PATENT
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Anticipated Classification of this application:
Class _____ Subclass
PRIOR APPLICATION Serial Number 10/100,892
Examiner: M. Fletcher
Art Unit: 2637

MS Divisional Application
Assistant Commissioner for Patents
PO BOX 1450
Alexandria, VA 22313-1450

DIVISIONAL APPLICATION TRANSMITTAL

This is a request for a filing the enclosed divisional application under 37 CFR §1.53(b).

XXX I hereby verify that the attached papers are a true copy of what is shown in my records to be the above-identified prior application, including the oath or declaration originally filed (37 CFR 1.53(b)).

The copy of the papers of the parent application as filed are attached as follows:

44 Pages of Specification
8 Pages of 28 Claims
1 Pages of Abstract
9 Sheets of Drawings
X Declaration and Power of Attorney

Certification Under 37 CFR 1.10

I hereby certify that this Divisional Application Transmittal and the documents referred to as attached therein are being deposited with the United States Postal Service on this date 1/27/04 in an envelope as "Express Mail Post Office to Addressee" mailing Label Number EV 310021520 US addressed to the: Assistant Commissioner for Patents, MS DIVISIONAL APPLICATION, PO BOX 1450, Alexandria, VA 22313-1450.

Jeanne P. Liptay (signature)

I. PARTICULARS OF PRIOR APPLICATION

A. Application Serial No. 10/100,892 filed March 18, 2002 .

B. Title (as originally filed): COLLISION MONITORING SYSTEM
(and as last amended - if applicable): _____

C. Name of applicant(s) (as originally filed and as last amended) and current correspondence address of applicant(s)

1. *FULL NAME OF INVENTOR*	**FAMILY NAME** Boisvert	**FIRST GIVEN NAME** Mario	**SECOND GIVEN NAME**
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1. *FULL NAME OF INVENTOR*	**FAMILY NAME** Perrin	**FIRST GIVEN NAME** Randall	**SECOND GIVEN NAME**
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I. INVENTORSHIP STATEMENT

☒ This application discloses and claims only subject matter disclosed in the prior application whose particulars are set out above and the inventor(s) in this application are ☒ the same as, ☐ less than, those named in the prior application; and it is requested that the following inventor(s) identified above for the prior application be deleted: _____

☐ This application discloses and claims additional subject matter with respect to the prior application and a new declaration is forthcoming. With respect to the prior application whose particulars are set out above the inventor(s) in this application are ☒ the same, ☐ add the following additional inventor(s):

_____

☒ The inventorship for all the claims in this application is ☒ the same, ☐ not the same, and an explanation, including the ownership of the various claims at the time the last claimed invention was made, is submitted.

III. DECLARATION OR OATH

☒ Continuation or division: ☒ none required.
☐ Continuation-in-part ☐ attached (executed by inventor(s)), ☐ not attached.

V. AMENDMENTS

☒ Please enter the attached preliminary amendment before calculating the filing fee. The attached preliminary amendment adds claims 28-35 to the originally filed 27 claims. Note, 26 and 27 were renumbered..

V. FEE CALCULATION

CLAIMS AS FILED IN DIVISIONAL APPLICATION

	Number filed		Number Extra	Rate	Basic Fee
					$ 770.00
Total Claims	35	-20=	15	x $18.00=	270.00
Independent Claims	8	- 3=	5	x $86.00=	430.00
Multiple Dependent Claim(s), if any				$260.00=	

Filing Fee Calculation $ 1,470.00

VI. PETITION FOR SUSPENSION OF PROSECUTION FOR THE TIME NECESSARY TO FILE AN AMENDMENT ☐ Attached is a Petition to Suspend Prosecution for the Time Necessary to File an Amendment.

VII. SMALL ENTITY STATEMENT

☒ Small entity status is claimed.

☐ The small entity statement was filed in the parent application Serial No. which parent application was filed on_____ and this status is still proper and its benefit under 37 CFR 1.28(a) is hereby claimed.

Reduced Filing Fee Calculation (50% of above) $ 735.00

VIII. FEE PAYMENT

☒ Filing Fee enclosed $ 735.00

☐ Fee for Recording Assignment ($40) $_____

☐ Petition fee for filing by other than all the inventors or person not the inventor where inventor refused to sign or cannot be reached ($130.00) $_____

Total Fees Enclosed $ 735.00

IX. METHOD OF PAYMENT OF FEES

☒ Enclosed is a check in the amount of $ 735.00

☐ Charge Deposit Account No. 23-0630 in the amount of $_____

X. AUTHORIZATION TO CHARGE ADDITIONAL FEES

☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 23-0630.

XI. PRIORITY - 35 U.S.C. 119

☐ Priority of application Serial No. 0 /_____ filed on _____ in _____ is claimed under 35 U.S.C. 119.

☐ The certified copy has been filed on _____ in prior U.S. application Serial No. 0 /_____, filed on _____.

☐ Certified copy will follow.

XII. RELATE BACK - 35 U.S.C. 120

☒ Amend the Specification by inserting before the first line the sentence: "This is a Divisional application of application Serial No. 10/100,892, filed on March 18, 2002".

XIII. ASSIGNMENT

☒ The prior application is assigned of record to Nartron Corporation.

☐ An assignment of the invention to _____ is attached. A separate cover sheet for assignment is also attached.

XIV. POWER OF ATTORNEY

The power of attorney in the prior application is to Stephen J. Schultz, Reg. No. 29,109

☒ The power appears in the original papers in the prior application.

☐ The power does not appear in the original papers, but was filed on _____.

☐ A new power of attorney is forthcoming.

XV. MAINTENANCE OF COPENDENCY OF PRIOR APPLICATION

(must be completed and the necessary papers filed in the prior application if the period set in the prior application has run)

☐ A petition and fee are enclosed.

XVI. CONDITIONAL PETITION FOR EXTENSION OF TIME IN PRIOR APPLICATION

☒ No Petition for extension of time is believed to be required. However, this is a conditional petition for extension of time for the pending prior application in the event that the need for an extension of time has been inadvertently overlooked in the prior application.

XVII. ABANDONMENT OF PRIOR APPLICATION

☐ Please abandon the prior application at a time while the prior application is pending or when the petition for extension of time or petition to revive in that application is granted and when this application is granted a filing date so as to make this application copending with said prior application. At the same time please add the words ", now abandoned" to the end of the sentence amending the specification in XII above.

VIII. INFORMATION DISCLOSURE STATEMENT

☐ Submitted herewith is an Information Disclosure Statement.

XIX. Petition to Withdraw from Issue

☐ A Petition to withdraw the prior application from issue is being filed concurrently herewith for consideration of the Information Disclosure Statement filed hereby in connection with the new CIP application.

Stephen Schultz

(signature)

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14-733C2

COLLISION MONITORING SYSTEM

CROSS REFERENCE TO RELATED APPLICATIONS:

The present application is a continuation-in-part of application serial no. 09/562,986 filed May 1, 2000 which is a continuation-in-part of application serial number 08/736,786 to Boisvert et al. which was filed on October 25, 1996, now US patent no. 6,064,165 which was a continuation of united States application serial number 08/275,107 to Boisvert et al. which was filed on July 14, 1994 which is a continuation in part of application serial number 07/872,190 filed April 22, 1992 to Washeleski et al., now United States patent 5,334,876. These related applications are incorporated herein by reference. Applicants also incorporate by reference United States patent number 5,952,801 to Boisvert et al, which issued September 14, 1999. This application also claims priority from United States Provisional application serial no. 60/169,061 filed December 6, 1999 which is also incorporated herein by reference.

FIELD OF THE INVENTION:

The present invention concerns motor driven actuator control systems and methods whereby empirically characterized actuation operation parameters are subsequently monitored.

BACKGROUND:

National Highway Traffic Safety Administration (NHTSA) Standard 118 contains regulations to assure safe operation of power-operated windows and roof panels. It establishes requirements for power window control systems located on the vehicle exterior and for remote control devices. The purpose of the standard is to reduce the risk of personal injury that could result if a limb catches between a closing power operated window and its window frame. Standard 118 states that maximum allowable obstacle interference force during

an automatic closure is less than 100 Newton onto a solid cylinder having a diameter from 4 millimeters to 200 millimeters.

Certain technical difficulties exist with operation of prior art automatic power window controls. One difficulty is undesirable shutdown of the power window control for causes other than true obstacle detection. Detection of obstacles during startup energization, soft obstacle detection, and hard obstacle detection each present technical challenges requiring multiple simultaneous obstacle detection techniques. Additionally, the gasket area of the window that seals to avoid water seepage into the vehicle presents a difficulty to the design of a power window control, since the window panel encounters significantly different resistance to movement in this region. Operation under varying power supply voltage results in actuator speed variations that result in increased obstacle detection thresholds.

SUMMARY OF THE INVENTION:

This invention concerns an improved actuator system that provides faster operation, more sensitive obstacle detection, faster actuator stopping with reduced pinch force, and reduced false obstacle detection all with less costly hardware. This invention has utilization potential for diverse automatic powered actuator applications including positioning of doors, windows, sliding panels, seats, control pedals, steering wheels, aerodynamic controls, hydrodynamic controls, and much more. One exemplary embodiment of primary emphasis for this disclosure concerns an automatic powered actuator as a motor vehicle sunroof panel.

An exemplary system built in accordance with one embodiment of the invention implements position and speed sensing is via electronic motor current commutation pulse sensing of the drive motor. Motor current commutation pulse counting detection means and counting correction routines provide improved position and speed accuracy.

In one exemplary embodiment, stored empirical parameter characterizations and algorithms adaptively modify obstacle detection thresholds

during an ongoing actuation for improved obstacle detection sensitivity and thresholds resulting in quicker obstacle detection with lower initial force, lower final pinch force and reduced occurrences of false obstacle detection.

An exemplary embodiment of the collision sensing system uses a memory for actuation speed measurement, motor current measurement, and calculations of an ongoing actuation with real time adaptive algorithms enables real time running adaptive compensation of obstacle detection thresholds.

BRIEF DESCRIPTIONS OF THE DRAWINGS:

Figure 1 is a block diagram schematic of the components of an exemplary embodiment of the present invention;

Figures 2A – 2D are schematics of circuitry for controlling movement and sensing obstructions of a motor driven panel such as a motor vehicle sunroof;

Figure 3A is a plan view depicting an optical sensing system for monitoring an obstruction in the pinch zone of a moving panel such as a motor vehicle sunroof;

Figure 3B is a front elevation view of the Figure 3A optical sensing system;

Figure 3C is a plan view depicting an optical system with moving optics for monitoring an obstruction at the leading edge of a moving panel such as a motor vehicle sunroof;

Figure 3D is a front elevation view of the Figure 3C optical sensing system;

Figure 3E is a plan view depicting an optical sensing system with moving optics, flexible optic fiber, remote IR emission, and remote IR detection for monitoring an obstruction at the leading edge of a moving panel such as a motor vehicle sunroof;

Figure 4 represents typical startup energization characteristics of motor current and per speed versus time;

Figure 5 represents a simplified example of characteristic steady state nominal motor operation function versus time or position;

Figure 6 represents a simplified example characteristic dynamic transient motor operation function versus time and/or position showing motor operation function with transients;

Figure 7 represents a simplified example characteristic dynamic periodic cyclic motor operation function versus time and/or position showing motor operation function with cyclic disturbances; and

Figure 8 is a sequence of measurements taken by a controller during successive time intervals and operation of a monitored panel drive motor.

BEST MODE FOR PRACTICING THE INVENTION:

Figure 1 shows a functional block diagram of an actuator safety feedback control system 1 for monitoring and controlling movement of a motor driven panel such as a motor vehicle sunroof. A panel movement controller 2 includes a commercially available multipurpose microcontroller IC (integrated circuit) with internal and/or external FIFO memory and/or RAM (Random Access Memory) 2a and ADC (analog-to-digital-converter) 2b.

Eight-bit word bytes, eight-bit counters, and eight-bit analog-to-digital conversions are used with the exemplary controller 2. It should be fully realized, however, that alternative word lengths may be more appropriate for systems requiring different parameter resolution. Larger word bytes with equivalent ADC resolution enables greater resolution for motor current sensing. Likewise, larger word bytes with higher microcontroller clock speeds enable greater resolution for motor per speed sensing plus quicker digital signal processing and algorithm processing for quicker response time.

A temperature sensor 3 (which according to the preferred embodiment of the invention is an option) when installed, is driven by and sensed by the controller 2. Temperature sensing allows the panel controller 2 to automatically sense vehicle cabin temperature and open or close the sunroof to help maintain a desired range of temperatures. Temperature compensation of actuator obstacle detection thresholds is typically unnecessary.

An optional rain sensor 4 can be both driven by and sensed by the

microcontroller 2. Automatic closing of the sunroof panel occurs when the sensor is wet. Subsequently, the sunroof panel can be opened when either falling rain has stopped for some time duration or when the rain has evaporated to some extent.

Manual switch inputs 5 are the means by which operator control of the system occurs.

Limit switch inputs 6 indicate to the control system such physical inputs as HOME position, VENT/NOT OPEN Quadrant Switch, and end of panel movement. Limit switch signals indicate where microcontroller encoder pulse counter registers are set or reset representative of specific panel position(s).

Motor drive outputs 7a and 7b control whether the motor drives the panel in the forward or the reverse direction. When neither the forward nor the reverse direction are driven, the motor drive terminals are electrically shorted together, possibly via a circuit node such as COMMON, resulting in an electrical loading and thus a dynamic braking effect.

Motor plugging drive, which is the application of reverse drive polarity while a motor is still rotating, is an optional method of more quickly stopping the motor, but has been unnecessary for use with the preferred embodiment of the sunroof panel controller due to satisfactory performance taught by this disclosure. Very large motor plugging currents are often undesirable because they can easily exceed typical maximum stalled rotor currents producing undesired motor heating in large applications. Such high motor plugging currents can be detrimental to the life and reliability of electromechanical relay contacts and solid state switches used to switch motor operating currents. High motor plugging currents can also cause undesirable transients, trip breakers, and blow fuses in a power supply system.

Application of brakes and/or clutches is also unnecessary with the automotive sunroof system due to the improved real time obstacle detection performance taught by this disclosure.

Optical Obstacle Detection

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Obstacle detection by actual physical contact and/or pinch force with human subjects is somewhat unnerving to some individuals. For improved system safety and user comfort, the preferred system utilizes non-contact detection of obstacles in the path of the moving panel. Of various technologies by which it is possible to sense an obstacle without physical contact, IR (infrared) emission with transmission interruption mode detection is preferred. IR emitting diodes and/or IR laser diodes are the two preferred IR emission sources. IR photodiodes and/or IR phototransistors are the two preferred IR detection means. Optical obstacle detection senses and enables stopping of the actuator movement prior to significant applied pinch force and possibly prior to actual physical contact with a subject. In unusual light conditions, explained below, optical sensing means becomes temporarily ineffective, thus obstacle detection via motor current sensing or current sensing and speed sensing means becomes the remaining reliable backup method of detecting an obstacle.

Of two preferred configurations utilized for implementing IR transmission interruption mode of obstacle detection, the first is use of at least one emitter and at least one detector sensing at least across the pinch zone in close proximity to an end of travel region of a sunroof. As shown in Figures 3A and 3B, at least one IR emitter 100 and at least one IR detector 102 are separated from each other by a sunroof pinch zone 104. In an exemplary embodiment of the invention, opto sensing of obstructions is across and in relatively close proximity to a pinch zone near the end of travel region of a sunroof. The depictions in Figures 3A and 3B do not show the entire region between emitter and detector but it is appreciated that a gap G between emitter and detector is on the order of the width of the moving sunroof. In this preferred embodiment, cabling 108 passes to the region of the detector 102 around the end of the sunroof liner in the region of the end of the sunroof travel. The detector and emitter are fixed to the sunroof liner and do not move. Implementation of this fixed configuration is simplified by lack of moving components, although the sunroof may have to push the obstacle into a sensing field between the emitter 100 and the detector 102. Thus, although the sensing means is non-contact, the sunroof can still contact

the obstacle.

Of two preferred configurations utilized for implementing IR transmission interruption obstacle detection, the second is use of at least one emitter and at least one detector sensing at least immediately ahead of the front moving edge of the moving portion of a sunroof. As shown in Figures 3C and 3D, at least one IR emitter 100 and at least one IR detector 102 are separated proximal a front moving edge of a sunroof 103. In an exemplary embodiment of the invention, opto-sensing of obstructions is across and in relatively close proximity to a front edge 105 of the sunroof 103. The depictions in Figures 3C and 3D show the entire region between emitter and detector for which a gap G, between emitter and detector, is on the order of the width of the moving sunroof. In this preferred embodiment, flexible flat circuitry 107 passes to the emitter 100 and the detector 102 of the moving panel or window to the region of the front moving edge. Alternate means to supply electrical signal and/or power to the moving opto-electronic components includes means such as electrical contact brushes cooperating with conductive traces on the moving panel. Power and signal are optionally both transmitted over the same conductors. Figure 3E shows an alternative means to supply IR emission to receive IR detection from the front edge of the moving panel via flexible moving optic fiber 303 means connected with components 300, 302 that respectively emit IR and detect IR signals. IR optical fibers are terminated at each end to optical components 304, 305 that perform collimating, reflecting, and focusing requirements. The structure depicted in Figures 3A – 3E make it possible to sense obstructions with no physical obstacle contact regardless of the position of the moving sunroof.

Alternate, non-preferred means of obstacle detection include sensing back reflection from a reflective surface of radiation emitted from an emitter, electric field sensing of proximal material dielectric properties, and magnetic field sensing of proximal material inductive properties.

Various techniques improve the operation and reliability of non-contact optical detection sensing. In accordance with an exemplary embodiment of the present invention, the IR emitter 100 is driven with a duty cycle and frequency.

