title of Invention:	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES
First Named Inventor/Applicant Name:	Charles A. Leonard
Customer Number:	22474
Filer:	Seth Lee Hudson/Teresa Bush-Dugar
Filer Authorized By:	Seth Lee Hudson
Attorney Docket Number:	7137
Receipt Date:	16-JAN-2019
Filing Date:	07-DEC-2015
Time Stamp:	14:23:52
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	After Final Consideration Program Request	7137_AFCP.pdf	227143 d5599170ea7b1089e20fa1dfe617757600dd2147	no	2

Warnings:

Information:					
2		7137_FOA_Response_.pdf	297215 bc2baefe556f65b90a31a3e000d94c634252bc09	yes	14

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Response After Final Action	1	1
Claims	2	8
Applicant Arguments/Remarks Made in an Amendment	9	14

Warnings:	
Information:	
Total Files Size (in bytes):	524358

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/961,787	Filing Date 12/07/2015	☐ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $40 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $210 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	01/16/2019	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 23	Minus	** 25	= 0		x $50 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $230 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/SHARAIN E MORELAND/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/961,787	12/07/2015	Charles A. Leonard	7137	8904

22474 7590 02/01/2019

Clements Bernard Walker PLLC
4500 Cameron Valley Parkway
Suite 350
Charlotte, NC 28211

EXAMINER	
MARTINEZ BORRERO, LUIS A	

ART UNIT	PAPER NUMBER
3668	

NOTIFICATION DATE	DELIVERY MODE
02/01/2019	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patlaw@worldpatents.com

Applicant-Initiated Interview Summary	Application No. 14/961,787	Applicant(s) Leonard, Charles A.		
	Examiner LUIS A MARTINEZ BORRERO	Art Unit 3668	AIA (First Inventor to File) Status Yes	Page 1 of 2

All participants (applicant, applicants representative, PTO personnel):

1. LUIS A MARTINEZ BORRERO (Examiner); Telephonic

2. Elizabeth R. Kendall (Attorney); Telephonic

Date of Interview: 10 January 2019

Claims Discussed: The applicant discussed claim 1

Prior Art Discussed: The applicant discussed the rejection over Thorpe in view of Luk

Amendment proposed: The applicant proposed some amendments to further limit the leveling system.

Brief Description of the main topic(s) of discussion: The applicant discussed the prior art rejection and potential amendments to overcome such rejection. Some of the potential almendments include to further limit a digital temperature sensor. The applicant suggested to further limit the invention to distinguish the invention over the prior art. An agenda has been attached.

Issues Discussed:

Item(s) under 35 U.S.C. 103:

Attachment(s): Agenda,

/COURTNEY D HEINLE/ Primary Examiner, Art Unit 3668	/L.A.M/ Examiner, Art Unit 3668

Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04
Please further see:
MPEP 713.04
Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b)
37 CFR § 1.2 Business to be transacted in writing

U.S. Patent and Trademark Office
PTOL-413/413b (Rev. 01/01/2015)

Interview Summary

Paper No. 20190116

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

Doc Code: M865 or FAI.REQ.INTV

PTOL-413A (07-16)
Approved for use through 08/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Applicant Initiated Interview Request Form

Application No.: 14/961,787 First Named Applicant: Charles A. Leonard
Examiner: MARTINEZ BORRERO, LUIS A Art Unit: 3668 Status of Application: Pending

Tentative Participants:
(1) Elizabeth R. Kendall (2) _____
(3) _____ (4) _____

Proposed Date of Interview: January 10, 2019 **Proposed Time:** 11:00 (◉AM ○PM)

Type of Interview Requested:
(1) ☑ Telephonic (2) ☐ Personal (3) ☐ Video Conference

Exhibit To Be Shown or Demonstrated: ☐ YES ☐ NO
If yes, provide brief description: _____

Issues To Be Discussed

Issues (Rej., Obj., etc)	Claims/ Fig. #s	Prior Art	Discussed	Agreed	Not Agreed
(1) 103 Rej.	1		☐	☐	☐
(2)			☐	☐	☐
(3)			☐	☐	☐
(4)			☐	☐	☐

☐ Continuation Sheet Attached ☐ Proposed Amendment or Arguments Attached

Brief Description of Arguments to be Presented: Questions on prior art and claim interpretations of the Examiner.
Recap and overview of prosecution so far to gain a better understanding of agreeable claim language to be used in amendments.

An interview was conducted on the above-identified application on _____

NOTE: This form should be completed and filed by applicant in advance of the interview (see MPEP § 713.01). If this form is signed by a registered practitioner not of record, the Office will accept this as an indication that he or she is authorized to conduct an interview on behalf of the principal (37 CFR 1.32(a)(3)) pursuant to 37 CFR 1.34. This is not a power of attorney to any above named practitioner. See the Instruction Sheet for this form, which is incorporated by reference. By signing this form, applicant or practitioner is certifying that he or she has read the Instruction Sheet. After the interview is conducted, applicant is advised to file a statement of the substance of this interview (37 CFR 1.133(b)) as soon as possible. This application will not be delayed from issue because of applicant's failure to submit a written record of this interview.

/Elizabeth R. Kendall/
Applicant/Applicant's Representative Signature

Examiner/SPE Signature

Elizabeth R. Kendall
Typed/Printed Name of Applicant or Representative

704-790-3600
Applicant's/Applicant's Representative's Telephone Number

74,280
Registration Number, if applicable

This collection of information is required by 37 CFR 1.133. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 24 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS.
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/961,787	Filing Date 12/07/2015	☐ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $40 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $210 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	02/19/2019	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 24	Minus	** 25	= 0		x $50 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $230 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/SHARON D HARRIS/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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ETN1002
465/655

Doc code: RCEX
Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	14/961,787	Filing Date	2015-12-07	Docket Number (if applicable)	7137	Art Unit	3668
First Named Inventor	Charles A. Leonard			Examiner Name	Luis A. Martinez Borrero		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☒ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☐ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No _____

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

Applicant Signature

ETN1002
466/655

PTO/SB/30EFS (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Signature of Registered U.S. Patent Practitioner			
Signature	/Elizabeth R. Kendall/	Date (YYYY-MM-DD)	2019-02-19
Name	Elizabeth R. Kendall	Registration Number	74280

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If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	35187326
Application Number:	14961787
International Application Number:	
Confirmation Number:	8904
Title of Invention:	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES
First Named Inventor/Applicant Name:	Charles A. Leonard
Customer Number:	22474
Filer:	Elizabeth R. Kendall/Teresa Bush-Dugar
Filer Authorized By:	Elizabeth R. Kendall
Attorney Docket Number:	7137
Receipt Date:	19-FEB-2019
Filing Date:	07-DEC-2015
Time Stamp:	14:18:54
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		7137_RCE_Response.pdf	403292 12c6cf8420116913fb3cb716861d2d299009d35a	yes	14

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment Submitted/Entered with Filing of CPA/RCE	1	1
	Claims	2	8
	Applicant Arguments/Remarks Made in an Amendment	9	14

Warnings:					
Information:					
2	Request for Continued Examination (RCE)	7137_RCE_021919.pdf	1350098 35bf6f4dadb9d5e64d99a5c4ecb574ff3cf89287	no	3
Warnings:					
Information:					
		Total Files Size (in bytes):	1753390		

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s)	Charles A. Leonard
Application No.	14/961,787
Filing Date	December 07, 2015
Title	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES
Examiner	MARTINEZ BORRERO, LUIS A
Art Unit	3668
Confirmation No.	8904
Date	February 16, 2019

Commissioner for Patents
Via EFS-Web

AMENDMENT AND RESPONSE TO FINAL OFFICE ACTION

In response to the Final Office Action dated November 16, 2018, rejecting claims 1-5, 7, 10, 12, 14-16, 18, 20, 22-29, 38, and 43-44 of the above-referenced Application, in which claims 1-5, 7, 10, 12, 14-16, 18, 20, 22-29, 38, and 43-44 are pending, and pursuant to the Request for Continued Examination (RCE) filed herewith, Applicant respectfully requests that the following amendments be entered and remarks be considered, without prejudice or disclaimer to continued examination on the merits. In view of these amendments and remarks, Applicant submits that the Application is now in condition for allowance and respectfully requests such action.

SECTION	PAGE(S)
Amendment – After Final Rejection	**1**
Claims	**2 – 8**
Remarks	**9 – 13**
Internet Communications Authorized	**14**

CLAIMS

Please amend the claims as follows, without prejudice or disclaimer to continued examination on the merits:

1. (Currently Amended) A leveling system for leveling a vehicle that is at rest, the leveling system comprising:

one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction, each of the one or more sensor devices comprising a printed circuit board that comprises

a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured[[and]],

a processor to process data collected by the respective sensor device, and

a digital temperature sensor that collects and transmits temperature data of the ambient air where the vehicle is at rest to the processor, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table having temperature correction data for environmental air temperatures ranging from about −60 °C to about 90 °C to determine how to correct deviations within the collected data; and

a smart device in communication with the one or more sensor devices to allow information received from the one or more sensor devices about at least one of the inclination or the orientation of the vehicle in both the pitch direction and the roll direction to be processed to provide measurements to a user and to determine an amount of adjustments in height to at least one of a rear or front section or first or second side sections of the vehicle needed to level the vehicle, so that the vehicle is adjusted to obtain a level position based on a calculated change from the determination of the amount of adjustments in height, the smart device configured to determine an initial level position for a vehicle to determine any inconsistencies inherent in the leveling system by capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide a calibration data of the pitch and roll angle

measurements to permit consideration of any inconsistencies when determining the amount of adjustment in height.

2. (Previously Presented) The system according to claim 1, wherein the printed circuit board further comprises a digital gyroscope.

3. (Previously Presented) The system according to claim 1, wherein the processor performs calculations related to the determination the amount of adjustments needed to at least one of pitch direction or the roll direction to level the vehicle.

4. (Original) The system according to claim 3, wherein the sensor device comprises a memory in communication with the processor of the PCB, the sensor device capable of storing information transmitted from the smart device.

5. (Previously Presented) The system according to claim 4, wherein the sensor device uses data sensed by the sensor device and stored data obtained from the smart device to perform calculations on the sensor device and transmit the calculated data to the smart device.

6. (Cancelled)

7. (Previously Presented) The system according to claim 1, wherein the smart device communicates with the printed circuit board of the sensor device.

8. – 9. (Cancelled)

10. (Currently Amended) A method for leveling a recreational vehicle, the method comprising:

providing a leveling system comprising

one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction and a smart device in communication with the one or more sensor devices, each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of

positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured, and

a digital temperature sensor that collects and transmits temperature data of the ambient air where the vehicle is at rest to a processor, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table having temperature correction data for environmental air temperatures ranging from about −60 °C to about 90 °C to determine how to correct deviations within data collected from the one or more sensor devices;

determining an initial level position for the vehicle using the smart device to determine any inconsistencies inherent in the leveling system; ~~and~~

capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time;

measuring the pitch angle and the roll angle of the vehicle when the vehicle is at rest using the sensor device;

retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position;

calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle using the calibration data of pitch and roll angle measurements;

displaying the calculated change in the height to the at least one of the rear or front section or the first or second side sections of the vehicle in at least one of the pitch direction or the roll direction of the vehicle on the smart device; and

adjusting the height to the at least one of the rear or front section or the first or second side sections of the vehicle to obtain the level position of the vehicle based on the calculated change.

11. (Cancelled)

12. (Previously Presented) The method according to claim 10, wherein the step of determining an initial level position comprises using at least one of an accelerometer, gyroscope, or global positioning system sensor on the smart device to achieve the initial level position.

13. (Cancelled)

14. (Previously Presented) The method according to claim 10, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises communicating calibration data from the sensor device of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position to the smart device and saving the calibration data on the smart device.

15. (Previously Presented) The method according to claim 10, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises saving the calibration data of the pitch and roll angle measurements from the sensor device comprises saving the calibration data of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position on the sensor device.

16. (Previously Presented) The method according to claim 15, wherein the step of saving the calibration data of the pitch and roll angle measurements on the sensor device comprises transmitting instructions from the smart device to the sensor device to save and store the calibration data of the pitch and roll angle measurements on the sensor device and wherein the method further comprises recalling the calibration data of the pitch and roll angle measurements from the sensor device to the smart device.

17. (Cancelled)

18. (Previously Presented) The method according to claim 10, wherein the step of determining an initial level position comprises receiving measurements of a length and a width of the vehicle.

19. (Cancelled)

20. (Original) The method according to claim 10, wherein the step of displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle further comprises displaying the calculated change in the pitch direction and the roll direction of the vehicle in measurements of distance.

21. (Cancelled)

22. (Original) The method according to claim 10, further comprising saving a given pitch angle measurement on at least one of the smart device or the sensor device to permit later recall for the purpose of returning the vehicle to the given pitch angle position at a later time.

23. (Original) The method according to claim 10, further comprising receiving data at the smart device from one or more vehicle control panels.

24. (Original) The method according to claim 23, wherein the received data from one or more vehicle control panels comprises at least one of data regarding holding tank levels or data regarding battery power levels.

25. (Original) The method according to claim 23, further comprising displaying the data on the smart device that is generated and displayed on the one or more vehicle control panels.

26. (Original) The method according to claim 10, further comprising activating one or more systems on the vehicle with the smart device.

27. (Original) The method according to claim 26, wherein the one or more systems activated via the software application of the smart device comprise at least one of lighting systems, entertainment systems, power slideouts or a generator.

28. (Original) The method according to claim 10, further comprising collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

29. (Currently Amended) A non-transitory computer readable medium comprising computer executable instructions embodied in a computer readable medium that when executed by a processor of a computer control the computer to perform steps comprising:

receiving on a smart device a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device secured to the vehicle, the sensor device comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective device relative to the vehicle to which the one or more sensor devices are secured;

capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device after determining an initial level position for the vehicle using the smart device to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time;

retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at the initial level position;

comparing temperature data transmitted from a digital temperature sensor with data stored in a temperature correction table having temperature correction data for environmental air temperatures ranging from about −60 °C to about 90 °C to determine how to correct deviations within the captured measurement data;

calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of a pitch direction or a roll direction of the vehicle using the calibration data of the pitch and roll angle measurements; and

displaying the calculated change in height to at least one of the rear or front section or one of the first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device so that the height to at least one of the rear or front section or the first or second side sections of the vehicle is adjusted to obtain the level position of the vehicle based on the calculated change.

30. – 37. (Cancelled)

38. (Original) The non-transitory computer readable medium according to claim 29, further comprising receiving data at the smart device from one or more vehicle control panels.

39. – 42. (Cancelled)

43. (Original) The non-transitory computer readable medium according to claim 29, further comprising collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

44. (Cancelled)

REMARKS

Applicant respectfully requests reconsideration of the present Application in light of the foregoing amendments and following remarks.

In the Office Action mailed November 16, 2018 ("Office Action"), the Office rejected claims 1-5, 7, 10, 12, 14-16, 18, 20, 22-29, 38, and 43-44 in the instant Application.

Claims 1-5, 7, 10, 12, 14-16, 18, 20, 22-29, 38, and 43 remain pending. Claim 44 is hereby cancelled.

Claims 1, 10, and 29 are currently amended for clarity and to incorporate the elements of cancelled claim 44. Support for these amendments may be found in at least ¶¶ [0036]–[0038] of the Application, as originally filed. No new matter is added.

Telephonic Interview Summary

Applicant would like to thank the Examiner for his time and helpful discussion during the telephonic interview on January 10, 2019, in which the independent claims were discussed in view of the prior art. Specifically, amendments incorporating the previously disclosed temperature sensor into the independent claims to further distinguish the invention over the prior art were discussed.

Claim Rejections under 35 U.S.C. § 103

Independent claims 1, 10, and 29 and dependent claims 2-5, 7, 12-16, 18, 20, 22-28, 38, and 43 stand rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent Publication No. 2008/0142768 to Thorpe *et al.* ("*Thorpe*") in view of U.S. Patent Publication No. 2012/0197587 to Luk *et al.* ("*Luk*"). Additionally, dependent claims 28, 38, and 43 stand rejected under 35 U.S.C. § 103 as being unpatentable over *Thorpe* in view of *Luk* and in further view of U.S. Patent Publication No. 2012/0208520 to Howarter *er al.* ("*Howarter*"). Finally, dependent claim 44 stands rejected under 35 U.S.C. § 103 as being unpatentable over *Thorpe* in view of *Luk* and *Howarter* and in further view of U.S. Patent No. 4,935,883 to Hulsing *et al.* ("*Hulsing*"). These rejections are respectfully traversed for at least the following reasons.

Independent claims 1, 10, and 29 and dependent claims 2-5, 7, 12-16, 18, 20, 22-28, 38, and 43 are patentable over *Thorpe*, *Luk*, *Howarter*, and *Hulsing*, alone or in combination. As explained below, any combination of *Thorpe* in view of *Luk*, *Howarter*, and *Hulsing* fails to teach or suggest every element recited in Applicant's claims 1, 10, and 29.

Independent claim 1, as amended, recites (with emphasis added):

> A leveling system for leveling a vehicle that is at rest, the leveling system comprising:
>
> one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction, each of the one or more sensor devices comprising a printed circuit board that comprises
>
> a digital accelerometer that uses an X-axis, Y axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured,
>
> a processor to process data collected by the respective sensor device, and
>
> ***a digital temperature sensor that collects and transmits temperature data of the ambient air where the vehicle is at rest to the processor, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table having temperature correction data for environmental air temperatures ranging from about −60 °C to about 90 °C to determine how to correct deviations within the collected data***; and
>
> a smart device in communication with the one or more sensor devices to allow information received from the one or more sensor devices about at least one of the inclination or the orientation of the vehicle in both the pitch direction and the roll direction to be processed to provide measurements to a user and to determine an amount of adjustments in height to at least one of a rear or front section or first or second side sections of the vehicle needed to level the vehicle, so that the vehicle is adjusted to obtain a level position based on a calculated change from the determination of the amount of adjustments in height, the smart device configured to determine an initial level position for a vehicle to determine any inconsistencies inherent in the leveling system by capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies when determining the amount of adjustment in height.

Independent claims 10 and 29 have similarly been amended to include a digital temperature sensor. The cited references do not teach or suggest, either alone or in combination, a digital temperature sensor that collects and transmits temperature data to a processor, wherein the processor compares

the transmitted temperature data with data stored in a temperature correction table to determine how to correct deviations within data collected from a digital accelerometer.

First, the rejections should be withdrawn because, as admitted in the Office Action, *Thorpe*, *Luk*, and *Howarter* fail to disclose or suggest at least "a digital temperature sensor that collects and transmits temperature data to the processor, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table to determine how to correct deviations within the collected data", as recited in independent claims 1, 10, and 29, as amended.

The Office Action points to *Hulsing* to cure the deficiencies of *Thorpe*, *Luk*, and *Howarter*. However, *Hulsing* teaches leveling a precision gravity measurement device for use in boreholes when surveying oil or gas wells.[1] Specifically, *Hulsing* teaches using stepper motors in a

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[1] *See Hulsing*, Background ("The earth's gravitational field varies, depending upon the position at which it is measured, the density of adjacent mass, the altitude or depth of the measurement and the proximity of natural topographical features and man-made artifacts of substantial mass, such as mountains and large buildings. Variations in gravitational field have been measured with precision over a substantial portion of the earth's surface, and maps have been prepared relating gravitational field intensity to position. While these maps are of scientific interest, they also have military applications. Using these maps, for example, a submerged submarine can navigate while on covert missions by monitoring gravity profiles along the ocean floor.

Accurate gravity measurement is also important to the petroleum industry. Precision gravity surveys of depleted oil or gas wells are sometimes made, in which variations in local gravity are monitored in the microgal or nano-g range, to develop data profiling variations in the density of the strata surrounding the well or borehole that may provide an indication of untapped pockets of gas or oil. Gravity measurements at this level of resolution require use of a very high precision gravity sensor, and great care must be taken during the measurements to achieve usable results. For example, the gravity sensor must be oriented so that its sensitive axis is vertically aligned. Deviation from vertical alignment by an angle θ produces an error equal to the value of the gravitational acceleration, g, multiplied by $\cos \theta$. Thus, a deviation from vertical, by an angle θ equal to 50 microradians contributes one nano-g (or about one microgal) error.

A conventional gravity measurement device of the type used in gravimetric logging of boreholes, typically includes a sensor fixed to a frame, that is mounted in a two-axis gimbal, so that a reference plane in the frame may be precisely leveled. The sensor is fixed at a precise angle of 90° relative to the reference plane, enabling its sensitive axis to be vertically aligned by leveling the reference plane. Clearly, the angular relationship between the reference plane and the sensitive axis must be correct to avoid alignment errors. Both the lack of precision in properly leveling the reference plane and the difficulty in maintaining the precise 90° angle between the sensitive axis of the gravity measurement device and the reference plane have significantly hindered the speed, resolution, and accuracy of prior art gravity measurement devices. In addition, the two-axis gimbal of such prior art devices has been limited to rotation about each axis through an angle of only about ±12°. The limited angle of gimbal travel has made gravity measurement impossible for use in surveying boreholes having an inclination angle in excess of 12°.

Another approach for determining vertical alignment for gravity measurement uses a wheel rotating about a level axis. A plurality of accelerometers are mounted around the periphery of the wheel and are operative to produce an output signal that periodically cycles through a +1 g, 0 g, -1 g, and 0 g indication as the wheel rotates. The advantage of this approach over the two-axis gimbal device is that data produced by the rotating accelerometers may be processed to determine and cancel bias errors in the output signal. However, it is still necessary to level the axis of rotation of the wheel, so that the plane of the wheel is vertical. Furthermore, the signals output by the accelerometers must be transmitted to a processor through slip rings or other moving electrical connections, likely to introduce noise.

two-gimbal system to rotate an accelerometer a predetermined amount of steps that equal 90° from an initial minimum or maximum measurement of the acceleration of gravity. The gravimetric survey equipment of *Hulsing* requires that heaters within the two-gimbal system be keep the system at a predetermined temperature, 98°±2°C, or even 100°±0.1°C for more accurate accelerometers.[2] The system of *Hulsing* uses temperature sensors to control the operation of the heaters, and the data based on the signal from the accelerometer is then corrected for the predetermined temperature at which the system is kept. The system in *Hulsing* is unlike the claimed system in that the claimed system does not use a temperature feedback loop to control the temperature surrounding the accelerometer. Rather, the claimed system simply uses the measured temperature to cross reference a table lookup for dynamically applying a correction factor to adjust the data collected from the digital accelerometer, no matter what the temperature of the ambient air happens to be in the environment in which the vehicle is at rest. Therefore, it would not be

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Processing the signal output from a rotating accelerometer is also more difficult and potentially a source of error; the result is in part dependent on accurately timing the rotation of the wheel.

The limitations and problems associated with prior art gravity measurement devices described above, particularly with respect to accurately leveling the devices so that the sensitive axis of the gravity sensor is vertically aligned, have greatly inhibited widespread use of precision gravity surveys, particularly with respect to gravimetric borehole logging surveys. The present invention provides a simple, very accurate solution to this problem, which promises to greatly improve the accuracy and speed with which such measurements may be made. These and other advantages of the present invention will be apparent from the attached drawings and the Description of the Preferred Embodiment that follows.").

[2] *See Hulsing*, col. 9, ll. 6–51 ("The signal indicative of acceleration, which is output from accelerometer 68, is conveyed via leads 170 to a digital counter 168. A 400 Hz timer 164 generates a read interrupt signal for the digital counter which is input thereto over leads 166. Digital counter 168 determines the frequency of the output signal, including fractional cycles of the signal (by comparison to the number of cycles of an internal high frequency clock). Data representing the frequency of the signal output from accelerometer 68 and thus the acceleration it is measuring are provided CPU 142 over data lines 150.

Stepping motors 20 and 22 are controlled by CPU 142 in accordance with digital data input to stepping motor drivers 172 over data lines 150. The sequential steps described above for determining level and for aligning the acceleration sensitive axis of accelerometer 68 vertically to measure the acceleration of gravity are carried out by CPU 142, as provided in a software digital program stored within ROM 144. Stepping motor drivers 172 take their commands from the CPU and drive stepping motors 20 and 22 through the required number of steps determined by the CPU, accordingly. CPU 142 ensures that stepping motors 20 and 22 are energized as required.

To achieve maximum precision in measurement of the acceleration of gravity, gravity measurement device 10 includes an internal temperature control circuit, including a plurality of temperature sensors 174, which are disposed at spaced apart positions within tubular enclosure 12. The output from temperature sensors 174 is converted from an analog signal to a digital signal by an A to D converter (not separately shown), and transmitted to CPU 142 over leads 175. The temperature within the enclosure is controlled by temperature control 176 in response to the signals produced by temperature sensors 174 and transmitted over leads 173. CPU 142 applies appropriate temperature correction factors in modeling the acceleration data derived from accelerometer 68, correcting for errors in the control of temperature by temperature control 176.

In the preferred embodiment, temperature control 176 attempts to maintain the temperature within tubular enclosure 12 at approximately 98° ±2° C. by energizing heaters 180 as required. In addition, a more critical temperature control is provided for accelerometer 68, which is preferably maintained at 100° ±0.1° C.").

obvious to adapt the statically attached two-axis leveling system of *Thorpe* with the freely rotating accelerometer gravity measurement device of *Hulsing*.

Second, the rejections should be withdrawn because *Luk* also fails to cure the deficiencies of *Thorpe*. Despite teaching evaluating a vehicle's ride using a 3-axis accelerometer, the system of *Luk* must be operated while the vehicle is in motion and not at rest as specified in the claims of the present Application.[3]

Accordingly, *Thorpe*, *Luk*, *Howarter*, and *Hulsing* do not teach or suggest, either alone or in combination, the subject matter recited in independent claims 1, 10, and 29. The dependent claims are allowable based on their direct or indirect dependency from an allowable independent claim.[4]

Therefore, because the teachings of *Luk*, *Howarter*, and *Hulsing* do not cure the deficiencies of *Thorpe*, Applicant's claims 1, 10, and 29, and claims 2-5, 7, 12-16, 18, 20, 22-28, 38, and 43 depending thereon, are patentable over the teachings of *Thorpe*, *Luk*, *Howarter*, and *Hulsing*, alone or in combination. For at least these reasons, Applicant respectfully requests that the Office withdraw the rejections of claims1-5, 7, 10, 12, 14-16, 18, 20, 22-29, 38, and 43 and allow these claims.

