PATROLL Claim Chart Submission

U.S. Patent 8,682,558

U.S. Patent 8,682,558 ("*Vision Works*" or the "patent-at-issue") was filed on October 11, 2012, and claims an earliest priority date on October 5, 2004. 1 of the patent-at-issue is directed to an absolute acceleration sensor for use within moving vehicles. The communication system includes a vehicle speed sensor configured to emit a periodic function with a parameter correlated to the speed of the vehicle, an acceleration monitoring system, a braking system engagement detector to detect a braking status of the vehicle, an alerting device capable of signaling other drivers of a deceleration condition of the vehicle, and a control device. The acceleration monitoring system is configured to compute the acceleration of the vehicle from variations in the parameter of the periodic function of the vehicle speed sensor and to output a deceleration status of the vehicle. The control device is coupled to the acceleration monitoring system, the braking system engagement detector, and the alerting device, wherein the acceleration monitoring system sends signals to the control device and the control device operates the alerting device in a manner dependent on the deceleration status of the vehicle.

The primary reference, U.S. Patent 6,768,944 ("*American Vehicular Sciences*"), was filed on August 9, 2002, and claims an earliest priority date on April, 9, 2002. The patent is directed to a method and system for controlling a vehicle or a component of a vehicle in which an inertial reference unit includes accelerometers and gyroscopes which provide data on vehicle motion and a processor processes the data and controls the vehicle or the component of the vehicle based thereon. Movement of the vehicle may be controlled via control over servos, such as a servo associated with the braking system, a servo associated with the drive train or throttle and a servo associated with the steering system. A display to the driver can also be controlled by the processor to provide data on vehicle motion or data or information derived from the data on vehicle motion. Optionally, a Kalman filter is coupled to the processor for optimizing the data on vehicle motion from the inertial reference unit.

The secondary reference, U.S. Patent 2005/0085950 ("*Volkswagen*") was filed on November 19, 2004, and claims an earliest priority date on November 6, 2001. The patent is directed to a method and device for determining the geometric vehicle inclination of a motor vehicle, where an acceleration signal of at least one acceleration sensor is used and a speed gradient dv/dt is determined from a measured vehicle speed v. In the case of a moving or standing vehicle, an acceleration value is derived from a force acting on the acceleration sensor. A corrected acceleration value akorr is determined as a function of the speed gradient dv/dt. The current vehicle inclination α is directly deduced from the corrected acceleration value akorr. In addition, the method and device includes a device for implementing a method to determine a geometric vehicle inclination α of a motor vehicle, the device includes a speed-measuring device and at least one acceleration sensor, a programmable and readable microcontroller being provided, with the aid of which the current vehicle inclination may be calculated from the values of the speed-measuring device and the acceleration sensor at a vehicle speed v of the vehicle greater than or equal to zero, and directly transmitted to at least one control unit.

A sample claim chart comparing claim 1 of *Vision Works* to *American Vehicular Sciences* and *Volkswagen* is provided below.

US-8682558-B2 ("*Vision Works*")	**A. US-6768944-B2** ("*American Vehicular Sciences*") **B. US-20050085950-A1** ("*Volkswagen*")
[1.pre] **A device for a vehicle comprising:**	**A. US-6768944-B2** "1. **A control system for controlling a warning system of a vehicle, comprising**…" *American Vehicular Sciences* at claim 1 **B. US-20050085950-A1** "**A device for determining a geometric vehicle inclination of a motor vehicle, comprising**…" *Volkswagen* at claim 17
[1.a] a. **an accelerometer-gyroscope**;	**A. US-6768944-B2** "In order to achieve objects of the invention, a communication arrangement for a vehicle in accordance with the invention comprises an inertial reference unit **including a plurality of accelerometers and gyroscopes which provide data on vehicle motion**…" *American Vehicular Sciences* at col. 33:49-53 "A method for vehicular communications in accordance with the invention comprises the steps of arranging an inertial reference unit including **a plurality of accelerometers and gyroscopes on the vehicle, obtaining data on vehicle motion from the accelerometers and gyroscopes**, derive information about the vehicle from the data on vehicle motion, and transmitting the information about the vehicle via a communications system to a remote facility." *American Vehicular Sciences* at col. 34:15-24 "The inertial navigation system (INS), sometimes called the inertial reference unit or IRU, **comprises one or more accelerometers 78 and one or more gyroscopes 80**." *American Vehicular Sciences* at col. 77:39-41 **B. US-20050085950-A1** "…**at least one acceleration sensor**…" *Volkswagen* at claim 17
[1.b] b. **a vehicle computer unit**; and	**A. US-6768944-B2** "In order to achieve objects of the invention, a communication arrangement for a vehicle in accordance with the invention comprises… **a processor coupled to the inertial reference unit and arranged to process the data on vehicle motion to**

(cont.) [1.b] b. **a vehicle computer unit**; and	**derive information about the vehicle**…" *American Vehicular Sciences* at col. 33:49-55 "Further, there are disclosed several **computers or controllers, that perform various operations.** The specific form of computer is not important to the invention. **In its preferred form, applicants divide the computing and analysis operations into several cooperating computers or microprocessors. However, with appropriate programming well known to those of ordinary skill in the art, the inventions can be implemented using a single, high-power computer.** Thus, it is not applicants' intention to limit their invention to any particular form of computer." *American Vehicular Sciences* at col. 37:39-48 "If a vehicle passes through a precise positioning location as described elsewhere herein, that vehicle **(the vehicle's processor or computer)** momentarily knows or can calculate the errors in the GPS signals and thus becomes a differential correction station. The error corrections can then be transmitted to nearby vehicles plus enhancing their knowledge of their position." *American Vehicular Sciences* at col. 55:50-56 **B. US-20050085950-A1** "[0023] **In this regard, a programmable and readable microcontroller may be provided,** with the aid of which current vehicle inclination α may be calculated from the values of the speed-measuring device and the acceleration sensor at a vehicle speed v of the vehicle greater than or equal to zero, and directly transmitted to **at least one control unit**." *Volkswagen* at para. 23 "[0024] **The microcontroller may be programmed with one or more computational algorithms,** which process the speed and acceleration values and output the geometric vehicle inclination as a result… The outputted signals are conditioned so that they may be passed on to a **control unit for further processing**." *Volkswagen* at para. 24
[1.c] c. **an internal warning system**,	**A. US-6768944-B2** "A navigation system may be coupled to the processor and arranged to provide information about a roadway on which the vehicle is traveling from a map database to the processor. The processor is then arranged to process the data on vehicle motion and the roadway information and control **a warning**