One typical automobile sunroof application uses 20% duty cycle at 500 Hz IR emitter drive synchronized with IR detector sensing. Pulsed drive allows the IR emitter 100 to be driven harder during its on time at a low average power. This harder drive yields improved signal-to-noise for IR sensing by the IR detector. The IR detector circuit synchronously compares the IR signal detected during IR emitter on times with IR emitter off times to determine ambient IR levels for drive and signal compensation purposes. This allows the IR emitter to IR detector optical coupling to be determined with a level of accuracy and reliability using closed loop feedback techniques.

Automatic gain feedback control techniques maintain the level of the IR emitter drive and/or the gain of the IR detector circuit so that optical coupling is above minimum desirable values. Such automatic gain compensates, within certain limitations, factors including decrease in IR emitter output over accumulated time at temperature, IR emitter output temperature coefficient, dirt and haze fouling optic components, and high ambient IR levels.

Highly directional IR optical lenses and/or aligned polarized filters on both the IR emitter and IR detector maintain better optical coupling and reduce the effects of ambient IR and reflected IR from other directions. Location of the IR detector in a physical recess further reduces the possibility of extraneous IR "noise" from affecting the optical coupling.

Despite various means to reduce the possibility of excess extraneous IR from being detected, certain conditions occur that may allow very high levels of direct and/or reflected sunlight to be "seen" by the detector. Sun IR power levels can saturate the detector output signal level so that obstacle blockage of the pulsed IR emitter signals is not reliably sensed. Under such unusual "white out" circumstances, the IR optical system is disabled by the panel controller 2 until the sunroof actuator is nearly closed , at which position ambient IR noise is shielded by the sunroof. Thus, the complete emitter-detector IR coupling is made more reliable for the last movement of pinch point closure. Complete body blockage of the IR coupling path between the emitter and detector is not a "white out" condition, although if the body is blocking both ambient IR and emitted IR signal

at the detector, a "black out" condition is interpreted as an obstacle detection.

Although the IR obstacle detection means may be temporarily found to be unreliable by high ambient levels of IR, the disclosed sensing of hard and/or soft obstacles by motor current monitoring is always active as a redundant obstacle detection means.

Detailed Schematic

The controller schematic shown in Figures 2A – 2D implements collision sensing in one form by activating a light emitting diode 100a which emits at periodic intervals. In the event the infra red radiation is not sensed by a photo transistor detector 102a , the controller 2 assumes an obstruction and deactivates the sunroof motor M. There is also a redundant and more reliable obstacle detection means for detecting obstacles based upon sensed motor operation parameters.

The preferred controller 2 is an Atmel 8 Bit microprocessor having 8 Kilobytes of ROM and includes programming inputs 106 which can be coupled to an external data source and used to reprogram the microprocessor controller 2. User controlled inputs 5a, 5b are coupled to user activated switches which are activated to control movement of the sunroof. The inputs are similar to now issued Patent No. 5,952,801 to Boisvert et al, which describes the functionality of those inputs. Limit switch outputs 5c, 5d, 5e are also monitored by the controller 2 and used to control activation of the sunroof drive motor.

The schematic depicts a clock oscillator 110 for providing a clock signal of 6 MHZ for driving the microprocessor controller 2. To the upper left of the oscillator is a decoupling capacitor circuit 112 for decoupling a VCC power signal to the microprocessor.

The circuitry depicted in Figure 2B provides power signals in response to input of a high signal at the ignition input 114. When the ignition input goes high, this signal passes through a diode 116 to the base input 118 of a transistor 120 which turns on. When the transistor 120 turns on, a regulated output of 5 volts (VCC) is provided by a voltage regulator 122 in the upper right hand corner of

Figure 2B. A voltage input to the voltage regulator 122 is derived from two battery inputs 124, 126 coupled through a filtering and reverse polarity protection circuit 130. Immediately above the positive battery input 124 is a relay output 131 which provides a signal one diode drop less than battery voltage VBAT which powers the relay coils 132, 134 (Figure 2D) for activating the motor.

The circuitry of Figures 2A – 2D includes a number of operational amplifiers which require higher voltage than the five volt VCC logic circuitry power signal. At the extreme right hand side of the schematic of Figure 2B are two transistors 136, 138 one of which includes a base 140 coupled to an output 142 from the microprocessor controller 2. The second transistor has its collector coupled to the battery and an output on the emitter designated V-SW. When the microprocessor turns on the transistor 138, the V-SW output goes to battery voltage. The V-SW output is connected to a voltage regulator (not shown) which generates a DC signal that is supplied throughout the circuit for operation of the various operational amplifiers.

The microprocessor controller 2 also has two motor control outputs 150, 152 which control two switching transistors 154, 156 , which in turn energize two relay coils 132, 134. The relay coils have contacts 162, 164 coupled across the motor M for energizing the motor windings with a battery voltage VBAT. One or the other of the transistors must be turned on in order to activate the motor. When one of the two transistors is on, the motor M rotates to provide output power at an output shaft for moving the sunroof or other panel along a path of travel in one direction. To change the direction of the motor rotation, the first transistor is turned off and the second activated. The motor used to drive the sunroof panel back and forth along its path of travel in the exemplary embodiment of the present invention is a DC motor.

Figure 2C depicts a circuit 180 for monitoring light emitting diode signals. A light emitting diode 100a has an anode connection 181 coupled to the V-switched signal and the cathode is coupled through a switching transistor 182 to a microprocessor output 183. The microprocessor outputs a 500 hertz signal at this output 183 having a 20% duty cycle to the base input of the transistor. When

the transistor turns on, the LED cathode is pulled low, causing the light emitting diode 100a to emit IR radiation. Under microprocessor control, the light emitting diode produces a 500 hertz output which is sensed by a photo detector 102a. As the light emitting diode pulses on and off at 500 hertz, the photo detector responds to this input. When current flows in the photo detector, a voltage drop is produced across a voltage divider 184 having an output coupled to an operational amplifier 186. When current flows in the photo detector in response to receipt of a light signal the voltage divider raises the voltage at the inverting input 188 to the amplifier 186. The non-inverting input to this amplifier is maintained at 2.5 volts by a regulated voltage divider 188. The operational amplifier 186 and a second operational amplifier 190 define two inverting amplifiers which in combination produce an output signal of 500 hertz. With no signal appearing at the photo detector, an output 192 from the operational amplifier 190 is 2.5 volts. This signal is coupled to the microprocessor controller 2. In response to receipt of the photo detector signal, this signal oscillates and this oscillating signal in turn is sensed by the microprocessor.

The microprocessor controller 2 has two inputs 192, 194 that provide input signals to a comparator implemented by the microprocessor controller. As the state of the comparator changes, internal microprocessor interrupts are generated which cause the microprocessor to execute certain functions. The first input 192 is derived from the output from the phototransistor 102a. The second input 194 to the comparator is a 3.3 volt signal generated by a voltage divider 195.

Motor current monitoring

A motor current monitoring circuit is depicted in Figure 2D and includes a number of operational amplifiers 200 – 203 coupled to a current measuring resistor 210 in the lower right hand portion of the circuit diagram. This current measuring resistor is coupled to the operational amplifier 200 configured as a differential amplifier through a second resistor 211. An output 212 from this differential amplifier is a signal proportional to the current through the motor

windings which has been amplified by a factor of about four. The output from this amplifier passes to a second gain of 3 amplifier 201 to an output 214 coupled to the microprocessor controller through a resistor 215. This signal is monitored by the microprocessor and converted by an A to D conversion to a digital value directly related to motor current.

An input 220 to the second pair of operational amplifiers 202, 203 is either an output from the first differential amplifier 200 or the second gain of 3 amplifier 201 depending upon whether a resistor 222 is installed in the circuit. One but not both of the resistors 222, 223 are installed in the circuit.

The changing signal output from the resistor 210 is coupled to an inverting input of an AC coupled amplifier and produces an output signal 226 to the microprocessor controller 2 which changes with motor current and more particularly as the commutator brushes pass over the motor armature commutation segments , the signal changes to form a sequence of pulses. The amplifier 203 is a level shifting amplifier which reduces the gain of the first amplifier depending upon sensed conditions. When the motor first is activated a large current rush occurs due to the fact that the motor is stalled. This large current rush changes the output of the amplifier 203 thereby producing meaningful data even in a high current situation. As the current changes, the output of this top amplifier 203 varies to allow meaningful data to be supplied to the microprocessor regardless of absolute values of motor current.

The signal at the microprocessor is a analog signal having the ripple component as the motor rotates. This signal is in turn interpreted by the microprocessor controller 2 which generates values directly related to motor speed based upon the sensing and counting of these pulses. Additionally, the value changes in such a way that the slope can be monitored so that the microprocessor can use digital signal processing techniques on the input signal to determine a stalled motor condition representing an obstacle.

At motor startup the large currents that are experienced make it difficult to sense object collisions with the moving window or panel. In accordance with one embodiment of the invention the controller maintains a position of the leading

edge of the window or panel and during certain startups will alter a startup sequence.

If the window or panel is stopped in a region where entrapment is more likely, such as in the last portion of travel just before closing of the window or panel, the motor is energized to move the window a short distance away from its stopped position away from the closed position. A controller which controls the motor then reverses motor rotation sense to move the window or panel in a direction to close the window or panel. Stated another way, the controller causes the motor to move the panel or window in a direction to open the window or panel and then change motor energization to close the window or panel. This process avoids difficult to sense obstacle detection during the initial start up period of motor operation.

The region of the window or panel seal is a region of increased motor load. In this region, in accordance with one embodiment of the invention, in response to a detection of an obstacle, the controller immediately causes motor deenergization, followed by quick reversal of actuation drive for a short distance (for example one inch). The controller then performs an immediate re-energization in the initial direction so that a more sensitive and accurate obstacle detection process can be performed. The controller can either determine that the initial obstacle detection was false due to actuator startup conditions, and thus continue to power the motor or else verify the obstacle presence that was previously detected and cause the appropriate response of stopping or alternatively stopping and reversing the window or panel for a short distance.

Measured Motor Parameters - DC Current Sensing

By monitoring the two inputs 216, 226, the microprocessor controller 2 monitors the motor current from which the controller 2 determines both sunroof incremental position and speed. Sensed motor current is always positive regardless of motor drive polarity and rotation direction. For either condition of drive polarity the non-energized side of the motor is connected to COMMON through the low value current sensing resistor 210 to produce a positive analog signal voltage directly proportionate to the motor current.

This motor current signal is converted via hardware and/or software to a filtered signal and scaled by a fixed or optionally variable reference voltage to produce a value less than a determined maximum value where the following definition applies: CUR = {sensed motor current analog-to-digital-converted and scaled to engineering units}, where the analog value for motor current is converted to eight-bit digital resolution via an eight-bit ADC (analog-to-digital converter) within the microprocessor controller 2. Eight bit resolution in a controller counter for CUR yields an absolute count range of $0 \leq CUR \leq 255$, where a maximum analog reference voltage is provided to the ADC to set the anticipated maximum possible motor current limit value represented by a reference value 255.

A preferred means to increase sensed motor current resolution and thus improve obstacle detection sensitivity is to adaptively adjust the reference voltage (set = value of 255 representative of full scale) and/or the sensed motor current signal during times of relatively low current operation, returning to the highest scale during starting energization, end-stall detection, and as necessary for obstruction detection. For this eight-bit example, at least one bit of current measurement resolution can be gained during low current operation by decreasing the reference voltage by such means as a variable attenuation network and/or by scaling up the motor current signal by such means as a variable gain amplifier.

Analog motor current signal is lowpass filtered to remove noises from motor current commutation and switching transients to produce a fast running average analog drive current signal to the microcontroller representative of motor torque load conditions. This voltage signal is converted to a scaled digital value by the microprocessor. For example, normal steady operation of the motor at low battery voltage causes the controller to register a digital value of approximately 80 of full scale 255, whereas startup energization at high battery voltage will result in a peak digital value of approximately 240 of full scale 255.

Measured Motor Parameters - AC Current Sensing

Typical DC brush motor current signals also have inherent waveform AC ripples due to rotor current commutation. These motor current pulses directly relate to incremental rotation of the motor shaft and since gears and/or mechanical drive linkages link the shaft to the moving window or panel, directly relate to incremental change of position of the actuator. The relationship of motor current commutation pulses to actuator incremental motion is not necessarily a linear correspondence.

Motor current analog signal can be AC coupled, bandpass filtered, amplified, and compared with a threshold to produce a digital signal via an input representative of motor current commutation signals. Alternatively, motor current commutation signals can be directly sensed from the motor current signal via ADC and digital signal processing bandpass filtering having sufficient resolution to accurately measure the relatively lower amplitude waveforms characteristic of motor current commutation pulses.

Various alternative and more expensive incremental encoder, absolute encoder, and resolver means can produce similar signals representative of incremental or absolute motor rotor position.

A parameter monitored by the controller, indicated by a variable, PP, has generic units of time per fixed increment of motor rotation or time per distance which is defined as: PP = {integer number of microcontroller clock cycles per incremental motor encoder pulse period}, alternatively referred to as inverse speed or per speed. Eight-bit resolution in an integer counter for PP yields an absolute range of $0 \leq PP \leq 255$.

An input from a resistor network provides a reference voltage (in the disclosed design about 2.5 volts) to an operational amplifier configured as a comparator. Each time the motor current commutates a generated spike is transmitted through a coupling capacitor to this comparator to "square up" the output waveform for input to the microprocessor controller. The microprocessor counts the number of microcontroller clock pulses between adjacent motor current commutation pulse signals as an indication of pulse period (PP), which is inversely proportionate to motor speed.

As an example, a relatively low count of 72 clock cycles per incremental motor encoder pulse period is representative of typical steady operation at maximum motor power supply voltage under light loading conditions whereas the count of 240 clock cycles per encoder pulse period is representative of typical transient startup energization acceleration at minimum motor power supply voltage under heavy loading conditions.

As an alternative to a presently preferred current sensing process, other means of determining motor speed are contemplated. Alternate speed sensing technologies include monitoring changes in a magnetic field and converting such changes to a speed of movement. Non-contact sensors for such monitoring include: Hall effect, magnetoresistive, magnetodiode, magnetotransistor, Wiegand effect, and variable reluctance; capacitive; and optical sensors. Such encoders are contemplated in United States patent 5,334,876, Figure 5 which depicts pulses produced by a motor shaft encoder that monitors position, speed and direction of travel of a window or panel.

In accordance with an alternative embodiment of the invention, reflective and blocking sensing; generated inductive magnetic fields: ECKO (eddy current killed oscillator), variable inductor, and variable transformer; and film resistor can be used to monitor window or panel movement.

Position Accuracy

Motor current commutation pulses occur at generally regular intervals over the travel path of the panel. One representative vehicle sunroof has approximately 3000 commutation pulses over the full actuation range of the full open to the full CLOSED positions of the sunroof.

Back extrapolation of decreasing pulse periods upon startup indicates the typical loss of approximately one sensed pulse upon motor energization due to the excessive time duration of the first pulse. This lost pulse is either added or subtracted, depending upon direction of energization, to or from the actuator position counter register to increase incremental position detection accuracy.

Weak and/or missing motor pole signals, due to a faulty coil and/or

commutator segment, are detected via software algorithms that call automatic compensation algorithms to maintain a corrected position counter register value. Therefore, missed motor current commutation pulses ostensibly representative of motor deceleration magnitude beyond empirically-determined limits are pulse simulated for accurate representation of motor speed and actuator position.

Extraneous pulses representative of motor acceleration beyond empirically-determined maximums are deleted from processing to maintain accurate representation of motor speed and actuator position. Adapting parameters for a DSP bandpass filter algorithm, based upon motor current and speed, enable improved motor current commutation pulse-sensing signal-to-noise ratios that result in improved accuracy for incremental position and speed sensing and ultimately in improved obstacle detection accuracy and sensitivity.

Minor corrections are made to a position counter register based upon empirical determinations of numbers of motor current commutation pulses missed due to inertial motion after motor de-energization. This number of missed pulses is based upon the speed of the motor due primarily to the monitored power supply voltage. To reduce errors in this inertial correction term, consistent motor speeds and thus consistent number of missed pulses are achieved at motor de-energization by energization of the motor for no less than a minimum time duration in response to even a very brief actuation of the manual motor energization switch. Furthermore, software debouncing of the manual switch contact deglitches the switch outputs at the microcontroller inputs by requiring the switch contacts be sensed for some minimum time to be considered as a valid control input. Excepting abnormal circumstances such a power loss and/or obstruction detection, activation of the manual motor energization switch for more than the debounce time will result in motor energization for at least a minimum amount of time, thus providing sufficient time to achieve a relatively consistent speed and also a relatively consistent number of missed pulses after de-energization.

Position Sensing & Alternatives

By counting motor current commutation pulses as an incremental encoder, the microcontroller maintains a representation of actuator position by upcounting or downcounting a position count register based upon whether the motor is being energized in a clockwise or counterclockwise direction. Limit switch inputs and/or end-of-travel stall current indications indicate where the microcontroller position counter register is either SET or RESET.

This method of position sensing is significantly simpler and less costly than alternate well-known methods of sensing position using specialized sensors such as incremental encoders, absolute encoders, and resolvers. Improvements provided by adaptive DSP bandpass filters increase the signal-to-noise and performance accuracy of this sensorless electronic position encoding method and means to render it now technically viable for this implementation.

Alternate position-sensing technologies include permanent magnet fields: Hall effect, magnetoresistive, magnetodiode, magnetotransistor, Wiegand effect, and variable reluctance; capacitive; optical: Reflective and blocking; generated inductive magnetic fields: ECKO (eddy current killed oscillator), variable inductor, and variable transformer; and film resistor.