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[3] *See Luk*, ¶¶ [0005]–[0012] ("In accordance with this invention, a method of determining an evaluation of ride quality of a wheeled vehicle includes the steps of: (A) providing a portable device (e.g. instrument such as, for example, a smart phone) containing: (1) a built-in tri-axial accelerometer capable of sensing and measuring the device's individual accelerations in each of tri-axial fore-aft, lateral and vertical directions, and, (2) conversion analytical software capable of calculating and displaying the Root-Mean-Square (RMS) value of accelerations acquired in each of said three tri-axial directions and a summation of said tri-axial accelerations (e.g. by means of vector sum analysis); (B) ***operating said wheeled vehicle over the ground at a constant rate of vehicular speed*** to thereby create a moving wheeled vehicle, wherein the wheels of said wheeled vehicle are comprised of rigid wheels with circumferential ground-contacting rubber tires; wherein said device is securely attached to said wheeled vehicle in a manner that sensed tri-axial directional accelerations by said device are tri-axial directional accelerations of the moving vehicle, (C) activating said device secured to said wheeled vehicle to: (1) sense (e.g. by the built-in accelerometer) and measure the moving wheeled vehicle's individual accelerations in each of said tri-axial fore-aft, lateral and vertical directions, and, (2) calculate and display the Root-Mean-Square (RMS) values (*e.g.* by the analytical software) of accelerations acquired in each of said three tri-axial directions, and (3) calculate and display a summation (e.g. vector summation by the analytical software) of said tri-axial accelerations.") (emphasis added).

[4] MPEP § 2143.03.

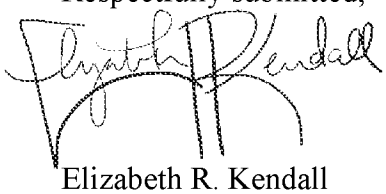
AUTHORIZATION FOR E-MAIL COMMUNICATION - MPEP § 502.03

Recognizing that Internet communications are not secure, we hereby authorize the USPTO to communicate with any authorized representative concerning any subject matter of this Application by electronic mail. We understand that a copy of these communications will be made of record in the Application file.

CONCLUSION

Applicant would like to thank the Examiner for the attention and consideration accorded the present Application. It is submitted that the Application is in good and proper form for allowance. A favorable action on the part of the Examiner is respectfully solicited. The Examiner is encouraged to call the undersigned at (704) 790-3600 for any questions or if it appears that an interview would be helpful in advancing the case. Should the Examiner determine that any further action is necessary to place the Application in condition for allowance, the Examiner is encouraged to contact the undersigned at the telephone number, facsimile number, address, or email address provided below. It is not believed that any fees for additional claims, extensions of time, or the like are required beyond those that may otherwise be indicated in the documents accompanying this paper. However, if such additional fees are required, the Examiner is encouraged to notify the undersigned at the Examiner's earliest convenience.

Respectfully submitted,



Elizabeth R. Kendall
Registration No. 74,280
Attorney for Applicant

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Electronic Patent Application Fee Transmittal

Application Number:	14961787
Filing Date:	07-Dec-2015
Title of Invention:	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES
First Named Inventor/Applicant Name:	Charles A. Leonard
Filer:	Elizabeth R. Kendall/Teresa Bush-Dugar
Attorney Docket Number:	7137

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
RCE- 2ND AND SUBSEQUENT REQUEST	2820	1	950	950
		Total in USD ($)		**950**

Electronic Acknowledgement Receipt

EFS ID:	35187652
Application Number:	14961787
International Application Number:	
Confirmation Number:	8904
Title of Invention:	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES
First Named Inventor/Applicant Name:	Charles A. Leonard
Customer Number:	22474
Filer:	Elizabeth R. Kendall/Teresa Bush-Dugar
Filer Authorized By:	Elizabeth R. Kendall
Attorney Docket Number:	7137
Receipt Date:	19-FEB-2019
Filing Date:	07-DEC-2015
Time Stamp:	14:28:22
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$950
RAM confirmation Number	022019INTEFSW14293300
Deposit Account	
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The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

ETN1002
487/655

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Fee Worksheet (SB06)	fee-info.pdf	30947 604e4b35d18bf75fa9404e6cb37429b54553c230	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	30947		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/961,787	12/07/2015	Charles A. Leonard	7137	8904

22474 7590 02/21/2019

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4500 Cameron Valley Parkway
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Charlotte, NC 28211

EXAMINER	
MARTINEZ BORRERO, LUIS A	

ART UNIT	PAPER NUMBER
3668	

NOTIFICATION DATE	DELIVERY MODE
02/21/2019	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patlaw@worldpatents.com

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 14/961,787	**Applicant(s)** Leonard, Charles A.	
	Examiner LUIS A MARTINEZ BORRERO	**Art Unit** 3668	**AIA Status** Yes

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 16 January 2019 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

NO NOTICE OF APPEAL FILED

1. ☑ The reply was filed after a final rejection. No Notice of Appeal has been filed. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114 if this is a utility or plant application. Note that RCEs are not permitted in design applications. The reply must be filed within one of the following time periods:
   a) ☐ The period for reply expires ____ months from the mailing date of the final rejection.
   b) ☑ The period for reply expires on: (1) the mailing date of this Advisory Action; or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.
   c) ☐ A prior Advisory Action was mailed more than 3 months after the mailing date of the final rejection in response to a first after-final reply filed within 2 months of the mailing date of the final rejection.The current period for reply expires ____ months from the mailing date of *the prior Advisory Action* or SIX MONTHS from the mailing date of the final rejection, whichever is earlier.
   Examiner Note: If box 1 is checked, check either box (a), (b) or (c). ONLY CHECK BOX (b) WHEN THIS ADVISORY ACTION IS THE FIRST RESPONSE TO APPLICANTS FIRST AFTER-FINAL REPLY WHICH WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. ONLY CHECK BOX (c) IN THE LIMITED SITUATION SET FORTH UNDER BOX (c). See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) or (c) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37CFR 41.37(a).

AMENDMENTS

3. ☑ The proposed amendments filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
   b) ☐ They raise the issue of new matter (see NOTE below);
   c) ☑ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.
   NOTE: _____ (See 37CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicants reply has overcome the following rejection(s): _____
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☑ For purposes of appeal, the proposed amendment(s):(a) ☑ will not be entered, or (b) ☐ will be entered, and an explanation of how the new or amended claims would be rejected is provided below or appended.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____
9. ☐ The affidavit or other evidence filed after final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
10. ☐ The affidavit or other evidence filed after the date of filing the Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
11. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

12. ☑ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: See Continuation Sheet.
13. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____
14. ☑ Other: PTO-2323, PTO-413.

STATUS OF CLAIMS

15. The status of the claim(s) is (or will be) as follows:
    Claim(s) allowed:_____.
    Claim(s) objected to:_____.
    Claim(s) rejected:1-5,7,10,12,14-16,18,20,22-29,38 and 43-44.
    Claim(s) withdrawn from consideration:_____.

/COURTNEY D HEINLE/ Primary Examiner, Art Unit 3668	/L.A.M/ Examiner, Art Unit 3668

Continuation of REQUEST FOR RECONSIDERATION/OTHER 12. The request for reconsideration has been considered but does NOT place the application in condition for allowance because: The proposed amendment is already taught by Hulsing in the final rejection of the claims. Specifically Hulsing teaches in at least Column 9, lines 35-45, "The output from temperature sensors 174 is converted from an analog signal to a digital signal by an A to D converter (not separately shown), and transmitted to CPU 142 over leads 175. The temperature within the enclosure is controlled by temperature control 176 in response to the signals produced by temperature sensors 174 and transmitted over leads 173. CPU 142 applies appropriate temperature correction factors in modeling the acceleration data derived from accelerometer 68, correcting for errors in the control of temperature by temperature control 176" Therefore, the rejection is maintained.

Examiner-Initiated Interview Summary	Application No. 14/961,787	Applicant(s) Leonard, Charles A.		
	Examiner LUIS A MARTINEZ BORRERO	Art Unit 3668	AIA (First Inventor to File) Status Yes	Page 1 of 2

All participants (applicant, applicants representative, PTO personnel):

1. LUIS A MARTINEZ BORRERO (Examiner); 2. ELIZABETH KENDALL (Attorney)
Telephonic

Date of Interview: 31 January 2019

Claims Discussed: The examiner discussed amendments of claim 1.

Prior Art Discussed: The examiner discussed the Hulsing reference against the new amendments.

Amendment proposed: Amendments were included in the AFCP 2.0.

Brief Description of the main topic(s) of discussion: The examiner discussed the amendments of the AFCP 2.0. The examiner considered that the amendments do no overcome the current rejection of the claims. The applicant considered that Hulsing does not entirely disclosed the amendments because the prior art do not seem to collect the temperature measurements the same way as the invention since it uses heaters to maintain the temperature. Also, the applicant added that her inventions does not require to correct such high temperatures as in Hulsing which can be at about 100 degrees Celsius. The applicant agreed to further limit the amendment to differentiate the temperature sensor mechanism of correction.

Issues Discussed:

Item(s) under 35 U.S.C. 103:

Attachment(s): Other Attachment
{SEE ALSO PTO-2323, PTO-303}

/COURTNEY D HEINLE/ Primary Examiner, Art Unit 3668	/L.A.M/ Examiner, Art Unit 3668

Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04
Please further see:
MPEP 713.04
Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b)
37 CFR § 1.2 Business to be transacted in writing

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

AFCP 2.0 Decision

Application No.	Applicant(s)	
14/961,787	Leonard, Charles A.	
Examiner	**Art Unit**	**AIA Status**
LUIS A MARTINEZ BORRERO	3668	Yes

This is in response to the After Final Consideration Pilot request filed 16 January 2019.

1. **Improper Request** – The AFCP 2.0 request is improper for the following reason(s) and the after final amendment submitted with the request will be treated under pre-pilot procedure.

   ☐ An AFCP 2.0 request form PTO/SB/434 (or equivalent document) was not submitted.

   ☐ A non-broadening amendment to at least one independent claim was not submitted.

   ☐ A proper AFCP 2.0 request was submitted in response to the most recent final rejection.

   ☐ Other: _____

2. **Proper Request**

   A. After final amendment submitted with the request will not be treated under AFCP 2.0.
   The after final amendment cannot be reviewed and a search conducted within the guidelines of the pilot program.

   ☐ The after final amendment will be treated under pre-pilot procedure.

   B. Updated search and/or completed additional consideration.
   The examiner performed an updated search and/or completed additional consideration of the after final amendment within the time authorized for the pilot program. The result(s) of the updated search and/or completed additional consideration are:

   ☐ 1. All of the rejections in the most recent final Office action are overcome and a Notice of Allowance is issued herewith.

   ☑ 2. The after final amendment would not overcome all of the rejections in the most recent final Office action . See attached interview summary for further details.

   ☐ 3. The after final amendment was reviewed, and it raises a new issue(s). See attached interview summary for further details.

   ☐ 4. The after final amendment raises new issues, but would overcome all of the rejections in the most recent final Office action. A decision on determining allowability could not be made within the guidelines of the pilot. See attached interview summary for further details, including any newly discovered prior art.

   ☐ 5. Other: _____

   Examiner Note: Please attach an interview summary when necessary as described above.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s)	Charles A. Leonard
Application No.	14/961,787
Filing Date	December 07, 2015
Title	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES
Examiner	MARTINEZ BORRERO, LUIS A
Art Unit	3668
Confirmation No.	8904

Commissioner for Patents
Via EFS-Web

AMENDMENT AND RESPONSE TO FINAL OFFICE ACTION

In response to the Final Office Action dated November 16, 2018, rejecting claims 1-5, 7, 10, 12, 14-16, 18, 20, 22-29, 38, and 43-44 of the above-referenced Application, in which claims 1-5, 7, 10, 12, 14-16, 18, 20, 22-29, 38, and 43-44 are pending, and pursuant to the After Final Consideration Pilot (AFCP) 2.0 request filed herewith, Applicant respectfully requests that the following amendments be entered and remarks be considered, without prejudice or disclaimer to continued examination on the merits. In view of these amendments and remarks, Applicant submits that the Application is now in condition for allowance and respectfully requests such action.

SECTION	PAGE(S)
Amendment – After Final Rejection	1
Claims	2 – 8
Remarks	9 – 13
Internet Communications Authorized	14

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/961,787	12/07/2015	Charles A. Leonard	7137	8904

22474 7590 05/16/2019

Clements Bernard Walker PLLC
4500 Cameron Valley Parkway
Suite 350
Charlotte, NC 28211

EXAMINER	
MARTINEZ BORRERO, LUIS A	

ART UNIT	PAPER NUMBER
3668	

NOTIFICATION DATE	DELIVERY MODE
05/16/2019	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patlaw@worldpatents.com

Office Action Summary	Application No. 14/961,787	Applicant(s) Leonard, Charles A.	
	Examiner LUIS A MARTINEZ BORRERO	Art Unit 3668	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 02/19/2019.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-5,7,10,12,14-16,18,20,22-29,38 and 43 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-5,7,10,12,14-16,18,20,22-29,38 and 43 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 02/16/2016 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAIL ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Notice on Prior Art Rejections

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103") is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 19 February 2019 has been entered.

Status of Claims

This Office Action is in response to the Applicant's RCE filed February 19, 2019. Claim 44 is canceled. Claims **1, 10, and 29** are amended. Claims **1-5, 7, 10, 12, 14-16, 18, 20, 22-29, 38, and 43,** are presently pending and are presented for examination.

Response to Arguments/Remarks

1. **Claim Rejections - 35 USC § 103.** Applicant's arguments filed on February 19, 2019 with regard to the previous 35 USC § 103 rejection have been fully considered. However, Applicant's arguments/amendments are not persuasive to overcome the previous 35 USC § 103 rejection.

The applicant argues that Howarter is combination fail to teach "a digital temperature sensor that collects and transmits temperature data of the ambient air where the vehicle is at rest to the processor, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table having temperature correction data for environmental air temperatures".

The examiner respectfully disagrees. The temperature sensor of Howarter has the capacity to generate temperature signals and transmit them to the CPU for correction factor in modeling the acceleration data from accelerometer ***(See at least Column 9, lines 35-45, via The output from temperature sensors 174 is converted from an analog signal to a digital signal by an A to D converter (not separately shown), and transmitted to CPU 142 over leads 175. The temperature within the enclosure is controlled by temperature control 176 in response to the signals produced by temperature sensors 174 and transmitted over leads 173. CPU 142 applies appropriate temperature correction factors in modeling the acceleration data derived from accelerometer 68, correcting for errors in the control of temperature by temperature control 176).*** The additional details about the temperature range of the temperature sensor added by the applicant to the limitation are not part of the specification and they are merely ranges of ambient temperature at which a known system as an accelerometer works. However, upon further

consideration and without agreeing to the applicant remarks, a new ground(s) of rejection is made in view of Tanenhaus et al, US 8,239,162, to clarify any misinterpretation of the prior art.

Further, the applicant argues that Luk fails to disclose "a digital accelerometer that uses an X-axis, Y-axis, and Z-axis" because the system of Luk must be operated while the vehicle is in motion and not at rest as specified in the claims of the present Application".

The examiner respectfully disagrees. While the prior art method is directed to evaluate a vehicle ride quality, tri-axial accelerometers are known in the art to be able to measure individual accelerations in each of tri-axial fore-aft, lateral and vertical directions regardless of motion state since at rest they can measure the force cause by gravity. They are also known to be components of cell phones to measure the above information ***(See at least Luk ¶ 29, "a built-in tri-axial accelerometer capable of sensing accelerations in three axial directions… Representative of such smart phone is, for example, an iPhone™ from Apple").*** Additionally, the new grounds of rejection that includes Tanenhaus teaches as well that triaxial accelerometers measure inclination pitch, roll, and yaw data for calculating at least one of a change in attitude, position, angular rate, acceleration, and velocity of the unit. Therefore, rejection in view of Luk is maintained.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112(a):

> (a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

The following is a quotation of the first paragraph of pre-AIA 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person

skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1, 10, and 29 rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 1, 10, and 29 recite "a digital temperature sensor that collects and transmits temperature data of the ambient air where the vehicle is at rest to the processor, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table having temperature correction data for environmental air temperatures ranging from about -60 °C to about 90 °C to determine how to correct deviations within the collected data". There is no description in the original specification of the above features. There is some description of a digital temperature sensor may also be included on the vehicle leveling device and used to collect temperature data necessary to correct variations or irregularities in the data obtained by the above mentioned angle measurement sensors (¶ [30, 37, 44]), however, the specification does not specifically refers to the features describe above. Therefore, the claim is rejected under 35 U.S.C. 112(a) for failing to comply with the written description requirement. Independent claims present or are part of the features described above thus they are rejected for the same reasons.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness

rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims **1-5, 7, 10, 12, 14-16, 18, 20, 22-26, and 29** are rejected under 35 U.S.C 103 as being unpatentable over Thorpe et al, US 2008/0142768, in view of Luk et al, US 2012/0197587, further in view of Tanenhaus et al, US 8,239,162, hereinafter referred to as Thorpe, Luk, and Tanenhaus respectively.

As per Claim 1. Thorpe discloses a leveling system for leveling a vehicle that is at rest, the leveling system comprising: one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction ***(See at least ¶ 12, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition… the level sensing means is a dual-axis accelerometer that is configured to determine the tilt of the recreational vehicle in both the front-to-back and side-to-side directions), (¶ 0038, via Level sensing means 38 comprises one or more tilt sensors that are configured to detect the amount of pitch and roll of recreational vehicle), (¶ 0038, via In one configuration, level sensing means 38 comprises two separate tilt sensors, one positioned in the front/back direction for determining the pitch and one positioned in the left/right direction for determining the roll)***, each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or

more sensor devices relative to the vehicle to which the one or more sensor devices are secured and a processor to process data collected by the respective sensor device ***(See at least ¶ 34, via In other embodiments, the vehicle sensors 206, 208 may comprise one or more of an accelerometer, a gyroscope, a liquid capacitive device, an electrolytic level device, a gas bubble in liquid device, a pendulum device, and the like), (¶ 29, via a vehicle 104 may be leveled by a leveling system 102 based on a first signal 202 representing a lateral force (i.e., tilt, roll) acting on the vehicle 104 and a second signal 204 representing a longitudinal force (i.e., pitch) acting on the vehicle 104. The first 202 and second 204 signals may be sent by one or more vehicle sensors (206, 208) associated with the vehicle 104, and received by a processing or control portion 210 of the leveling system), (¶ 36, via level unit 12 is placed on a flat surface inside recreational vehicle 16), (¶ 38, via level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 low-power two-axis linear accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle 16 relative to a calibrated reference position (i.e., the level condition 20). The level sensing means 38 includes an integrated circuit interface that takes the information from the sensing element of sensing means 28 to deliver an analog signal for conversion and then use by control unit 14);*** a smart device in communication with the one or more sensor devices to allow information received from the one or more sensor devices about at least one of the inclination or the orientation of the vehicle in both the pitch direction and the roll direction to be processed to provide measurements to a user and to determine an amount of adjustments in height to at least one of a rear or front section or first or second side sections of the vehicle needed to level the vehicle ***(See at least ¶ 8, via The foregoing patents are representative of leveling systems that require manual,***

independent determination of the amount of height adjustment needed to place the vehicle in the level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator), so that the vehicle is adjusted to obtain a level position based on a calculated change from the determination of the amount of adjustments in height, ***(See at least fig 2. ¶ 0040, via control unit 14 has a front cover 68 and back cover 70 that define control housing 72 enclosing a control chamber 74 in which is disposed the components that allow the user to control leveling system 10 and communicate with the spaced apart level unit), (¶ 0040, via, Preferably, any such attachment mechanism is removable from the location where it is stored to allow the operator to utilize control unit 14 as a hand-held device so that he or she may stand outside recreational vehicle 16 during use of leveling system 10 to level recreational vehicle), (¶ 0040, via, control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition),*** the smart device configured to determine an initial level position for a vehicle ***(See at least ¶ 43, via To set leveling system 10 for future use, it is preferred to place the recreational vehicle 16 in its level condition 20 based on the operator's preference…This activity will set the reference position, from which the amount of out-of-level will be determined, to zero. This calibration step should be done even if the initial placement of level unit 12 indicates recreational vehicle 16 is level to ensure the surface on which level unit 12 is placed is not***

compensating for an incorrect level of recreational vehicle) to determine any inconsistencies inherent in the leveling system ***(See at least ¶ 11, via The leveling system of the present invention includes a calibration procedure to allow the operator to selectively calibrate the zero or level condition), (the examiner interprets inconsistencies as an example of miscalculations during calibration. For example, reference level position not equal to zero.)*** by capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies when determining the amount of adjustment in height ***(¶ 12, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition)***.

Thorpe fails to explicitly disclose a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis.

However, Luk teaches a digital accelerometer that uses an X-axis, Y-axis, and Z-axis ***(See at least ¶ 11, via wherein said device is securely attached to said wheeled vehicle in a manner that sensed tri-axial directional accelerations by said device are tri-axial directional accelerations of the moving vehicle), (See at least ¶ 13, via sense (e.g. by the built-in accelerometer) and measure the moving wheeled vehicle's individual accelerations in each of said tri-axial fore-aft, lateral and vertical directions).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor

devices relative to the vehicle to which the one or more sensor devices are secured and a processor to process data collected by the respective sensor device of Thorpe and include a digital accelerometer that uses an X-axis, Y-axis, and Z-axis as taught by Luk because it would allow the system to measure the pitch and roll tilt in multiple axis so that leveling system can determine the adjustment necessary to neutralize that tilting.

Thorpe fails to explicitly disclose a digital temperature sensor that collects and transmits temperature data of the ambient air where the vehicle is at rest to the processor, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table having temperature correction data for environmental air temperatures ranging from about -60 °C to about 90 °C to determine how to correct deviations within the collected data.

However, Tanenhaus teaches a digital temperature sensor that collects and transmits temperature data of the ambient air where the vehicle is at rest to the processor ***(See at least Column 11, lines 4-8, "Temperature sensors 121 in a particular embodiment are part of each of the gyros 104 and accelerometer 107. The temperature sensors 121 sense temperature and compensate for changes outside the normal gyro and accelerometer ranges")***, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table ***(See at least Column 15, lines 36-39, "the measurement system to provide a correction signal for correction of gyro bias errors, the accelerometer errors, and the temperature derived from an internal temperature sensor to measure and correct for temperature extremes")*** having temperature correction data for environmental air temperatures ranging from about -60 °C to about 90 °C to determine how to correct deviations within the collected data ***(See at least Column 22, lines 19-28, "Accuracy is improved by using DC offset removal at two temperature points, recalibrating the gyros to reduce drift. These equations can be extended to both -60° C.***

and + 105° C., if needed…"The IMU measures each gyro temperature sensor continuously and corrects each device once per second to achieve maximum overall accuracy).

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured and a processor to process data collected by the respective sensor device of Thorpe and include a digital temperature sensor that collects and transmits temperature data of the ambient air where the vehicle is at rest to the processor, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table having temperature correction data for environmental air temperatures ranging from about -60 °C to about 90 °C to determine how to correct deviations within the collected data as taught by Tanenhaus because it would allow the temperature sensors sense temperature and compensate for changes outside the normal gyro and accelerometer ranges ***(See Tanenhaus at least Column 11, lines 6-8).***

As per Claim 2. Thorpe discloses the system according to claim 1, wherein the circuit board further comprises a digital gyroscope ***(¶ 0012, via Although separate tilt sensors can be utilized, in the preferred embodiment the level sensing means is a dual-axis accelerometer that is configured to determine the tilt of the recreational vehicle in both the front-to-back and side-to-side directions), (¶ 0038, via In a preferred embodiment of the present invention, however, level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 lowpower two-axis linear accelerometer available from ST Microelectronics, that is configured***

to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle).

As per Claim 3. Thorpe discloses the system according to claim 1, wherein the processor performs calculations related to the determination the amount of adjustments needed to at least one of the pitch direction or the roll direction to level the vehicle ***(¶ 0037, via These components include a circuit board 34, shown in FIGS. 9through12, having a controller 36 which is operatively connected to a level sensing means 38, power supply 40 and transmitter/ receiver or transceiver 42, including antenna 44. In a preferred embodiment, shown in the figures, the controller 36 includes transceiver 42), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).***

As per Claim 4. Thorpe discloses the system according to claim 3, wherein the sensor device comprises a memory in communication with the processor of the PCB, the sensor device capable of storing information transmitted from the smart device ***(¶ 0039, via As shown on FIG. 9, the circuit boards 34 of level 12 and control 14 units also include a flash memory chip 60 to store***

data useful for the operation of leveling system), (¶ 0039, via The circuit board 34 shown in the figures also includes a memory chip connector 62 for programming the flash memory chip 60 with the manufacturer's computer control code and a diagnostic chip).

As per Claim 5. Thorpe discloses the system according to claim 4, wherein the sensor device uses data sensed by the sensor device and stored data obtained from the smart device to perform calculations on the sensor device and transmit the calculated data to the smart device ***(¶ 0038, via As shown in FIG. 11, the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information), (¶ 0011, via In the preferred embodiment of the present invention, the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle).***

As per Claim 7. Thorpe discloses the system according to claim 1, wherein the smart device communicates with the printed circuit board of the sensor device ***(¶ 0012, via In the preferred embodiment, the controller and the transceiver is a single integrated unit that wireless transmits the data from the level sensing means to the control unit The level unit has having a level housing that encloses a controller, a level sensing means, a power supply and a***

transceiver mounted on a circuit board.), (¶ 0038, via As shown in FIG. 11, the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator-useable information).