(cont.) [1.c] c. **an internal warning system**,	**system to provide a warning to the driver upon detection of a potential crash situation**…" *American Vehicular Sciences* at col. 33:1-7 "In order to achieve objects of the invention, a communication arrangement for a vehicle in accordance with the invention comprises… **a communication system coupled to the processor for transmitting the information about the vehicle**." *American Vehicular Sciences* at col. 33:49-57 "For this simple system, the driver is warned if any of the above events is detected **by a driver warning system 45 coupled to the navigation system 46. The driver warning system 45 can be an alarm, light, buzzer or other audible noise, or, preferable, a simulated rumble strip for yellow line and "running off of road" situations and a combined light and alarm for the stop sign and stoplight infractions**." *American Vehicular Sciences* at col. 75:49-56 **B. US-20050085950-A1** "[0029] According to an example embodiment of the present invention, **a rollover warning device may be activated** in response to a specifiable transverse inclination α_Q." *Volkswagen* at para. 29 "[0030] **The rollover warning may be of an acoustic or optical kind.** This may allow the driver to timely react in limit situations, which means that the safety may be increased, e.g., in the case of off-road vehicles." *Volkswagen* at para. 30
[1.d] wherein **the accelerometer-gyroscope sends a signal to the vehicle computer unit** and **the vehicle computer unit operates one or more vehicle performance systems based upon the signal from the accelerometer-gyroscope**.	**A. US-6768944-B2** "In order to achieve objects of the invention, a control system for controlling a vehicle or a component of a vehicle comprises **an inertial reference unit including three accelerometers and three gyroscopes which provide data on vehicle motion** and **a processor coupled to the inertial reference unit and arranged to process the data on vehicle motion and control the vehicle or the component of the vehicle based thereon**." *American Vehicular Sciences* at col. 32:51-58 "A method for vehicular communications in accordance with the invention comprises the steps of **arranging an inertial reference unit including a plurality of accelerometers and gyroscopes on the vehicle, obtaining data on vehicle motion from the accelerometers and gyroscopes, derive information about the vehicle from the data on vehicle**

(cont.) [1.d] wherein **the accelerometer-gyroscope sends a signal to the vehicle computer unit** and **the vehicle computer unit operates one or more vehicle performance systems based upon the signal from the accelerometer-gyroscope**.	**motion, and transmitting the information about the vehicle via a communications system to a remote facility**." *American Vehicular Sciences* at col. 34:15-24 "6. The control system of claim 1, wherein **said processor is arranged to control the movement of the vehicle based on the data on vehicle motion**." *American Vehicular Sciences* at claim 6 "22. The control system of claim 18, wherein **said processor is arranged to control the movement of the vehicle based on the data on vehicle motion provided by said inertial reference unit** and signals relating to the position of the vehicle received by said GPS receiver." *American Vehicular Sciences* at claim 22 "26. A method for controlling a warning system a vehicle, comprising the steps of: **arranging an inertial reference unit including three accelerometers and three gyroscopes on the vehicle;** **obtaining data on vehicle motion from the inertial reference unit;** arranging a navigation system on the vehicle including a map database; obtaining information about a roadway on which the vehicle is traveling from the map database; **controlling the warning system based on the data on vehicle motion obtained from the inertial reference unit** and the roadway information obtained from the map database to provide a warning to the driver upon detection of a potential crash situation." *American Vehicular Sciences* at claim 26 **B. US-20050085950-A1** "…**For example, the control of the control systems mostly available in modern motor vehicles, such as ABS (anti-lock brake system), TCS (traction control system) and ESP (electronic stability program) should be adjusted to the specific vehicle inclination**…" *Volkswagen* at para. 3 "[0023] **In this regard, a programmable and readable microcontroller may be provided, with the aid of which current vehicle inclination α may be calculated from the values of the speed-measuring device and the acceleration sensor at a vehicle speed v of the vehicle greater than or equal to zero, and directly transmitted to at least one control unit**." *Volkswagen* at para. 23

(cont.) [1.d] wherein **the accelerometer-gyroscope sends a signal to the vehicle computer unit** and **the vehicle computer unit operates one or more vehicle performance systems based upon the signal from the accelerometer-gyroscope**.	"[0024] **The microcontroller may be programmed with one or more computational algorithms, which process the speed and acceleration values and output the geometric vehicle inclination as a result… The outputted signals are conditioned so that they may be passed on to a control unit for further processing**." *Volkswagen* at para. 24 "[0025] **According to an example embodiment of the present invention, the signals output by the microcontroller may be processed further by a transmission control unit. The microcontroller signals may also be processed further by an engine control unit and/or an all-wheel-drive control unit and/or a brake control unit; and/or an adaptive cruise control unit and/or a vehicle-dynamics control unit and/or a drivetrain control unit. In general, the control units are operatively connected to each other and to the existing control systems, such as ABS, TCS, and ESP**." *Volkswagen* at para. 25