No Template Calibration – Simple Position & Range Learning

Upon powerup, the calibration and/or learning of characteristic current and/or speed versus position may not be necessary. In accordance with certain embodiments of the invention, the only required learning is the absolute position of the actuator from a position input so that an incremental position counter can be either SET or RESET. This true position can be provided by such means as a limit switch, a Hall-effect switch at a known actuator position, and/or by sensing motor stall conditions at the ends of travel. Resetting the absolute position counter is necessary with some embodiments that sense motor commutation pulses for incremental position encoding. Alternatively, the use of a more expensive absolute encoders having no such incremental position counter and requiring no such resetting is a performance versus cost engineering design tradeoff decision. By measuring the position of the roof through the sensor on

the motor, the full open and close positions can be determined without the need of additional limit switches or sensors to determine end-of-travel. Also, the true position can be determined by the end-of-travel by the current of the motor, or the preferred method is to detect no position movements through the motor position sensor and detect end-of-travel and therefore stall. The compensation for the window sizes and travels can be pre-programmed via memory locations at the factory or it can be programmed in a training of installation mode thus eliminating the need for additional end-of-travel switches for home positions.

For certain cases the sunroof controller can be used with more than one type of sunroof, therefore calibration is really a misnomer for what amounts to determining which type of sunroof mechanism is being controlled by learning the characteristic range of allowable motion of the cooperating mechanism, as well as the actuator position. The calibration step need only be performed the first time power is applied to the circuit, or if the physical characteristics of the sunroof change. Until calibration is performed, a automatic operation express mode movement feature is inhibited.

Recalibration can be initiated at any time the user feels that the control circuit is not performing as it should and must always be done if either the controller 2 or the sunroof is changed. The size of the roof is recorded in the EEPROM as well as an identification word flag to enable sunroof operation in the express mode. The position of the sunroof is recorded in the EEPROM each time the sunroof is stopped from moving. This is done to guarantee that in the case of a power down situation, the current position of the sunroof is always known. If at any time the position is considered to be unknown, the express mode is disabled until the next time the sunroof is moved to the fully CLOSED or home position.

The calibration learning of the movement range and position of the sunroof are learned and recorded as follows. The ignition is turned OFF and within five seconds the OPEN switch is pressed and the ignition is switched ON. The controller 2 attempts to find the HOME or PARK position then proceeds to find the limit of the open area or the sunroof, i.e. the fully open position. When a

stall condition is sensed the size of the sunroof open area (by count of motor encoder pulses) is recorded and the controller reverses the direction toward the PARK position. The controller then finds the limit of the vent area by driving the sunroof toward the full VENT position until a stall condition is sensed. A stall condition is determined when analog-to-digital converted motor current is equal to or greater to 180 on the unitless current scale ranging from 0 to 255. If it is not possible to perform the calibration due to a failure to find the park position, no information is recorded and the sunroof express mode (automatic operation) is disabled.

Soft Stop

High position sensing resolution and accuracy enable the actuation system to anticipate the mechanical limit and thus deenergize the motor drive just prior to the actuator hitting its hard stop limit. This saves wear and tear on the mechanism as well as aids in maintaining high motor commutation pulse sensing accuracy. Mechanical "windup" of actuator drive components is significantly reduced by deenergizing and thus stopping the actuator before the torque becomes unnecessarily excessive. Reduction of mechanical windup further improves the consistency of the motor current commutation pulse train of a subsequent motor energization, thus enabling both improved capability of obstacle detection at startup and quicker obstacle detection threshold adaptation. Utilization of motor current commutation pulse sensing as an incremental encoder is enhanced in both speed and position accuracy by reduction of pulse sensing errors associated with windup relaxation and erratic motor pulse train upon startup.

Soft stop also limits high values of end-of-travel motor current, thus enabling improved current sensing resolution by use of a lower ADC motor current reference value that is significantly closer to normal operating value than to higher stall value. High position sensing accuracy enables improved position-related determination of critical and fast-changing obstacle detection thresholds. High position sensing accuracy also enables accurate anticipation of increased

motor loading due to the elastomeric environmental seal near the closing of the panel, thus obstacle detection thresholds are appropriately increased as a function of position.

Digital Signal Processing

Motor current is sensed by preferred DSP techniques that provide lowpass software filtering of the motor current signal to filter out electrical noises, especially the undesirable frequency ranges characteristic of commutation pulses, switching transients, pulse drive transients, and drive transients.

Motor current commutation pulses are sensed by preferred DSP techniques that provide bandpass software filtering of the motor current signal to highpass filter out the DC motor current signal and to lowpass filter out electrical noises and especially the undesirable frequency ranges characteristic of pulse width drive transients, when applicable.

Additionally, adaptive DSP algorithms modify the obstacle detection thresholds in real time response to actual monitored motor operation parameters. A static shift in motor current and/or speed will result in a related shift in obstacle detection threshold. A transient dynamic motor current and/or speed will result in a related shift in obstacle detection threshold. Sensed periodic cyclical dynamic motor current and/or speed will result in a related periodic cyclical obstacle detection threshold.

Advantages of DSP versus hardware implementation as described above include smaller circuit size, fewer components, lower cost, lower mass, and especially ability to adapt filter algorithms for pulse detection thresholds during operation to improve performance characteristics.

Variable Load Parameters – Adaptive Obstacle Detection Threshold

With the sunroof panel automatic powered actuator system, normal vehicle inside-to-outside relative pressure differences and/or wind buffeting can cause respective static, periodic dynamic, and/or transient dynamic variations in the effective actuator motor loading and thus in the motor current that is

compensated for by algorithms for adaptive obstacle detection thresholds. Increasing vehicle wind speed and/or operation of forced vehicle ventilation can produce static pressure differences that increase the load on the sunroof panel motor during operation. Increasing vehicle wind speed and/or external conditions can produce cyclical wind buffeting conditions that correspondingly cyclically alters the motor loading. Amplitude and frequency of cyclical buffeting as fluid vortices is a function of relative fluid velocity. In certain circumstances, there is a relationship between cyclical wind buffeting and static differential air pressure. Obstacle detection thresholds are actively modified with increasing vehicle air speed and with increasing wind buffeting to reduce false obstacle detection. It is anticipated that information about the vehicle speed and/or direction can provide value to the sunroof application by correlation with characteristic loading of the vehicle sunroof and/or window operation.

Unique software algorithms enable characteristic determination of real time actuator operation load categorized as startup transient, nominal, static variable, periodic dynamic variable, transient dynamic, soft obstacle, and hard obstacle. Nominal load is the characteristic motor current and speed as empirically pre-characterized for the actuator. Static variable represents a steady factor of the nominal load by which the ongoing nominal actuation is correspondingly factored up or down. Transient dynamic load represents temporary load magnitude excursion terms by which the ongoing nominal actuation parameter is altered. Periodic dynamic is a cyclical load term by which the ongoing nominal actuation is cyclically loaded with a regular period and amplitude.

Figures 5 – 7 show simplified examples of how DSP is applied in real time to alter and reduce obstacle detection function thresholds for increased obstacle detection sensitivity tolerances. The inventive obstacle detection function threshold adaptively responds via superposition of individual responses to various simultaneous types of load disturbance variables herein described.

Figure 5 shows an example of a simplified case of a typical obstacle detection threshold based on template technology versus the adaptive obstacle

detection function threshold of the present invention. The relatively large and fixed obstacle detection threshold accommodates the three types of system load variables described above. Adaptive obstacle detection achieves comparatively lower threshold values with higher sensitivity than fixed threshold systems by virtue of its ability to adapt to various types of system load variables.

Figure 6 shows an example of a simplified case of a DSP adapting the obstacle detection function threshold in real time to accommodate dynamic load shifts. Note that the adaptive threshold tracks the motor operation function with intentional adaptive response delay time and slew rate. The degenerate case of a static load shift is not shown, although somewhat similar to figure 6. A comparatively lower threshold value and higher sensitivity is achieved by virtue of the ability to adapt to various types of system load variables.

Figure 7 shows an example of a simplified case of inventive DSP adapting the obstacle detection function threshold in real time to accommodate periodic cyclic dynamic load variations. Initially, before periodicity is ascertained, the adaptive response delay time of figure 6 prevails. Upon a determination that the disturbance is strictly periodic, as with a bad gear tooth, after perhaps three cycles, the adaptive response delay time delay time is reduced to more accurately track the known periodicity of the cyclic disturbance. A comparatively lower threshold value and thus higher sensitivity is provided by the ability to adapt to various types of system load variables. Note that after cyclical periodicity of the disturbance is established, the normally lagging response of the adaptive threshold obstacle detection function becomes predictive so the periodicity of the dynamic response of the adaptive threshold obstacle detection function becomes in phase with the related dynamic disturbance of the motor operation function. Thus, the adaptive threshold more closely tracks actual motor operation function. The net result is obstacle detection with greater sensitivity to real obstacles with reduced occurrences of false obstacle detection.

The engineered characteristic response time, slew rate, and frequency response of the real time adaptive obstacle detection threshold algorithm must respond in a manner significantly less than 180 degrees out of phase with

anticipated cyclical load variables, yet not so fast as to interfere with either hard and/or soft obstacle detection algorithms. These adaptive threshold response constraints effectively limit how fast the real time adaptive obstacle detection function threshold is allowed to change in response to changes in load variable that are ascertained to be not caused by hard or soft obstacle interference. It is important to see that the real time adaptive obstacle detection function threshold is equal or lower than the fixed obstacle detection threshold. Lower obstacle detection function thresholds produce more sensitive obstacle detection, faster obstacle detection, faster actuator deenergization, faster actuator stopping, and lower peak obstacle force at final stopping position.

Reduced Actuation Speed

Circuitry disclosed in United States patent 5,334,876 uses a PWM (pulse width modulated) activation of the motor windings of a direct current motor to control and/or regulate the speed of motor output shaft rotation as the motor opens or closes the window or panel. The present system preferably applies full battery voltage of a motor vehicle across the motor to drive actuator panel motion. As the motor controller industry learns to meet obstacle detection anti-pinch force regulations, it is fully anticipated that allowable forces might be lowered, possibly resulting in the necessity to use motor drive speed-reducing techniques to enable full regulatory compliance.

Typical applications of drive power to a motor include full power supply voltage, fixed duty cycle pulse drive, PWM (pulse width modulation) to regulate average motor speed and/or acceleration, pulse repetition modulation to regulate average motor speed and/or acceleration, linear drive of a fixed fraction of the full power supply voltage, linear drive of a fixed voltage, controlled linear drive to regulate average motor speed and/or acceleration, and phase angle switching control for AC motor applications. Switching transients are reduced and RFI/EMC is improved for any of the above switchmode methods of motor drive by filtering the drive output and/or controlling the slew rate of turn on and/or turn off of the motor drive power.

Relays and power contactors are typically utilized for relatively slow power control applications such as for switching on/off and for switching energization between forward and reverse. Solid state switches are typically utilized for relatively fast power control switching applications. Solid state linear drive components typically require significant heat sinks to dissipate the waste heat, although the relatively smooth output drive voltages are best for motor drive and low RFI EMC issues. Furthermore, AC motor applications typically use triacs or SCRs (silicon controlled rectifiers) for phase switching control of motor power.

Generic Obstacle Detection

To detect an obstruction when the sunroof panel is closing in its automatic operation mode, in brief, the microprocessor measures the motor current and speed for the ongoing actuation and compares against an empirically-determined algorithm within the controller for motor current and speed versus position and/or time. When calculations based upon sensed current, pulse period, derivatives thereof, and actuator position cause a calculated threshold to be exceeded, an obstruction is ascertained and the sunroof is brought back to its full OPEN or full VENT position.

A trippoint calculation utilizes memory buffers to store motor operation parameter information needed to make a determination about obstruction detection. If the sunroof is calibrated and is subsequently placed in the automatic close mode, the controller 2 uses the contents of these buffers to determine the presence of an obstruction. Variations of numerical term and factor values of the obstacle detection threshold algorithm of cited references, commonly owned, are fully anticipated per empirical characterization of any particular actuation system. Such term and factor values can be predetermined and/or adaptive via DSP algorithms. It is impractical to even attempt to show all apparent variations.

Trip point algorithms are based upon empirically obtained measurements from actuations over chosen ranges of operating conditions.

The pulse period relates to sunroof speed. As the speed increases,

factors that utilize pulse period (PP) cause obstruction indication more easily than at low speed. Stated another way, the threshold is made to be close to the operating current since there is a shorter time to react to the occurrence of an obstruction.

Other terms relate to motor current. Another term avoids obstruction sensing for a sharp current increase due to spurious and short lived currents that might otherwise cause false obstruction detection. Nominal values for I (motor current) are from 40 to 80. These do not correspond to units of amperes or milliamperes, but are instead scaled engineering units based upon the motor and circuitry used to sense the motor current.

Startup Obstruction Detection Summary

Figure 4 shows typical startup energization characteristics of current and per speed for a motor. Startup obstacle detection is somewhat difficult because the characteristic startup current for a motor typically begins with a quick inductive rise toward a peak value primarily limited by the resistive impedance of the motor coil and speed starts from zero. Startup current peaks typically approach stalled rotor current of approximately four and one half to six times normal operating current. Starting currents peak quickly, approaching a typical maximum value of approximately 75% of stalled rotor condition, after which motor current gradually reduces to a steady state operating condition primarily due to increasing back EMF (electromotive force) generated by gradual increasing rotation speed of the rotor. Higher reference values for current sense scaling can be preferred for startup and stall conditions versus normal steady operation.

Relatively fast clock speeds of microcontroller circuitry enable fast detection of hard obstacles at startup by monitoring parameters of motor current and motor PP. Algorithms based upon monitored parameter values of motor voltage and motor current load, during a fixed startup time interval enable predicted anticipation of motor speed. If the sensed speed at the end of the fixed startup time interval is below a determined threshold, then an obstacle is

determined. If the sensed current at the end of the fixed startup time interval is above a determined threshold, then an obstacle is determined.

Expressed in other terminology, after allowing some small initial amount of time for the motor rotor to begin rotation, I is immediately measured and compared against a fixed maximum threshold value and PP is immediately measured and compared against some maximum threshold number of clock cycles. If either measured parameter variable exceeds its fixed threshold value, then a hard obstacle detection is made and motor drive is immediately discontinued, and the actuation is briefly reversed to release the obstruction. The initial amount of time is that time during which a significant increase in motor speed is expected to be measurable. A larger motor and a motor with greater associated rotational inertia from the load will both typically require a longer acceleration time.

Hard Obstacle Detection Summary

In brief, hard obstacle detection is generally based upon adaptive algorithms that evaluate an immediate short history of motor current and speed of the immediate actuation. Hard obstacle detection is via fast processing algorithms of at least one FIFO memory containing sequential measurements of motor electrical current and per speed. Running calculations based upon the FIFO memory of measured values are stored in at least one FIFO memory. Hard obstacle detection after startup is performed via two algorithms. One algorithm method is based upon speed and rates of change of speed (also known as acceleration and deceleration) and/or rates of change of acceleration or deceleration (also known as jerk) to determine at least one value in excess of at least one limit. Another algorithm method is based upon measurements of motor current and derivatives thereof based upon time and/or position at times and/or positions determined at each motor commutation pulse and with further calculations based thereupon to determine at least one value in excess of at least one limit.

Hard obstacle threshold detection limits based upon motor current are

also modified based upon the number of microcontroller pulses counted per motor current commutation pulse period. The condition of exceeding either one of these adaptive threshold limits is construed as hard obstacle detection. Implementation of this method is by utilization of at least one FIFO memory for storing such running measured values as PP and/or I, as previously defined. Additional FIFO memory can be used to store additional running calculated values based on PP and/or I. These running calculated values based upon time and/or position are of types including first derivative, second derivative, higher order derivative(s), weighted running averages, algebraic expressions, logarithms, statistical functions, and the like for computation of adaptive thresholds based thereupon.

Fast real time digital processing routines are simplified algebraic equations derived from piecewise linearization and/or other simplified algorithms for curve fitting of empirical sunroof panel operational data. Depending on accuracy requirements and relative algorithm processing speeds, higher order curve-fitting routines are anticipated. Hard obstacle detection occurs when either I and/or PP exceed a running adaptive threshold value comprised of terms based upon fixed, static, and/or dynamic values.

Soft Obstacle Detection Summary

In brief, soft obstacle detection is generally based upon adaptive algorithms that evaluate an immediate history of motor current and speed of the immediate actuation. The immediate history is much longer than that immediate short history per hard obstacle detection algorithms. Soft obstacle detection is also via fast processing algorithms of at least one FIFO memory containing sequential measurements of motor electrical current and per speed. Running calculations based upon the FIFO memory of measured values are stored in at least one FIFO memory. Soft obstacle detection after startup is performed via two algorithms. One algorithm method is based upon speed and rates of change of speed (deceleration) to determine at least one value in excess of at least one limit. Another algorithm method is based upon measurements of motor current

and derivatives thereof based upon time and/or position at times and/or positions determined at each motor commutation pulse and with further calculations based thereupon to determine at least one value in excess of at least one limit.

Implementation of this unique method is by utilization of at least one FIFO memory for storing such running measured values as PP and/or I. Additional FIFO memory can be used to store additional running calculated values based on PP and/or I. These running calculated values based upon time and/or position are of types including first derivative, second derivative, higher order derivative(s), weighted running averages, algebraic expressions, logarithms, statistical functions, and the like for computation of adaptive thresholds based thereupon. Fast real time digital processing routines are simplified algebraic equations derived from piecewise linearization and/or other simplified algorithms for curve fitting of empirical sunroof panel operational data. Depending on accuracy requirements and relative algorithm processing speeds, higher order curve-fitting routines are anticipated. Soft obstacle detection occurs when either I and/or PP exceed a running adaptive threshold value comprised of terms based upon fixed, static, and/or dynamic values.