As per Claim 10. Thorpe discloses a method for leveling a recreational vehicle, the method comprising: providing a leveling system comprising one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction and a smart device in communication with the one or more sensor devices ***(¶ 0038, via Level sensing means 38 comprises one or more tilt sensors that are configured to detect the amount of pitch and roll of recreational vehicle), (¶ 0038, via In one configuration, level sensing means 38 comprises two separate tilt sensors, one positioned in the front/back direction for determining the pitch and one positioned in the left/right direction for determining the roll)***, each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured ***(See at least ¶ 34, via In other embodiments, the vehicle sensors 206, 208 may comprise one or more of an accelerometer, a gyroscope, a liquid capacitive device, an electrolytic level device, a gas bubble in liquid device, a pendulum device, and the like), (¶ 29, via a vehicle 104 may be leveled by a leveling system 102 based on a first signal 202 representing a lateral force (i.e., tilt, roll) acting on the vehicle***

104 and a second signal 204 representing a longitudinal force (i.e., pitch) acting on the vehicle 104. The first 202 and second 204 signals may be sent by one or more vehicle sensors (206, 208) associated with the vehicle 104, and received by a processing or control portion 210 of the leveling system), (¶ 36, via level unit 12 is placed on a flat surface inside recreational vehicle 16), (¶ 38, via level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 low-power two-axis linear accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle 16 relative to a calibrated reference position (i.e., the level condition 20). The level sensing means 38 includes an integrated circuit interface that takes the information from the sensing element of sensing means 28 to deliver an analog signal for conversion and then use by control unit 14); determining an initial level position for the vehicle using the smart device to determine any inconsistencies inherent in the leveling system ***(See at least ¶ 11, via The leveling system of the present invention includes a calibration procedure to allow the operator to selectively calibrate the zero or level condition), (the examiner interprets inconsistencies as an example of misreadings or miscalculations during calibration)*** and capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device to provide a calibration data of the pitch and roll angle measurements ***(¶ 12, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition)*** to permit consideration of any inconsistencies determined when taking measurement readings at a future time ***(¶ 19, via provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must***

be raised to place it in the preset level condition); measuring the pitch angle and the roll angle of the vehicle when the vehicle is at rest using the sensor device ***(¶ 0036, via allow the components disposed in interior chamber 28 of level unit 12 to measure the pitch and roll tilt so that leveling system 10 can determine the adjustment necessary to neutralize that tilting), (¶ 0012, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition), (¶ 0044, via To level a recreational vehicle 16 having leveling system 10 after parking recreational vehicle 16 where desired)***; retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position ***(¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator);*** calculating any needed change in height to at least one of a rear or front section or

first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle using the calibration data of pitch and roll angle measurements ***(¶ 8, via The foregoing patents are representative of leveling systems that require manual, independent determination of the amount of height adjustment needed to place the vehicle in the level condition), (¶ 0011, via the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition 20);*** displaying the calculated change in height to at least one of a rear or front section or first or second side sections of the vehicle in at least one of the pitch direction or the roll direction of the vehicle on the smart device ***(¶ 0040, via on FIG. 9, is used to switch control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition), (¶ 0038, via controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator);*** adjusting the height to the at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle based on the calculated change ***(¶ 8, via The foregoing patents are representative of leveling systems that require manual, independent determination of the amount of height adjustment needed to place the vehicle in the level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers***

48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator), (See at least fig 2. ¶ 0040, via control unit 14 has a front cover 68 and back cover 70 that define control housing 72 enclosing a control chamber 74 in which is disposed the components that allow the user to control leveling system 10 and communicate with the spaced apart level unit).

Thorpe fails to explicitly disclose a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis.

However, Luk teaches a digital accelerometer that uses an X-axis, Y-axis, and Z-axis ***(See at least ¶ 11, via wherein said device is securely attached to said wheeled vehicle in a manner that sensed tri-axial directional accelerations by said device are tri-axial directional accelerations of the moving vehicle), (See at least ¶ 13, via sense (e.g. by the built-in accelerometer) and measure the moving wheeled vehicle's individual accelerations in each of said tri-axial fore-aft, lateral and vertical directions).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify providing a leveling system comprising one or more sensor devices secured to a vehicle to sense at least one of an inclination or an orientation of the vehicle in both a pitch direction and a roll direction and a smart device in communication with the one or more sensor devices of Thorpe and include a digital accelerometer that uses an X-axis, Y-axis, and Z-axis as taught by Luk because it would allow

the system to measure the pitch and roll tilt in multiple axis so that leveling system can determine the adjustment necessary to neutralize that tilting.

Thorpe fails to explicitly disclose a digital temperature sensor that collects and transmits temperature data of the ambient air where the vehicle is at rest to the processor, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table having temperature correction data for environmental air temperatures ranging from about -60 °C to about 90 °C to determine how to correct deviations within the collected data.

However, Tanenhaus teaches a digital temperature sensor that collects and transmits temperature data of the ambient air where the vehicle is at rest to the processor ***(See at least Column 11, lines 4-8, "Temperature sensors 121 in a particular embodiment are part of each of the gyros 104 and accelerometer 107. The temperature sensors 121 sense temperature and compensate for changes outside the normal gyro and accelerometer ranges")***, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table ***(See at least Column 15, lines 36-39, "the measurement system to provide a correction signal for correction of gyro bias errors, the accelerometer errors, and the temperature derived from an internal temperature sensor to measure and correct for temperature extremes")*** having temperature correction data for environmental air temperatures ranging from about -60 °C to about 90 °C to determine how to correct deviations within the collected data ***(See at least Column 22, lines 19-28, "Accuracy is improved by using DC offset removal at two temperature points, recalibrating the gyros to reduce drift. These equations can be extended to both -60° C. and + 105° C., if needed…"The IMU measures each gyro temperature sensor continuously and corrects each device once per second to achieve maximum overall accuracy).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured and a processor to process data collected by the respective sensor device of Thorpe and include a digital temperature sensor that collects and transmits temperature data of the ambient air where the vehicle is at rest to the processor, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table having temperature correction data for environmental air temperatures ranging from about -60 °C to about 90 °C to determine how to correct deviations within the collected data as taught by Tanenhaus because it would allow the temperature sensors sense temperature and compensate for changes outside the normal gyro and accelerometer ranges ***(See Tanenhaus at least Column 11, lines 6-8).***

As per Claim 12. Thorpe discloses the method according to claim 11, wherein the step of determining an initial level position comprises using at least one of an accelerometer, gyroscope, or global positioning system sensor on the smart device to achieve the initial level position ***(¶ 0012, via Although separate tilt sensors can be utilized, in the preferred embodiment the level sensing means is a dual-axis accelerometer that is configured to determine the tilt of the recreational vehicle in both the front-to-back and side-to-side directions), (¶ 0038, via In a preferred embodiment of the present invention, however, level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 lowpower two-axis linear***

accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle).

As per Claim 14. Thorpe discloses the method according to claim 10, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises communicating calibration data from the sensor device of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position to the smart device and saving the calibration data on the smart device ***(¶ 0011, via the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition 20).***

As per Claim 15. Thorpe discloses the method according to claim 10, wherein the step of capturing the pitch and roll angle measurements from the sensor device comprises saving the calibration data of the pitch and roll angle measurements measured by the sensor device when the vehicle is at the initial level position on the sensor device ***(¶ 0038, via As shown in FIG. 11, the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the***

common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information), (¶ 0011, via In the preferred embodiment of the present invention, the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle).

As per Claim 16. Thorpe discloses the method according to claim 15, wherein the step of saving the calibration data of the pitch and roll angle measurements on the sensor device comprises transmitting instructions from the smart device to the sensor device to save and store the calibration data of the pitch and roll angle measurements on the sensor device and wherein the method further comprises recalling the calibration data of the pitch and roll angle measurements from the sensor device to the smart device ***(¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly***

transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).

As per Claim 18. Thorpe discloses the method according to claim 10, wherein the step of determining an initial level position comprises receiving measurements of a length and a width of the vehicle ***(¶ 0040, via As shown in FIG. 6, display panel 90 can display the amount of pitch or roll in degrees and the amount in inches or other measurement units, based on a known length or width of recreational vehicle 16, that one end or side of the recreational vehicle 16 must be raised to place recreational vehicle 16 in level condition), (¶ 0044, via If desired, leveling system 10 can be adapted to include the length information for specific lengths of recreational vehicles 16 and/or to allow the operator to input the length into its operating system, such as at flash memory 60, by entering the data at control unit).***

As per Claim 20. Thorpe discloses the method according to claim 10, wherein the step of displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle further comprises displaying the calculated change in the pitch direction and the roll direction of the vehicle in measurements of distance ***(¶ 0040, via on FIG. 9, is used to switch control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition), (¶ 0038, via controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).***

As per Claim 22. Thorpe discloses the method according to claim 10, further comprising saving a given pitch angle measurement on at least one of the smart device or the sensor device to permit later recall for the purpose of returning the vehicle to the given pitch angle position at a later time ***(¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).***

As per Claim 23. Thorpe discloses the method according to claim 10, further comprising receiving data at the smart device from one or more vehicle control panels ***(¶ 0036, via In an alternative configuration, not shown, user accessible buttons and/or a display panel can be used with level unit 12 to allow the operator to directly access the operation of level unit), (¶ 0044, via In the preferred embodiment, battery monitoring circuit 61 of level 12 and control 14 units is configured to transmit battery level information to display panel 90 when the amount***

of power in batteries 40 or 86 reach a certain low level. Alternatively, leveling system 10 can also be configured to such that the operator can access the battery level information by pushing the mode button 80 on control unit 14 when he or she desires to check the battery levels).

As per Claim 24. Thorpe discloses the method according to claim 23, wherein the received data from one or more vehicle control panels comprises at least one of data regarding holding tank levels or data regarding battery power levels ***(¶ 0036, via In an alternative configuration, not shown, user accessible buttons and/or a display panel can be used with level unit 12 to allow the operator to directly access the operation of level unit), (¶ 0044, via In the preferred embodiment, battery monitoring circuit 61 of level 12 and control 14 units is configured to transmit battery level information to display panel 90 when the amount of power in batteries 40 or 86 reach a certain low level. Alternatively, leveling system 10 can also be configured to such that the operator can access the battery level information by pushing the mode button 80 on control unit 14 when he or she desires to check the battery levels).***

As per Claim 25. Thorpe discloses the method according to claim 23, further comprising displaying the data on the smart device that is generated and displayed on the one or more vehicle control panels ***(¶ 0036, via In an alternative configuration, not shown, user accessible buttons and/or a display panel can be used with level unit 12 to allow the operator to directly access the operation of level unit), (¶ 0044, via In the preferred embodiment, battery monitoring circuit 61 of level 12 and control 14 units is configured to transmit battery level information to display panel 90 when the amount of power in batteries 40 or 86 reach a***

certain low level. Alternatively, leveling system 10 can also be configured to such that the operator can access the battery level information by pushing the mode button 80 on control unit 14 when he or she desires to check the battery levels).

As per Claim 26. Thorpe discloses the method according to claim 10, further comprising activating one or more systems on the vehicle with the smart device ***(¶ 0012, via The control unit also has a display panel for displaying the pitch and roll information received from the level unit and one or more operator accessible control buttons for activating and operating the leveling system.), (¶ 0044, via The operator first activates the control unit 14 by pushing the power button 78 to tum leveling system 10 to its on condition).***

As per Claim 29. Thorpe discloses a non-transitory computer readable medium comprising computer executable instructions embodied in a computer readable medium that when executed by a processor of a computer control the computer to perform steps comprising: receiving on a smart device a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device secured to the vehicle ***(¶ 0036, via allow the components disposed in interior chamber 28 of level unit 12 to measure the pitch and roll tilt so that leveling system 10 can determine the adjustment necessary to neutralize that tilting), (¶ 0012, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition), (¶ 0044, via To level a recreational vehicle 16 having leveling system 10 after parking recreational vehicle 16 where desired)***, the sensor device comprising a printed circuit board that comprises a digital accelerometer that permits calculation in both the

pitch or roll direction regardless of positioning of the respective device relative to the vehicle to which the one or more sensor devices are secured ***(See at least ¶ 34, via In other embodiments, the vehicle sensors 206, 208 may comprise one or more of an accelerometer, a gyroscope, a liquid capacitive device, an electrolytic level device, a gas bubble in liquid device, a pendulum device, and the like), (¶ 29, via a vehicle 104 may be leveled by a leveling system 102 based on a first signal 202 representing a lateral force (i.e., tilt, roll) acting on the vehicle 104 and a second signal 204 representing a longitudinal force (i.e., pitch) acting on the vehicle 104. The first 202 and second 204 signals may be sent by one or more vehicle sensors (206, 208) associated with the vehicle 104, and received by a processing or control portion 210 of the leveling system), (¶ 36, via level unit 12 is placed on a flat surface inside recreational vehicle 16), (¶ 38, via level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 low-power two-axis linear accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle 16 relative to a calibrated reference position (i.e., the level condition 20). The level sensing means 38 includes an integrated circuit interface that takes the information from the sensing element of sensing means 28 to deliver an analog signal for conversion and then use by control unit 14)*** capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device ***(See at least ¶ 11, via The leveling system of the present invention includes a calibration procedure to allow the operator to selectively calibrate the zero or level condition), (the examiner interprets inconsistencies as an example of misreadings or miscalculations during calibration)*** after determining an initial level position for the vehicle using the smart device to provide a calibration data of the pitch and roll angle measurements ***(¶ 12, via The level sensing means is***

configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition) to permit consideration of any inconsistencies determined when taking measurement readings at a future time ***(¶ 19, via provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition)***; retrieving calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position ***(¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator);*** calculating any needed change in height to at least one of a rear or front section or first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle

using the calibration data of pitch and roll angle measurements ***(¶ 8, via The foregoing patents are representative of leveling systems that require manual, independent determination of the amount of height adjustment needed to place the vehicle in the level condition), (¶ 0011, via the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition 20);*** displaying the calculated change in height to at least one of the rear or front section or one or one of the first or second side sections of the vehicle to obtain a level position of the vehicle in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device so that the height to at least one of the rear or front section or the first or second side sections of the vehicle is adjusted to obtain the level position of the vehicle based on the calculated change ***(¶ 0040, via on FIG. 9, is used to switch control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition), (¶ 0038, via controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).***

Thorpe fails to explicitly disclose a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis.

However, Luk teaches a digital accelerometer that uses an X-axis, Y-axis, and Z-axis ***(See at least ¶ 11, via wherein said device is securely attached to said wheeled vehicle in a manner that sensed tri-axial directional accelerations by said device are tri-axial directional accelerations of the moving vehicle), (See at least ¶ 13, via sense (e.g. by the built-in accelerometer) and measure the moving wheeled vehicle's individual accelerations in each of said tri-axial fore-aft, lateral and vertical directions).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify receiving on a smart device a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device secured to the vehicle of Thorpe and include a digital accelerometer that uses an X-axis, Y-axis, and Z-axis as taught by Luk because it would allow the system to measure the pitch and roll tilt in multiple axis so that leveling system can determine the adjustment necessary to neutralize that tilting.

Thorpe fails to explicitly disclose a digital temperature sensor that collects and transmits temperature data of the ambient air where the vehicle is at rest to the processor, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table having temperature correction data for environmental air temperatures ranging from about -60 °C to about 90 °C to determine how to correct deviations within the collected data.

However, Tanenhaus teaches a digital temperature sensor that collects and transmits temperature data of the ambient air where the vehicle is at rest to the processor ***(See at least Column 11, lines 4-8, "Temperature sensors 121 in a particular embodiment are part of each of the gyros 104 and accelerometer 107. The temperature sensors 121 sense temperature and compensate for changes outside the normal gyro and accelerometer ranges")***, wherein the

processor compares the transmitted temperature data with data stored in a temperature correction table ***(See at least Column 15, lines 36-39, "the measurement system to provide a correction signal for correction of gyro bias errors, the accelerometer errors, and the temperature derived from an internal temperature sensor to measure and correct for temperature extremes")*** having temperature correction data for environmental air temperatures ranging from about -60 °C to about 90 °C to determine how to correct deviations within the collected data ***(See at least Column 22, lines 19-28, "Accuracy is improved by using DC offset removal at two temperature points, recalibrating the gyros to reduce drift. These equations can be extended to both -60° C. and + 105° C., if needed…"The IMU measures each gyro temperature sensor continuously and corrects each device once per second to achieve maximum overall accuracy).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured and a processor to process data collected by the respective sensor device of Thorpe and include a digital temperature sensor that collects and transmits temperature data of the ambient air where the vehicle is at rest to the processor, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table having temperature correction data for environmental air temperatures ranging from about -60 °C to about 90 °C to determine how to correct deviations within the collected data as taught by Tanenhaus because it would allow the temperature sensors sense temperature and compensate for changes outside the normal gyro and accelerometer ranges ***(See Tanenhaus at least Column 11, lines 6-8).***

6. Claims **27, 28, 38, and 43** are rejected under 35 U.S.C 103 as being unpatentable over Thorpe in view of Luk and Tanenhaus as presented in independent claims 1, 10 and 29, further in view of Howarter et al. US 2012/0208520, hereinafter referred to as Howarter, respectively.

As per Claim 27. Thorpe discloses the method according to claim 26, wherein the one or more systems activated via the software application of the smart device ***(¶ 0012, via The control unit also has a display panel for displaying the pitch and roll information received from the level unit and one or more operator accessible control buttons for activating and operating the leveling system.), (¶ 0044, via The operator first activates the control unit 14 by pushing the power button 78 to tum leveling system 10 to its on condition).***

Thorpe fails to explicitly disclose comprise at least one of lighting systems, entertainment systems, power slide outs or a generator.

However, Howarter teaches comprise at least one of lighting systems, entertainment systems, power slide outs or a generator ***(¶ 0019 via The vehicle 106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0031, via The user interface 208 may include the other controls or systems for managing systems of the vehicle which may include the stereo, entertainment system, temperature controls, driving controls, and other elements of the vehicle).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify wherein the one or more systems activated via the software application of the smart device of Thorpe and include comprise at least

one of lighting systems, entertainment systems, power slide outs or a generator as taught by Howarter because it would allow the method to provide support to the user to configure and control the different features and elements managed by the vehicle control systems via a cell phone.

As per Claim 28. Thorpe discloses the method according to claim 10.

Thorpe fails to explicitly disclose collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

However, Howarter teaches collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device ***(¶ 0019 via The vehicle 106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0020, via the vehicle system includes a GPS or other navigation systems. The GPS may be utilized to determine the location of the vehicle 106. The GPS may also receive data or information from the cell phone 104 in order to determine the location and direction of travel of the cell phone and an associated user).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle on the smart device of Thorpe and include collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device as taught by Howarter because it would allow the method to provide information to the user with respect to the location of the vehicle and the

location and direction of travel of the cell phone and an associated user to determine the exact or approximate distance between the cell phone and the vehicle.

As per Claim 38. Thorpe discloses the non-transitory computer readable medium according to claim 29.

Thorpe fails to explicitly disclose receiving data at the smart device from one or more vehicle control panels.

However, Howarter teaches receiving data at the smart device from one or more vehicle control panels ***(¶ 0019 via The vehicle 106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0031, via The user interface 208 may include the other controls or systems for managing systems of the vehicle which may include the stereo, entertainment system, temperature controls, driving controls, and other elements of the vehicle).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device of Thorpe and include receiving data at the smart device from one or more vehicle control panels as taught by Howarter because it would allow the method to provide support to the user to configure and control the different features and elements managed by the vehicle control systems via a cell phone.

As per Claim 43. Thorpe discloses the non-transitory computer readable medium according to claim 29.

Thorpe fails to explicitly disclose collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

However, Howarter teaches collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device ***(¶ 0019 via The vehicle 106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0020, via the vehicle system includes a GPS or other navigation systems. The GPS may be utilized to determine the location of the vehicle 106. The GPS may also receive data or information from the cell phone 104 in order to determine the location and direction of travel of the cell phone and an associated user).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle needed to obtain the level position of the vehicle on the smart device of Thorpe and include collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device as taught by Howarter because it would allow the method to provide information to the user with respect to the location of the vehicle and the location and direction of travel of the cell phone and an associated user to determine the exact or approximate distance between the cell phone and the vehicle.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUIS A MARTINEZ BORRERO whose email is luis.martinezborrero@uspto.gov and telephone number is (571)272-4577. The examiner can normally be reached on M-F 8:00-5:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, FADEY JABR can be reached on 5712721516. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L.A.M/

Examiner, Art Unit 3668

/COURTNEY D HEINLE/
Primary Examiner, Art Unit 3668

Notice of References Cited	Application/Control No. 14/961,787	Applicant(s)/Patent Under Reexamination Leonard, Charles A.	
	Examiner LUIS A MARTINEZ BORRERO	Art Unit 3668	Page 1 of 4

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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	W	
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Notice of References Cited	Application/Control No. 14/961,787	Applicant(s)/Patent Under Reexamination Leonard, Charles A.	
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	S					
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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

ETN1002
534/655

Notice of References Cited	Application/Control No. 14/961,787	Applicant(s)/Patent Under Reexamination Leonard, Charles A.	
	Examiner LUIS A MARTINEZ BORRERO	Art Unit 3668	Page 3 of 4

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20140142783-A1	05-2014	Grimm; Donald K.	G06F17/00	701/2
*	B	US-20120208520-A1	08-2012	Howarter; Jamie C.	B60R25/2009	455/420
*	C	US-8538408-B2	09-2013	Howarter; Jamie C.	B60R25/2009	455/420
*	D	US-20150021866-A1	01-2015	Solbrack; Dennis R.	B60G15/067	280/6.155
*	E	US-9409459-B2	08-2016	Solbrack; Dennis R.	B60G15/067	1/1
*	F	US-5864768-A	01-1999	Bieber; Martin	B60G17/0182	280/5.506
*	G	US-7463953-B1	12-2008	Lee; Jonathan	B60W40/12	701/1
*	H	US-20070200304-A1	08-2007	Brookes; Graham R.	B60G17/0155	280/5.514
*	I	US-20040178587-A1	09-2004	Hiebert, Grant W.	B60G17/0155	280/5.507
*	J	US-20020035423-A1	03-2002	Shank, David	B60G17/0185	701/37
*	K	US-20170136843-A1	05-2017	MARKING; John	F16F9/466	1/1
*	L	US-20120197587-A1	08-2012	Luk; Yiu Wah	B60W40/09	702/141
*	M	US-20030176959-A1	09-2003	Breed, David S.	B60N2/0232	701/36

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
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U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-5097419-A	03-1992	Lizell; Magnus B.	B60G17/016	188/266.5
*	B	US-20110202225-A1	08-2011	Willis; Richard Ernest	G01C21/165	701/31.4
*	C	US-20180045753-A1	02-2018	Sun; Chen	G01P15/125	1/1
*	D	US-20150354951-A1	12-2015	Ali; Abdelrahman	G01C21/16	702/141
*	E	US-20140338452-A1	11-2014	Sun; Chen	G01P15/125	73/514.32
*	F	US-9829504-B2	11-2017	Sun; Chen	G01P15/125	1/1
*	G	US-20120330497-A1	12-2012	De Tommasi; Claudio	G01C21/165	701/33.1
*	H	US-20120209502-A1	08-2012	Nichols; Boyd M.	B62D53/021	701/124
*	I	US-5231583-A	07-1993	Lizell; Magnus B.	B60G17/015	280/5.506
*	J	US-4935883-A	06-1990	Hulsing II; Rand H.	G01V7/00	175/45
*	K	US-8239162-B2	08-2012	Tanenhaus; Martin E.	G01C21/16	702/145
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
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NON-PATENT DOCUMENTS

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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/961,787	Leonard, Charles A.
	Examiner	**Art Unit**
	LUIS A MARTINEZ BORRERO	3668

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/06/2016	08/01/2017	03/15/2018	11/15/2018	04/29/2019				
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	2	✓	✓	✓	✓	✓				
	3	✓	✓	✓	✓	✓				
	4	✓	✓	✓	✓	✓				
	5	✓	✓	✓	✓	✓				
	6	-	-	-	-	-				
	7	✓	✓	✓	✓	✓				
	8	-	-	-	-	-				
	9	-	-	-	-	-				
	10	✓	✓	✓	✓	✓				
	11	✓	✓	✓	-	-				
	12	✓	✓	✓	✓	✓				
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	42	-	-	-	-	-				

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
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CLAIM		DATE								
Final	Original	12/06/2016	08/01/2017	03/15/2018	11/15/2018	04/29/2019				
	43	✓	✓	✓	✓	✓				
	44			✓	✓	-				

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/961,787	Leonard, Charles A.
	Examiner	Art Unit
	LUIS A MARTINEZ BORRERO	3668

CPC - Searched*		
Symbol	Date	Examiner
G05D1/0891, 1/0016, 1/0236, 1/0251, 1/0255, 1/027,	12/7/2016	/L.A.M./
B60W2540/28, 2550/141, 2550/402, 2710/30, 2550/406, 2720/30,	12/7/2016	/L.A.M./
G05D1/0274, 1/0278, 1/0287, 2201/0201, 1/0858,	8/1/2017	/L.A.M./
B60G2204/127, 2204/4232, 2204/83022, 2500/30, 2600/73,	8/1/2017	/L.A.M./
G05D1/0094, 1/0231, 1/0246,	03/15/2018	LAM
B60G17/08, 13/08, 2600/20, 2500/10, 2800/162,	03/15/2018	LAM
B60T8/172, 2201/04, 7/12,	11/15/2018	LAM
G05D1/0088, 1/0257, 201/0213, 1/00,	11/15/2018	LAM
G05D1/0016, 1/0891,	04/29/2019	LAM

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
701	22, 37, 112, 2, 23, 21, 123, 1, 101, 102, 50, 60,	12/7/2016	/L.A.M./
701	2, 49, 1, 19, 23, 25, 3, 41, 50,	8/1/2017	/L.A.M./

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

	/L.A.M/ Examiner, Art Unit 3668

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/961,787	Leonard, Charles A.
	Examiner	Art Unit
	LUIS A MARTINEZ BORRERO	3668

Search Notes		
Search Notes	**Date**	**Examiner**
East Search	12/7/2016	/L.A.M./
Google Patent Search	12/7/2016	/L.A.M./
East Search	8/1/2017	/L.A.M./
Consulted with primary Jelani smith (101, 112, patentability),	8/1/2017	/L.A.M./
Consulted with primary Jelani Smith	03/15/2018	LAM
East Search	03/15/2018	LAM
East Seach	11/15/2018	LAM
Consulted with primary Courtney Heinle	11/15/2018	LAM
East Search	04/29/2019	LAM
Consulted with primary Courtney Heinle	04/29/2019	LAM

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**

	/L.A.M/ Examiner, Art Unit 3668

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	0	((vehicle or car or automobile) near4 (lavel$3)) with ((sens$4 or detect$3) near5 (inclinat$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 10:57
S2	0	((vehicle or car or automobile) near4 (lavel$4)) and ((sens$4 or detect$3) near5 (inclinat$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 10:57
S3	1252	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 10:58
S4	25	S3 AND ((B60T8/172 OR B60T2201/04 OR B60T2210/14 OR B60T2210/16 OR B60T2220/04 OR B60T2260/06 OR B60T7/12 OR B60T8/175 OR B60T11/22 OR B60T11/26 OR B60T13/741 OR B60T2210/12 OR B60T2230/00 OR B60T2250/06 OR B60T7/085 OR B60T7/107 OR B60T7/122 OR B60T8/32 OR G05D1/0088 OR G05D1/0257 OR G05D1/0891 OR G05D1/0016 OR G05D1/0061 OR G05D1/0231 OR G05D1/0236 OR G05D1/024 OR G05D1/0251 OR G05D1/0255 OR G05D1/027 OR G05D1/048 OR G05D2201/0213 OR G05D2201/0216).CPC. AND (701/22 OR 701/37 OR 701/112 OR 701/2 OR 701/23 OR 701/21 OR 701/29.1 OR 701/49 OR 701/70 OR 701/93 OR 701/96 OR 701/99 OR 701/1 OR 701/101 OR 701/102 OR 701/123 OR 701/300 OR 701/30.8 OR 701/32.4 OR 701/33.1 OR 701/36 OR 701/41 OR 701/468 OR 701/48 OR 701/50 OR 701/519 OR 701/54 OR 701/60 OR 701/65 OR 701/71 OR 701/82 OR 701/91 OR 701/94).CCLS. AND (G05D1/00 OR G05D1/02 OR G05D1/04 OR G05D1/08 OR B60T7/12 OR B60T8/172 OR B60T11/22 OR B60T11/26 OR B60T8/32).IPCR.)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:00
S5	5	S4 and inclinat$3 and sensor and pitch and roll	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:02
S6	145	S3 and inclinat$3 and sensor and pitch	US-PGPUB;	OR	ON	2016/12/05

		and roll	USPAT; EPO; JPO; DERWENT; IBM_TDB			11:07
S7	66	("6554293").URPN.	USPAT	OR	ON	2016/12/05 11:09
S8	2	((vehicle or car or automobile) near4 (level$4)) with ((sens$4 or detect$3) near5 (inclinat$4)) with (accelerometer or gyroscope)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:25
S9	2	((vehicle or car or automobile) near4 (level$4)) with ((sens$4 or detect$3) near5 (inclinat$4)) with (accelerometer or gyroscope) with ((smart adj device) or device or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:32
S10	278	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:33
S11	134	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone) and wireless	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:35
S12	19	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone) and wireless and roll and pitch and adjust$3 and display$3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:36
S13	518	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclination or orientation)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone) and roll and pitch and adjust$3 and display$3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:42
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S17	1	("8757637").URPN.	USPAT	OR	ON	2016/12/05 12:14
S18	16	("20110024706" | "3332669" | "3454251" | "3825279" | "3857582" | "4061309" | "4216939" | "4940110" | "5176391" | "5727767" | "6142488" | "8690128" | "8757637" | "8840144").PN. OR ("9156441").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:14
S19	1	("8840144").URPN.	USPAT	OR	ON	2016/12/05 12:16
S20	44	("20050127341" | "20060017241" | "20060081755" | "20070114734" | "20070284499" | "20070289439" | "20080217898" | "20090102176" | "20090200782" | "20110163523" | "20110169231" | "20120299279" | "20130074377" | "2924463" | "2979304"	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:16

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S24	47	("1539974" | "20020053794" | "2747836" | "3310181" | "3345038" | "3475008" | "3565396" | "3767226" | "3826470" | "3854750" | "3870276" | "3989277" | "4103869" | "4146250" | "4148461" | "4515520" | "4955450" | "5042779" | "5205586" | "5348330" | "5488788" | "5501428" | "5547220" | "5901980" | "6089603" | "6102438" | "6224102").PN. OR ("6494487").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:19
S25	94	((vehicle or car or automobile) near4 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or device or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:20
S26	6132	((vehicle or car or automobile) near4 (level$4 or stabilizat$3)) same ((smart adj device) or phone or cell or cellphone or mobile)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:26
S27	2491	((vehicle or car or automobile) near4 (level$4 or stabilizat$3)) near10 ((smart adj device) or phone or cell or cellphone or mobile)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:26
S28	49	S27 and sensor and pitch and roll	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:27
S29	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:33
S30	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone or cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:33
S31	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or	US-PGPUB; USPAT;	OR	ON	2016/12/05 12:33

		detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone or cell or cellphone or pda)	EPO; JPO; DERWENT; IBM_TDB			
S32	11	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) same ((sens$4 or detect$3) near5 (inclination or orientation)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:36
S33	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:39
S34	43	((vehicle or car or automobile) near6 (level$4 or stabilizat$3 or inclinat$4)) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:41
S35	2	(vehicle or car or automobile) same (park$3 near8 (level$4 or stabilizat$3 or inclinat$4)) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:45
S36	15	(vehicle or car or automobile) same (adjust$5) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:48
S37	23284	(vehicle or car or automobile) same ((adjust$5) near5(level$3 or inclination or tilt$3))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:52
S38	4438	S37 and ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:52
S39	130	S38 and (sens$3 near5 (pitch and roll))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:53
S40	92815	S39 and accelerometer or gyroscope	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:54
S41	51	S39 and accelerometer and gyroscope	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:54
S42	271	(vehicle or car or automobile) same ((adjust$5) near5 (level$3 or inclination or tilt$3)) same parking	US-PGPUB; USPAT; EPO; JPO;	OR	ON	2016/12/05 12:57

			DERWENT; IBM_TDB			
S43	5	("2008/0142768").URPN.	USPAT	OR	ON	2016/12/05 13:05
S44	22	"6921100"	USPAT	OR	ON	2016/12/05 13:11
S45	5	"20070103289"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 13:15
S46	27	("4353565" | "5167289" | "5476277" | "5780782" | "5863057" | "6203045").PN. OR ("6921100").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:32
S47	36	("20020038193" | "4103752" | "4639872" | "4651838" | "4706768" | "4836308" | "4852674" | "4854407" | "4941365" | "5040826" | "5167289" | "5314201" | "5526702" | "5606516" | "5617072" | "5626356" | "5803502" | "5915713" | "6032090" | "6037550" | "6157889" | "6242701" | "6252497" | "6307164" | "6308131" | "6357777" | "6363331" | "6459367" | "6921100").PN. OR ("7072763").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:32
S48	33	("20060100979" | "20070180719" | "20070245579" | "20080142768" | "2155876" | "3181203" | "3258884" | "3260564" | "3417518" | "3866365" | "4232488" | "4568096" | "4572527" | "4743037" | "4746133" | "4784400" | "5078442" | "5136784" | "5159989" | "5176391" | "5188379" | "5676385" | "5806196" | "6176495" | "6526668" | "7025361").PN. OR ("7786883").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:34
S49	16	("20020027346" | "20020030592" | "20030191568" | "20030231118" | "20060064223" | "20080142768" | "5008647" | "6009356" | "6326613" | "6356812" | "6366840" | "6408232" | "6472979" | "6629032" | "6662642").PN. OR ("7584026").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:35
S50	17	("2454896" | "3219972" | "3820065" | "3835279" | "3922638" | "4101868" | "4145681").PN. OR ("4288777").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:37
S51	1	"20060113783"	US-PGPUB	OR	ON	2016/12/05 13:39
S52	3	"20150025789"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:03
S53	0	S52 and (trajectory near5 comparison)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:04
S54	2	S52 and (trajectory near10 comparison)	US-PGPUB;	OR	ON	2016/12/05

			USPAT; EPO; JPO; DERWENT; IBM_TDB			15:05
S55	3	"20120206597"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:08
S56	776	((smart adj device) or phone or cell or cellphone or pda or (personal adj computer) or (mobile adj device) or (mobile near3 phone)) near10 ((activat$3 or turnon or control$4) near5 ((vehicle or car or automobile) adj (systems or navigation or gps)))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 13:53
S57	30	S56 and (suspension near4 Control$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 13:54
S58	41	(((smart adj device) or phone or cell or cellphone or pda or (personal adj computer) or (mobile adj device) or (mobile near3 phone)) near10 ((activat$3 or turnon or control$4) near5 ((vehicle or car or automobile) adj (systems or navigation or gps)))) with application	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 13:58
S59	17	S58 and gps and (position or location)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 15:08
S60	3	"20120208520"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 15:10
S61	1	"20120208520"	US-PGPUB	OR	ON	2016/12/06 15:10
S62	1841	(vehicle or car or automobile) with (inclination or orientation) with accelerometer	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:13
S63	1054	S62 and ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:14
S64	80	S62 with ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:14
S65	22	S64 and ((adjust$3 or alter$3 or chang$3 or modif$4) near3 (level$3 or orientation or inclination))	US-PGPUB; USPAT; EPO; JPO; DERWENT;	OR	ON	2017/08/01 08:17

			IBM_TDB			
S66	0	lavel$3 with vehicle with sensor with tilt	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:21
S67	0	lavel$3 with vehicle with tilt	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:21
S68	1259	level$3 with vehicle with tilt	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:22
S69	15	S68 AND ((G05D1/0891 OR G05D1/027 OR G05D1/0274 OR G05D1/0278 OR G05D1/0287 OR G05D2201/02 OR G05D2201/0201 OR G05D2201/0202 OR G05D1/0016 OR G05D1/0816 OR G05D1/0858 OR B60G2204/62 OR B60G17/0163 OR B60G17/0165 OR B60G17/018 OR B60G17/01908 OR B60G17/0195 OR B60G2200/44 OR B60G2200/46 OR B60G2200/464 OR B60G2204/127 OR B60G2204/128 OR B60G2204/4232 OR B60G2204/83022 OR B60G2300/24 OR B60G2300/37 OR B60G2300/40 OR B60G2400/204 OR B60G2500/30 OR B60G2600/73 OR B60G2800/24 OR B60G2800/962 OR B60G3/01 OR B60G3/02).CPC. AND (701/49 OR 701/2 OR 701/1 OR 701/19 OR 701/23 OR 701/25 OR 701/3 OR 701/32.4 OR 701/33.1 OR 701/36 OR 701/41 OR 701/45 OR 701/50 OR 701/519 OR 180/65.1 OR 180/65.8 OR 180/9.32 OR 280/228 OR 280/30 OR 280/657 OR 280/86.751).CCLS. AND (G05D1/08 OR G05D1/02 OR G05D1/00 OR B60G17/0165 OR B60G17/019 OR B60G21/055 OR B60G3/01).IPCR.)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:25
S70	36	("4564214" | "4575116" | "4613154" | "4616163" | "4621832" | "4624477" | "4634143" | "4652010" | "4673194" | "4682675" | "4697237" | "4765649" | "4789935" | "4797823" | "4803627" | "4807128" | "4853860" | "4922427" | "4975849" | "5056812" | "5071157" | "5080392" | "5102162" | "5144558" | "5177681" | "5360089" | "5437354" | "5440488" | "5442554" | "5490068" | "5529153" | "5555173" | "5559701").PN. OR ("5979616").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2017/08/01 08:27
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S72	14	("2001/0005803").URPN.	USPAT	OR	ON	2017/08/01 08:32
S73	11	(pitch near3 roll) with level$3 with balance	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:36
S74	27	("20020050699" | "20050098975" | "20050116437" | "20050206149" | "20090057048" | "20120166043" | "20130147140" | "20130147141" | "20130147142" | "20150001829" | "20150291233" | "4266627" | "4397473" | "4600069" | "4760686" | "4850786" | "5018453" | "5288101" | "5700025" | "5865444" | "5896731" | "6367831" | "7416201" | "7866671" | "7914020" | "8408559" | "9168940").PN. OR ("9409459").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2017/08/01 08:39
S75	20	("5062658" | "5071157" | "5119297" | "5322318" | "5322320" | "5377107" | "5438514" | "5442554" | "5475593" | "5488562" | "5510986" | "5563789").PN. OR ("5864768").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2017/08/01 08:58
S76	315	(("LEONARD") near3 ("Charles")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/08/01 08:58
S77	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone or cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 09:04
S78	2336	(pitch near3 roll) with level$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:05
S79	351	S78 and (axis near3 accelerometer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2017/08/01 12:05

			DERWENT; IBM_TDB			
S80	204	S79 and ((adjust$3 or alter$3 or chang$3 or modif$4) near3 (level$3 or orientation or inclination))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:06
S81	98	S80 and (z near3 axis)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:06
S82	7	S81 and ((adjust$3 or alter$3 or chang$3 or modif$4) near3 (height))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:08
S83	20	((pitch near3 roll) near6 (axis near3 accelerometer)) with (vehicle car or automobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:11
S84	110	(vehicle car or automobile) with (level$3) with ((all or multi or three) near3 axis)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:21
S85	2	S84 and ((adjust$3 or alter$3 or chang$3 or modif$4) near3 (height))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:21
S86	0	S84 and ((adjust$3 or alter$3 or chang$3 or modif$4) near5 ((vehicle car or automobile) adj (height)))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:23
S87	26	(vehicle car or automobile) and (level$3) and ((all or multi or three) near3 axis) and ((adjust$3 or alter$3 or chang$3 or modif$4) near5 ((vehicle car or automobile) adj (height)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:24
S88	15	(vehicle or car or automobile) same (adjust$5) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 15:06
S89	78	((pitch near3 roll) near6 (axis near3 accelerometer)) with (LEVEL$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/14 16:37

S90	77	S89 AND MEMS	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/14 16:37
S91	2	S90 AND (CIRCUIT near4 accelerometer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/14 16:38
S92	117	(tri-axial) with accelerometer with vehicle	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/15 12:16
S93	1	"20110202225"	US-PGPUB	OR	ON	2018/03/15 12:46
S94	51	(tri-axial) with accelerometer with level$3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/15 12:48
S95	73	S92 AND ((B60G17/08 OR B60G13/08 OR B60G2202/24 OR B60G2500/11 OR B60G2600/20 OR B60G13/06 OR B60G2500/10 OR B60G2800/162 OR G06F7/00 OR G06F21/44).CPC. OR (280/735 OR 280/736 OR 280/738 OR 280/731 OR 280/740 OR 280/728.2 OR 280/730.2 OR 280/734 OR 280/728.3 OR 280/741 OR 280/742 OR 280/400 OR 280/728.1 OR 280/743.1 OR 280/79.11 OR 701/45 OR 701/301 OR 701/2 OR 701/300 OR 701/124 OR 701/22 OR 701/31.4 OR 701/31.5 OR 701/33.1 OR 701/33.4 OR 701/70 OR 701/1 OR 701/11 OR 701/117 OR 701/119 OR 701/29.1 OR 701/3 OR 701/31.1 OR 701/36 OR 701/41 OR 701/46 OR 701/472 OR 701/65 OR 701/7 OR 180/282 OR 702/141 OR 702/150 OR 702/104 OR 702/173 OR 702/175 OR 702/179 OR 702/188 OR 702/33 OR 702/39 OR 702/85 OR 702/95).CCLS. OR (G06F17/10 OR G06F19/00 OR G06F7/00 OR G06F17/00 OR G06F11/00 OR G06F15/00 OR G06F17/18 OR G06F17/40 OR G06F21/44 OR G06F3/048 OR B60G17/08 OR B60G13/06 OR B60G13/08).IPCR.)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/15 13:16
S96	16190	accelerometer with (temperature adj sensor)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 16:03
S97	93	(tri-axial) with accelerometer with (temperature adj sensor)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 16:04

S98	0	avoid$ with error with accelerometer with (temperature adj sensor)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 16:07
S99	5	avoid$ with error with accelerometer with temperature	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 16:07
S100	51	((tri-axial) near3 accelerometer) near6 (temperature adj sensor)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 17:10
S101	46	S100 AND ((G05D1/0038 OR G05D1/0061 OR G05D1/0094 OR G05D1/0297 OR G05D1/0231 OR G05D1/0278 OR G05D1/0022 OR G05D1/0246 OR G05D1/0289).CPC. OR (1/1 OR 455/456.1 OR 455/404.1 OR 455/404.2 OR 455/414.2 OR 455/422.1 OR 455/457 OR 280/5.515 OR 360/5 OR 701/14 OR 701/21 OR 701/3 OR 701/37 OR 701/532 OR 702/127 OR 702/130 OR 702/138 OR 702/141 OR 702/150 OR 702/151 OR 702/176 OR 702/187 OR 702/189 OR 702/191 OR 702/92).CCLS. OR (G05D1/00 OR G05D1/02).IPCR.)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 17:11
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S103	326	(("LEONARD") near3 ("Charles")).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/03/15 17:13
S104	20	((pitch near3 roll) near6 (axis near3 accelerometer)) with (vehicle car or automobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/15 12:25
S105	128	(vehicle car or automobile) with (level$3) with ((all or multi or three) near3 axis)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/15 12:25
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S109	39	("0312266" | "20010025426" | "20020174553" | "20030066198" | "20030093909" | "2624118" | "2752692" | "2831264" | "3820249" | "3916531" | "4506408" | "4542592" | "4739561" | "4785544" | "4829676" | "5025568" | "5123768" | "5163229" | "5174034" | "5402579" | "5406713" | "5421094" | "5628521" | "5685083" | "5806196" | "5839200" | "5933919" | "6131298" |	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/15 12:27

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S110	27	(vehicle car or automobile) and (level$3) and ((all or multi or three) near3 axis) and ((adjust$3 or alter$3 or chang$3 or modif$4) near5 ((vehicle car or automobile) adj (height)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/15 12:28
S111	1498	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/15 12:34
S112	26	S111 AND ((B60T8/172 OR B60T2201/04 OR B60T2210/14 OR B60T2210/16 OR B60T2220/04 OR B60T2260/06 OR B60T7/12 OR B60T8/175 OR B60T11/22 OR B60T11/26 OR B60T13/741 OR B60T2210/12 OR B60T2230/00 OR B60T2250/06 OR B60T7/085 OR B60T7/107 OR B60T7/122 OR B60T8/32 OR G05D1/0088 OR G05D1/0257 OR G05D1/0891 OR G05D1/0016 OR G05D1/0061 OR G05D1/0231 OR G05D1/0236 OR G05D1/024 OR G05D1/0251 OR G05D1/0255 OR G05D1/027 OR G05D1/048 OR G05D2201/0213 OR G05D2201/0216).CPC. AND (701/22 OR 701/37 OR 701/112 OR 701/2 OR 701/23 OR 701/21 OR 701/29.1 OR 701/49 OR 701/70 OR 701/93 OR 701/96 OR 701/99 OR 701/1 OR 701/101 OR 701/102 OR 701/123 OR 701/300 OR 701/30.8 OR 701/32.4 OR 701/33.1 OR 701/36 OR 701/41 OR 701/468 OR 701/48 OR 701/50 OR 701/519 OR 701/54 OR 701/60 OR 701/65 OR 701/71 OR 701/82 OR 701/91 OR 701/94).CCLS. AND (G05D1/00 OR G05D1/02 OR G05D1/04 OR G05D1/08 OR B60T7/12 OR B60T8/172 OR B60T11/22 OR B60T11/26 OR B60T8/32).IPCR.)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/15 12:34
S113	2698	(temperature adj sensor) same range same "60"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/04/28 19:34
S114	0	(G05D1/0016).IPCR.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/04/28 19:35
S115	1983	(G05D1/0016).CPC.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/04/28 19:35

S116	838	(G05D1/0891).CPC.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/04/28 19:36
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S118	0	S113 AND S115	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/04/28 19:36
S119	1213	(G01C9/00).CPC.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/04/28 19:37
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S121	7835	(G01C9/00).IPCR.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/04/28 19:38
S122	26	S121 AND S113	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/04/28 19:38
S123	127	S113 AND ACCELEROMETER	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/04/28 19:39
S124	9	S123 AND (SENSOR NEAR3 ERROR)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/04/28 19:40
S125	6916	((temperature adj sensor) NEAR5 (GYRO OR ACCELEROMETER))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/04/28 19:42
S126	771	S125 AND (CORRECT$3 NEAR4 ERROR) AND RANGE	US-PGPUB; USPAT; USOCR; FPRS;	OR	OFF	2019/04/28 19:44

			EPO; JPO; DERWENT; IBM_TDB			
S127	555	S125 AND (CORRECT$3 NEAR4 ERROR) AND RANGE AND AMBIENT	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/04/28 19:44
S128	532	S125 AND (CORRECT$3 NEAR4 ERROR) AND RANGE AND AMBIENT AND ACCUR$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/04/28 19:47
S129	1	S121 AND S128	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/04/28 19:47
S130	37	("20020008661" | "20020144548" | "20030135327" | "20050033200" | "20050040985" | "20050114023" | "20050240347" | "6415223" | "6427122" | "6463802" | "6480152" | "6498996" | "6516272" | "6658354" | "6671648" | "6853909" | "6859727" | "6879875" | "7043364" | "7089148" | "7248964" | "7289906" | "7409290").PN. OR ("8239162").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/28 19:51
S131	68	S115 AND (CORRECT$3 NEAR4 ERROR) AND RANGE	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/04/28 19:52
S132	5	S115 AND (CORRECT$3 NEAR4 ERROR) AND RANGE AND AMBIENT AND ACCUR$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/04/28 19:52
S133	243	("4213678" | "4758080" | "4886351" | "5106179" | "5177511" | "5331149" | "5467104" | "5604818" | "5644642" | "5659327" | "5815126" | "5815741" | "5912720" | "6140980" | "6213627" | "6227667" | "6346929" | "6445365" | "6456261" | "6456262" | "6523955").PN. OR ("7245273").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/28 19:52
S134	243	("4213678" | "4758080" | "4886351" | "5106179" | "5177511" | "5331149" | "5467104" | "5604818" | "5644642" | "5659327" | "5815126" | "5815741" | "5912720" | "6140980" | "6213627" |	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/28 19:53

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EAST Search History (Interference)

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UNITED STATES PATENT AND TRADEMARK OFFICE

USPTO Automated Interview Request (AIR)

Jul 25 2019

This paper requesting to schedule and/or conduct an interview is appropriate because:

This submission is requested to be accepted as an authorization for this interview to communicate via the internet. Recognizing that Internet communications are not secure, I hereby authorize the USPTO to communicate with the undersigned concerning scheduling of the interview via video conference, instant messaging, or electronic mail, and to conduct the interview in accordance with office practice including video conferencing.

Name(s):
Glenn W. Brown

S-signature:
/Glenn Brown/

Registration Number:
51310

U.S. Application Number:
14961787

Confirmation Number:
8904

E-mail Address:
gbrown@worldpatents.com

Phone Number:
+1 704-790-3600

Proposed Time of Interview:
8-1-2019 2:00 PM ET

Alternative Proposed Time(s) of Interview:
7-31-2019 2:00 PM ET

Alternative Proposed Time(s) of Interview:
8-2-2019 2:00 PM ET

Prefered Interview Type:
Telephonic

I am the applicant or applicant's representative for this application.

Topic for Discussion:
I would like to discuss a proposed claim amendment to independent claims 1, 10, and 29, particularly to add that the "smart device is configured to simultaneously display, in near real time, the adjustment in height to the rear section or front section of the vehicle needed to level the vehicle in the pitch direction and the adjustment in the second side section of the in the roll direction.".

UNITED STATES PATENT AND TRADEMARK OFFICE

USPTO Automated Interview Request (AIR)

Aug 7 2019

This paper requesting to schedule and/or conduct an interview is appropriate because:

This submission is requested to be accepted as an authorization for this interview to communicate via the internet. Recognizing that Internet communications are not secure, I hereby authorize the USPTO to communicate with the undersigned concerning scheduling of the interview via video conference, instant messaging, or electronic mail, and to conduct the interview in accordance with office practice including video conferencing.

Name(s):
Seth Hudson

S-signature:
/Seth Hudson/

Registration Number:
48281

U.S. Application Number:
14961787

Confirmation Number:
8904

E-mail Address:
shudson@worldpatents.com

Phone Number:
+1 7047249602

Proposed Time of Interview:
8-14-2019 10:00 AM ET

Alternative Proposed Time(s) of Interview:
8-15-2019 2:00 PM ET

Prefered Interview Type:
Telephonic

I am the applicant or applicant's representative for this application.

Topic for Discussion:
This is our second Automated Interview Request. We filed our First Interview Request on July 25, but never received a response. We have also called on multiple occasions without a response. We called Fadey Jabr as well, but did not receive a response. We would like to discuss potential claim amendments.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s)	Charles A. Leonard
Application No.	14/961,787
Filing Date	December 07, 2015
Title	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES
Examiner	MARTINEZ BORRERO, LUIS A
Art Unit	3668
Confirmation No.	8904

Commissioner for Patents
Via EFS-Web

AMENDMENT AND RESPONSE TO NON-FINAL OFFICE ACTION

In response to the Office Action dated May 16, 2019, rejecting claims 1-5, 7, 10, 12, 14-16, 18, 20, 22-29, 38, and 43 of the above-referenced Application, in which claims 1, 10, 12, 14, 15, 20, 22, 23, 26, 28, 29, 38, and 45-54 are now pending, Applicant respectfully requests that the following amendments be entered and remarks be considered, without prejudice or disclaimer to continued examination on the merits. In view of these amendments and remarks, Applicant submits that the Application is now in condition for allowance and respectfully requests such action.

SECTION	PAGE(S)
Amendment and Response to Non-Final Rejection	**1**
Specification	**2 – 3**
Claims	**4 – 11**
Remarks	**12 – 14**
Internet Communications Authorized	**15**

SPECIFICATION

Please amend the specification as follows. No new matter is added.

Please replace paragraph [0035] with the following replacement paragraph:

[0035] As stated above, the devices, systems, methods and computer program products relate to leveling an RV relative to the two main axes of the RV (side-to-side and front-to-back). As used herein to describe the proposed leveling method and shown in FIGS. 1 and 2, pitch is defined as the angle of the RV from front to back and roll will be defined as the angle of the RV from side to side. As shown in FIG. 1, when adjusting the pitch, an embodiment of an RV 10 can be adjusted in pitch rotational directions P depend on the inclination of the RV from front-to-back. For example, if the RV 10 is inclined forward so that a rear section 12 is above a front section 14 proximal to a jack 26 of the RV 10, then the pitch of RV 10 can be adjusted in the direction of arrow point P_1. If the RV 10 is inclined backward so that the front section 14 is above the rear section 12, then the pitch can be adjusted in the direction of arrow point P_2. Similarly, as shown in FIG. 2, when adjusting the roll, the RV 10 can be adjusted in roll rotational directions R depending on the inclination of the RV from side-to-side. For example, if the RV 10 is inclined ~~forward~~ to the right so that a first side section 16 of the RV 10 is above a second side section 18 of the RV 10, then the roll of RV 10 can be adjusted in the direction of arrow point R_1. If the RV 10 is inclined ~~backward~~ to the left so that the second side ~~section 14~~ section 18 is above the first side section 16, then the pitch can be adjusted in the direction of arrow point R_2.

Please replace paragraphs [0052] and [0053] with the following replacement paragraphs:

[0052] For example, as shown in FIG. 7A and 8A, an RV 10 can be parked, or positioned, at a desired location. A leveling system 20 on RV 10 (as shown in FIGS. 1 and 2) can be previously used to determine an initial level position that provides a true level measurement that has been stored on the smart device 24 of the leveling system 20, or stored in a memory storage location on the PCB sensor device 22, such as an RV leveling device, and recalled to the smart device 24, for later use. The RV 10 can have three or more structural supports, such as wheels W_A, W_B and jack 26 on a ground G at the desired location. As shown in FIG. 7A, the RV 10 leans toward the first side A of RV 10 on first side section 16 at the desired location. Similarly, as shown in FIG. 8A, the RV 10 leans toward the ~~front C~~ front D of

RV 10 on the front section 14 at the desired location. Thus, the RV 10 is not leveled at the desired location based on the structural supports current position on the ground G.