Software Digital Signal Processing Techniques

Algorithm methods generally used for data analysis can include time domain and/or frequency domain techniques. These data processing techniques include, but are not restricted to, algebraic manipulation, logical comparison, convolution, convolution integral, Fourier transforms, fast Fourier transforms, discrete Fourier transforms, z-transforms, wavelet analysis, and the like. Digital signal processing techniques and algorithms are used to monitor data from motor operation parameters and/or derived data thereof in practical real time to ascertain motor operation parameter changes characteristic of undesired obstacle loading.

Collision detection notation

Measured readings of hardware-filtered I_n (motor current) and PP_n (pulse

period) are triggered by and thus synchronized with motor current commutation pulse detections. Multiple FIFOs (first-in-first-out memories) are utilized to store running measurements of I_n and PP_n as well as calculated values derived therefrom. In a very general sense, both hard obstruction detection and soft obstruction detection algorithms are based upon weighted factors of the history of running measurements and running calculations. Hard obstacle detection is biased more toward a relatively recent-term history, whereas soft obstacle detection is weighted more toward a relatively longer-term history.

Generalized obstacle detection is considered as an abbreviated subset from a very broad set of weighted factors based upon a running history of measured motor operation parameters and data calculations based thereupon for the immediate actuation operation. Prior methods of obstacle detection implement the method of predetermining an operation parameter template based upon some number of running weighted averages of sequential prior actuations. The present method uses no such predetermined operation parameter template, but rather calculates both hard and soft obstacle detection thresholds during the immediate actuator operation based upon at least one software algorithm.

Motor speed fractionally varies significantly more than does motor current with magnitude of motor supply voltage. Motor torque load correlates very well with motor current. Thus, motor current is the primary measured parameter of immediate importance for both hard and soft obstacle detection. Obstacle detection is desensitized to electronic noise by implementing a running software filter to calculate noise-reduced motor current for determination of obstacle detection. Obstacle detection is based upon measurements of motor current and motor speed per the following notations.

Processing equations, data, and variables utilize the following notations and definitions.

Subscript n represents pulse number, $n \geq 0$, where
$n = 0 \equiv$ most recent motor current commutation pulse
$n = 1 \equiv$ motor current commutation pulse just prior to $n = 0$
$n = 2 \equiv$ motor current commutation pulse just prior to $n = 1$.

Subscript m represents the identifier for motor operation term weighting

factors, $m \geq 0$, where
Km ≡ empirically determined term-weighting factors, alternatively adaptive.

Measured motor operation parameters, FIFO registers, where
I_n ≡ measured motor current at the n^{th} commutation pulse
PPn ≡ counted number of clock cycles per pulse period between motor current commutation pulses from pulse n to (n + 1).

Calculated motor operation values, FIFO registers, where
I_{R0} ≡ calculated running software-filtered value of prior sequential measured motor currents in range zero
I_{R1} ≡ calculated running software-filtered value of prior sequential measured motor currents in range one
$I_{Ra\text{-}f}$ ≡ calculated running software-filtered value of prior sequential measured motor currents in ranges a – f (a through f) ...
{Min $I_{Ra\text{-}f}$} ≡ determined value of a minimum of motor current readings in prior sequential ranges a-f
{Max $I_{Ra\text{-}f}$} ≡ determined value of a maximum of motor current readings in prior sequential ranges a-f
PP_{R0} ≡ calculated running software-filtered value of prior sequential counted PP in range zero
PP_{R1} ≡ calculated running software-filtered value of prior sequential counted PP in range one
$PP_{Ra\text{-}f}$ ≡ calculated running software-filtered value of prior sequential counted PP in ranges a-f

Very recent motor operation parameter history is represented by at least one data set range given numeric identifier. Range zero includes data sets represented by the most recent sequential few motor current commutation pulses, typically 4 to 8 pulses. Range one includes data sets represented by a similar number of 4 to 8 motor current commutation pulses immediately prior to range zero. Although ranges zero and one typically represent data sets for 4 to 8 motor current commutation pulses each, the quantity of represented data sets can be as low as 1 and higher than 16, as determined by system operation requirements and monitored dynamic system conditions. Furthermore, the

quantity of represented pulses per data set can be interactively modified in response to variations of measured motor operation parameters. The number of data sets in ranges one and two are empirically determined somewhat by the extent of software filtering necessary to adequately represent very recent history of motor operation parameters.

The quantity of such numeric identifier data ranges can be as low as 1 and higher than 8, depending upon actuator system dynamic response and fast filtration algorithm requirements. Furthermore, the quantity of data sets can be interactively modified in response to variations of measured motor operation parameters. Fast filtration requirements are determined by the electrical noise level, the number of motor current commutation pulses per motor revolution, the numbers of gear teeth in drive mechanisms, mechanical vibrations, and the like.

Longer recent motor operation parameter history is represented by at least one range given alphabetic identity. Range a, b, c, d, e, and f includes six data sets each represented by a significantly larger data set range than numeric identifier ranges zero and one. Although six ranges are here described, this quantity can be as low as one and higher than six, as determined by system operation requirements and monitored dynamic system conditions. Typically, each of the ranges a-f includes 8 to 24 data sets. Range a represents the most recent sequential motor current commutation pulses. Range b represents the similar-sized range immediately preceding range a. Likewise, up to range f. The number of data sets in ranges a-f can be as low as one and significantly higher than 24, depending upon slow filtration algorithm requirements. Furthermore, the number of data sets in each of ranges a-f, as well as the quantity of ranges, can be interactively modified in response to variations of measured motor operation parameters. Fast filtration requirements are determined by the electrical noise level, the number of motor current commutation pulses per motor revolution, the numbers of gear teeth in drive mechanisms, mechanical vibrations, frequency of periodic load disturbances, and the like.

Following examples will describe the use of two numeric identifier data set ranges zero and one, for very recent motor operation data, with each range

representing data sets for six motor current commutation pulses. Following examples will also describe the use of six alphabetic identifier data set ranges a-f, for longer recent motor operation data, with each range representing data sets for 15 motor current commutation pulses.

In a simple preferred case, calculated running software-filtered algorithms determine even-weighted boxcar averages of sequential data from defined FIFO ranges, as follows.

For defined range zero,

$$I_{R0} \equiv \sum_{n=0}^{n=x-1} A_n I_n$$

and

$$PP_{R0} \equiv \sum_{n=0}^{n=x-1} A_n PP_n .$$

In this simple preferred example case, set

$$x = 6 \text{ and } A_n = (1/x)$$

to produce evenly weighted boxcar averages from data representing six sequential motor current commutation pulse measurements. And likewise,

$$I_{R1} \equiv \sum_{n=x}^{n=2x-1} A_n I_n$$

and

$$PP_{R1} \equiv \sum_{n=x}^{n=2x-1} A_n PP_n$$

for range one.

In similar manner, evenly weighted boxcar averages are calculated from data in defined alphabetic ranges, as follows.

By setting

$$y = 15 \text{ and } A_n = (1/y)$$

and applying into equations

$$I_{Ra} \equiv \sum_{n=0}^{n=y-1} A_n I_n$$

$$n = 2y - 1$$

$$I_{Rb} \equiv \sum_{n=y}^{n=3y-1} A_n I_n$$

$$I_{Rc} \equiv \sum_{n=2y}^{n=4y-1} A_n I_n$$

$$I_{Rd} \equiv \sum_{n=3y}^{n=5y-1} A_n I_n$$

$$I_{Re} \equiv \sum_{n=4y}^{n=6y-1} A_n I_n$$

$$I_{Rf} \equiv \sum_{n=5y}^{n=7y-1} A_n I_n$$

and into equations

$$PP_{Ra} \equiv \sum_{n=0}^{n=y-1} A_n PP_n$$

$$PP_{Rb} \equiv \sum_{n=y}^{n=2y-1} A_n PP_n$$

$$PP_{Rc} \equiv \sum_{n=2y}^{n=3y-1} A_n PP_n$$

$$PP_{Rd} \equiv \sum_{n=3y}^{n=4y-1} A_n PP_n$$

$$PP_{Re} \equiv \sum_{n=4y}^{n=5y-1} A_n PP_n$$

$$PP_{Rf} \equiv \sum_{n=5y}^{n=6y-1} A_n PP_n$$

These evenly weighted running software filtered averages are used to

reveal calculated trends in larger recent motor operating parameter history.

For a system where algorithm processing must be very fast, the use of range sizes that are integer powers of the number 2, e.g. 1, 2, 4, 8, 16, 32, etc., result in boxcar averaging weighting factors that are very quickly multiplied by simply and quickly bit or nibble shifting the measured data.

In addition to running filtered shorter-term and longer-term averages of respective numeric range data and alphabetic range data it is necessary to compute dynamic noise levels of measured parameters to compensate obstacle detection thresholds for system noise. Increased relative noise levels necessitate increased obstacle detection thresholds to avoid false obstacle detection with subsequent stopping and reversal of the actuator. Such noise levels are computed from minimums and maximums determined by the following definitions.

$\{MinI_{Ra}\}$ ≡ minimum value of motor current readings in range a
$\{MinI_{Rb}\}$ ≡ minimum value of motor current readings in range b
$\{MinI_{Rc}\}$ ≡ minimum value of motor current readings in range c
$\{MinI_{Rd}\}$ ≡ minimum value of motor current readings in range d
$\{MinI_{Re}\}$ ≡ minimum value of motor current readings in range e
$\{MinI_{Rf}\}$ ≡ minimum value of motor current readings in range f
$\{MaxI_{Ra}\}$ ≡ maximum value of motor current readings in range a
$\{MaxI_{Rb}\}$ ≡ maximum value of motor current readings in range b
$\{MaxI_{Rc}\}$ ≡ maximum value of motor current readings in range c
$\{MaxI_{Rd}\}$ ≡ maximum value of motor current readings in range d
$\{MaxI_{Re}\}$ ≡ maximum value of motor current readings in range e
$\{MaxI_{Rf}\}$ ≡ maximum value of motor current readings in range f

Maximums and minimums from multiple alphabetic ranges are per these examples.

$\{MinI_{Rb\text{-}f}\}$ ≡ minimum value of motor current readings in ranges b-f

$\{MaxI_{Rb\text{-}f}\}$ ≡ maximum value of motor current readings in ranges b-f

Obstacle detection is based upon the history of minimum and maximum motor operation parameter measurements. The difference between the minimum and the maximum values gives an indication of the measured noise levels.

A very generic equation for obstacle detection includes above factors, shown below. Note that the term including the factor I_{R0} is incorporated into the term on the left side and accommodated by suitable adjustment of remaining K_n factors.

HARD and/or SOFT OBSTRUCTION DETECTION:

If $I_{R0} \geq [K_1 I_{Ra}] + [K_2 I_{Rb}] + [K_3 I_{Rc}] + [K_4 I_{Rd}] + [K_5 I_{Re}] + [K_6 I_{Rf}] + [K_7 PP_{Ra}] + [K_8 PP_{Rb}] + [K_9 PP_{Rc}] + [K_{10} PP_{Rd}] + [K_{11} PP_{Re}] + [K_{12} PP_{Rf}] + [K_{13} I_{R1}] + [K_{14} \{MinI_{Ra-f}\}] + [K_{15} \{MaxI_{Ra-f}\}] + [K_{16} PP_{R0}] + [K_{17} PP_{R1}] + K_8$

THEN AN OBSTACLE IS DETECTED

All of the above factors based upon I, PP, and calculated values thereof are preferred to be simple evenly weighted running averages and/or simple maximum and minimum comparisons that process relatively quickly. The large quantity of algebraic and logical operations precludes complete processing fast enough to quickly detect an obstruction and stop before pinch forces exceed safe limits.

Algorithm processing for hard and soft obstruction detection is divided into two separate equations, weighting the various terms depending upon magnitude of importance and processing time requirements. The following examples show generalized and preferred algorithms for hard and soft obstruction detection. K_n factors are empirically determined to meet system dynamic performance mandates.

HARD OBSTRUCTION DETECTION:

IF $I_{R0} \geq [K_1 I_{R1}] + [K_2 PP_{R1}] + K_3$

THEN AN OBSTACLE IS DETERMINED.

Hard obstruction detection is imperative to determine very quickly so this implementation keeps processing requirements to a low level, yet enables fast and reasonably precise hard obstacle detection. Large range average terms including current, pulse period, minimum current, and maximum current are all considered insignificant enough in the tradeoff against speed so they are removed. Small range average motor current, I_{R0}, is thus unitlessly compared

with the sum of three terms I_{R1}, PP_{R1}, and K_3. This essentially compares immediate average current with immediately prior average current and immediately prior average pulse period plus an offset constant. Thus, a quick increase in sustained motor current tends toward hard obstruction determination. High values of pulse period indicate that the motor is running slow with high torque, so the difference between the actuator force and the maximum allowable pinch force is also low. Thus, high values of pulse period also tend toward hard obstruction determination.

SOFT OBSTRUCTION DETECTION:

IF $I_{R0} \geq [K_4\ PP_{Rb\text{-}f}] + [K_5\ \{\text{Min}\ I_{Rb\text{-}f}\}] + [K_6\ \{\text{Max}\ I_{Rb\text{-}f}\}] + K_7$

THEN AN OBSTACLE IS DETERMINED.

Soft obstruction detection is not nearly as time sensitive, as is hard obstruction detection, thus additional terms can be computed in the time allowed before the slow increase in entrapment force exceeds maximum allowable values. The large range average term for pulse period of ranges b-f provides a relatively stable representation of pulse period that relates inversely with speed. As speed is decreased, pulse period is increased. High values of PP indicate that the motor is running slow with high torque, so the difference between the actuator force and the maximum allowable pinch force is also low. Thus, high values of pulse period also tend toward hard obstruction determination. The large range minimum and maximum terms for motor current in ranges b-f are lumped together into two terms to provide a practical combination of terms representing both average current and current noise range. Dynamic loading conditions produce dynamic currents that result in a wider range of maximum, minimum, and maximum minus minimum current values. High values of current noise necessitate higher soft obstruction detection threshold values to avoid nuisance detection.

Depending upon the periodicity of motor loading conditions, it is possible to not only adapt thresholds reactively, but also to predictively adapt thresholds in anticipation of continued cyclic loading conditions. Software algorithms that

evaluate various alphabetic range sizes of the FIFO data set to quantify max and min enable determination of alternating amplitudes characteristic of frequency and/or frequencies for which motor operation parameter loading reveals cyclic periodicity. Adaptive predictive compensation of soft obstacle detection enables improved sensitivity for set detection thresholds with reduced affect by cyclic dynamic loads such as wind buffeting or repetitive gear loading. The obstacle detection threshold is cyclically modified in anticipation of the regular disturbance detected. Such cyclic obstacle detection modification can occur simultaneously with dynamic transient response of obstacle detection threshold levels, as otherwise described.

Alternative Incremental Encoding Implementions

Sensorless electronic sensing of motor current commutation pulses is the preferred low cost method of motor rotor movement disclosed herein in fair detail. In certain circumstances, it may be preferable to use alternative absolute and/or incremental position sensing by at least one hardware sensor means. Such circumstances that might lead to the choice to implement position sensing via hardware sensors include: 1)desire to sense a greater number of encoder pulses per motor rotor revolution than produced by motor commutation segments to enable faster obstacle detection per time and/or per rotation; 2)high electrical noise environment that makes it difficult to maintain high accuracy of position count from electronic sensing of encoder pulses; 3)actuator mechanisms that potentially allow mechanical windup and/or jitter that mechanically feeds back to the motor rotor allowing production of rotor electronic pulses representing ostensible actuator motion and/or motion in the incorrect sense; and 4)systems for which it is desired to maintain strict position accuracy regardless of electrical noise and mechanical disturbances.

One particular general alternative preferred embodiment for incremental positioning sensing utilizes two sensing elements physically aligned to produce phase quadrature signals from a relatively moving target. Two sensing elements in phase quadrature orientation provide information about both speed and direction. A typical example of this implementation is to attach a diametrically

magnetized (two pole) magnet to the rotor of a motor with two symmetrical bipolar latch Hall effect sensors held in 90 mechanical degrees and in proximity to sense the magnet. By this setup, there are two transitions per Hall effect sensor per pole pair, thus a total of four transitions per motor rotor revolution by which to trigger measurements of motor operation parameters as herein described with motor current commutation pulse sensing. Alternatively, use of a ring magnet having 10 pole pairs with similar symmetric bipolar latch Hall effect sensors in phase quadrature will produce 40 transitions per motor rotor revolution.

Various sensing properties utilized for incremental and/or absolute position sensing including optical, magnetic field, electric field, potentiometric, and the like. Magnetic fields are sensed by Hall effect, magnetoresistance, anisotropic magnetoresistance, giant magnetoresistance, collosal magnetoresistance, Wiegand effect, fluxgate magnetometry, magnetodiode, magnetotransistor, superconducting quantum interference magnetometry, and more. Electric fields are sensed by electrodes of fixed and/or variable geometry with sensitive electronic circuitry. Optical fields are sensed by photodiode, phototransistor, photoresistor, and thermocouple (for slowly changing fields converted to heat). Electromagnetic fields are sensed by electrodes as coupled antennas with tuned electronic circuitry.

Battery and Motor Protection

Battery voltage is monitored to determine when the power supply drops below some minimum value so the motor drive can be discontinued. This protects against battery rundown in the situation where a low voltage battery power supply is insufficient to drive the motor and/or sustained electrical load might pose a risk of draining the battery. A timeout timer to limit motor drive time is an additional preferred means by which similar protection is affected. Motor protection is optionally provided by such means as a current limiting diode, a positive temperature coefficient resistor, and/or a thermal cutout switch.

Ice Breaking

An alternative functional capability is an ice-breaking mode whereby full motor force is allowed for more than the minimum amount of time and/or distance to enable a window and/or sunroof panel to break loose from ice. This feature will be appreciated by many in cold climates who find their car windows and/or sunroofs stuck in position due to ice. For visibility and/or escape safety, this option is fully anticipated as a preferred functional feature. For this optional mode of operation, the controller remembers the starting position for safety reference and will not allow significant deviation therefrom if hard obstacle detection conditions are sustained. Under manual switched input control, the controller allows for alternating direction application of full motor force for some predetermined maximum distance and/or time, for example three millimeters and/or three seconds alternately in either direction before enabling hard obstacle detection capability. The characteristic current peak and then drop usually occurs over approximately 10 motor current commutation pulses, which corresponds to approximately 3 mm. IF startup current deviates significantly above normal AND IF the number of motor current commutation pulses deviates significantly below 10 during the usual amount of time for a typical startup characteristic, THEN the stall timeout timer can be increased up to perhaps 5 seconds to break ice by a simple algorithm based upon the two deviations. Thereafter, if normal actuator motion does not commence by breaking loose from the ice, the actuator can then be retracted to remove hard obstacle preload and the ice breaking cycle repeated. 3 mm is typically sufficient to break ice and also corresponds with the startup hard obstacle detection distance under conditions of obstacle preload. If the motor current remains high and the number of pulses is normal at the characteristic startup time, then a hard obstacle is determined. For safety considerations, this feature might be enabled only when the sensed ambient temperature is sufficiently cool to allow for the existence of ice conditions. Soft frozen ice might actually take a longer amount of time and/or distance to break free than hard frozen ice, there necessitating adjustment of the maximum set times and/or distances based on sensed temperature. An alternate method of

breaking ice can be enabled with a switch press sequence. For example, two taps and hold, then the unit can go into manual mode which disables obstruction detection.

Timed Power Latch

An optional feature included in the preferred embodiment is for the controller to self latch power for an amount of time after the vehicle ignition is switched off, for example 15 seconds, to allow the vehicle operator to close the sunroof and/or windows. Likewise, another vehicle security alternative is to allow the operator to select the option for the vehicle sunroof and/or windows to automatically close when the ignition is switched OFF. This feature can work in conjunction with an alternative feature whereby the vehicle cabin temperature is sensed for the automatic function of opening the sunroof and/or the windows to the VENT position when the sensed vehicle cabin temperature exceeds some maximum set temperature. Similarly, a sunroof and/or window can automatically close to the fully closed position when the sensed vehicle cabin temperature is below some set temperature. A reasonable hysteresis between the vent set temperature and the cool close temperature will reduce unnecessary cycling between VENT and CLOSED positions.

Vehicle Communication Systems

Communication motor vehicle computer via the vehicle communication bus problem is optional based upon interface system capability and application requirements. Examples of vehicle communication buses include SAE (Society of Automotive Engineers) J1850, CAN (Controller Area Network), and numerous others developed by various automotive manufacturers. Such communication means can communicate actuator system fault conditions including faulty motor coil or commutator segment, low actuation speed, excessive motor current, drive mechanism range limitation, component failures, system failures, and the like.

This vehicle speed information might be obtained by vehicle bus multiplexing (MUX) communication and/or demultiplexing (DEMUX)

communication from such sources as speedometer, transmission, and transfer case as is used by other sources such as cruise control system, anti-skid braking system, and traction control system. Similarly, information from the vehicle environmental control systems might provide information such as fan speeds and ventilation settings that can be of value to anticipate an amount of static and transient loading on the sunroof and windows. Utilization of a relatively fast responding pressure sensor enables empirically-correlative predictive modification of obstacle detection thresholds to overcome variable changes of actuator load due to static, periodic dynamic, and transient dynamic vehicle cabin atmospheric pressures. An optional anticipated feature is for the vehicle sunroof position to be automatically moved to a position to reduce sensed cabin wind buffeting and/or noise.

Empirical Actuation Motor Load Profile Equation and Algorithm

Nominal operation parameters for obstacle detection threshold are empirically characterized as motor current loading versus actuator position. Alternative empirical characterizations include motor current versus time, motor speed versus time, motor speed versus position, and combinations thereof as per prior art references. In the present embodiment, this algebraic representation has a general simplified algebraic form for fast computation via DSP processing, particularly implementing adding and/or bit shifting and/or byte shifting operations. These types of empirical data manipulations for conversion to fast computing real time microcontroller algorithms have been found to be applicable to various diverse combinations of vehicles and sunroofs.

To accommodate each vehicle's fixed aerodynamic profile, it is typically necessary to empirically determine and characterize each type of vehicle with each type of sunroof for each direction of opening and/or closing over a wide range of vehicle speed and temperature conditions to determine all appropriate adaptive obstacle detection threshold calculation algorithms.

The present invention provides a system wherein empirical data representing a range of operational conditions and empirically determined

functional terms and factors for an automatic powered actuator can be converted by simplified piecewise line and/or curve fitting means to algorithmic equations with coefficients that support fast real time processing such that adaptive sensing thresholds are enabled resulting in improved sensitivity, improved accuracy, and improved time response to obstruction conditions. Based upon the complexity of the actuation system, sensitivity requirements, and time response requirements, additional refinements as threshold error reducing terms can be characterized for inclusion into the sensing threshold equation using similar methods.

Utilization of simplified equations in the processing algorithms allows for fast performance in real time without relying upon previous methods such as using fixed characteristic signature templates and/or slowing down actuator motor drive speed.

Alternative Applications

When used to operate a power sunroof the control circuit can open the sunroof, close the sunroof, and tilt open the sunroof to a vent position. The preferred embodiment of the invention automatically controls a power sunroof but similar actuation of other automatic powered panels or windows is anticipated using the disclosed control circuit and obstruction detection methods.

Load sensing threshold determinations via similar methods to this teaching are anticipated for alternative application functions including those without human involvement and for applications without potential for equipment damage. It is fully anticipated and expected that systems and methods can well be similarly utilized to control practically any system variable by monitoring at least one operational parameter such that the controlled variable is not required to be safety related. This method and system, based on empirical determinations of operating parameters, running measurements of operating parameters, FIFO memories for storing measured and/or calculated values, fast computation algorithms, and subjective determination of load threshold parameter values can generally be applied to systems and devices where such variable thresholds are chosen for functional means other than for purposes of

human safety or equipment protection. The large scope includes systems having more than one such controlled variable.

Aeronautical systems have applicability of the inventive disclosure. An example is the detection of the onset of stall conditions by the change in force and/or a cyclical varying lift produced by an airfoil as it is increasingly approaching a stall condition. Such impending stall condition is the sensed input, instead of obstacle detection, that precedes the control response to outputs including engine power, flap actuation, elevator actuation, aileron actuation, rudder actuation, ice boot actuation, and the like. Analogously, hydraulic liquid flow control systems for ships and submarines are anticipated.

Hydraulic, pneumatic, and mechanical systems are similarly anticipated by computations based upon time, position, and/or other derivatives of monitored parameters including: position, pressure, volume, flow, force, torque and the like. Utilization of analogous algorithms and adaptive methods and systems enables obstacle detection, and/or arbitrary functional limit detections

Broad Encompassed Alternatives

While the present invention has been described with a degree of particularity, it is the full intent that the invention include modifications and altercations from the disclosed and anticipated designs falling within the spirit and/or scope of the appended claims.

Claims

1. Apparatus for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said apparatus comprising:

a) a sensor for measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element;

b) a memory for storing a number of measurement values from the sensor based on measurements of said parameter over at least a portion of said range of motion;

c) a controller coupled to the memory for determining to de-activate the motor based on the measurement values stored in the memory as the motor driven element moves over its range of motion; and

d) a controller interface coupled to the motor for altering motion of said motor driven element in response to a determination made by the controller.

2. A method for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said method comprising:

a) measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element by taking a multiplicity of measurements as the motor moves the motor driven element over its range of motion;

b) storing a number of measurement values based on measurements of said parameter over at least a portion of said range of motion;

c) determining that the parameter is outside a parameter range based on previous stored measurement values as the motor driven element moves over its range of motion; and

d) altering motion of said motor driven element in response to a

determination that the parameter is outside the parameter range.

3. The method of claim 2 wherein the motor driven element is a window or panel and additionally comprising reverse actuating the window or panel prior to moving said window or panel in a direction to close the window or panel.

4. The method of claim 3 additionally comprising maintaining a position of the window or panel based on the sensed parameter and the reverse actuation is initiated if a leading edge of the window or panel is near a closed position.

5. The method of claim 4 movement is first initiated toward a closed position when a leading edge of the window or panel is near the closed position and wherein the reverse actuation is performed upon a sensing of an obstacle that is based on determining the parameter is outside the parameter range.

6. Apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving said window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel, said apparatus comprising:

a) a sensor for sensing movement of the window or panel and providing a sensor output signal related to a speed of movement of the window or panel;

b) a switch for controllably actuating the motor by providing an energization signal; and

c) a controller having an interface coupled to the sensor and the switch for controllably energizing the motor; said controller sensing a collision with an obstruction when power is applied to the controller by:

i) monitoring movement of the window or panel by monitoring a signal from the sensor related to the movement of the window or panel;

ii) identifying a collision of the window or panel with an obstacle due to a change in the signal from the sensor that is related to a change in movement of the window or panel; and

iii) outputting a control signal to said switch to deactivate said motor in response to a sensing of a collision between an obstacle and said window or panel.

7. The apparatus of claim 6 wherein the controller comprises a programmable controller including a processing unit for executing a control program and including a memory for storing multiple window or panel speed values corresponding to a signal received from the sensor.

8. The apparatus of claim 6 additionally comprising one or more limit switches for use by the controller to determine window or panel position for use in identifying a collision.

9. The apparatus of claim 6 wherein the control program adjusts an obstacle detection threshold in real time based on immediate past measures of the signal sensed by the sensor to adapt to varying conditions encountered during operation of the window or panel.

10. The apparatus of claim 6 wherein the controller maintains a position of a leading edge of the window or panel and further wherein the controller reverse energizes the motor to move the window or panel away from a closure position prior to activating the motor to close the window or panel.

11. The apparatus of claim 10 wherein the controller reverse energizes the motor in response to a sensing of an obstacle and the reverse energizing and attempt to move the window or panel to a closed position is performed to confirm sensing of the obstacle.

12. Apparatus for controlling activation of a motor for moving an object along a travel path and de-activating the motor if an obstacle is encountered by the object comprising:

a) a movement sensor for monitoring movement of the object as the

motor moves said object along a travel path;

b) a switch for controlling energization of the motor with an energization signal; and

c) a controller including an interface coupled to the switch means for controllably energizing the motor and said interface additionally coupling the controller to the movement sensor for monitoring signals from said movement sensor; said controller comprising a stored program that:

i) determines motor speed from an output signal from the movement sensor;

ii) calculates an obstacle detect threshold based on motor speed of movement detected during at least one prior period of motor operation;

iii) compares a value based on currently sensed motor movement with the obstacle detect threshold; and

iv) outputs a signal from the interface to said switch for stopping the motor if the comparison based on currently sensed motor movement indicates the object has contacted an obstacle.

13 The apparatus of claim 12 wherein the controller includes a buffer memory for storing successive values of motor movement for use in determining the obstacle detect threshold.

14. The apparatus of claim 12 wherein the controller includes a clock and an input from the movement sensor is in a form of a sequence of pulses and further wherein the controller counts clock signals occurrences between receipt of pulses to provide an indication of motor speed.

15. The apparatus of claim 12 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a motor energization sequence a specified minimum time period in response to a short period user actuation of said control inputs to maintain position accuracy in monitoring

window or panel movement.

16. The apparatus of claim 12 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the object and wherein in response to a specified input the controller conducts a calibration motor energization sequence to determine parameters of object.

17. The apparatus of claim 12 wherein the motor is coupled to a motor vehicle window or panel and wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a position indication which is updated in response movement of the window or panel and further wherein the controller reverse actuations the motor near an end point in an object path of travel to avoid false obstacle detection in the region of closure of the window or panel.

18. The apparatus of claim 12 wherein the sensor is a current sensor and wherein the controller includes means for adjusting the obstacle threshold based on dynamic motor current as sensed from the current sensor to take into account varying loads experienced by the motor.

19. Apparatus for controlling activation of a motor for moving a window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel comprising:

a) a sensor for sensing movement of a window or panel along a travel path;

b) a switch for controlling energization of the motor with an energization signal; and

c) a controller coupled to the switch for controllably energizing the motor and having an interface coupling the controller to the sensor and to the switch; said controller comprising decision making logic for:

i) monitoring a signal from the sensor;

ii) calculating an obstacle detect threshold based on the signal that is detected during at least one prior period of motor operation, or a predetermined threshold;

iii) comparing a value based on a currently sensed motor parameter with the obstacle detect threshold; and

iv) stopping movement of the window or panel by controlling an output to said switch that controls motor energization if the comparison based on a currently sensed motor parameter indicates the window or panel has contacted an obstacle.

20. Apparatus for controlling activation of a motor for moving a window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel comprising:

a) a sensor for generating signals representative of the window or panel speed as the motor moves the window or panel along a travel path;

b) an obstacle detection controller for monitoring at least a part of the travel path of the window or panel for sensing and generating an obstacle detect signal indicating the presence in said travel path of an obstacle to movement of the window or panel;

c) a switch coupled to said controller for controlling energization of the motor with an energization signal; and

d) said controller including means for processing motor speed and obstacle detection signals and controlling operation of the motor in response to said speed or obstacle detection signals; said controller including:

i) a storage for storing a number of speed signals that vary with motor speed;

ii) a processor for calculating an obstacle detect threshold based on one or more speed signals stored in said storage;

iii) a logic unit for making a comparison between a value representing window or panel speed based on currently sensed motor speed with a calculated predetermined obstacle detect threshold, and generating a control output based on said comparison; and

iv) an interface coupled to said switch for changing the state of the switch to stop the motor.

21. The apparatus of claim 20 wherein the sensor for generating a speed signal comprises a Hall-effect sensor.

22. The apparatus of claim 20 wherein the sensor for generating a speed signal comprises a magnetic pick-up.

23. The apparatus of claim 20 additionally comprising an obstacle detector having an output coupled to the controller that senses a disruption in a region through which the window or panel moves.

24. The apparatus of claim 23 wherein the obstacle detector comprises a microwave generator and a reflected wave transducer.

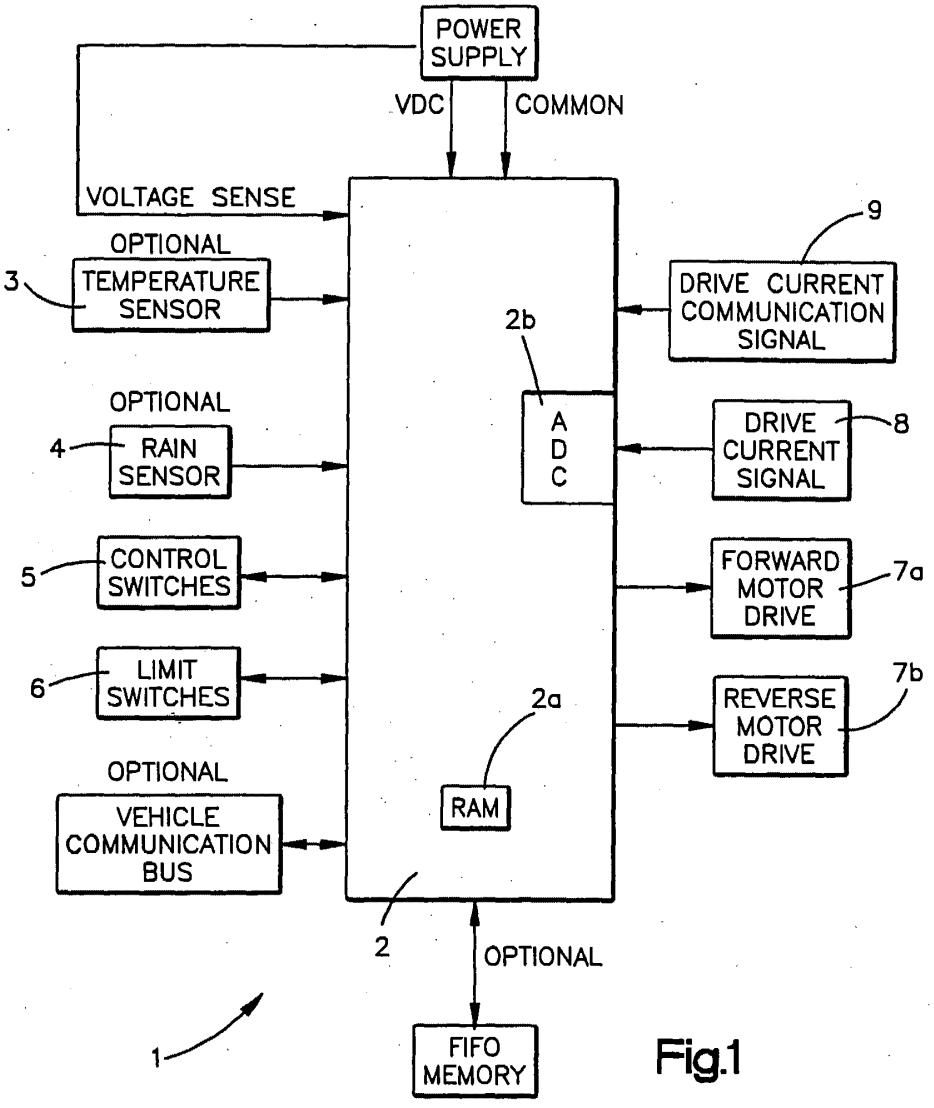
25. The apparatus of claim 23 wherein the obstacle detector comprises an infrared light source and detector.