[0053] The software application on the smart device 24 of the leveling system can be accessed to initiate the determination of the needed change in the roll and pitch directions to level the RV 10 at the desired location. The smart device 24 can communicate with the sensor device 22 of the leveling system 20 to obtain sensor data used to determine the current angle measurements for the roll and pitch directions off from true level, i.e., the initial level position stored in the smart device. The needed angle change, distance change, and/or direction of change for the roll and pitch directions can be displayed on the smart device 24 as shown in the roll display 42 and pitch display 44 in screen 40 of the software application (see FIG. 5). As shown in FIG. 7B, the first side A of RV 10 can then be raised the needed amount so that the first side A and a second side B of the RV 10 can be level with one another in the roll direction based on the information provided in the roll display 42 (see FIG. 5). For example, a jack 70, or other mechanism can be used to raise the first side A of RV 10. Similarly, as shown in FIG. 8B, the front ~~side C~~ side D of RV 10 can be raised the needed amount so that the front ~~side C~~ side D and a rear ~~side D~~ side C of the RV 10 can be level with one another in the pitch direction based on the information provided in the pitch display 44 (see FIG. 5). For example, a jack 26 can raise the front ~~side C~~ side D of RV 10 the needed amount.

CLAIMS

Please amend the claims as follows, without prejudice or disclaimer to continued examination on the merits:

1. (Currently Amended) A leveling system for leveling a vehicle that is at rest, the leveling system comprising:

one or more sensor devices secured to a vehicle to sense ~~at least one of~~ an inclination ~~or an orientation~~ of the vehicle in both a pitch direction and a roll direction, each of the one or more sensor devices comprising a printed circuit board that ~~comprises~~ includes:

a digital accelerometer ~~that uses an X-axis, Y-axis, and a Z-axis~~ that permits calculation in both the pitch ~~or~~ direction and the roll direction ~~regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured~~, and

a processor to process data collected by the respective ~~sensor device~~ digital accelerometer; ~~and~~

~~a digital temperature sensor that collects and transmits temperature data to the processor, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table to determine how to correct deviations within the collected data~~; and

a smart device in wireless communication with the one or more sensor devices, the smart device configured to activate a software application operating on the smart device to cause the one or more sensor devices to sense information regarding the inclination of the vehicle in both the pitch direction and the roll direction,

wherein the ~~to allow~~ information ~~received from~~ sensed by the one or more sensor devices ~~about at least one of~~ regarding the inclination ~~or the orientation~~ of the vehicle in both the pitch direction and the roll direction ~~to be~~ is processed ~~to provide measurements to a user and~~ to determine an amount of ~~adjustments~~ adjustment in height to ~~at least one of~~ a rear section or front section ~~or~~ of the vehicle needed to level the vehicle in the pitch direction and to determine an amount of adjustment in height to a first side section or a second side ~~sections~~ section of the vehicle needed to level the vehicle in the roll direction, ~~so that the vehicle is adjusted to obtain a level position based on a calculated change from the determination of the amount of adjustments in height, the smart device configured to determine an initial level position for a vehicle to determine~~

~~any inconsistencies inherent in the leveling system by capturing pitch and roll angle measurements from the sensor device taken at the initial level position to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies when determining the amount of adjustment in height;~~

wherein the smart device is configured to simultaneously display, in near real time, the adjustment in height to the rear section or front section of the vehicle needed to level the vehicle in the pitch direction and the adjustment in height to the first side section or the second side section of the vehicle needed to level the vehicle in the roll direction.

2-9. (Cancelled)

10. (Currently Amended) A method for leveling a recreational vehicle or trailer, the method comprising the steps of:

providing a leveling system ~~comprising~~ that includes:

one or more sensor devices secured ~~to a~~ to the recreational vehicle or trailer, each of the one or more sensor devices configured to sense ~~at least one of~~ an inclination ~~or an orientation~~ of the recreational vehicle or trailer in both a pitch direction and a roll direction; and

a smart device in wireless communication with the one or more sensor devices, the smart device configured to instruct the one or more sensor devices to sense the inclination of the recreational vehicle or trailer in both the pitch direction and roll direction, ~~each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured; and;~~

~~a digital temperature sensor that collects and transmits temperature data to a processor, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table to determine how to correct deviations within data collected from the one or more sensor devices;~~

determining an initial level position for the recreational vehicle or trailer using the smart device ~~to determine any inconsistencies inherent in the leveling system~~;

capturing initial pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device to ~~provide a~~ determine calibration offset data of the initial pitch and roll angle measurements to ~~permit consideration of any inconsistencies determined~~ be used when taking measurement readings at a future time;

measuring the pitch angle and the roll angle of the recreational vehicle or trailer when the recreational vehicle or trailer is at rest using the sensor device;

retrieving the calibration offset data of initial pitch angle and roll angle measurements taken by the sensor device when the recreational vehicle or trailer was ~~at on~~ at the initial level position;

calculating any needed change in height to ~~at least one of~~ a rear section or front section of the recreational vehicle or trailer to obtain a level position of the recreational vehicle or trailer in the pitch direction using the measured pitch angle and the calibration offset data of the initial pitch angle measurement; ~~or~~

calculating any needed change in height to a first side section or second side ~~sections~~ section of the recreational vehicle or trailer to obtain a level position of the recreational vehicle or trailer in ~~at least one of the pitch direction or~~ the roll direction ~~of the vehicle~~ using the measured roll angle and the calibration offset data of the initial ~~pitch and~~ roll angle ~~measurements~~ measurement;

displaying, on the smart device, the calculated change in the height to ~~the at least one of~~ the rear section or front section ~~or the first or second side sections~~ of the recreational vehicle or trailer needed to level the recreational vehicle or trailer in ~~at least one of~~ the pitch direction ~~or the roll direction of the vehicle on the smart device~~; and

~~adjusting the height to the at least one of the rear or front section or the first or second side sections of the vehicle to obtain the level position of the vehicle based on the calculated change~~ simultaneously displaying, on the smart device, the calculated change in the height to the first side section or second side section of the recreational vehicle or trailer needed to level the recreational vehicle or trailer in the roll direction.

11. Cancelled)

12. (Previously Presented) The method according to claim 10, wherein the step of determining an initial level position comprises using at least one of an accelerometer, gyroscope, or global positioning system sensor on the smart device to achieve the initial level position.

13. (Cancelled)

14. (Currently Amended) The method according to claim 10, wherein the step of capturing the initial pitch and roll angle measurements from the one or more sensor ~~device~~ devices comprises communicating the calibration offset data from the one or more sensor ~~device~~ devices of the initial pitch and roll angle measurements measured by the one or more sensor ~~device~~ devices when the vehicle is at the initial level position to the smart device and saving the calibration offset data on the smart device.

15. (Currently Amended) The method according to claim 10, wherein the step of capturing the initial pitch and roll angle measurements from the one or more sensor ~~device comprises saving the calibration data of the pitch and roll angle measurements from the sensor device~~ devices comprises saving the calibration offset data of the initial pitch and roll angle measurements measured by the one or more sensor ~~device~~ devices when the vehicle is at the initial level position on the one or more sensor ~~device~~ devices.

16-19. (Cancelled)

20. (Currently Amended) The method according to claim 10, wherein the step of displaying the calculated change in ~~at least one of~~ the pitch direction ~~or~~ and the step of simultaneously displaying the calculated change in the roll direction ~~of the vehicle~~ further comprises the step of displaying the calculated change in the pitch direction and the roll direction of the recreational vehicle or trailer in measurements of distance.

21. (Cancelled)

22. (Currently Amended) The method according to claim 10, further comprising saving a given pitch angle measurement on at least one of the smart device or the one or more sensor ~~device~~ devices to permit later recall for the purpose of returning the vehicle to the given pitch angle position at a later time.

23. (Currently Amended) The method according to claim 10, further comprising receiving data regarding holding tank levels or data regarding battery power levels at the smart device from one or more vehicle control panels.

24-25. (Cancelled)

26. (Currently Amended) The method according to claim 10, further comprising the step of activating a software application operating on the smart device to cause the one or more sensor devices to sense information regarding the inclination of the vehicle in both the pitch direction and the roll direction, wherein the step of activating the software application further includes activating one or more systems on the vehicle ~~with the smart device~~, wherein the one or more systems include at least one of lighting systems, entertainment systems, power slide-outs, or generators.

27. (Cancelled)

28. (Original) The method according to claim 10, further comprising collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

29. (Currently Amended) A non-transitory computer readable medium comprising computer executable instructions ~~embodied in a computer readable medium~~ that, when executed by a processor of a ~~computer control~~ smart device, cause the ~~computer~~ smart device to perform the steps comprising:

receiving ~~on a smart device~~ a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device secured to the vehicle, the sensor device

comprising a printed circuit board that ~~comprises~~ includes a digital accelerometer ~~that uses an X-axis, Y-axis, and a Z-axis~~ that permits calculation in both the pitch ~~or~~ direction and the roll direction ~~regardless of positioning of the respective device relative to the vehicle to which the one or more sensor devices are secured~~;

~~capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device after determining an initial level position for the vehicle using the smart device to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time;~~

retrieving stored calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at ~~the~~ an initial level position;

~~comparing temperature data transmitted from a digital temperature sensor with data stored in a temperature correction table to determine how to correct deviations within the captured measurement data;~~

calculating any needed change in height to ~~at least one of~~ a rear section or a front section of the vehicle to obtain a level position of the vehicle in a pitch direction using the pitch angle measurement and the stored calibration data of pitch angle measurements;

calculating any needed change in height to a ~~or~~ first side section or a second side ~~sections~~ section of the vehicle to obtain a level position of the vehicle in ~~at least one of a pitch direction or~~ a roll direction ~~of the vehicle~~ using the roll angle measurement and the stored calibration data of ~~the pitch and~~ roll angle measurements; ~~and~~

displaying the calculated change in height to ~~at least one of~~ the rear section or front section ~~or one of the first or second side sections~~ of the vehicle to obtain a level position of the vehicle in ~~at least one of~~ the pitch direction; and

simultaneously displaying the calculated change in height to the first side section or second side section of the vehicle ~~or the roll direction of the vehicle needed~~ to obtain ~~the~~ a level position of the vehicle ~~on the smart device so that the height to at least one of the rear or front section or the first or second side sections of the vehicle is adjusted to obtain the level position of the vehicle based on the calculated change~~ in the roll direction.

30-37. (Cancelled)

38. (Currently Amended) The non-transitory computer readable medium according to claim 29, wherein, when executed by the processor of the smart device, the executable instructions further ~~comprising receiving~~ cause the smart device to receive data ~~at the smart device~~ from one or more vehicle control panels.

39-44. (Cancelled)

45. (New) The leveling system according to claim 1, wherein the one or more sensor devices are further configured to determine one or more of temperature, relative humidity, and barometric pressure, and wherein the smart device is further configured to adjust the information regarding the inclination of the vehicle in both the pitch direction and the roll direction to compensate for variations in measurements caused by changes to one or more of the temperature, relative humidity, and barometric pressure.

46. (New) The leveling system according to claim 1, wherein the smart device communicates with the one or more sensor devices using the Bluetooth protocol.

47. (New) The leveling system according to claim 1, wherein the adjustments in height needed to level the vehicle in both the pitch direction and roll direction are calculated from the pitch angle measurements, roll angle measurements, a width dimension of the vehicle, and a length dimension of the vehicle.

48. (New) The leveling system according to claim 47, wherein the width dimension of the vehicle is taken from an outside point on a first wheel to an outside point on a second wheel on an opposite side from the first wheel, and wherein the length dimension of the vehicle is taken from a center point of a rear axle to a front jack.

49. (New) The leveling system according to claim 47, wherein the width dimensions and length dimensions of a plurality of makes and models of vehicles are pre-programmed in a vehicle list, and wherein the smart device enables a user to select the vehicle from the vehicle list.

50. (New) The leveling system according to claim 1, wherein the smart device is further configured to display an adjustment in the pitch angle needed to level the vehicle in the pitch direction and an adjustment in the roll angle needed to level the vehicle in the roll direction.

51. (New) The leveling system according to claim 50, wherein the smart device is further configured to display an image of the vehicle and one or more arrows indicating the direction of adjustment needed to level the vehicle in both the pitch and roll directions.

52. (New) The leveling system according to claim 1, wherein the smart device is further configured to update the display during a leveling process to indicate remaining adjustments needed to level the vehicle.

53. (New) The leveling system according to claim 1, wherein calibration data is stored on the smart device or one or more sensor devices, wherein the calibration data is obtained when the vehicle is in a known level position, wherein the calibration data includes an initial pitch offset angle of the one or more sensor devices taken when the vehicle is in the known level position and an initial roll offset angle of the one or more sensor devices taken when the vehicle is in the known level position, and wherein the information regarding the inclination of the vehicle in both the pitch direction and the roll direction is calculated relative to the initial pitch offset angle and the initial roll offset angle.

54. (New) The leveling system according to claim 53, wherein the one or more sensor devices are secured to the vehicle during a manufacturing process of the vehicle, and wherein the calibration data is obtained during the manufacturing process.

REMARKS

Applicant respectfully requests reconsideration of the present application in light of the foregoing amendments and following remarks. In the present amendment, claims 1, 10, 14, 15, 20, 22, 23, 26, 29, and 38 are amended; claims 2-5, 7, 16, 18, 24, 25, 27, and 43 are cancelled without prejudice or disclaimer; and claims 45-54 are newly added. Claims 1, 10, 12, 14, 15, 20, 22, 23, 26, 28, 29, 38, and 45-54 are now pending in the present application.

I. Response to 35 U.S.C. § 112 Rejection

Claims 1, 10, and 29 stand rejected under 35 U.S.C. § 112(a) for allegedly failing to comply with the written description requirement. Particularly, the Office Action states that the claims contain subject matter (i.e., "digital temperature sensor...") that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor had possession of the claimed invention. In the present amendment, claims 1, 10, and 29 have been amended so as to remove the subject matter regarding the digital temperature sensor. Therefore, since the claims no longer include the subject matter referenced in the Office Action, Applicant believes that the 35 U.S.C. § 112(a) rejection has been rendered moot and that the claims are patentable under 35 U.S.C. § 112. Applicant therefore respectfully requests that the Examiner kindly withdraw the 35 U.S.C. § 112 rejection.

II. Response to 35 U.S.C. § 103 Rejection

Claims 1-5, 7, 10, 12, 14-16, 18, 20, 22-26, and 29 were rejected under 35 U.S.C. § 103 as allegedly being unpatentable over U.S. Pub. No. 2008/0142768 ("Thorpe") in view of U.S. Pub. No. 2012/0197587 ("Luk") and U.S. Pat. No. 8,239,162 ("Tanenhaus"). Also, claims 27, 28, 38, and 43 were rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Thorpe in view of Luk and Tanenhaus, and further in view of U.S. Pub. No. 2012/02008520 ("Howarter"). Applicant respectfully traverses the 35 U.S.C. § 103 rejections, as discussed below.

Independent claim 1, as amended, is reproduced below:

> 1. A leveling system for leveling a vehicle that is at rest, the leveling system comprising:
>
> one or more sensor devices secured to a vehicle to sense an inclination of the vehicle in both a pitch direction and a roll direction, each of the one or more sensor devices comprising a printed circuit board that includes:
>
> a digital accelerometer that permits calculation in both the pitch direction and the roll direction, and
>
> a processor to process data collected by the respective digital accelerometer; and
>
> a smart device in wireless communication with the one or more sensor devices, **the smart device configured to activate a software application operating on the smart device to cause the one or more sensor devices to sense information regarding the inclination of the vehicle in both the pitch direction and the roll direction**;
>
> wherein the information sensed by the one or more sensor devices regarding the inclination of the vehicle in both the pitch direction and the roll direction is processed to determine an amount of adjustment in height to a rear section or front section of the vehicle needed to level the vehicle in the pitch direction and to determine an amount of adjustment in height to a first side section or a second side section of the vehicle needed to level the vehicle in the roll direction;
>
> wherein the smart device is configured to **simultaneously display, in near real time, the adjustment in height to the rear section or front section of the vehicle needed to level the vehicle in the pitch direction and the adjustment in height to the first side section or the second side section of the vehicle needed to level the vehicle in the roll direction**.

(*Emphasis added*)

Claim 1 is directed to a leveling system for leveling a vehicle that is at rest. The leveling system includes one or more sensor devices and a smart device in wireless communication with the one or more sensor devices. The smart device is configured to **activate a software application operating on the smart device to cause the one or more sensor devices to sense information regarding the inclination of the vehicle in both the pitch direction and the roll direction**. The cited references appear to be silent with respect to a smart device that has a software application operating thereon, whereby this software application is activated **to cause the one or more sensor devices to sense information regarding the inclination of the vehicle in both the pitch direction and the roll direction**.

Furthermore, claim 1 recites that the smart device is configured to **simultaneously display, in near real time, the adjustment in height to the rear section or front section of the vehicle needed to level the vehicle in the pitch direction and the adjustment in height to the first side section or the second side section of the vehicle needed to level the vehicle in the roll direction**.

The Office Action relies on paragraphs [0038] and [0040] of Thorpe regarding the aspect of displaying height adjustments. However, the display panel 90 of Thorpe is configured to show only one adjustment at a time and thus is unable to **simultaneously display… the adjustment in height… to level the vehicle in the pitch direction and the adjustment in height… to level the vehicle in the roll direction**. The other cited references do not overcome the deficiencies of Thorpe with respect to the claimed features highlighted above.

For at least the reasons above, claim 1 is allowable over the cited references. Also, independent claims 10 and 29 include features that are similar to the above-highlighted features of claim 1 and are likewise allowable. Furthermore, claims 12, 14, 15, 20, 22, 23, 26, 28, 38, and 45-54 depend from one of claims 1, 10, or 29 and therefore contain the same allowable features. Therefore, Applicant contends that the pending claims are allowable over the cited references and are patentable under 35 U.S.C. § 103. Applicant respectfully requests that the Examiner kindly withdraw the 35 U.S.C. § 103 rejections.

AUTHORIZATION FOR E-MAIL COMMUNICATION – MPEP §502.03

Recognizing that Internet communications are not secure, we hereby authorize the USPTO to communicate with any authorized representative concerning any subject matter of this Application by electronic mail. We understand that a copy of these communications will be made of record in the Application file.

CONCLUSION

Applicant would like to thank the Examiner for the attention and consideration accorded the present Application. It is submitted that the Application is in good and proper form for allowance. A favorable action on the part of the Examiner is respectfully solicited. The Examiner is encouraged to call the undersigned at (704) 790-3600 for any questions or if it appears that an interview would be helpful in advancing the case. Should the Examiner determine that any further action is necessary to place the Application in condition for allowance, the Examiner is encouraged to contact the undersigned at the telephone number, facsimile number, address, or email address provided below. It is not believed that any fees for additional claims, extensions of time, or the like are required beyond those that may otherwise be indicated in the documents accompanying this paper. However, if such additional fees are required, the Examiner is encouraged to notify the undersigned at the Examiner's earliest convenience.

Respectfully submitted,

Date: August 13, 2019

/Seth L. Hudson/
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Electronic Acknowledgement Receipt

EFS ID:	36862472
Application Number:	14961787
International Application Number:	
Confirmation Number:	8904
Title of Invention:	VEHICLE LEVELING SYSTEMS, DEVICES AND METHODS AND COMPUTER PROGRAM PRODUCTS FOR LEVELING VEHICLES USING SMART DEVICES
First Named Inventor/Applicant Name:	Charles A. Leonard
Customer Number:	22474
Filer:	Seth Lee Hudson/Teresa Bush-Dugar
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Attorney Docket Number:	7137
Receipt Date:	13-AUG-2019
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Application Type:	Utility under 35 USC 111(a)

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		7137_OA_Response.pdf	165234 afec579b10fbd060fb962e0b21780d00ccf63eee	yes	15

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Specification	2	3
	Claims	4	11
	Applicant Arguments/Remarks Made in an Amendment	12	15
Warnings:			
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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/961,787	Filing Date 12/07/2015	☐ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $40 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $210 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	08/13/2019	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 21	Minus	** 25	= 0		x $50 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $230 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/TARA A WASHINGTON/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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14/961,787	12/07/2015	Charles A. Leonard	7137	8904

22474 7590 08/16/2019

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MARTINEZ BORRERO, LUIS A	

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NOTIFICATION DATE	DELIVERY MODE
08/16/2019	ELECTRONIC

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The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Applicant-Initiated Interview Summary	Application No. 14/961,787	Applicant(s) Leonard, Charles A.		
	Examiner LUIS A MARTINEZ BORRERO	Art Unit 3665	AIA (First Inventor to File) Status Yes	Page 1 of 2

All participants (applicant, applicants representative, PTO personnel):

1. LUIS A MARTINEZ BORRERO (Examiner); Telephonic

2. Glenn W. Brown (Attorney)

Date of Interview: 13 August 2019

Claims Discussed: The applicant discussed claim 1.

Amendment proposed: Applicant proposed amendments to the claims to overcome current rejection.

Brief Description of the main topic(s) of discussion: The applicant discussed amendments to overcome current 103 rejection. The examiner will need more time and consideration to examine the application based on proposed amendments. No agreement was reached.

Issues Discussed:

Item(s) under 35 U.S.C. 103:

Attachment(s): Proposed Amendments,

/HUNTER B LONSBERRY/ Supervisory Patent Examiner, Art Unit 3665	/L.A.M/ Examiner, Art Unit 3665

Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04
Please further see:
MPEP 713.04
Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b)
37 CFR § 1.2 Business to be transacted in writing

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

PROPOSED CLAIM AMENDMENT

1. (Currently Amended) A leveling system for leveling a vehicle that is at rest, the leveling system comprising:

one or more sensor devices secured to a vehicle to sense ~~at least one of~~ an inclination ~~or an orientation~~ of the vehicle in both a pitch direction and a roll direction, each of the one or more sensor devices comprising a printed circuit board that ~~comprises~~ includes:

a digital accelerometer ~~that uses an X axis, Y axis, and a Z axis~~ that permits calculation in both the pitch ~~or~~ direction and the roll direction ~~regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured~~, and

a processor to process data collected by the respective ~~sensor device~~ digital accelerometer~~, and~~

~~a digital temperature sensor that collects and transmits temperature data to the processor, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table to determine how to correct deviations within the collected data~~; and

a smart device in wireless communication with the one or more sensor devices, the smart device configured to activate a software application operating on the smart device to cause the one or more sensor devices to sense information regarding the inclination of the vehicle in both the pitch direction and the roll direction;

wherein the ~~to allow~~ information ~~received from~~ sensed by the one or more sensor devices ~~about at least one of~~ regarding the inclination ~~or the orientation~~ of the vehicle in both the pitch direction and the roll direction ~~to be~~ is processed ~~to provide measurements to a user and~~ to determine an amount of ~~adjustments~~ adjustment in height to ~~at least one of~~ a rear section or front section ~~or~~ of the vehicle needed to level the vehicle in the pitch direction and to determine an amount of adjustment in height to a first side section or a second side ~~sections~~ section of the vehicle needed to level the vehicle in the roll direction~~, so that the vehicle is adjusted to obtain a level position based on a calculated change from the determination of the amount of adjustments in height, the smart device configured to determine an initial level position for a vehicle to determine any inconsistencies inherent in the leveling system by capturing pitch and roll angle measurements~~

~~from the sensor device taken at the initial level position to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies when determining the amount of adjustment in height;~~

wherein the smart device is configured to simultaneously display, in near real time, the adjustment in height to the rear section or front section of the vehicle needed to level the vehicle in the pitch direction and the adjustment in height to the first side section or the second side section of the vehicle needed to level the vehicle in the roll direction.

2-9. (Cancelled)

10. (Currently Amended) A method for leveling a recreational vehicle or trailer, the method comprising the steps of:

providing a leveling system ~~comprising~~ that includes:

one or more sensor devices secured ~~to a~~ to the recreational vehicle or trailer, each of the one or more sensor devices configured to sense ~~at least one of~~ an inclination ~~or an orientation~~ of the recreational vehicle or trailer in both a pitch direction and a roll direction; and

a smart device in wireless communication with the one or more sensor devices, the smart device configured to instruct the one or more sensor devices to sense the inclination of the recreational vehicle or trailer in both the pitch direction and roll direction, ~~each of the one or more sensor devices comprising a printed circuit board that comprises a digital accelerometer that uses an X-axis, Y-axis, and a Z-axis that permits calculation in both the pitch or roll direction regardless of positioning of the respective one or more sensor devices relative to the vehicle to which the one or more sensor devices are secured, and;~~

~~a digital temperature sensor that collects and transmits temperature data to a processor, wherein the processor compares the transmitted temperature data with data stored in a temperature correction table to determine how to correct deviations within data collected from the one or more sensor devices;~~

determining an initial level position for the recreational vehicle or trailer using the smart device ~~to determine any inconsistencies inherent in the leveling system~~;

capturing initial pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device to ~~provide a~~ determine calibration offset data of the initial pitch and roll angle measurements to ~~permit consideration of any inconsistencies determined~~ be used when taking measurement readings at a future time;

measuring the pitch angle and the roll angle of the recreational vehicle or trailer when the recreational vehicle or trailer is at rest using the sensor device;

retrieving the calibration offset data of initial pitch angle and roll angle measurements taken by the sensor device when the recreational vehicle or trailer was ~~at an~~ at the initial level position;

calculating any needed change in height to ~~at least one of~~ a rear section or front section of the recreational vehicle or trailer to obtain a level position of the recreational vehicle or trailer in the pitch direction using the measured pitch angle and the calibration offset data of the initial pitch angle measurement; ~~or~~

calculating any needed change in height to a first side section or second side ~~sections~~ section of the recreational vehicle or trailer to obtain a level position of the recreational vehicle or trailer in ~~at least one of the pitch direction or~~ the roll direction ~~of the vehicle~~ using the measured roll angle and the calibration offset data of the initial ~~pitch and~~ roll angle ~~measurements~~ measurement;

displaying, on the smart device, the calculated change in the height to ~~the at least one of~~ the rear section or front section ~~or the first or second side sections~~ of the recreational vehicle or trailer needed to level the recreational vehicle or trailer in ~~at least one of~~ the pitch direction ~~or the roll direction of the vehicle on the smart device~~; and

~~adjusting the height to the at least one of the rear or front section or the first or second side sections of the vehicle to obtain the level position of the vehicle based on the calculated change~~ simultaneously displaying, on the smart device, the calculated change in the height to the first side section or second side section of the recreational vehicle or trailer needed to level the recreational vehicle or trailer in the roll direction.

11. Cancelled)

12. (Previously Presented) The method according to claim 10, wherein the step of determining an initial level position comprises using at least one of an accelerometer, gyroscope, or global positioning system sensor on the smart device to achieve the initial level position.

13. (Cancelled)

14. (Currently Amended) The method according to claim 10, wherein the step of capturing the initial pitch and roll angle measurements from the one or more sensor ~~device~~ devices comprises communicating the calibration offset data from the one or more sensor ~~device~~ devices of the initial pitch and roll angle measurements measured by the one or more sensor ~~device~~ devices when the vehicle is at the initial level position to the smart device and saving the calibration offset data on the smart device.