27 The apparatus of claim 23 wherein the obstacle detector comprises a field effect device.

28. The apparatus of claim 27 wherein the field effect device comprises a magnetic field inductive sensor.

ABSTRACT:

Disclosed is an improved system and method for sensing both hard and soft obstructions for a movable panel such as a sunroof. A dual detection scheme is employing that includes an optical sensing as the primary means and electronic sensing of motor current as a secondary means. The secondary means utilizes system empirical precharacterization, fast processing algorithms, motor parameter monitoring including both current sensing and sensorless electronic motor current commutation pulse sensing, and controller memory, to adaptively modify electronic obstacle detection thresholds in real time without the use of templates and cycle averaging techniques.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OPTIONAL
3
TEMPERATURE SENSOR
OPTIONAL
4
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5
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6
LIMIT SWITCHES
OPTIONAL
VEHICLE COMMUNICATION BUS
2
OPTIONAL
FIFO MEMORY
1
9
DRIVE CURRENT COMMUNICATION SIGNAL
2b
A
D
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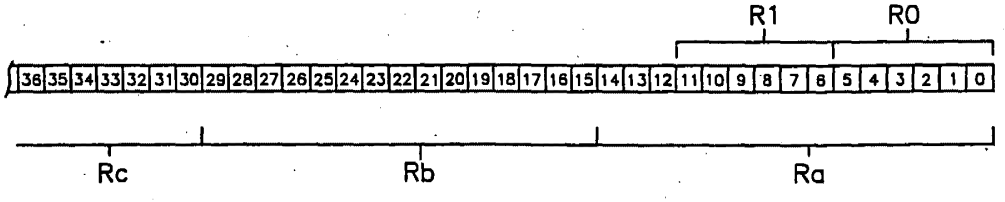
REVERSE MOTOR DRIVE
7b
2a
RAM

Fig.1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R0
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Rc
Rb
Ra

Fig.8

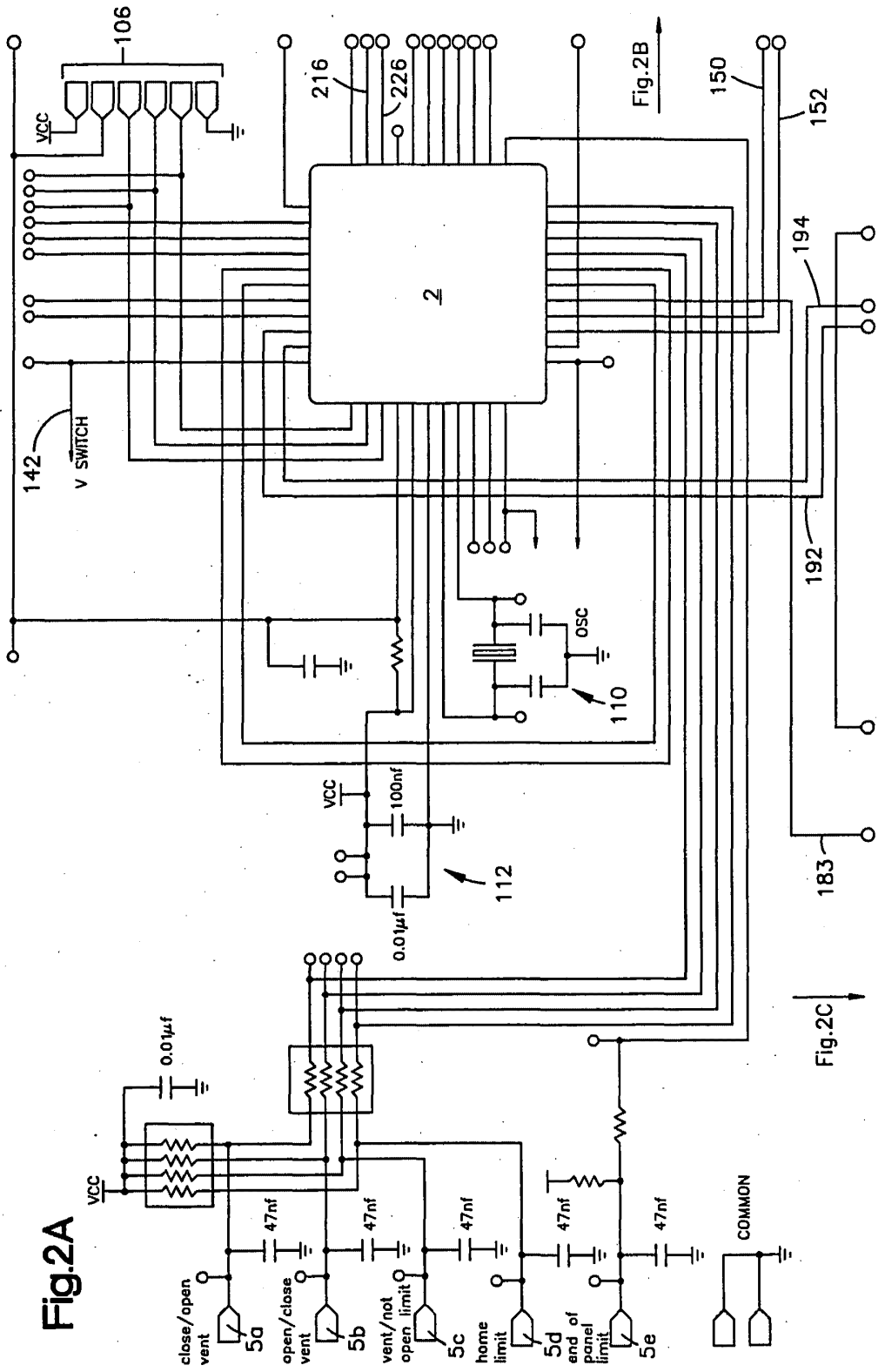
Fig.2A
106
VCC
216
226
Fig.2B
150
152
194
192
183
142
V SWITCH
2
OSC
110
VCC
100nf
0.01µf
112
0.01µf
47nf
47nf
47nf
47nf
47nf
COMMON
close/open vent
5a
open/close vent
5b
vent/not open limit
5c
home limit
5d
end of panel limit
5e
Fig.2C

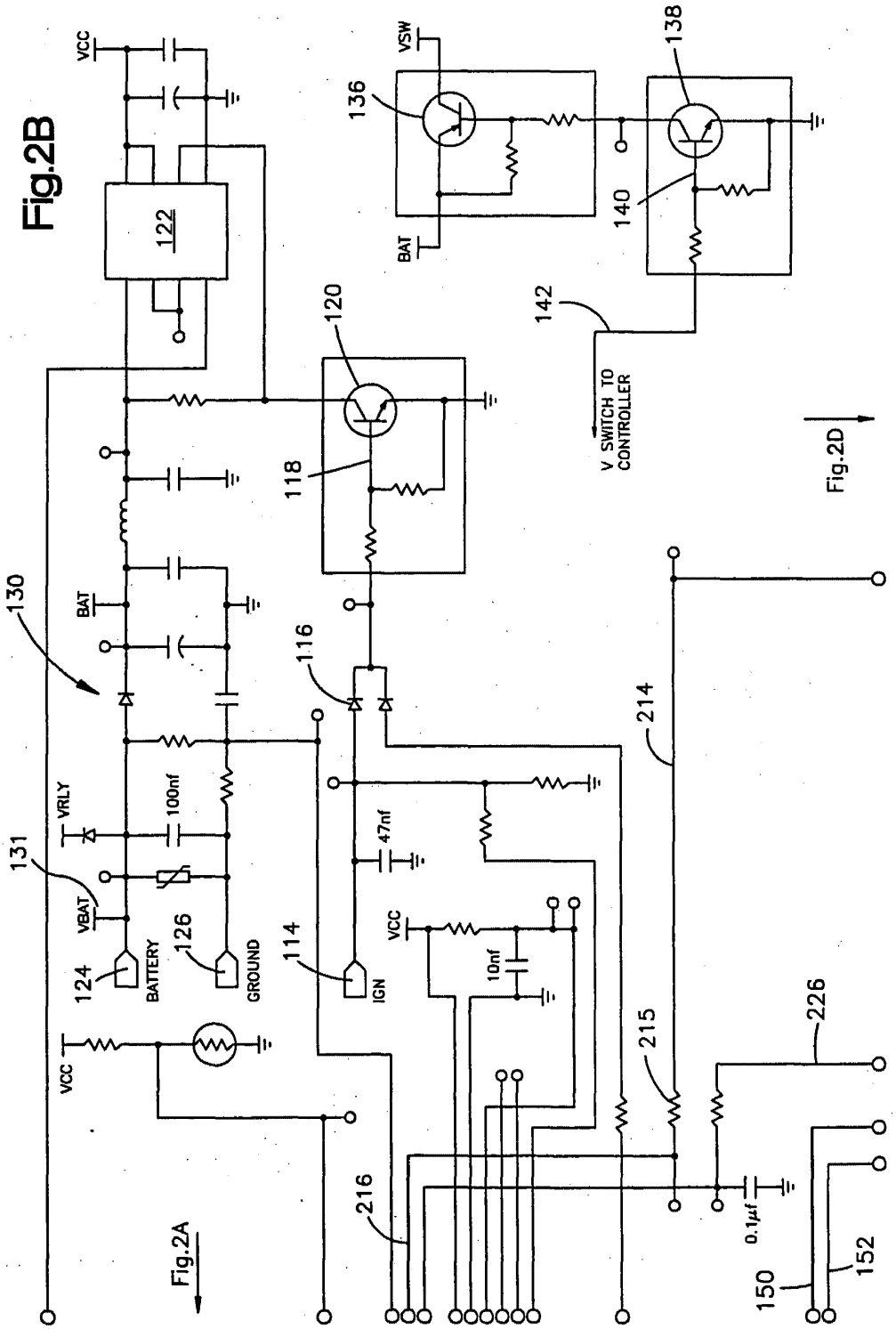
Fig.2B
VCC
122
VSW
136
138
BAT
140
142
120
V SWITCH TO CONTROLLER
118
Fig.2D
130
BAT
116
214
VRLY
100nf
131
47nf
VBAT
VCC
126
114
124
BATTERY
GROUND
IGN
10nf
VCC
215
226
216
0.1μf
150
152
Fig.2A

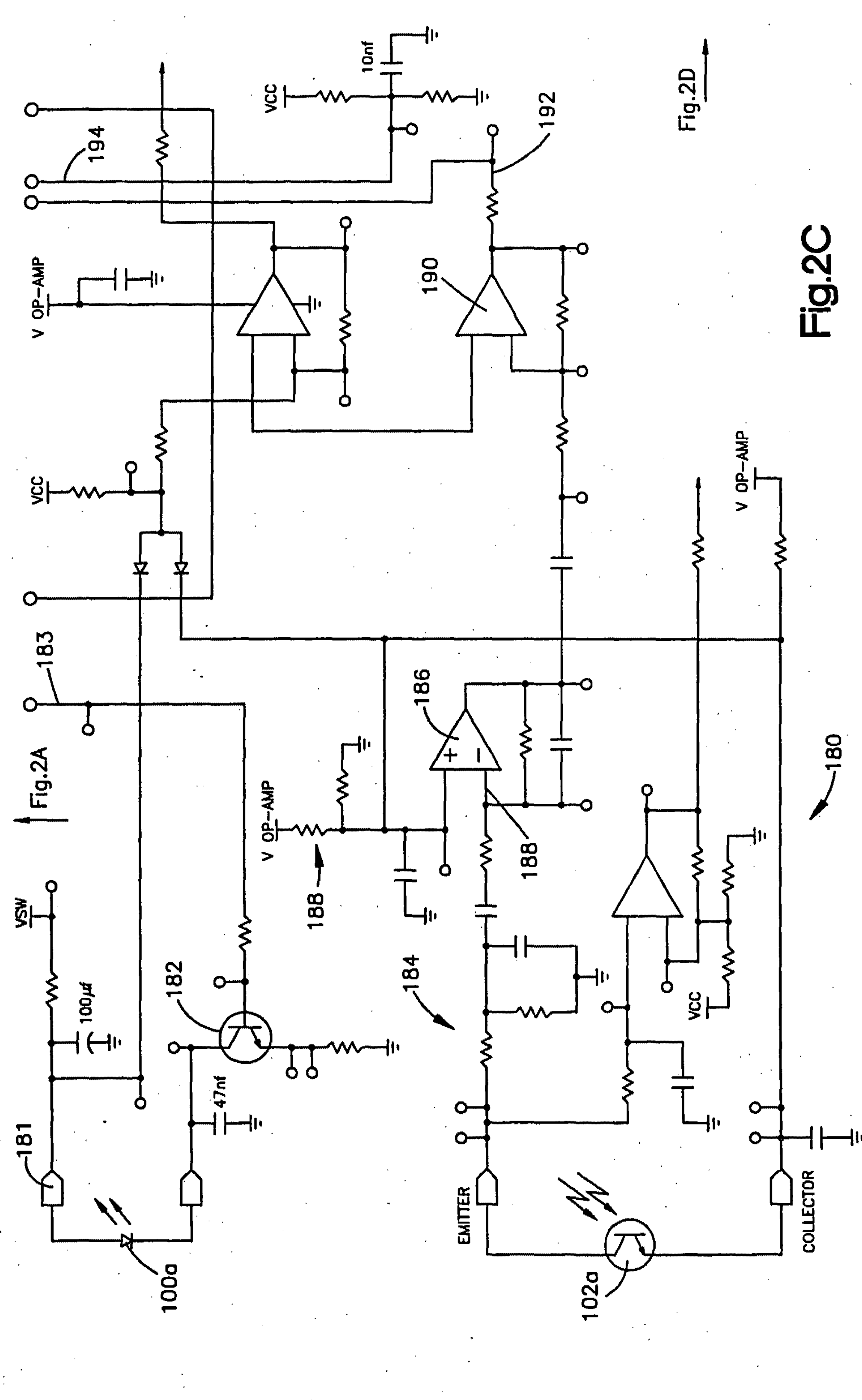

Fig.2A
Fig.2D
VSW
100µf
47nf
181
182
183
184
186
188
190
192
194
180
100a
102a
EMITTER
COLLECTOR
V OP-AMP
VCC
10nf

Fig.2C

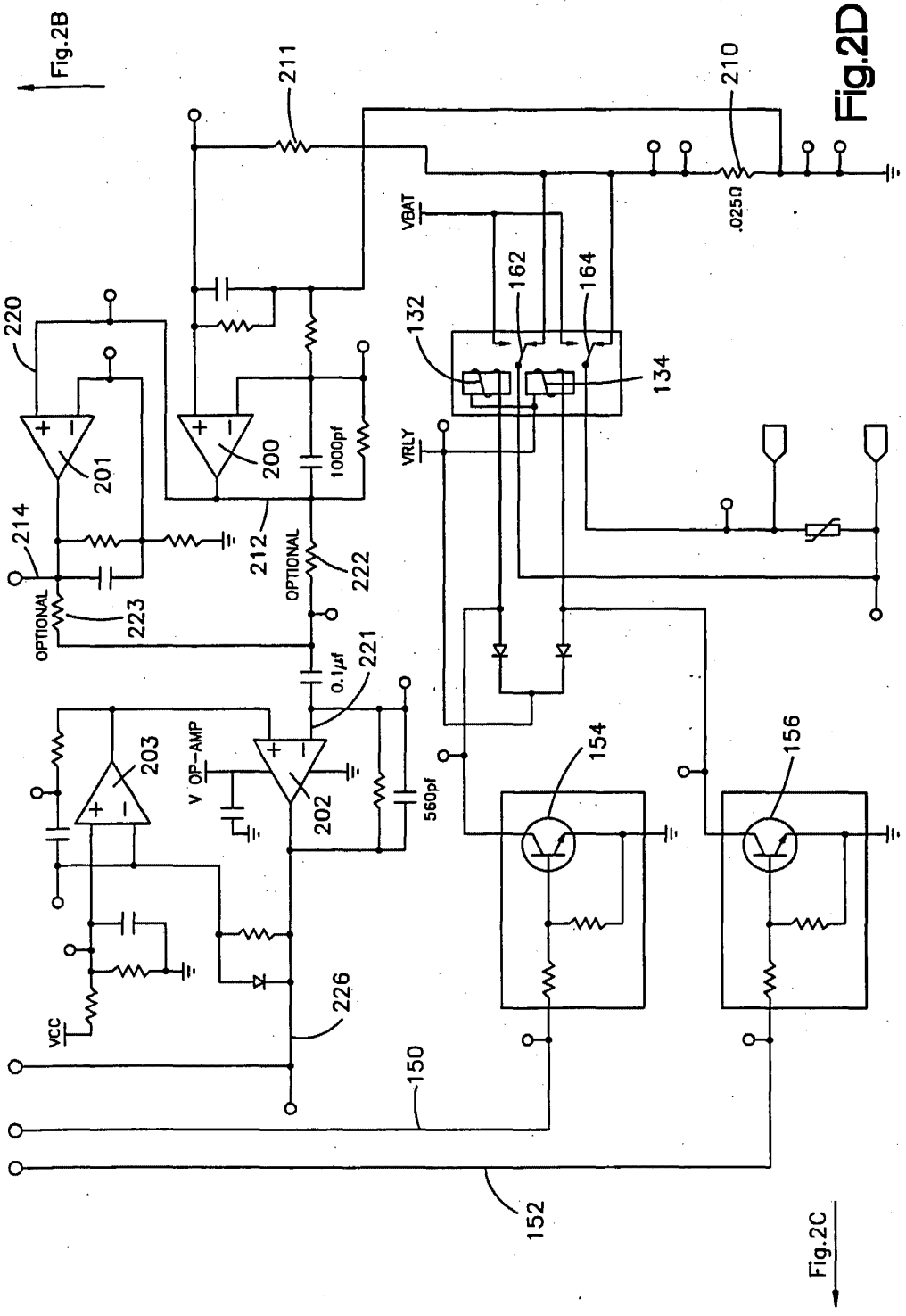
Fig.2B
Fig.2D
Fig.2C
211
210
.025Ω
VBAT
162
164
132
134
220
201
200
1000pf
VRLY
214
212
OPTIONAL
222
OPTIONAL
223
0.1μf
221
203
V OP-AMP
202
560pf
154
156
226
VCC
150
152