15. (Currently Amended) The method according to claim 10, wherein the step of capturing the initial pitch and roll angle measurements from the one or more sensor ~~device comprises saving the calibration data of the pitch and roll angle measurements from the sensor device~~ devices comprises saving the calibration offset data of the initial pitch and roll angle measurements measured by the one or more sensor ~~device~~ devices when the vehicle is at the initial level position on the one or more sensor ~~device~~ devices.

16-19. (Cancelled)

20. (Currently Amended) The method according to claim 10, wherein the step of displaying the calculated change in ~~at least one of~~ the pitch direction ~~or~~ and the step of simultaneously displaying the calculated change in the roll direction ~~of the vehicle~~ further comprises the step of displaying the calculated change in the pitch direction and the roll direction of the recreational vehicle or trailer in measurements of distance.

21. (Cancelled)

22. (Currently Amended) The method according to claim 10, further comprising saving a given pitch angle measurement on at least one of the smart device or the one or more sensor ~~device~~ devices to permit later recall for the purpose of returning the vehicle to the given pitch angle position at a later time.

23. (Currently Amended) The method according to claim 10, further comprising receiving data regarding holding tank levels or data regarding battery power levels at the smart device from one or more vehicle control panels.

24-25. (Cancelled)

26. (Currently Amended) The method according to claim 10, further comprising the step of activating a software application operating on the smart device to cause the one or more sensor devices to sense information regarding the inclination of the vehicle in both the pitch direction and the roll direction, wherein the step of activating the software application further includes activating one or more systems on the vehicle ~~with the smart device~~, wherein the one or more systems include at least one of lighting systems, entertainment systems, power slide-outs, or generators.

27. (Cancelled)

28. (Original) The method according to claim 10, further comprising collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

29. (Currently Amended) A non-transitory computer readable medium comprising computer executable instructions ~~embodied in a computer readable medium~~ that, when executed by a processor of a ~~computer control~~ smart device, cause the ~~computer~~ smart device to perform the steps comprising:

receiving ~~on a smart device~~ a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device secured to the vehicle, the sensor device

comprising a printed circuit board that ~~comprises~~ includes a digital accelerometer ~~that uses an X-axis, Y-axis, and a Z-axis~~ that permits calculation in both the pitch ~~or~~ direction and the roll direction ~~regardless of positioning of the respective device relative to the vehicle to which the one or more sensor devices are secured~~;

~~capturing pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device after determining an initial level position for the vehicle using the smart device to provide a calibration data of the pitch and roll angle measurements to permit consideration of any inconsistencies determined when taking measurement readings at a future time;~~

retrieving stored calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at ~~the~~ an initial level position;

~~comparing temperature data transmitted from a digital temperature sensor with data stored in a temperature correction table to determine how to correct deviations within the captured measurement data;~~

calculating any needed change in height to ~~at least one of~~ a rear section or a front section of the vehicle to obtain a level position of the vehicle in a pitch direction using the pitch angle measurement and the stored calibration data of pitch angle measurements;

calculating any needed change in height to a ~~or~~ first side section or a second side ~~sections~~ section of the vehicle to obtain a level position of the vehicle in ~~at least one of a pitch direction or~~ a roll direction ~~of the vehicle~~ using the roll angle measurement and the stored calibration data of ~~the pitch and~~ roll angle measurements; ~~and~~

displaying the calculated change in height to ~~at least one of~~ the rear section or front section ~~or one of the first or second side sections~~ of the vehicle to obtain a level position of the vehicle in ~~at least one of~~ the pitch direction; and

simultaneously displaying the calculated change in height to the first side section or second side section of the vehicle ~~or the roll direction of the vehicle needed~~ to obtain ~~the~~ a level position of the vehicle ~~on the smart device so that the height to at least one of the rear or front section or the first or second side sections of the vehicle is adjusted to obtain the level position of the vehicle based on the calculated change~~ in the roll direction.

30-37. (Cancelled)

38. (Currently Amended) The non-transitory computer readable medium according to claim 29, wherein, when executed by the processor of the smart device, the executable instructions further ~~comprising receiving~~ cause the smart device to receive data ~~at the smart device~~ from one or more vehicle control panels.

39-44. (Cancelled)

45. (New) The leveling system according to claim 1, wherein the one or more sensor devices are further configured to determine one or more of temperature, relative humidity, and barometric pressure, and wherein the smart device is further configured to adjust the information regarding the inclination of the vehicle in both the pitch direction and the roll direction to compensate for variations in measurements caused by changes to one or more of the temperature, relative humidity, and barometric pressure.

46. (New) The leveling system according to claim 1, wherein the smart device communicates with the one or more sensor devices using the Bluetooth protocol.

47. (New) The leveling system according to claim 1, wherein the adjustments in height needed to level the vehicle in both the pitch direction and roll direction are calculated from the pitch angle measurements, roll angle measurements, a width dimension of the vehicle, and a length dimension of the vehicle.

48. (New) The leveling system according to claim 47, wherein the width dimension of the vehicle is taken from an outside point on a first wheel to an outside point on a second wheel on an opposite side from the first wheel, and wherein the length dimension of the vehicle is taken from a center point of a rear axle to a front jack.

49. (New) The leveling system according to claim 47, wherein the width dimensions and length dimensions of a plurality of makes and models of vehicles are pre-programmed in a vehicle list, and wherein the smart device enables a user to select the vehicle from the vehicle list.

50. (New) The leveling system according to claim 1, wherein the smart device is further configured to display an adjustment in the pitch angle needed to level the vehicle in the pitch direction and an adjustment in the roll angle needed to level the vehicle in the roll direction.

51. (New) The leveling system according to claim 50, wherein the smart device is further configured to display an image of the vehicle and one or more arrows indicating the direction of adjustment needed to level the vehicle in both the pitch and roll directions.

52. (New) The leveling system according to claim 1, wherein the smart device is further configured to update the display during a leveling process to indicate remaining adjustments needed to level the vehicle.

53. (New) The leveling system according to claim 1, wherein calibration data is stored on the smart device or one or more sensor devices, wherein the calibration data is obtained when the vehicle is in a known level position, wherein the calibration data includes an initial pitch offset angle of the one or more sensor devices taken when the vehicle is in the known level position and an initial roll offset angle of the one or more sensor devices taken when the vehicle is in the known level position, and wherein the information regarding the inclination of the vehicle in both the pitch direction and the roll direction is calculated relative to the initial pitch offset angle and the initial roll offset angle.

54. (New) The leveling system according to claim 53, wherein the one or more sensor devices are secured to the vehicle during a manufacturing process of the vehicle, and wherein the calibration data is obtained during the manufacturing process.

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14/961,787	12/07/2015	Charles A. Leonard	7137	8904

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EXAMINER	
MARTINEZ BORRERO, LUIS A	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patlaw@worldpatents.com

Office Action Summary	Application No. 14/961,787	Applicant(s) Leonard, Charles A.	
	Examiner LUIS A MARTINEZ BORRERO	Art Unit 3665	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 08/13/2019.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☑ This action is **FINAL.** 2b) ☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1,10,12,14-15,20,22-23,26,28-29,38 and 45-54 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1,10,12,14-15,20,22-23,26,28-29,38 and 45-54 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 02/16/2016 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Notice on Prior Art Rejections

2. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

Status of Claims

3. This Office Action is in response to the applicant's arguments/amendments filed August 13, 2019. Claims **1, 10, 14, 15, 20, 22, 23, 26, 29**, and **38** are amended; claims **2-5, 7, 16, 18, 24, 25, 27,** and **43** are cancelled. Claims **1, 10, 12, 14, 15, 20, 22, 23, 26, 28, 29, 38, and 45-54** are presently pending and are presented for examination.

Response to Arguments/Remarks

4. **35 U.S.C. 112(b) rejection.** Applicant's arguments/amendments filed on August 13, 2019 with regard to the previous 35 U.S.C. 112(b) rejection have been fully considered. Applicant's arguments/amendments are persuasive. Accordingly, 35 U.S.C. 112(b) rejection is withdrawn.

5. **35 USC § 103 rejection**. Applicant's arguments/amendments filed on August 13, 2019 with regard to the previous 35 USC § 103 rejection have been fully considered. Applicant's arguments, with respect to the previous 35 USC § 103 rejection are not persuasive.

The applicant further argues that "The cited references appear to be silent with respect to a smart device that has a software application operating thereon, whereby this software application is activated to cause the one or more sensor devices to sense information regarding the inclination of the vehicle in both the pitch direction and the roll direction".

However, the examiner respectfully disagrees. Thorpe discloses the computer control code or program to perform leveling operation **(see at least ¶ 39)**. A person of ordinary skill in the art would have understood that the concept of a program with a user-interface is an application. The examiner interprets the device of Thorpe as inclusive of a smart device that has a software application. Regardless of this interpretation, the examiner will continue to use the reference of Luk that also teaches a smart device that has a software application as well as a digital accelerometer that uses an X-axis, Y-axis, and Z-axis. Therefore, the prior art discloses the above limitation.

The applicant further argues that "the display panel 90 of Thorpe is configured to show only one adjustment at a time and thus is unable to simultaneously display... the adjustment in height... to level the vehicle in the pitch direction and the adjustment in height... to level the vehicle in the roll direction".

However, the examiner respectfully disagrees. Thorpe explicitly states in paragraph 12 that the control unit also has a display panel for displaying the pitch and roll information received from the level unit and one or more operator accessible control buttons for activating

and operating the leveling system. Since pitch and roll information are displayed, Thorp is not only showing one adjustment but both the pitch and roll.

Therefore, for the above reasons, the examiner maintains the 35 USC § 103 rejection over claim **1**.

Claims **45-54** depend from claim **1** and therefore include the same limitation as claim **1** so they are rejected for the same reason.

Independent claims **10** and **29** contain similar limitations so they are rejected for similar reasons.

Claims **12, 14, 15, 20, 22, 23, 26, 28, and 38** depend from independent claim **10** and **29** respectively and therefore include the same limitation as claims **10** and **29** so they are rejected for the same reason.

Claim Rejections - 35 USC § 112

6. The following is a quotation of 35 U.S.C. 112(b):

> (B) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.
>
> The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
>
> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims **22, 26, 28** are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

8. Claims **22, 26, 28** recite "the vehicle". There is no clarity as to what vehicle the applicant refers to. The applicant claims a recreational vehicle or a trailer in independent claim **10**, however claims **22, 26, 28** seem to talk about a different vehicle. Neither the claims nor the specification provide sufficient detail such that a person of ordinary skill would understand precisely what vehicle the applicant refers to. As a result of this ambiguity, the precise boundary of the claim cannot be determined. Therefore, the claims are rejected as indefinite under 35 U.S.C. 112(b).

9. Claim **38** is rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as reciting or depending upon a claim that recites limitations for which there are no antecedent basis. In particular:

Claim **38** recites "the executable instructions". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims **1, 10, 12, 14, 15, 20, 22, 23, 29, and 46-54** are rejected under 35 U.S.C 103 as being unpatentable over Thorpe et al, US 2008/0142768, in view of Luk et al, US 2012/0197587, hereinafter referred to as Thorpe and Luk, and respectively.

As per Claim 1. Thorpe discloses a leveling system for leveling a vehicle that is at rest, the leveling system comprising:

one or more sensor devices secured to a vehicle to sense an inclination of the vehicle in both a pitch direction and a roll direction ***(See at least ¶ 12, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition… the level sensing means is a dual-axis accelerometer that is configured to determine the tilt of the recreational vehicle in both the front-to-back and side-to-side directions)***, each of the one or more sensor devices comprising a printed circuit board that includes ***(¶ 0038, via Level sensing means 38 comprises one or more tilt sensors that are configured to detect the amount of pitch and roll of recreational vehicle), (¶ 0038, via In one configuration, level sensing means 38 comprises two separate tilt sensors, one positioned in the front/back direction for determining the pitch and one positioned in the left/right direction for determining the roll)***:

a digital accelerometer that permits calculation in both the pitch direction and the roll direction ***(See at least ¶ 34, via In other embodiments, the vehicle sensors 206, 208 may comprise one or more of an accelerometer, a gyroscope, a liquid capacitive device, an electrolytic level device, a gas bubble in liquid device, a pendulum device, and the like)***, and

a processor to process data collected by the respective digital accelerometer ***(¶ 38, via level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 low-power two-axis linear accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle 16 relative to a calibrated reference position (i.e., the level***

condition 20). The level sensing means 38 includes an integrated circuit interface that takes the information from the sensing element of sensing means 28 to deliver an analog signal for conversion and then use by control unit 14), and

a smart device in wireless communication with the one or more sensor devices ***(See at least fig 2, ¶ 0011, via In the preferred embodiment of the present invention, the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle)***, the smart device configured to activate the smart device to cause the one or more sensors devices to sense information regarding the indication of the vehicle in both the pitch direction and the roll direction ***(Claim 1, "control unit having a display panel for displaying the pitch and roll information of said recreational vehicle and one or more control buttons for activating and/or operating said leveling system")***,

wherein the information sensed by the one or more sensor devices regarding the inclination of the vehicle in both the pitch direction and the roll direction is processed to determine an amount of adjustment in height to a rear section or front section of the vehicle needed to level the vehicle in the pitch direction ***(¶ 11, "a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle")*** and to determine an amount of adjustment in height to a first side section or a second side section of the vehicle needed to level the vehicle in the roll direction ***(¶ 12, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can***

operate the leveling mechanism to place the recreational vehicle in its level condition…The control unit also has a display panel for displaying the pitch and roll information received from the level unit and one or more operator accessible control buttons for activating and operating the leveling system),

wherein the smart device is configured to simultaneously display, in near real time, the adjustment in height to the rear section or front section of the vehicle needed to level the vehicle in the pitch direction and the adjustment height to the first side section or the second side section of the vehicle needed to level the vehicle in the roll direction ***(¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator-useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator)***.

Thorpe fails to explicitly disclose a software application operating on the smart device.

However, Luk teaches a software application operating on the smart device ***(See at least ¶ 35, "Such portable device (2) may be further equipped with a commercially available software application program (an App) that can activate the device (2) automatically by a remotely transmitted command signal), (Thorpe discloses the computer control code or program to perform leveling operation (see at least ¶ 39). A person of ordinary skill in the art would have understood that the concept of a program with a user-interface is an application).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify a smart device configured to activate the

smart device to cause the one or more sensors devices to sense information regarding the indication of the vehicle in both the pitch direction and the roll direction of Thorpe and include a software application operating on the smart device as taught by Luk because it would allow the system to activate the smart device automatically by a remotely transmitted command signal (Luk ¶ 35).

As per Claim 10. Thorpe discloses a method for leveling a recreational vehicle or trailer, the method comprising the steps of:

providing a leveling system that includes:

one or more sensor devices secured to the recreational vehicle or trailer, each of the one or more sensor devices configured to sense an inclination of the recreational vehicle or trailer in both a pitch direction and a roll direction ***(See at least ¶ 12, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition… the level sensing means is a dual-axis accelerometer that is configured to determine the tilt of the recreational vehicle in both the front-to-back and side-to-side directions)***; and

a smart device in wireless communication with the one or more sensor devices ***(See at least fig 2, ¶ 0011, via In the preferred embodiment of the present invention, the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle)***, the smart device configured to instruct the one or more sensors devices to sense the inclination of the recreational vehicle or trailer in both the pitch

direction and the roll direction ***(Claim 1, "control unit having a display panel for displaying the pitch and roll information of said recreational vehicle and one or more control buttons for activating and/or operating said leveling system")***,

determining an initial level position for the recreational vehicle or trailer using the smart device ***(See at least ¶ 11, via The leveling system of the present invention includes a calibration procedure to allow the operator to selectively calibrate the zero or level condition), (the examiner interprets inconsistencies as an example of misreadings or miscalculations during calibration);***

capturing initial pitch and roll angle measurements from the sensor device taken at the initial level position on the smart device to determine calibration offset data of the initial pitch and roll angle measurements ***(¶ 12, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition)*** to be used when taking measurement readings at a future time ***(¶ 19, via provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition)***;

measuring the pitch angle and the roll angle of the recreational vehicle or trailer when the recreational vehicle or trailer is at rest using the sensor device ***(¶ 0036, via allow the components disposed in interior chamber 28 of level unit 12 to measure the pitch and roll tilt so that leveling system 10 can determine the adjustment necessary to neutralize that tilting), (¶ 0012, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational***

vehicle in its level condition), (¶ 0044, via To level a recreational vehicle 16 having leveling system 10 after parking recreational vehicle 16 where desired);

retrieving the calibration offset data of initial pitch angle and roll angle measurements taken by the sensor device when the recreational vehicle or trailer was at the initial level position ***(¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator);***

calculating any needed change in height to a rear section or front section of the recreational vehicle or trailer to obtain a level position of the recreational vehicle or trailer in the pitch direction using the measured pitch angle and the calibration offset data of the initial pitch angle measurements ***(¶ 11, "a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a***

side or end of the vehicle in order to level the vehicle"), (¶ 12, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition…The control unit also has a display panel for displaying the pitch and roll information received from the level unit and one or more operator accessible control buttons for activating and operating the leveling system);

calculating any needed change in height to a first side section or second side section of the recreational vehicle or trailer to obtain a level position of the recreational vehicle or trailer in the roll direction using the calibration measured roll angle and the calibration offset data of the initial roll angle measurement ***(¶ 8, via The foregoing patents are representative of leveling systems that require manual, independent determination of the amount of height adjustment needed to place the vehicle in the level condition), (¶ 0011, via the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition 20);***

displaying, on the smart device, the calculated change in height to the rear section or front section of the recreational vehicle or trailer needed to level the recreational vehicle or trailer in the pitch direction ***(¶ 0040, via on FIG. 9, is used to switch control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to***

obtain level condition), (¶ 0038, via controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator);

simultaneously displaying, on the smart device, the calculated change in the height to the first side section or second side section of the recreational vehicle or trailer needed to level the recreational vehicle or trailer in the roll direction ***(¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator)***.

Thorpe fails to explicitly disclose a software application operating on the smart device.

However, Luk teaches a software application operating on the smart device ***(See at least ¶ 35, "Such portable device (2) may be further equipped with a commercially available software application program (an App) that can activate the device (2) automatically by a remotely transmitted command signal), (Thorpe discloses the computer control code or program to perform leveling operation (see at least ¶ 39). A person of ordinary skill in the art would have understood that the concept of a program with a user-interface is an application).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify a smart device configured to instruct the one or more sensors devices to sense the inclination of the recreational vehicle or trailer in both the pitch direction and the roll direction of Thorpe and include a software application operating

on the smart device as taught by Luk because it would allow the system to activate the smart device automatically by a remotely transmitted command signal (Luk ¶ 35).

As per Claim 12. Thorpe discloses the method according to claim 11, wherein the step of determining an initial level position comprises using at least one of an accelerometer, gyroscope, or global positioning system sensor on the smart device to achieve the initial level position ***(¶ 0012, via Although separate tilt sensors can be utilized, in the preferred embodiment the level sensing means is a dual-axis accelerometer that is configured to determine the tilt of the recreational vehicle in both the front-to-back and side-to-side directions), (¶ 0038, via In a preferred embodiment of the present invention, however, level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 lowpower two-axis linear accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle).***

As per Claim 14. Thorpe discloses the method according to claim 10, wherein the step of capturing the initial pitch and roll angle measurements from the one or more sensor devices comprises communicating the calibration offset data from the one or more sensor devices of the initial pitch and roll angle measurements measured by the one or more sensor devices when the vehicle is at the initial level position to the smart device and saving the calibration offset data on the smart device ***(¶ 0011, via the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (¶ 0036, via***

Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition 20).

As per Claim 15. Thorpe discloses the method according to claim 10, wherein the step of capturing the initial pitch and roll angle measurements from the one or more sensor devices comprises saving the calibration offset data of the initial pitch and roll angle measurements measured by the one or more sensor devices when the vehicle is at the initial level position on the one or more sensor devices ***(¶ 0038, via As shown in FIG. 11, the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information), (¶ 0011, via In the preferred embodiment of the present invention, the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle).***

As per Claim 20. Thorpe discloses the method according to claim 10, wherein the step of displaying the calculated change in the pitch direction and the step of simultaneously displaying the calculated change in the roll direction further comprises the step of displaying the calculated

change in the pitch direction and the roll direction of the recreational vehicle or trailer in measurements of distance ***(¶ 0040, via on FIG. 9, is used to switch control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition), (¶ 0038, via controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).***

As per Claim 22. Thorpe discloses the method according to claim 10, further comprising saving a given pitch angle measurement on at least one of the smart device or the one or more sensor devices to permit later recall for the purpose of returning the vehicle to the given pitch angle position at a later time ***(¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).***

As per Claim 23. Thorpe discloses the method according to claim 10, further comprising receiving data regarding holding tank levels or data regarding battery power levels at the smart device from one or more vehicle control panels ***(¶ 0036, via In an alternative configuration, not shown, user accessible buttons and/or a display panel can be used with level unit 12 to allow the operator to directly access the operation of level unit), (¶ 0044, via In the preferred embodiment, battery monitoring circuit 61 of level 12 and control 14 units is configured to transmit battery level information to display panel 90 when the amount of power in batteries 40 or 86 reach a certain low level. Alternatively, leveling system 10 can also be configured to such that the operator can access the battery level information by pushing the mode button 80 on control unit 14 when he or she desires to check the battery levels).***

As per Claim 29. Thorpe discloses a non-transitory computer readable medium comprising computer executable instructions that, when executed by a processor of a smart device, causes the smart device to perform the steps comprising:

receiving a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device secured to the vehicle ***(¶ 0036, via allow the components disposed in interior chamber 28 of level unit 12 to measure the pitch and roll tilt so that leveling system 10 can determine the adjustment necessary to neutralize that tilting), (¶ 0012, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition), (¶ 0044, via To level a recreational vehicle 16 having leveling system 10 after parking recreational vehicle 16 where desired)***, the sensor device comprising a

printed circuit board that includes a digital accelerometer that permits calculation in both the pitch direction and the roll direction ***(See at least ¶ 34, via In other embodiments, the vehicle sensors 206, 208 may comprise one or more of an accelerometer, a gyroscope, a liquid capacitive device, an electrolytic level device, a gas bubble in liquid device, a pendulum device, and the like), (¶ 29, via a vehicle 104 may be leveled by a leveling system 102 based on a first signal 202 representing a lateral force (i.e., tilt, roll) acting on the vehicle 104 and a second signal 204 representing a longitudinal force (i.e., pitch) acting on the vehicle 104. The first 202 and second 204 signals may be sent by one or more vehicle sensors (206, 208) associated with the vehicle 104, and received by a processing or control portion 210 of the leveling system), (¶ 36, via level unit 12 is placed on a flat surface inside recreational vehicle 16), (¶ 38, via level sensing means 38 is a dual-axis accelerometer, such as the model number LIS2L02AS4 low-power two-axis linear accelerometer available from ST Microelectronics, that is configured to detect tilting in both the front/back and left/right directions so as to determine the attitude of recreational vehicle 16 relative to a calibrated reference position (i.e., the level condition 20). The level sensing means 38 includes an integrated circuit interface that takes the information from the sensing element of sensing means 28 to deliver an analog signal for conversion and then use by control unit 14), (See at least ¶ 11, via The leveling system of the present invention includes a calibration procedure to allow the operator to selectively calibrate the zero or level condition);***

retrieving stored calibration data of pitch angle and roll angle measurements taken by the sensor device when the vehicle was at an initial level position ***(¶ 0019, via provide a leveling system for recreational vehicles that provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the***

amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition), (¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator);

calculating any needed change in height to a rear section or a front section of the vehicle to obtain a level position of the vehicle in a pitch direction using the pitch angle measurement and the stored calibration data of pitch angle measurements ***(¶ 12, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition), (¶ 19, via provides the operator with the ability to set the calibration for a zero or level condition from which future measurements will be taken to determine the amount a side and/or an end of the vehicle must be raised to place it in the preset level condition), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition 20)***;

calculating any needed change in height to a first side section or a second side section of the vehicle to obtain a level position of the vehicle in a roll direction using the roll angle measurement and the stored calibration data of roll angle measurements ***(¶ 8, via The foregoing patents are representative of leveling systems that require manual, independent determination of the amount of height adjustment needed to place the vehicle in the level condition), (¶ 0011, via the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (¶ 0036, via Proper placement of level unit 12 is necessary for the operation of level unit 12 to determine the amount of pitch (front/back angle) and roll (left/right) for analyzing the attitude of recreational vehicle 16 relative to a calibrated reference position or predetermined attitude at level condition 20);***

displaying the calculated change in height to the rear section or front section of the vehicle to obtain a level position of the vehicle in the pitch direction ***(¶ 0040, via on FIG. 9, is used to switch control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition), (¶ 0038, via controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator)***; and

simultaneously displaying the calculated change in the height to the first side section or second side section of the vehicle to obtain a level position of the vehicle in the roll direction ***(¶ 0038, via the output from level sensing means 38 goes to one or more analog conversion devices, such as the operation amplifiers 48a, 48b, 48c and 48d, that convert the analog signal to a linear value that is used by controller 36 to determine the pitch and roll level position***

relative to the common reference 50. This data is then wirelessly transmitted to control unit 14 for processing into operator- useable information. Alternatively, controller 36 or level unit 12 can process the data and transmit the final tilt adjustment data to control unit 14 for display to the operator).

Thorpe fails to explicitly disclose a software application operating on the smart device.

However, Luk teaches a software application operating on the smart device ***(See at least ¶ 35, "Such portable device (2) may be further equipped with a commercially available software application program (an App) that can activate the device (2) automatically by a remotely transmitted command signal), (Thorpe discloses the computer control code or program to perform leveling operation (see at least ¶ 39). A person of ordinary skill in the art would have understood that the concept of a program with a user-interface is an application).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify a processor of a smart device, causes the smart device to perform the steps comprising: receiving a pitch angle measurement and a roll angle measurement of a vehicle when the vehicle is at rest from a sensor device secured to the vehicle of Thorpe and include a software application operating on the smart device as taught by Luk because it would allow the system to activate the smart device automatically by a remotely transmitted command signal (Luk ¶ 35).

As per Claim 46. Thorpe discloses the leveling system according to claim 1, wherein the smart device communicates with the one or more sensor devices using the Bluetooth protocol ***(¶ 0011, via In the preferred embodiment of the present invention, the leveling system has a level unit which determines how level the vehicle is and wirelessly transmits that information to a***

control unit which visually indicates to the operator the amount the recreational vehicle is out of level in degrees and the amount needed to raise a side or end of the vehicle in order to level the vehicle), (The examiner interprets the Bluetooth protocol as inclusive of wireless transmission).

As per Claim 47. Thorpe discloses the leveling system according to claim 1, wherein the adjustments in height needed to level the vehicle in both the pitch direction and roll direction are calculated from the pitch angle measurements, roll angle measurements, a width dimension of the vehicle, and a length dimension of the vehicle ***(¶ 0038, via Level sensing means 38 comprises one or more tilt sensors that are configured to detect the amount of pitch and roll of recreational vehicle), (¶ 0038, via In one configuration, level sensing means 38 comprises two separate tilt sensors, one positioned in the front/back direction for determining the pitch and one positioned in the left/right direction for determining the roll)***.

As per Claim 48. Thorpe discloses the leveling system according to claim 47, wherein the width dimension of the vehicle is taken from an outside point on a first wheel to an outside point on a second wheel on an opposite side from the first wheel, and wherein the length dimension of the vehicle is taken from a center point of a rear axle to a front jack ***(¶ 0040, via As shown in FIG. 6, display panel 90 can display the amount of pitch or roll in degrees and the amount in inches or other measurement units, based on a known length or width of recreational vehicle 16, that one end or side of the recreational vehicle 16 must be raised to place recreational vehicle 16 in level condition), (¶ 0044, via If desired, leveling system 10 can be adapted to include the length information for specific lengths of recreational vehicles 16 and/or to allow the operator to***

input the length into its operating system, such as at flash memory 60, by entering the data at control unit).

As per Claim 49. Thorpe discloses the leveling system according to claim 47, wherein the width dimensions and length dimensions of a plurality of makes and models of vehicles are pre-programmed in a vehicle list, and wherein the smart device enables a user to select the vehicle from the vehicle list ***(¶ 0040, via As shown in FIG. 6, display panel 90 can display the amount of pitch or roll in degrees and the amount in inches or other measurement units, based on a known length or width of recreational vehicle 16, that one end or side of the recreational vehicle 16 must be raised to place recreational vehicle 16 in level condition), (¶ 0044, via If desired, leveling system 10 can be adapted to include the length information for specific lengths of recreational vehicles 16 and/or to allow the operator to input the length into its operating system, such as at flash memory 60, by entering the data at control unit).***

As per Claim 50. Thorpe discloses the leveling system according to claim 1, wherein the smart device is further configured to display an adjustment in the pitch angle needed to level the vehicle in the pitch direction and an adjustment in the roll angle needed to level the vehicle in the roll direction ***(¶ 0040, via, control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition)***.

As per Claim 51. Thorpe discloses the leveling system according to claim 50, wherein the smart device is further configured to display an image of the vehicle and one or more arrows indicating

the direction of adjustment needed to level the vehicle in both the pitch and roll directions ***(¶ 10, via the leveling system include a visual indicating means to inform the operator of the amount a side or an end must be raised to place the vehicle in a substantially level condition), (¶ 40, via, control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition)***.

As per Claim 52. Thorpe discloses the leveling system according to claim 1, wherein the smart device is further configured to update the display during a leveling process to indicate remaining adjustments needed to level the vehicle ***(¶ 40, via, control unit 14 between its various display and function modes, such as showing the pitch or roll adjustments needed to obtain level condition)***.

As per Claim 53. Thorpe discloses the leveling system according to claim 1, wherein calibration data is stored on the smart device or one or more sensor devices, wherein the calibration data is obtained when the vehicle is in a known level position ***(See at least ¶ 11, via The leveling system of the present invention includes a calibration procedure to allow the operator to selectively calibrate the zero or level condition)***, wherein the calibration data includes an initial pitch offset angle of the one or more sensor devices taken when the vehicle is in the known level position and an initial roll offset angle of the one or more sensor devices taken when the vehicle is in the known level position ***(See at least ¶ 43, via To set leveling system 10 for future use, it is preferred to place the recreational vehicle 16 in its level condition 20 based on the operator's preference…This activity will set the reference position, from which the amount of out-of-level will be determined, to zero. This calibration step should be done even if the initial placement of***

level unit 12 indicates recreational vehicle 16 is level to ensure the surface on which level unit 12 is placed is not compensating for an incorrect level of recreational vehicle), and wherein the information regarding the inclination of the vehicle in both the pitch direction and the roll direction is calculated relative to the initial pitch offset angle and the initial roll offset angle ***(¶ 12, via The level sensing means is configured to determine the pitch and the roll of the recreational vehicle so the user can operate the leveling mechanism to place the recreational vehicle in its level condition)***.

As per Claim 54. Thorpe discloses the leveling system according to claim 53, wherein the one or more sensor devices are secured to the vehicle during a manufacturing process of the vehicle, and wherein the calibration data is obtained during the manufacturing process ***(See at least ¶ 11, via The leveling system of the present invention includes a calibration procedure to allow the operator to selectively calibrate the zero or level condition), (a person of ordinary skill in the art would have understood that a manufacturing process already includes calibration data of a vehicle).***

12. Claims **26, 28, and 38** are rejected under 35 U.S.C 103 as being unpatentable over Thorpe in view of Luk, further in view of Howarter et al. US 2012/0208520, hereinafter referred to as Howarter, respectively.

As per Claim 26. Thorpe discloses the method according to claim 10, further comprising the step of activating the one or more sensor devices to sense information regarding the inclination of the vehicle in both the pitch direction and the roll direction ***(¶ 0012, via The control unit also***

has a display panel for displaying the pitch and roll information received from the level unit and one or more operator accessible control buttons for activating and operating the leveling system.), (¶ 0044, via The operator first activates the control unit 14 by pushing the power button 78 to tum leveling system 10 to its on condition).

Thorpe fails to explicitly disclose further includes activating one or more systems on the vehicle, wherein the one or more systems include at least one of lighting systems, entertainment systems, power slide-outs, or generators.

However, Howarter teaches activating one or more systems on the vehicle, wherein the one or more systems include at least one of lighting systems, entertainment systems, power slide-outs, or generators ***(¶ 0019 via The vehicle 106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0031, via The user interface 208 may include the other controls or systems for managing systems of the vehicle which may include the stereo, entertainment system, temperature controls, driving controls, and other elements of the vehicle).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify activating the one or more sensor devices to sense information regarding the inclination of the vehicle of Thorpe and include activating one or more systems on the vehicle, wherein the one or more systems include at least one of lighting systems, entertainment systems, power slide-outs, or generators as taught by Howarter because it would allow the method to provide support to the user to configure and control the different features and elements managed by the vehicle control systems via a cell phone.

As per Claim 28. Thorpe discloses the method according to claim 10.

Thorpe fails to explicitly disclose collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device.

However, Howarter teaches collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device ***(¶ 0019 via The vehicle 106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0020, via the vehicle system includes a GPS or other navigation systems. The GPS may be utilized to determine the location of the vehicle 106. The GPS may also receive data or information from the cell phone 104 in order to determine the location and direction of travel of the cell phone and an associated user).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify displaying the calculated change in at least one of the pitch direction or the roll direction of the vehicle on the smart device of Thorpe and include collecting and storing positional movement information of the vehicle using a global positioning system sensor on the sensor device as taught by Howarter because it would allow the method to provide information to the user with respect to the location of the vehicle and the location and direction of travel of the cell phone and an associated user to determine the exact or approximate distance between the cell phone and the vehicle.

As per Claim 38. Thorpe discloses the non-transitory computer readable medium according to claim 29.

Thorpe fails to explicitly wherein, when executed by the processor of the smart device, the executable instructions further cause the smart device to receive data from one or more vehicle control panels.

However, Howarter teaches wherein, when executed by the processor of the smart device, the executable instructions further cause the smart device to receive data from one or more vehicle control panels ***(¶ 0019 via The vehicle 106 may include a computer, global positioning system (GPS), stereo, user interface, computing system, or other vehicle elements configured to communicate with the cell phone), (¶ 0031, via The user interface 208 may include the other controls or systems for managing systems of the vehicle which may include the stereo, entertainment system, temperature controls, driving controls, and other elements of the vehicle).***

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify displaying the calculated change in height to the rear section or front section of the vehicle to obtain a level position of the vehicle in the pitch direction of Thorpe and include wherein, when executed by the processor of the smart device, the executable instructions further cause the smart device to receive data from one or more vehicle control panels as taught by Howarter because it would allow the method to provide support to the user to configure and control the different features and elements managed by the vehicle control systems via a cell phone.

13. Claim **45** is rejected under 35 U.S.C 103 as being unpatentable over Thorpe in view of Luk, further in view of Tanenhaus et al, US 8,239,162, hereinafter referred to as Tanenhaus respectively.

As per Claim 45. Thorpe discloses the leveling system according to claim 1.

Thorpe fails to explicitly disclose wherein the one or more sensor devices are further configured to determine one or more of temperature, relative humidity, and barometric pressure, and wherein the smart device is further configured to adjust the information regarding the inclination of the vehicle in both the pitch direction and the roll direction to compensate for variations in measurements caused by changes to one or more of the temperature, relative humidity, and barometric pressure.

However, Tanenhaus teaches wherein the one or more sensor devices are further configured to determine one or more of temperature, relative humidity, and barometric pressure, ***(See at least Column 11, lines 4-8, "Temperature sensors 121 in a particular embodiment are part of each of the gyros 104 and accelerometer 107. The temperature sensors 121 sense temperature and compensate for changes outside the normal gyro and accelerometer ranges")*** and wherein the smart device is further configured to adjust the information regarding the inclination of the vehicle in both the pitch direction and the roll direction to compensate for variations in measurements caused by changes to one or more of the temperature, relative humidity, and barometric pressure ***(See at least Column 15, lines 36-39, "the measurement system to provide a correction signal for correction of gyro bias errors, the accelerometer errors, and the temperature derived from an internal temperature sensor to measure and correct for temperature extremes")***.

Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention to modify a processor to process data collected by the respective digital accelerometer of Thorpe and include wherein the one or more sensor

devices are further configured to determine one or more of temperature, relative humidity, and barometric pressure, and wherein the smart device is further configured to adjust the information regarding the inclination of the vehicle in both the pitch direction and the roll direction to compensate for variations in measurements caused by changes to one or more of the temperature, relative humidity, and barometric pressure as taught by Tanenhaus because it would allow the temperature sensors sense temperature and compensate for changes outside the normal gyro and accelerometer ranges ***(See Tanenhaus at least Column 11, lines 6-8).***

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **LUIS MARTINEZ** whose email is luis.martinezborrero@uspto.gov and telephone number is (571)272-4577. The examiner can normally be reached on Monday-Friday 8:30AM-5:00PM EST.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **HUNTER LONSBERRY** can be reached on **(571)272-7298**. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/L.A.M/
Examiner, Art Unit 3665

/HUNTER B LONSBERRY/
Supervisory Patent Examiner, Art Unit 3665

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-6554293-B1	04-2003	Fennel; Helmut	B60T8/1708	280/5.502
*	B	US-7590481-B2	09-2009	Lu; Jianbo	B60T8/172	340/440
*	C	US-7029014-B2	04-2006	Hamm; Alton B.	B60G7/006	267/265
*	D	US-9421907-B2	08-2016	Carpani; Anthony	G01C9/00	1/1
*	E	US-8757637-B2	06-2014	Tiedge; Robert	B60S9/10	280/6.153
*	F	US-9073516-B2	07-2015	Schwindaman; Michael A.	B60S9/12	1/1
*	G	US-7294797-B2	11-2007	Erickson; John Scott	B60S9/02	200/18
*	H	US-6848693-B2	02-2005	Schneider; Robert H.	B60S9/12	280/6.153
*	I	US-4216939-A	08-1980	Valdespino; Joseph M.	B60S9/12	254/423
*	J	US-9004454-B1	04-2015	Faure; Luis Enrique	B65D90/14	254/89H
*	K	US-8840144-B2	09-2014	Armstrong; Rocky E	B60S9/04	280/764.1
*	L	US-20080217898-A1	09-2008	Hanscom; Paul	B60P3/36	280/763.1
*	M	US-20110169231-A1	07-2011	Tiedge; Robert	B60S9/12	280/6.153

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NON-PATENT DOCUMENTS

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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
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*	A	US-20090200782-A1	08-2009	Albrecht; Jeffrey	B60S9/04	280/763.1
*	B	US-20080142768-A1	06-2008	Thorpe; Jim	B60S9/12	254/423
*	C	US-9223302-B2	12-2015	Maurer; Garrett	H02P29/00	1/1
*	D	US-20070103289-A1	05-2007	Dagci; Oguz H.	G08B25/007	340/521
*	E	US-6921100-B2	07-2005	Mantini; John	B60G17/005	177/137
*	F	US-7786883-B1	08-2010	Davison, III; George M.	B60P3/36	33/366.11
*	G	US-7584026-B2	09-2009	Siemer; Edward D.	G07C5/008	342/357.57
*	H	US-20050161891-A1	07-2005	Trudeau, Curtis A.	B60G17/0155	280/5.507
*	I	US-20070192002-A1	08-2007	Iyoda; Ikuhide	B60G17/0164	701/37
*	J	US-20050212225-A1	09-2005	Suzuki, Shigeki	B60G17/0155	280/5.514
*	K	US-20060113783-A1	06-2006	Erickson; John Scott	B60S9/02	280/766.1
*	L	US-20150210287-A1	07-2015	Penilla; Angel A.	B60W40/08	701/49
*	M	US-20140200765-A1	07-2014	WAELLER; Christoph	H04L12/282	701/36

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*	B	US-20120208520-A1	08-2012	Howarter; Jamie C.	B60R25/2009	455/420
*	C	US-8538408-B2	09-2013	Howarter; Jamie C.	B60R25/2009	455/420
*	D	US-20150021866-A1	01-2015	Solbrack; Dennis R.	B60G15/067	280/6.155
*	E	US-9409459-B2	08-2016	Solbrack; Dennis R.	B60G15/067	1/1
*	F	US-5864768-A	01-1999	Bieber; Martin	B60G17/0182	280/5.506
*	G	US-7463953-B1	12-2008	Lee; Jonathan	B60W40/12	701/1
*	H	US-20070200304-A1	08-2007	Brookes; Graham R.	B60G17/0155	280/5.514
*	I	US-20040178587-A1	09-2004	Hiebert, Grant W.	B60G17/0155	280/5.507
*	J	US-20020035423-A1	03-2002	Shank, David	B60G17/0185	701/37
*	K	US-20170136843-A1	05-2017	MARKING; John	F16F9/466	1/1
*	L	US-20120197587-A1	08-2012	Luk; Yiu Wah	B60W40/09	702/141
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*	B	US-20110202225-A1	08-2011	Willis; Richard Ernest	G01C21/165	701/31.4
*	C	US-20180045753-A1	02-2018	Sun; Chen	G01P15/125	1/1
*	D	US-20150354951-A1	12-2015	Ali; Abdelrahman	G01C21/16	702/141
*	E	US-20140338452-A1	11-2014	Sun; Chen	G01P15/125	73/514.32
*	F	US-9829504-B2	11-2017	Sun; Chen	G01P15/125	1/1
*	G	US-20120330497-A1	12-2012	De Tommasi; Claudio	G01C21/165	701/33.1
*	H	US-20120209502-A1	08-2012	Nichols; Boyd M.	B62D53/021	701/124
*	I	US-5231583-A	07-1993	Lizell; Magnus B.	B60G17/015	280/5.506
*	J	US-4935883-A	06-1990	Hulsing II; Rand H.	G01V7/00	175/45
*	K	US-8239162-B2	08-2012	Tanenhaus; Martin E.	G01C21/16	702/145
*	L	US-20180004230-A1	01-2018	Leonard; Charles A.	G05D1/0891	1/1
*	M	US-20060226612-A1	10-2006	Smith; Scott W.	B60P3/00	280/6.153

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*	B	US-10427654-B2	10-2019	Garceau; Bernard F.	B60S9/08	1/1
*	C	US-7624995-B2	12-2009	Barbison; James M.	B60G17/005	280/5.514
*	D	US-6722635-B2	04-2004	Erickson; John Scott	B60S9/08	254/103
*	E	US-5915700-A	06-1999	Schneider; Robert H.	B60S9/12	280/6.15
*	F	US-5143386-A	09-1992	Uriarte; Jorge	B60S9/02	180/41
*	G	US-4784400-A	11-1988	Hofius; Walter E.	B60S9/10	254/122
*	H	US-4746133-A	05-1988	Hanser; Paul E.	B60S9/12	180/41
*	I	US-4743037-A	05-1988	Hanser; Paul. E.	B60S9/12	180/41
*	J	US-4597584-A	07-1986	Hanser; Paul E.	B60S9/12	180/41
*	K	US-3917307-A	11-1975	Shoebridge; Harold P.	B60G17/005	280/104
*	L	US-3912289-A	10-1975	Czajkowski, Jr.; Edward H.	F41A23/56	254/418
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CPC - Searched*		
Symbol	**Date**	**Examiner**
G05D1/0891, 1/0016, 1/0236, 1/0251, 1/0255, 1/027,	12/7/2016	/L.A.M./
B60W2540/28, 2550/141, 2550/402, 2710/30, 2550/406, 2720/30,	12/7/2016	/L.A.M./
G05D1/0274, 1/0278, 1/0287, 2201/0201, 1/0858,	8/1/2017	/L.A.M./
B60G2204/127, 2204/4232, 2204/83022, 2500/30, 2600/73,	8/1/2017	/L.A.M./
G05D1/0094, 1/0231, 1/0246,	03/15/2018	LAM
B60G17/08, 13/08, 2600/20, 2500/10, 2800/162,	03/15/2018	LAM
B60T8/172, 2201/04, 7/12,	11/15/2018	LAM
G05D1/0088, 1/0257, 201/0213, 1/00,	11/15/2018	LAM
G05D1/0016, 1/0891,	04/29/2019	LAM
G05D 1/0016, G05D 1/0891,	10/31/2019	LAM

CPC Combination Sets - Searched*		
Symbol	**Date**	**Examiner**

US Classification - Searched*			
Class	**Subclass**	**Date**	**Examiner**
701	22, 37, 112, 2, 23, 21, 123, 1, 101, 102, 50, 60,	12/7/2016	/L.A.M./
701	2, 49, 1, 19, 23, 25, 3, 41, 50,	8/1/2017	/L.A.M./

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

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ETN1002
629/655

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Search Notes		
Search Notes	**Date**	**Examiner**
East Search	12/7/2016	/L.A.M./
Google Patent Search	12/7/2016	/L.A.M./
East Search	8/1/2017	/L.A.M./
Consulted with primary Jelani smith (101, 112, patentability),	8/1/2017	/L.A.M./
Consulted with primary Jelani Smith	03/15/2018	LAM
East Search	03/15/2018	LAM
East Seach	11/15/2018	LAM
Consulted with primary Courtney Heinle	11/15/2018	LAM
East Search	04/29/2019	LAM
Consulted with primary Courtney Heinle	04/29/2019	LAM
East Search	10/31/2019	LAM

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**

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✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
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CLAIM		DATE								
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	54						✓			

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	649156	G05D 1/0016.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/10/31 17:37
L2	649156	G05D 1/0891.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/10/31 17:37
L3	442	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/10/31 17:38
L4	24	1 and 3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/10/31 17:38
L5	20	("20040173393" | "20050052080" | "20070170810" | "3717954" | "4714853" | "5562565" | "5947855" | "6165094" | "6184603" | "6208036" | "6290605" | "6302249" | "6484834" | "6552460" | "6930433" | "6935451" | "7115057" | "7255187" | "7432623").PN. OR ("8798828").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/10/31 17:38
L6	8	("20070083318" | "20080059007" | "20100131168" | "20100161173" | "6067031" | "6285929" | "6301530").PN. OR ("9187095").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/10/31 17:47
L7	20	4 and ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/10/31 17:48
L8	24	2 and 3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/10/31 17:48
L9	20	8 and ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT;	OR	ON	2019/10/31 17:48

			IBM_TDB			
L10	0	9 and (sofware near4 application)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/10/31 17:49
L11	490	((sens$4 or detect$3) near5 (pitch and roll)) with level$3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/10/31 17:50
L12	2	9 and 11	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/10/31 17:51
L13	0	((sens$4 or detect$3) near5 (pitch and roll)) with level$3 with trailer	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/10/31 17:53
L14	4	((sens$4 or detect$3) near5 (pitch and roll)) same level$3 same trailer	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/10/31 17:53
L15	48	("3770292" | "3831969" | "3873123" | "3912289" | "3917307").PN. OR ("4084830").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/10/31 17:55
L16	0	7 and 15	US-PGPUB; USPAT; USOCR	OR	OFF	2019/10/31 17:56
L17	57	("3404899" | "3669409" | "3817493" | "3885813" | "4061309" | "4067543" | "4084830" | "4165861").PN. OR ("4597584").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/10/31 17:58
L18	20	((("Leonard") near3 ("Charles") near3 ("A"))).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/10/31 17:59
S1	0	((vehicle or car or automobile) near4 (lavel$3)) with ((sens$4 or detect$3) near5 (inclinat$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 10:57
S2	0	((vehicle or car or automobile) near4 (lavel$4)) and ((sens$4 or detect$3) near5 (inclinat$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 10:57
S3	1252	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 10:58
S4	25	S3 AND ((B60T8/172 OR B60T2201/04 OR B60T2210/14 OR B60T2210/16 OR B60T2220/04 OR B60T2260/06 OR B60T7/12 OR B60T8/175 OR B60T11/22 OR B60T11/26 OR	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:00

		B60T13/741 OR B60T2210/12 OR B60T2230/00 OR B60T2250/06 OR B60T7/085 OR B60T7/107 OR B60T7/122 OR B60T8/32 OR G05D1/0088 OR G05D1/0257 OR G05D1/0891 OR G05D1/0016 OR G05D1/0061 OR G05D1/0231 OR G05D1/0236 OR G05D1/024 OR G05D1/0251 OR G05D1/0255 OR G05D1/027 OR G05D1/048 OR G05D2201/0213 OR G05D2201/0216).CPC. AND (701/22 OR 701/37 OR 701/112 OR 701/2 OR 701/23 OR 701/21 OR 701/29.1 OR 701/49 OR 701/70 OR 701/93 OR 701/96 OR 701/99 OR 701/1 OR 701/101 OR 701/102 OR 701/123 OR 701/300 OR 701/30.8 OR 701/32.4 OR 701/33.1 OR 701/36 OR 701/41 OR 701/468 OR 701/48 OR 701/50 OR 701/519 OR 701/54 OR 701/60 OR 701/65 OR 701/71 OR 701/82 OR 701/91 OR 701/94).CCLS. AND (G05D1/00 OR G05D1/02 OR G05D1/04 OR G05D1/08 OR B60T7/12 OR B60T8/172 OR B60T11/22 OR B60T11/26 OR B60T8/32).IPCR.)				
S5	5	S4 and inclinat$3 and sensor and pitch and roll	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:02
S6	145	S3 and inclinat$3 and sensor and pitch and roll	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:07
S7	66	("6554293").URPN.	USPAT	OR	ON	2016/12/05 11:09
S8	2	((vehicle or car or automobile) near4 (level$4)) with ((sens$4 or detect$3) near5 (inclinat$4)) with (accelerometer or gyroscope)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:25
S9	2	((vehicle or car or automobile) near4 (level$4)) with ((sens$4 or detect$3) near5 (inclinat$4)) with (accelerometer or gyroscope) with ((smart adj device) or device or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:32
S10	278	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:33
S11	134	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone) and wireless	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:35
S12	19	((vehicle or car or automobile) near4	US-PGPUB;	OR	ON	2016/12/05

		(level$4)) and ((sens$4 or detect$3) near5 (inclinat$4)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone) and wireless and roll and pitch and adjust$3 and display$3	USPAT; EPO; JPO; DERWENT; IBM_TDB			11:36
S13	518	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclination or orientation)) and (accelerometer or gyroscope) and ((smart adj device) or device or phone cell or cellphone) and roll and pitch and adjust$3 and display$3	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:42
S14	29	S13 AND ((B60W40/09 OR B60W50/08 OR B60W2540/18 OR B60W2040/0809 OR B60W2540/00 OR B60W2540/12 OR B60W2540/30 OR B60W50/10 OR B60W50/14 OR B60W2050/146 OR B60W2520/16 OR B60W2520/18 OR B60W40/06 OR B60W40/076 OR B60W2420/54 OR B60W2520/10 OR B60W2550/14 OR B60W2550/142 OR B60W2550/147 OR B60W2520/26 OR B60W10/10 OR B60W10/18 OR B60W10/20 OR B60W2050/0077 OR B60W2520/04 OR B60W2540/20 OR B60W2540/28 OR B60W2550/12 OR B60W2550/141 OR B60W2550/20 OR B60W2550/402 OR B60W2550/406 OR B60W2710/30 OR B60W2720/10 OR B60W2720/28 OR B60W2720/30 OR B60W30/143 OR B60W30/18009 OR B60W30/18172 OR B60W40/02 OR B60W40/08 OR B60W40/10 OR B60W40/101 OR B60W40/103 OR B60W50/0098 OR G05D1/0891 OR G05D1/0027 OR G05D1/0212 OR G05D23/1917 OR G05D1/0274 OR G05D1/027 OR G05D1/0278 OR G05D1/0287 OR G05D2201/02 OR G05D2201/0201 OR G05D2201/0202 OR G05D1/0227 OR G05D1/0088 OR G05D1/0011 OR G05D1/0016 OR G05D1/0061 OR G05D1/0038 OR G05D1/0225 OR G05D1/0238 OR G05D1/024 OR G05D1/0242 OR G05D1/0251 OR G05D1/0255 OR G05D1/028 OR G05D1/102 OR G05D2201/0211 OR G05D2201/0213 OR B60T2201/04 OR B60T2210/14 OR B60T2210/16 OR B60T2220/04 OR B60T2230/00 OR B60T2260/06 OR B60T8/175).CPC. AND (701/2 OR 701/36 OR 701/1 OR 701/408 OR 701/41 OR 701/25 OR 701/29.1 OR 701/31.9 OR 701/32.4 OR 701/37 OR 701/400 OR 701/50 OR 701/93 OR 701/21 OR 701/22 OR 701/23 OR 701/26 OR 701/3 OR 701/31.5 OR 701/33.2 OR 701/34.4 OR 701/409 OR 701/420 OR 701/469 OR 701/500 OR 701/534 OR 701/537 OR 701/70 OR 701/91).CCLS. AND (G05D1/08 OR G05D1/02 OR G05D1/00 OR G05D1/04	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:44