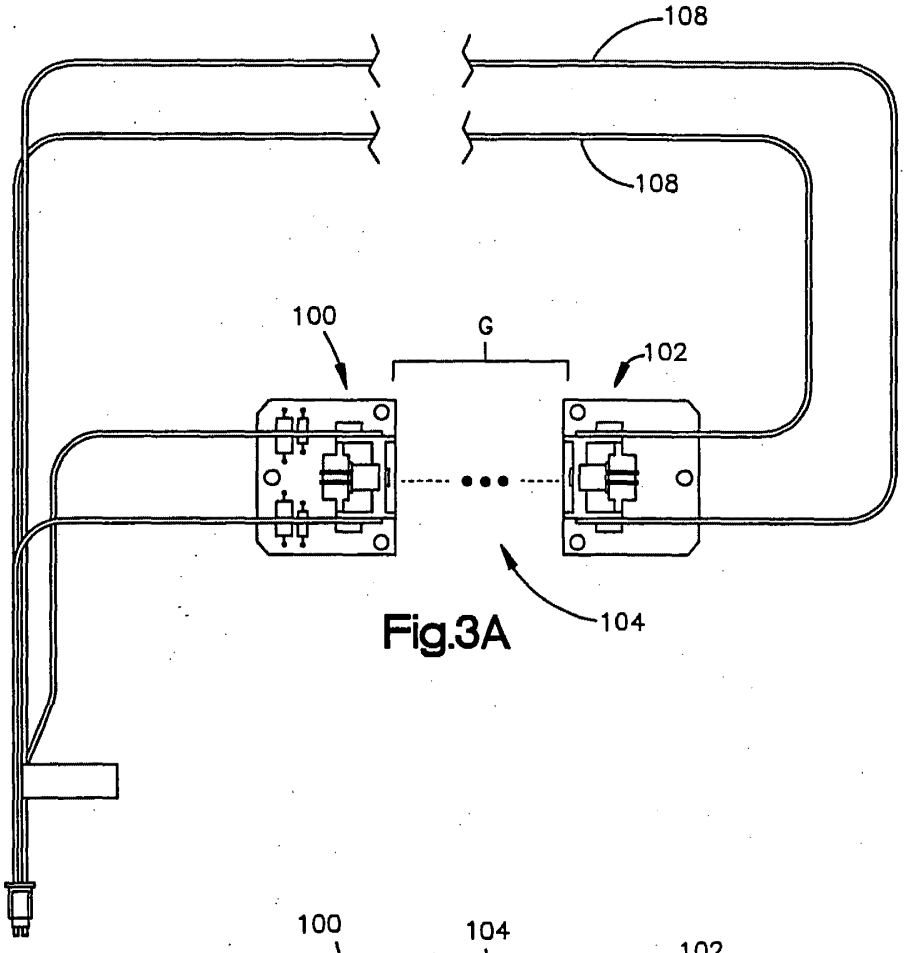

Fig.3A

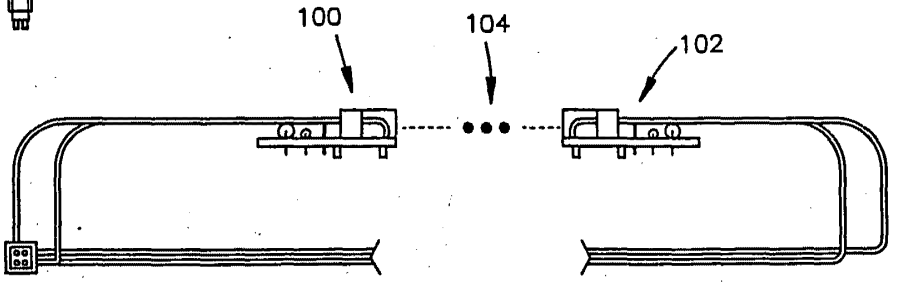

Fig.3B

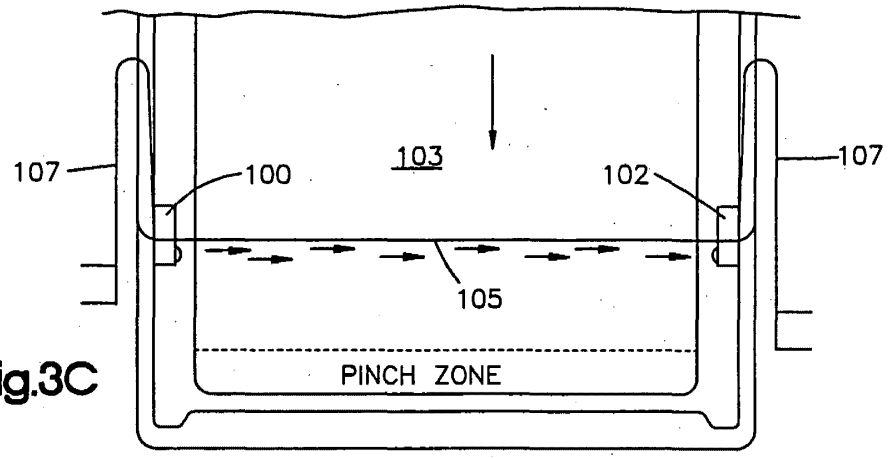

Fig.3C

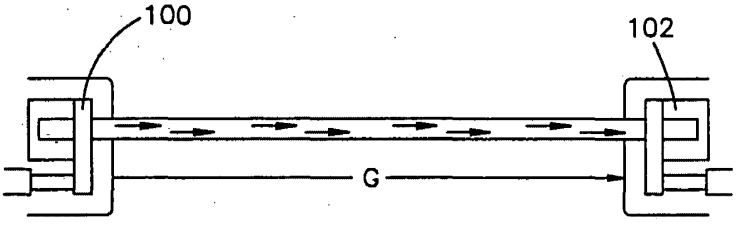

Fig.3D

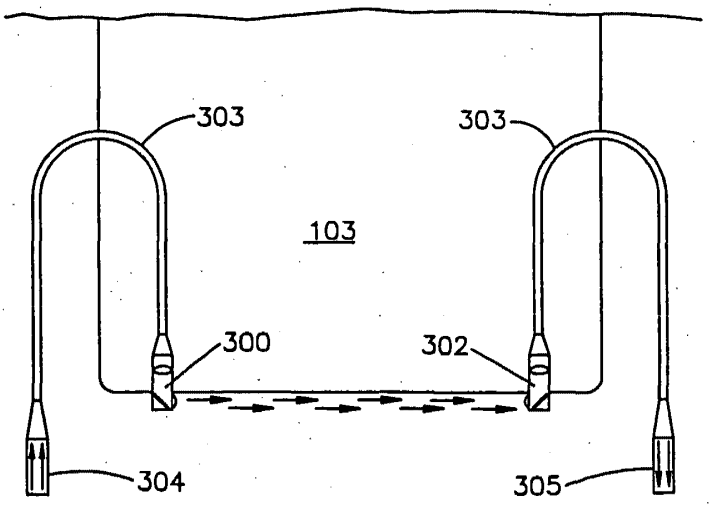

Fig.3E

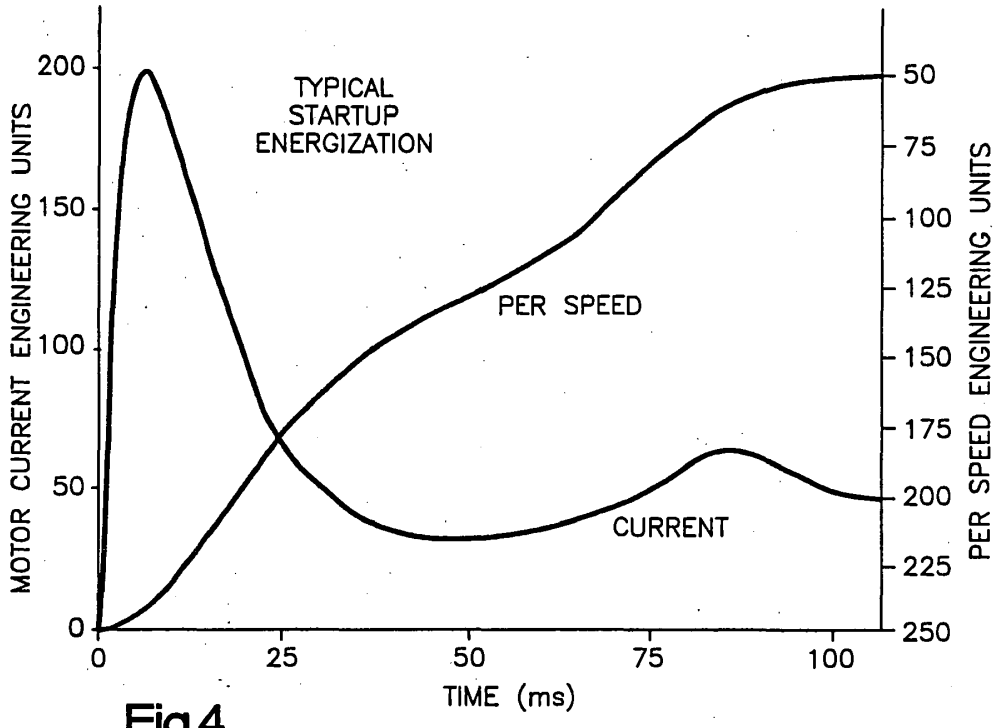
TYPICAL
STARTUP
ENERGIZATION
PER SPEED
CURRENT
MOTOR CURRENT ENGINEERING UNITS
PER SPEED ENGINEERING UNITS
TIME (ms)
0
50
100
150
200
25
75
125
175
225
250

Fig.4

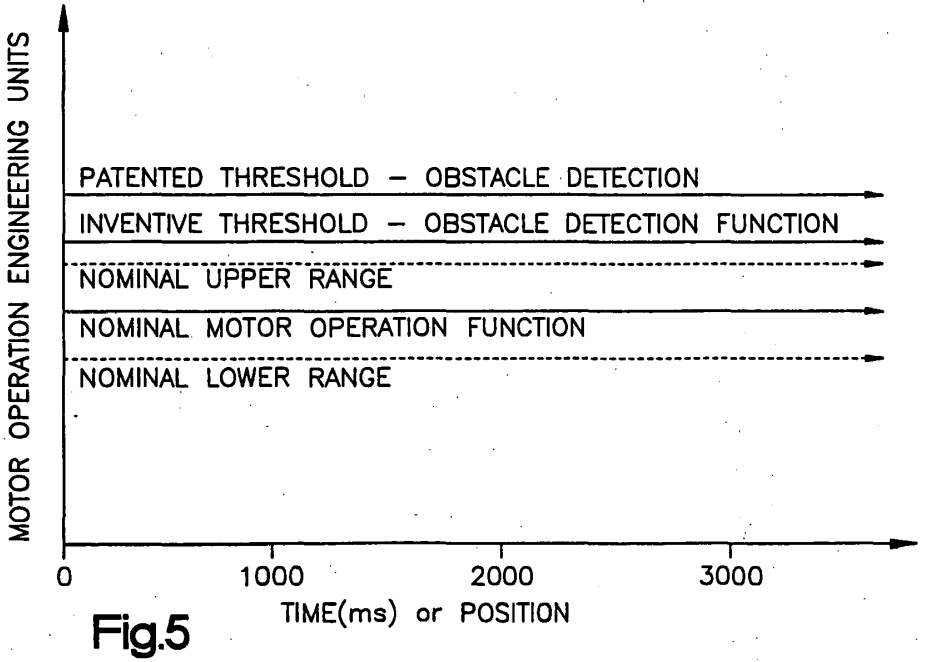
PATENTED THRESHOLD – OBSTACLE DETECTION
INVENTIVE THRESHOLD – OBSTACLE DETECTION FUNCTION
NOMINAL UPPER RANGE
NOMINAL MOTOR OPERATION FUNCTION
NOMINAL LOWER RANGE
MOTOR OPERATION ENGINEERING UNITS
TIME(ms) or POSITION
0
1000
2000
3000

Fig.5

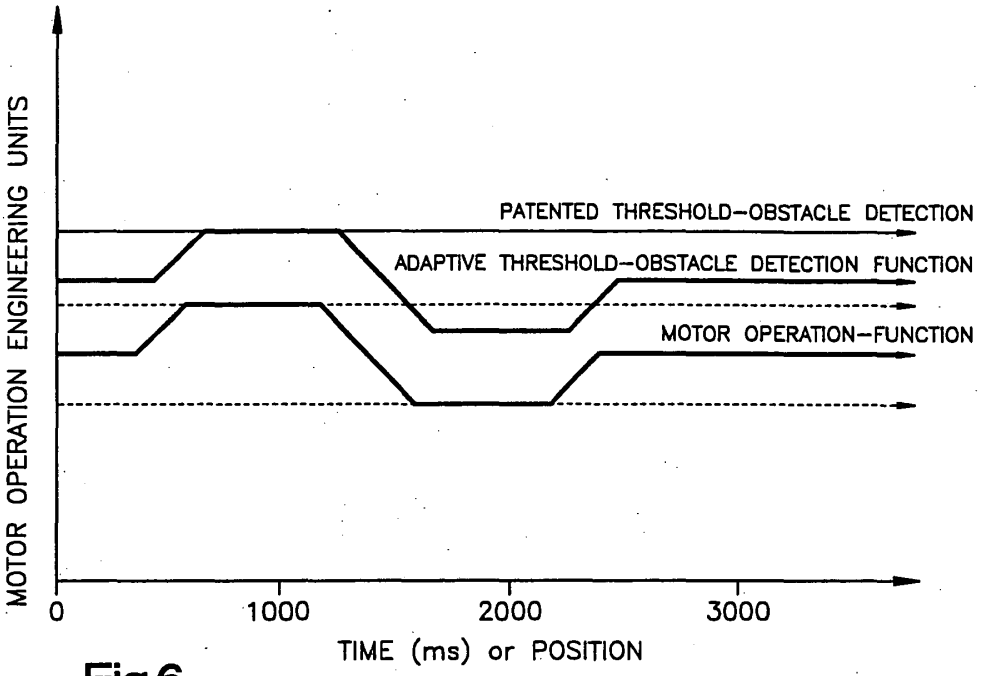
MOTOR OPERATION ENGINEERING UNITS
PATENTED THRESHOLD–OBSTACLE DETECTION
ADAPTIVE THRESHOLD–OBSTACLE DETECTION FUNCTION
MOTOR OPERATION–FUNCTION
0
1000
2000
3000
TIME (ms) or POSITION

Fig.6

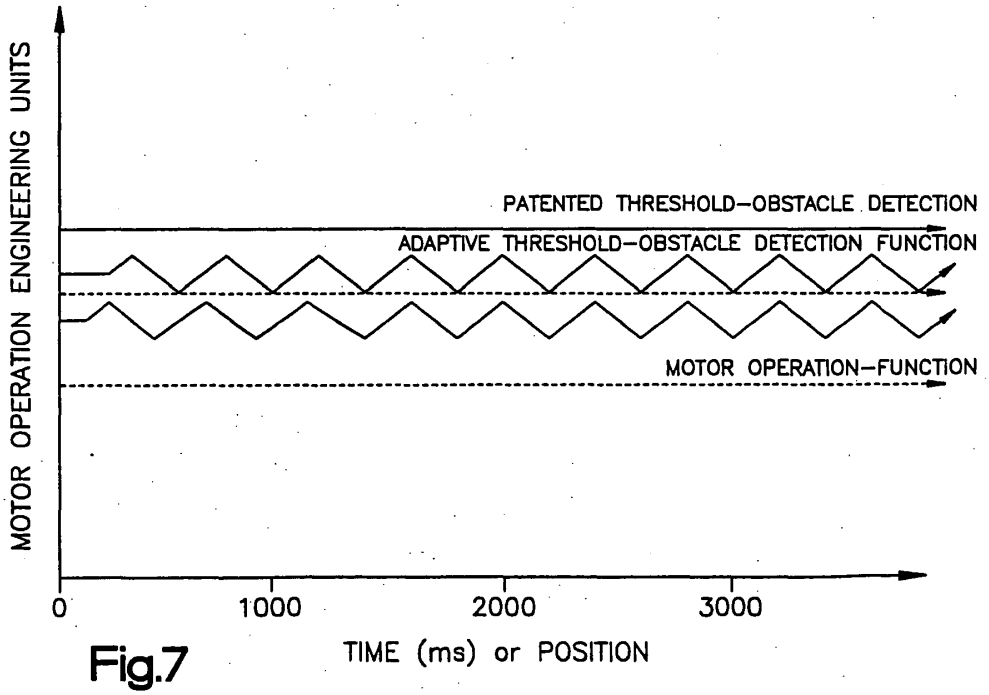
MOTOR OPERATION ENGINEERING UNITS
PATENTED THRESHOLD–OBSTACLE DETECTION
ADAPTIVE THRESHOLD–OBSTACLE DETECTION FUNCTION
MOTOR OPERATION–FUNCTION
0
1000
2000
3000
TIME (ms) or POSITION

Fig.7

DECLARATION and POWER OF ATTORNEY (JOINT)

We, Mario Boisvert and Randall Perrin hereby declare that:

Our residence and post office addresses are, respectively:
43 Old US 131, Reed City, MI 49677 and
667 Cobb Street, Cadillac, MI 49601.

We are, respectively, citizens of: Canada and the United States of America.

We believe we are the original, first and joint inventors of the subject matter which is claimed and for which a patent is sought on the invention entitled COLLISION MONITORING SYSTEM, the specification of which:

1) XX is attached hereto.
2) ____ was filed on _____ as Serial No. 0 /_____ and was amended on _____ (if applicable).
3) ____ was described and claimed in PCT International Application No. _____, filed on _____ and amended under PCT Article 19 on _____.