		OR G05D23/19 OR B60W30/14 OR B60W40/06 OR B60W40/09 OR B60W10/10 OR B60W10/18 OR B60W10/20 OR B60W30/18 OR B60W40/02 OR B60W40/076 OR B60W40/08 OR B60W40/10 OR B60W40/101 OR B60W40/103 OR B60W50/00).IPCR.)				
S15	27	"4216939"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 11:51
S16	3	("7294797").URPN.	USPAT	OR	ON	2016/12/05 12:13
S17	1	("8757637").URPN.	USPAT	OR	ON	2016/12/05 12:14
S18	16	("20110024706" | "3332669" | "3454251" | "3825279" | "3857582" | "4061309" | "4216939" | "4940110" | "5176391" | "5727767" | "6142488" | "8690128" | "8757637" | "8840144").PN. OR ("9156441").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:14
S19	1	("8840144").URPN.	USPAT	OR	ON	2016/12/05 12:16
S20	44	("20050127341" | "20060017241" | "20060081755" | "20070114734" | "20070284499" | "20070289439" | "20080217898" | "20090102176" | "20090200782" | "20110163523" | "20110169231" | "20120299279" | "20130074377" | "2924463" | "2979304" | "3253839" | "3367614" | "3475008" | "3558092" | "3642242" | "3690694" | "3801128" | "3823958" | "3933372" | "3989277" | "4268066" | "4461491" | "4708362" | "5575492" | "5628521" | "6089603" | "6142488" | "6224102" | "6331016" | "6494487" | "6827335" | "7226057" | "7338052").PN. OR ("8840144").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:16
S21	31	("3454251" | "3475008" | "3656778" | "3709518" | "3767226").PN. OR ("3933372").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:17
S22	38	("1540753" | "3186570" | "3324613" | "3367614").PN. OR ("4268066").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:17
S23	45	("2924463" | "3306629" | "3933372" | "4231044" | "4429851" | "4708362" | "4905953").PN. OR ("5575492").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:17
S24	47	("1539974" | "20020053794" | "2747836" | "3310181" | "3345038" | "3475008" | "3565396" | "3767226" | "3826470" | "3854750" | "3870276" | "3989277" | "4103869" | "4146250" | "4148461" | "4515520" | "4955450" | "5042779" | "5205586" | "5348330" | "5488788" | "5501428" | "5547220" | "5901980" | "6089603" | "6102438" | "6224102").PN. OR ("6494487").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 12:19

S25	94	((vehicle or car or automobile) near4 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or device or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:20
S26	6132	((vehicle or car or automobile) near4 (level$4 or stabilizat$3)) same ((smart adj device) or phone or cell or cellphone or mobile)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:26
S27	2491	((vehicle or car or automobile) near4 (level$4 or stabilizat$3)) near10 ((smart adj device) or phone or cell or cellphone or mobile)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:26
S28	49	S27 and sensor and pitch and roll	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:27
S29	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:33
S30	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone or cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:33
S31	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone or cell or cellphone or pda)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:33
S32	11	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) same ((sens$4 or detect$3) near5 (inclination or orientation)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:36
S33	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:39
S34	43	((vehicle or car or automobile) near6 (level$4 or stabilizat$3 or inclinat$4)) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:41
S35	2	(vehicle or car or automobile) same (park$3 near8 (level$4 or stabilizat$3 or inclinat$4)) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:45

S36	15	(vehicle or car or automobile) same (adjust$5) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:48
S37	23284	(vehicle or car or automobile) same ((adjust$5) near5(level$3 or inclination or tilt$3))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:52
S38	4438	S37 and ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:52
S39	130	S38 and (sens$3 near5 (pitch and roll))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:53
S40	92815	S39 and accelerometer or gyroscope	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:54
S41	51	S39 and accelerometer and gyroscope	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:54
S42	271	(vehicle or car or automobile) same ((adjust$5) near5 (level$3 or inclination or tilt$3)) same parking	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 12:57
S43	5	("2008/0142768").URPN.	USPAT	OR	ON	2016/12/05 13:05
S44	22	"6921100"	USPAT	OR	ON	2016/12/05 13:11
S45	5	"20070103289"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 13:15
S46	27	("4353565" | "5167289" | "5476277" | "5780782" | "5863057" | "6203045").PN. OR ("6921100").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:32
S47	36	("20020038193" | "4103752" | "4639872" | "4651838" | "4706768" | "4836308" | "4852674" | "4854407" | "4941365" | "5040826" | "5167289" | "5314201" | "5526702" | "5606516" | "5617072" | "5626356" | "5803502" | "5915713" | "6032090" | "6037550" | "6157889" | "6242701" | "6252497" | "6307164" | "6308131" | "6357777" | "6363331" | "6459367" |	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:32

		"6921100").PN. OR ("7072763").URPN.				
S48	33	("20060100979" | "20070180719" | "20070245579" | "20080142768" | "2155876" | "3181203" | "3258884" | "3260564" | "3417518" | "3866365" | "4232488" | "4568096" | "4572527" | "4743037" | "4746133" | "4784400" | "5078442" | "5136784" | "5159989" | "5176391" | "5188379" | "5676385" | "5806196" | "6176495" | "6526668" | "7025361").PN. OR ("7786883").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:34
S49	16	("20020027346" | "20020030592" | "20030191568" | "20030231118" | "20060064223" | "20080142768" | "5008647" | "6009356" | "6326613" | "6356812" | "6366840" | "6408232" | "6472979" | "6629032" | "6662642").PN. OR ("7584026").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:35
S50	17	("2454896" | "3219972" | "3820065" | "3835279" | "3922638" | "4101868" | "4145681").PN. OR ("4288777").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2016/12/05 13:37
S51	1	"20060113783"	US-PGPUB	OR	ON	2016/12/05 13:39
S52	3	"20150025789"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:03
S53	0	S52 and (trajectory near5 comparison)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:04
S54	2	S52 and (trajectory near10 comparison)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:05
S55	3	"20120206597"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/05 15:08
S56	776	((smart adj device) or phone or cell or cellphone or pda or (personal adj computer) or (mobile adj device) or (mobile near3 phone)) near10 ((activat$3 or turnon or control$4) near5 ((vehicle or car or automobile) adj (systems or navigation or gps)))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 13:53
S57	30	S56 and (suspension near4 Control$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 13:54
S58	41	(((smart adj device) or phone or cell or cellphone or pda or (personal adj computer) or (mobile adj device) or (mobile near3 phone)) near10 ((activat$3 or turnon or control$4)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 13:58

		near5 ((vehicle or car or automobile) adj (systems or navigation or gps)))) with application				
S59	17	S58 and gps and (position or location)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 15:08
S60	3	"20120208520"	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2016/12/06 15:10
S61	1	"20120208520"	US-PGPUB	OR	ON	2016/12/06 15:10
S62	1841	(vehicle or car or automobile) with (inclination or orientation) with accelerometer	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:13
S63	1054	S62 and ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:14
S64	80	S62 with ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:14
S65	22	S64 and ((adjust$3 or alter$3 or chang$3 or modif$4) near3 (level$3 or orientation or inclination))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:17
S66	0	lavel$3 with vehicle with sensor with tilt	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:21
S67	0	lavel$3 with vehicle with tilt	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:21
S68	1259	level$3 with vehicle with tilt	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:22
S69	15	S68 AND ((G05D1/0891 OR G05D1/027 OR G05D1/0274 OR G05D1/0278 OR G05D1/0287 OR G05D2201/02 OR G05D2201/0201 OR G05D2201/0202 OR G05D1/0016 OR G05D1/0816 OR G05D1/0858 OR B60G2204/62 OR B60G17/0163 OR B60G17/0165 OR B60G17/018 OR B60G17/01908 OR B60G17/0195 OR B60G2200/44 OR B60G2200/46 OR	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:25

		B60G2200/464 OR B60G2204/127 OR B60G2204/128 OR B60G2204/4232 OR B60G2204/83022 OR B60G2300/24 OR B60G2300/37 OR B60G2300/40 OR B60G2400/204 OR B60G2500/30 OR B60G2600/73 OR B60G2800/24 OR B60G2800/962 OR B60G3/01 OR B60G3/02).CPC. AND (701/49 OR 701/2 OR 701/1 OR 701/19 OR 701/23 OR 701/25 OR 701/3 OR 701/32.4 OR 701/33.1 OR 701/36 OR 701/41 OR 701/45 OR 701/50 OR 701/519 OR 180/65.1 OR 180/65.8 OR 180/9.32 OR 280/228 OR 280/30 OR 280/657 OR 280/86.751).CCLS. AND (G05D1/08 OR G05D1/02 OR G05D1/00 OR B60G17/0165 OR B60G17/019 OR B60G21/055 OR B60G3/01).IPCR.)				
S70	36	("4564214" | "4575116" | "4613154" | "4616163" | "4621832" | "4624477" | "4634143" | "4652010" | "4673194" | "4682675" | "4697237" | "4765649" | "4789935" | "4797823" | "4803627" | "4807128" | "4853860" | "4922427" | "4975849" | "5056812" | "5071157" | "5080392" | "5102162" | "5144558" | "5177681" | "5360089" | "5437354" | "5440488" | "5442554" | "5490068" | "5529153" | "5555173" | "5559701").PN. OR ("5979616").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2017/08/01 08:27
S71	402	("20020165648" | "20030014171" | "20030187560" | "20030208319" | "20040039514" | "20040212533" | "20050080559" | "20050225955" | "20050265494" | "20060167600" | "20060206246" | "20060215739" | "20070078570" | "20070088447" | "20070121708" | "20070205940" | "20070285308" | "20080129586" | "20080204312" | "20090171583" | "20090174597" | "20090174622" | "20090177395" | "20090177399" | "20090259397" | "20090259707" | "20090262014" | "20090262018" | "20090262974" | "20090265054" | "20090265101" | "20090265104" | "20090265308" | "20090273372" | "20090273513" | "20090274079" | "20090274113" | "20090276155" | "20090295633" | "20090295634" | "20090299550" | "20090322597" | "20090322598" | "20090322600" | "20090322601" | "20090322606" | "20090326809" | "20100013703" | "20100026569" | "20100030470" | "20100039316" | "20100039318" | "20100039320" | "20100039321" | "20100060518" | "20100063649" | "20100084147" | "20100085249" | "20100085253" | "20100103033" | "20100103034" | "20100103038" | "20100103040" | "20100106414" | "20100106445" | "20100109944" | "20100109945" | "20100109947" |	US-PGPUB; USPAT; USOCR	OR	ON	2017/08/01 08:27

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"5680140" | "5684696" | "5706015" |
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S72	14	("2001/0005803").URPN.	USPAT	OR	ON	2017/08/01 08:32
S73	11	(pitch near3 roll) with level$3 with balance	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 08:36
S74	27	("20020050699" | "20050098975" |	US-PGPUB;	OR	ON	2017/08/01

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S75	20	("5062658" | "5071157" | "5119297" | "5322318" | "5322320" | "5377107" | "5438514" | "5442554" | "5475593" | "5488562" | "5510986" | "5563789").PN. OR ("5864768").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2017/08/01 08:58
S76	315	(("LEONARD") near3 ("Charles")).INV.	US-PGPUB; USPAT; USOCR	OR	ON	2017/08/01 08:58
S77	3	((vehicle or car or automobile) near6 (level$4 or stabilizat$3)) with ((sens$4 or detect$3) near5 (inclination or orientation)) with ((smart adj device) or phone or cell or cellphone)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 09:04
S78	2336	(pitch near3 roll) with level$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:05
S79	351	S78 and (axis near3 accelerometer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:05
S80	204	S79 and ((adjust$3 or alter$3 or chang$3 or modif$4) near3 (level$3 or orientation or inclination))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:06
S81	98	S80 and (z near3 axis)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:06
S82	7	S81 and ((adjust$3 or alter$3 or chang$3 or modif$4) near3 (height))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:08
S83	20	((pitch near3 roll) near6 (axis near3 accelerometer)) with (vehicle car or automobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:11

S84	110	(vehicle car or automobile) with (level$3) with ((all or multi or three) near3 axis)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:21
S85	2	S84 and ((adjust$3 or alter$3 or chang$3 or modif$4) near3 (height))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:21
S86	0	S84 and ((adjust$3 or alter$3 or chang$3 or modif$4) near5 ((vehicle car or automobile) adj (height)))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:23
S87	26	(vehicle car or automobile) and (level$3) and ((all or multi or three) near3 axis) and ((adjust$3 or alter$3 or chang$3 or modif$4) near5 ((vehicle car or automobile) adj (height)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 12:24
S88	15	(vehicle or car or automobile) same (adjust$5) same ((sens$4 or detect$3) near5 (inclination or tilt)) same ((smart adj device) or phone or cell or cellphone or pda or (personal adj computer))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2017/08/01 15:06
S89	78	((pitch near3 roll) near6 (axis near3 accelerometer)) with (LEVEL$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/14 16:37
S90	77	S89 AND MEMS	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/14 16:37
S91	2	S90 AND (CIRCUIT near4 accelerometer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/14 16:38
S92	117	(tri-axial) with accelerometer with vehicle	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/15 12:16
S93	1	"20110202225"	US-PGPUB	OR	ON	2018/03/15 12:46
S94	51	(tri-axial) with accelerometer with level$3	US-PGPUB; USPAT;	OR	ON	2018/03/15 12:48

			EPO; JPO; DERWENT; IBM_TDB			
S95	73	S92 AND ((B60G17/08 OR B60G13/08 OR B60G2202/24 OR B60G2500/11 OR B60G2600/20 OR B60G13/06 OR B60G2500/10 OR B60G2800/162 OR G06F7/00 OR G06F21/44).CPC. OR (280/735 OR 280/736 OR 280/738 OR 280/731 OR 280/740 OR 280/728.2 OR 280/730.2 OR 280/734 OR 280/728.3 OR 280/741 OR 280/742 OR 280/400 OR 280/728.1 OR 280/743.1 OR 280/79.11 OR 701/45 OR 701/301 OR 701/2 OR 701/300 OR 701/124 OR 701/22 OR 701/31.4 OR 701/31.5 OR 701/33.1 OR 701/33.4 OR 701/70 OR 701/1 OR 701/11 OR 701/117 OR 701/119 OR 701/29.1 OR 701/3 OR 701/31.1 OR 701/36 OR 701/41 OR 701/46 OR 701/472 OR 701/65 OR 701/7 OR 180/282 OR 702/141 OR 702/150 OR 702/104 OR 702/173 OR 702/175 OR 702/179 OR 702/188 OR 702/33 OR 702/39 OR 702/85 OR 702/95).CCLS. OR (G06F17/10 OR G06F19/00 OR G06F7/00 OR G06F17/00 OR G06F11/00 OR G06F15/00 OR G06F17/18 OR G06F17/40 OR G06F21/44 OR G06F3/048 OR B60G17/08 OR B60G13/06 OR B60G13/08).IPCR.)	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/03/15 13:16
S96	16190	accelerometer with (temperature adj sensor)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 16:03
S97	93	(tri-axial) with accelerometer with (temperature adj sensor)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 16:04
S98	0	avoid$ with error with accelerometer with (temperature adj sensor)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 16:07
S99	5	avoid$ with error with accelerometer with temperature	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 16:07
S100	51	((tri-axial) near3 accelerometer) near6 (temperature adj sensor)	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 17:10
S101	46	S100 AND ((G05D1/0038 OR G05D1/0061 OR G05D1/0094 OR G05D1/0297 OR G05D1/0231 OR G05D1/0278 OR G05D1/0022 OR G05D1/0246 OR G05D1/0289).CPC. OR (1/1 OR 455/456.1 OR 455/404.1 OR 455/404.2 OR 455/414.2 OR 455/422.1 OR 455/457 OR 280/5.515 OR 360/5 OR 701/14 OR 701/21 OR 701/3 OR 701/37 OR 701/532 OR 702/127 OR	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2018/03/15 17:11

		702/130 OR 702/138 OR 702/141 OR 702/150 OR 702/151 OR 702/176 OR 702/187 OR 702/189 OR 702/191 OR 702/92).CCLS. OR (G05D1/00 OR G05D1/02).IPCR.)				
S102	291	("20020133277" | "20030164193" | "20030192755" | "20040090020" | "20040154887" | "20040199313" | "20050001472" | "20050029063" | "20050056502" | "20050056504" | "20050061593" | "20050085969" | "20050113997" | "20050173849" | "20060038149" | "20060124415" | "20060219503" | "20070034466" | "20070051574" | "20070255466" | "20080054537" | "20080243336" | "20080250844" | "20080264743" | "20080277218" | "20090071772" | "20090078517" | "20090084647" | "20090132122" | "20090192673" | "20090200125" | "20090200503" | "20100001217" | "20100018818" | "20100044172" | "20100066051" | "20100109276" | "20100138116" | "20100163354" | "20100181154" | "20100191420" | "20100211253" | "20100276906" | "20100301578" | "20100326267" | "20110017559" | "20110035091" | "20110056780" | "20110056783" | "20110079475" | "20110101579" | "20110153157" | "20110198172" | "20110214956" | "20110240424" | "20110298399" | "20120018263" | "20120048665" | "20120073918" | "20120073920" | "20120181126" | "20120186922" | "20120228072" | "20120305349" | "20130081913" | "20130090808" | "20130228401" | "20130234379" | "20130263943" | "20130275003" | "20130299291" | "20130313057" | "20130328277" | "20130340865" | "20130341140" | "20130341842" | "20130345933" | "20140102842" | "20140125018" | "20140202808" | "20140216871" | "20140231200" | "20140238797" | "20140239602" | "20140244112" | "20140260233" | "20140262648" | "20140262654" | "20140265169" | "20140265170" | "20140284156" | "20140291090" | "20140297116").PN. OR ("20140297117" | "20140303844" | "20150088379" | "2409349" | "2473043" | "3896908" | "3945474" | "4317105" | "4468050" | "4552324" | "4564214" | "4589528" | "4591186" | "4696489" | "4723640" | "4726453" | "4749070" | "4776437" | "4788489" | "4846317" | "4850460" | "4867476" | "4872537" | "4892328" | "4909536" | "4913457" | "4958706" | "4969662" | "4973854" | "4984819" | "4986393" | "4988967" | "5038613" | "5058715" |	US-PGPUB; USPAT; USOCR	OR	OFF	2018/03/15 17:12

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S103	326	(("LEONARD") near3 ("Charles")).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/03/15 17:13
S104	20	((pitch near3 roll) near6 (axis near3 accelerometer)) with (vehicle car or automobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	ON	2018/11/15 12:25

			DERWENT; IBM_TDB			
S105	128	(vehicle car or automobile) with (level$3) with ((all or multi or three) near3 axis)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/15 12:25
S106	22	("20040049059" | "20080103193" | "20080241339" | "20090035396" | "20100216872" | "20110098348" | "20120311744" | "20130109747" | "20140243405" | "20140245494" | "20140245495" | "20140298511" | "4279824" | "6403126" | "6630507" | "7968594").PN. OR ("9095554").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/15 12:26
S107	44	("20020091473" | "20020120374" | "20030236602" | "20040083041" | "20040225557" | "20050116829" | "20050131597" | "20070001831" | "20070010938" | "20070188348" | "5983161" | "6275773" | "6278362" | "6438472" | "6487500" | "6771176" | "6832157" | "6873911" | "6909947" | "6931309" | "6968260" | "6982647" | "7006917").PN. OR ("8170725").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/15 12:26
S108	8	("20010022166" | "20080093137" | "5934395" | "6247437" | "7497285").PN. OR ("8215425").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/15 12:27
S109	39	("0312266" | "20010025426" | "20020174553" | "20030066198" | "20030093909" | "2624118" | "2752692" | "2831264" | "3820249" | "3916531" | "4506408" | "4542592" | "4739561" | "4785544" | "4829676" | "5025568" | "5123768" | "5163229" | "5174034" | "5402579" | "5406713" | "5421094" | "5628521" | "5685083" | "5806196" | "5839200" | "5933919" | "6131298" | "6332277" | "6338203").PN. OR ("6981330").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/11/15 12:27
S110	27	(vehicle car or automobile) and (level$3) and ((all or multi or three) near3 axis) and ((adjust$3 or alter$3 or chang$3 or modif$4) near5 ((vehicle car or automobile) adj (height)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/15 12:28
S111	1498	((vehicle or car or automobile) near4 (level$4)) and ((sens$4 or detect$3) near5 (inclinat$4))	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/15 12:34
S112	26	S111 AND ((B60T8/172 OR B60T2201/04 OR B60T2210/14 OR B60T2210/16 OR B60T2220/04 OR B60T2260/06 OR B60T7/12 OR B60T8/175 OR B60T11/22 OR B60T11/26 OR B60T13/741 OR B60T2210/12 OR B60T2230/00 OR	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/11/15 12:34

		B60T2250/06 OR B60T7/085 OR B60T7/107 OR B60T7/122 OR B60T8/32 OR G05D1/0088 OR G05D1/0257 OR G05D1/0891 OR G05D1/0016 OR G05D1/0061 OR G05D1/0231 OR G05D1/0236 OR G05D1/024 OR G05D1/0251 OR G05D1/0255 OR G05D1/027 OR G05D1/048 OR G05D2201/0213 OR G05D2201/0216).CPC. AND (701/22 OR 701/37 OR 701/112 OR 701/2 OR 701/23 OR 701/21 OR 701/29.1 OR 701/49 OR 701/70 OR 701/93 OR 701/96 OR 701/99 OR 701/1 OR 701/101 OR 701/102 OR 701/123 OR 701/300 OR 701/30.8 OR 701/32.4 OR 701/33.1 OR 701/36 OR 701/41 OR 701/468 OR 701/48 OR 701/50 OR 701/519 OR 701/54 OR 701/60 OR 701/65 OR 701/71 OR 701/82 OR 701/91 OR 701/94).CCLS. AND (G05D1/00 OR G05D1/02 OR G05D1/04 OR G05D1/08 OR B60T7/12 OR B60T8/172 OR B60T11/22 OR B60T11/26 OR B60T8/32).IPCR.)				
S113	2698	(temperature adj sensor) same range same "60"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/04/28 19:34
S114	0	(G05D1/0016).IPCR.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/04/28 19:35
S115	1983	(G05D1/0016).CPC.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/04/28 19:35
S116	838	(G05D1/0891).CPC.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/04/28 19:36
S117	0	S113 AND S116	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/04/28 19:36
S118	0	S113 AND S115	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/04/28 19:36
S119	1213	(G01C9/00).CPC.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/04/28 19:37

S120	0	S113 AND S119	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/04/28 19:37
S121	7835	(G01C9/00).IPCR.	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/04/28 19:38
S122	26	S121 AND S113	US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/04/28 19:38
S123	127	S113 AND ACCELEROMETER	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/04/28 19:39
S124	9	S123 AND (SENSOR NEAR3 ERROR)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/04/28 19:40
S125	6916	((temperature adj sensor) NEAR5 (GYRO OR ACCELEROMETER))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/04/28 19:42
S126	771	S125 AND (CORRECT$3 NEAR4 ERROR) AND RANGE	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/04/28 19:44
S127	555	S125 AND (CORRECT$3 NEAR4 ERROR) AND RANGE AND AMBIENT	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/04/28 19:44
S128	532	S125 AND (CORRECT$3 NEAR4 ERROR) AND RANGE AND AMBIENT AND ACCUR$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/04/28 19:47
S129	1	S121 AND S128	US-PGPUB; USPAT; USOCR;	OR	OFF	2019/04/28 19:47

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S130	37	("20020008661" | "20020144548" | "20030135327" | "20050033200" | "20050040985" | "20050114023" | "20050240347" | "6415223" | "6427122" | "6463802" | "6480152" | "6498996" | "6516272" | "6658354" | "6671648" | "6853909" | "6859727" | "6879875" | "7043364" | "7089148" | "7248964" | "7289906" | "7409290").PN. OR ("8239162").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/28 19:51
S131	68	S115 AND (CORRECT$3 NEAR4 ERROR) AND RANGE	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/04/28 19:52
S132	5	S115 AND (CORRECT$3 NEAR4 ERROR) AND RANGE AND AMBIENT AND ACCUR$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/04/28 19:52
S133	243	("4213678" | "4758080" | "4886351" | "5106179" | "5177511" | "5331149" | "5467104" | "5604818" | "5644642" | "5659327" | "5815126" | "5815741" | "5912720" | "6140980" | "6213627" | "6227667" | "6346929" | "6445365" | "6456261" | "6456262" | "6523955").PN. OR ("7245273").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/28 19:52
S134	243	("4213678" | "4758080" | "4886351" | "5106179" | "5177511" | "5331149" | "5467104" | "5604818" | "5644642" | "5659327" | "5815126" | "5815741" | "5912720" | "6140980" | "6213627" | "6227667" | "6346929" | "6445365" | "6456261" | "6456262" | "6523955").PN. OR ("7245273").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/28 19:53

EAST Search History (Interference)

< This search history is empty>

10/31/2019 6:00:31 PM
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/961,787	12/07/2015	Charles A. Leonard	7137	8904

22474 7590 05/11/2020

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4500 Cameron Valley Parkway
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Charlotte, NC 28211

EXAMINER	
MARTINEZ BORRERO, LUIS A	

ART UNIT	PAPER NUMBER
3665	

NOTIFICATION DATE	DELIVERY MODE
05/11/2020	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

cwright@worldpatents.com
patlaw@worldpatents.com

Notice of Abandonment	Application No.	Applicant(s)
	14/961,787	Leonard, Charles A.
	Examiner	Art Unit
	LUIS A MARTINEZ BORRERO	3665

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

This application is abandoned in view of:

1. ☑ Applicant's failure to timely file a proper reply to the Office letter mailed on 05 November 2019.
   (a) ☐ A reply was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply (including a total extension of time of _____ month(s)) which expired on _____.
   (b) ☐ A proposed reply was received on _____, but it does not constitute a proper reply under 37 CFR 1.113 to the final rejection. (A proper reply under 37 CFR 1.113 to a final rejection consists only of:(1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) if this is utility or plant application, a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. Note that RCEs are not permitted in design applications.)
   (c) ☐ A reply was received on _____ but it does not constitute a proper reply, or a bona fide attempt at a proper reply, to the non-final rejection. See 37 CFR 1.85(a) and 1.111. (See explanation in box 7 below).
   (d) ☑ No reply has been received.

2. ☐ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
   (a) ☐ The issue fee and publication fee, if applicable, was received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).
   (b) ☐ The submitted fee of $ _____ is insufficient. A balance of $ _____ is due.
   The issue fee required by 37CFR 1.18 is $ _____ . The publication fee, if required by 37 CFR 1.18(d), is $ _____ .
   (c) ☐ The issue fee and publication fee, if applicable, has not been received.

3. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
   (a) ☐ Proposed corrected drawings were received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply.
   (b) ☐ No corrected drawings have been received.

4. ☐ The letter of express abandonment which is signed by the attorney or agent of record or other party authorized under 37 CFR 1.33 (b). See 37 CFR 1.138(b).

5. ☐ The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34) upon the filing of a continuing application.

6. ☐ The decision by the Patent Trial and Appeal Board rendered on _____ and because the period for seeking court review of the decision has expired and there are no allowed claims.

7. ☐ The dismissal of the appeal in an application having no allowed claims. (When an appeal is dismissed in an application having no allowed claims the application stands abandoned. See MPEP 1215.04 subsections I-V for an explanation of the reasons why an appeal is dismissed.)

8. ☐ The reason(s) below:

_____

/HUNTER B LONSBERRY/ Supervisory Patent Examiner, Art Unit 3665	/L.A.M/ Examiner, Art Unit 3665

Petitions to revive under 37 CFR 1.137, or requests to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.

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655/655