We hereby state that we have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

We acknowledge our duty to disclose to the Office information of which we are aware which is material to patentability. Such information is material to patentability when it is not cumulative to information already of record in the application, and (1) it establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim; or (2) it refutes, or is inconsistent with, a position the applicant takes in: (i) opposing an argument of unpatentability relied on by the Office, or (ii) asserting an argument of patentability as defined in Title 37, Code of Federal Regulations, §1.56.

We hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application for patent or inventor's certificate listed below and have also identified below any corresponding foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority Claimed	
(Number)	(Country)	(Day/Month/Year Filed)	(Yes)	(No)
(Number)	(Country)	(Day/Month/Year Filed)	(Yes)	(No)

We hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, We acknowledge the duty, as stated above, to disclose material information, as defined in Title 37, Code of Federal Regulations, §1.56, relating to events which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

09/562,986	May 1, 2000	Pending

(Application Serial No.)	(Filing Date)	(Status-patented, pending, abandoned)
08/736,786	October 25, 1996	Patented (U.S. 6,064,165)
(Application Serial No.)	(Filing Date)	(Status-patented, pending, abandoned)
08/275,107	July 14, 1994	Abandoned
(Application Serial No.)	(Filing Date)	(Status-patented, pending, abandoned)
07/872,190	April 22, 19992	Patented - (U.S. Patent No. 5,334,876)
(Application Serial No.)	(Filing Date)	(Status-patented, pending, abandoned)

I hereby claim the benefit under Title 35, United States Code, §119(e) of any United States provisional application(s) listed below.

60/169,061	December 6, 1999
(Application Number)	(Filing Date)

We hereby designate as our mailing address the office of:

WATTS, HOFFMANN, FISHER & HEINKE CO., L.P.A.
P.O. Box 99839
Cleveland, Ohio 44199-0839

And we hereby appoint each of the following attorneys, all of whom are associated with Watts, Hoffmann, Fisher & Heinke Co., L.P.A. (Telephone No. 216/241-6700), as attorney of record to prosecute this application and to transact all business in the Patent Office connected therewith: Thomas E. Fisher, Reg. No. 18,271; Lowell L. Heinke, Reg. No. 19,471; James G. Watterson, Reg. No. 20,180; Linn J. Raney, Reg. No. 23,078; John R. Hlavka, Reg. No. 29,076; Stephen J. Schultz, Reg. No. 29,108; Richard A. Sharpe, Reg. No. 34,722; George L. Pinchak, Reg. No. 37,697; Paul A. Serbinowski, Reg. No. 34,429; Peter R. Hagerty, Reg. No. 42,618 and Robert J. Diaz, Reg. No. 44,655.

And we hereby appoint the foregoing Stephen J. Schultz, Reg. No. 29,108, principal attorney.

This appointment shall include all power to prosecute and transact all business relating to all applications corresponding to the referenced application in all countries, including all regional and international patent offices, such as, but not limited to, the European Patent Office and all offices and bureaus established in accordance with the Patent Cooperation Treaty.

We hereby further designate and appoint any officer of Watts, Hoffmann, Fisher & Heinke Co., L.P.A. our attorney in fact with full power of substitution and revocation, including power to designate a substitute principal attorney.

We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States

Code and that such willful false statements may jeopardize the validity of this application or any patent issued thereon.

Full name of Inventor: Mario Boisvert

Inventor's signature: Mario Boisvert Date: 3/14/02

Residence: 43 Old US 131, Reed City, MI 49677

Citizenship: Canada

Post Office Address: 43 Old US 131, Reed City, MI 49677

Full name of Inventor: Randall Perrin

Inventor's signature: Randall Perrin Date: 3/11/02

Residence: 667 Cobb Street, Cadillac, MI 49601

Citizenship: United States of America

Post Office Address: 667 Cobb Street, Cadillac, MI 49601

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Mario Boisvert and Randall Perrin

Serial No.: To be assigned

Filing Date: To be assigned

Parent Application Serial No.: 10/100,892

Parent Application Filing Date: March 18, 2002

Title: COLLISION MONITORING SYSTEM

Examiner: To be assigned

Art Unit: 2837 (based on art unit of parent application)

Docket No.: 2546/14-733C3

Watts Hoffmann Co., LPA
Suite 1750
1100 Superior Ave.
Cleveland, OH 44114

MAIL STOP NON-FEE AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

FIRST PRELIMINARY AMENDMENT

Prior to examination of this application, please amend the claims as follows:

Express Mail Label No. EV 340752044 S
I hereby certify that this paper is being deposited today with the U.S. Postal Service as Express Mail addressed to the Assistant Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450
on 1/27/04
By: [signature]

1

In the Claims:

1. (Original) Apparatus for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said apparatus comprising:

a) a sensor for measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element;

b) a memory for storing a number of measurement values from the sensor based on measurements of said parameter over at least a portion of said range of motion;

c) a controller coupled to the memory for determining to de-activate the motor based on the measurement values stored in the memory as the motor driven element moves over its range of motion; and

d) a controller interface coupled to the motor for altering motion of said motor driven element in response to a determination made by the controller.

2. (Original) A method for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said method comprising:

a) measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element by taking a multiplicity of measurements as the motor moves the motor driven element over its range of motion;

b) storing a number of measurement values based on measurements of said parameter over at least a portion of said range of motion;

c) determining that the parameter is outside a parameter range based on previous stored measurement values as the motor driven element moves over its range of motion; and

d) altering motion of said motor driven element in response to a determination that the parameter is outside the parameter range.

3. (Original) The method of claim 2 wherein the motor driven element is a window or panel and additionally comprising reverse actuating the window or panel prior to moving said window or panel in a direction to close the window or panel.

4. (Original) The method of claim 3 additionally comprising maintaining a position of the window or panel based on the sensed parameter and the reverse actuation is initiated if a leading edge of the window or panel is near a closed position.

5. (Original) The method of claim 4 movement is first initiated toward a closed position when a leading edge of the window or panel is near the closed position and wherein the reverse actuation is performed upon a sensing of an obstacle that is based on determining the parameter is outside the parameter range.

6. (Original) Apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving said window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel, said apparatus comprising:

a) a sensor for sensing movement of the window or panel and providing a sensor output signal related to a speed of movement of the window or panel;

b) a switch for controllably actuating the motor by providing an energization signal; and

c) a controller having an interface coupled to the sensor and the switch for controllably energizing the motor; said controller sensing a collision with an obstruction when power is applied to the controller by:

i) monitoring movement of the window or panel by monitoring a signal from the sensor related to the movement of the window or panel;

ii) identifying a collision of the window or panel with an obstacle due to a change in the signal from the sensor that is related to a change in movement of the window or panel; and

iii) outputting a control signal to said switch to deactivate said motor in response to a sensing of a collision between an obstacle and said window or panel.

7. (Original) The apparatus of claim 6 wherein the controller comprises a programmable controller including a processing unit for executing a control program and including a memory for storing multiple window or panel speed values corresponding to a signal received from the sensor.

8. (Original) The apparatus of claim 6 additionally comprising one or more limit switches for use by the controller to determine window or panel position for use in identifying a collision.

9. (Original) The apparatus of claim 6 wherein the control program adjusts an obstacle detection threshold in real time based on immediate past measures of the signal sensed by the sensor to adapt to varying conditions encountered during operation of the window or panel.

10. (Original) The apparatus of claim 6 wherein the controller maintains a position of a leading edge of the window or panel and further wherein the controller reverse energizes the motor to move the window or panel away from a closure position prior to activating the motor to close the window or panel.

11. (Original) The apparatus of claim 10 wherein the controller reverse energizes the motor in response to a sensing of an obstacle and the reverse energizing and attempt to move the window or panel to a closed position is performed to confirm sensing of the obstacle.

12. (Original) Apparatus for controlling activation of a motor for moving an object along a travel path and de-activating the motor if an obstacle is encountered by the object comprising:

a) a movement sensor for monitoring movement of the object as the motor

moves said object along a travel path;

b) a switch for controlling energization of the motor with an energization signal; and

c) a controller including an interface coupled to the switch means for controllably energizing the motor and said interface additionally coupling the controller to the movement sensor for monitoring signals from said movement sensor; said controller comprising a stored program that:

i) determines motor speed from an output signal from the movement sensor;

ii) calculates an obstacle detect threshold based on motor speed of movement detected during at least one prior period of motor operation;

iii) compares a value based on currently sensed motor movement with the obstacle detect threshold; and

iv) outputs a signal from the interface to said switch for stopping the motor if the comparison based on currently sensed motor movement indicates the object has contacted an obstacle.

13 (Original) The apparatus of claim 12 wherein the controller includes a buffer memory for storing successive values of motor movement for use in determining the obstacle detect threshold.

14. (Original) The apparatus of claim 12 wherein the controller includes a clock and an input from the movement sensor is in a form of a sequence of pulses and further wherein the controller counts clock signals occurrences between receipt of pulses to provide an indication of motor speed.

15. (Original) The apparatus of claim 12 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a motor energization sequence a specified minimum time period in response to a short period user actuation of said control inputs to maintain position accuracy in monitoring window or panel movement.

16. (Original) The apparatus of claim 12 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the object and wherein in response to a specified input the controller conducts a calibration motor energization sequence to determine parameters of object.

17. (Original) The apparatus of claim 12 wherein the motor is coupled to a motor vehicle window or panel and wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a position indication which is updated in response movement of the window or panel and further wherein the controller reverse actuations the motor near an end point in an object path of travel to avoid false obstacle detection in the region of closure of the window or panel.

18. (Original) The apparatus of claim 12 wherein the sensor is a current sensor and wherein the controller includes means for adjusting the obstacle threshold based on dynamic motor current as sensed from the current sensor to take into account varying loads experienced by the motor.

19. (Original) Apparatus for controlling activation of a motor for moving a window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel comprising:

a) a sensor for sensing movement of a window or panel along a travel path;

b) a switch for controlling energization of the motor with an energization signal; and

c) a controller coupled to the switch for controllably energizing the motor and having an interface coupling the controller to the sensor and to the switch; said controller comprising decision making logic for:

i) monitoring a signal from the sensor;

ii) calculating an obstacle detect threshold based on the signal that is detected during at least one prior period of motor operation, or a predetermined threshold;

iii) comparing a value based on a currently sensed motor parameter with the obstacle detect threshold; and

iv) stopping movement of the window or panel by controlling an output to said switch that controls motor energization if the comparison based on a currently sensed motor parameter indicates the window or panel has contacted an obstacle.

20. (Original) Apparatus for controlling activation of a motor for moving a window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel comprising:

a) a sensor for generating signals representative of the window or panel speed as the motor moves the window or panel along a travel path;

b) an obstacle detection controller for monitoring at least a part of the travel path of the window or panel for sensing and generating an obstacle detect signal indicating the presence in said travel path of an obstacle to movement of the window or panel;

c) a switch coupled to said controller for controlling energization of the motor with an energization signal; and

d) said controller including means for processing motor speed and obstacle detection signals and controlling operation of the motor in response to said speed or obstacle detection signals; said controller including:

i) a storage for storing a number of speed signals that vary with motor speed;

ii) a processor for calculating an obstacle detect threshold based on one or more

speed signals stored in said storage;

iii) a logic unit for making a comparison between a value representing window or panel speed based on currently sensed motor speed with the calculated obstacle detect threshold, a predetermined threshold, and generating a control output based on said comparison; and

iv) an interface coupled to said switch for changing the state of the switch to stop the motor.

21. (Original) The apparatus of claim 20 wherein the sensor for generating a speed signal comprises a Hall-effect sensor.

22. (Original) The apparatus of claim 20 wherein the sensor for generating a speed signal comprises a magnetic pick-up.

23. (Original) The apparatus of claim 20 additionally comprising an obstacle detector having an output coupled to the controller that senses a disruption in a region through which the window or panel moves.

24. (Original) The apparatus of claim 23 wherein the obstacle detector comprises a microwave generator and a reflected wave transducer.

25. (Original) The apparatus of claim 23 wherein the obstacle detector comprises an infrared light source and detector.

26. (Renumbered – Original claim 27) The apparatus of claim 23 wherein the obstacle detector comprises a field effect device.

27. (Renumbered – Original claim 28) The apparatus of claim 27 wherein the field effect device comprises a magnetic field inductive sensor.

28. (New) Apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving said window or panel along a travel path and de-activating the motor when a predetermined position is encountered by the window or panel, said apparatus comprising:

a) a sensor for sensing movement of the window or panel and providing a sensor output signal related to a position of the window or panel;

b) a switch for controllably actuating the motor by providing an energization signal; and

c) a controller having an interface coupled to the sensor and the switch for controllably energizing the motor; said controller determines the position of the window or panel when power is applied to the controller by:

i) monitoring the position of the window or panel by monitoring the sensor output signal from the sensor related to the position of the window or panel;

ii) identifying the position of the window or panel based on the sensor output signal from the sensor; and

iii) outputting a control signal to said switch to deactivate said motor in response to a sensing of the predetermined position of said window or panel.

29. (New) The apparatus of claim 28 wherein the controller comprises a programmable controller including a processing unit for executing a control program and including a memory for storing multiple window or panel position values corresponding to a signal received from the sensor.

30. (New) The apparatus of claim 28 additionally comprising one or more position limits programmed for use by the controller to determine window or panel position for use in identifying whether the window or panel is closed or open.

31. (New) The apparatus of claim 28 wherein the controller maintains a position of a leading edge of the window or panel and further wherein the controller reverse energizes the motor to move the window or panel away from a closure position prior to activating the motor to close the window or panel.

32. (New) The apparatus of claim 28 wherein the motor is coupled to a motor vehicle or panel and wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintain a position indication which is updated in response to movement of the window or panel and further wherein the controller reverse actuates the motor

near an end point in the travel path of the window or panel to avoid false obstacle detection in a region of closure of the window or panel.

33. (New) Apparatus for controlling activation of a motor for moving a motor driven element in a vehicle over a range of motion and de-activating the motor when undesirable resistance to motion of the element is encountered, the apparatus comprising:

a) a sensor for sensing a speed of the motor and generating an output signal representative of a speed of the motor, a speed of the motor changing when undesirable resistance to motion of the element is encountered;

b) a switch for controlling activation of the motor; and

c) a controller coupled to the sensor and the switch, the controller receiving the sensor output signal from the sensor and outputting a control signal to the switch to de-activate the motor if the sensor output signal indicates that the element has encountered undesirable resistance to motion.

34. (New) The apparatus of claim 33 wherein the sensor includes a Hall effect sensor.

35. (New) The apparatus of claim 33 wherein the apparatus includes a memory for storing values corresponding to the sensor output signal over at least a portion of the range of motion of the element and the controller analyzes the sensor output signal

values stored in the memory to determine if the control signal to de-activate the motor should be output to the switch.

REMARKS

Entry of this preliminary amendment prior to substantive examination of this application is respectfully requested. All claims are believed to be in condition for allowance and prompt issuance of a Notice of Allowance is respectfully requested.

Respectfully submitted,

Date: 1/24/04

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PATENT APPLICATION SERIAL NO. _____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

01/30/2004 HLE333 00000047 10765487

01 FC:2001	385.00 OP
02 FC:2201	215.00 OP
03 FC:2202	135.00 OP

PTO-1556
(5/87)

*U.S. Government Printing Office: 2001 — 481-697/59173

PATENT APPLICATION FEE DETERMINATION RECORD
Effective October 1, 2003

Application or Docket Number
10765487

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	35	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	35 minus 20=	* 15
INDEPENDENT CLAIMS	8 minus 3 =	* 5
MULTIPLE DEPENDENT CLAIM PRESENT		☐

* If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY TYPE ☐		OR	OTHER THAN SMALL ENTITY	
RATE	FEE		RATE	FEE
BASIC FEE	385.00	OR	BASIC FEE	770.00
X$ 9=	135	OR	X$18=	
X43=	215	OR	X86=	
+145=		OR	+290=	
TOTAL	735	OR	TOTAL	

CLAIMS AS AMENDED - PART II

AMENDMENT A	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X43=		OR	X86=	
+145=		OR	+290=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT B	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X43=		OR	X86=	
+145=		OR	+290=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X43=		OR	X86=	
+145=		OR	+290=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. 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.

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APPL NO.	FILING OR 371 (c) DATE	ART UNIT	FIL FEE REC'D	ATTY.DOCKET NO	DRAWINGS	TOT CLMS	IND CLMS
10/765,487	01/27/2004	2837	735	15-890D1	9	35	8

CONFIRMATION NO. 9537

WATTS, HOFFMAN CO., L.P.A
Suite 1750
1100 Euclid Avenue
Cleveland, OH 44114-2518

FILING RECEIPT

OC000000012959100

Date Mailed: 06/17/2004

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. 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 write to the Office of Initial Patent Examination's Filing Receipt Corrections, facsimile number 703-746-9195. 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 (if appropriate).**

Applicant(s)

Mario Boisvert, Reed City, MI;
Randall Perrin, Cadillac, MI;

Assignment For Published Patent Application

Nartron Corporation;

Domestic Priority data as claimed by applicant

This application is a DIV of 10/100,892 03/18/2002
which is a CIP of 09/562,986 05/01/2000 PAT 6,404,158
which is a CIP of 08/736,786 10/25/1996 PAT 6,064,165
which is a CON of 08/275,107 07/14/1994 ABN
which is a CIP of 07/872,190 04/22/1992 PAT 5,334,876

Foreign Applications

If Required, Foreign Filing License Granted: 06/15/2004

Projected Publication Date: 09/23/2004

Non-Publication Request: No

Early Publication Request: No

**,SMALL ENTITY **

Title

Collision monitoring system

Preliminary Class

318

LICENSE FOR FOREIGN FILING UNDER
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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.

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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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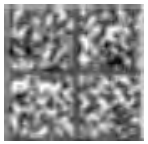

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PATENT APPLICATION FEE DETERMINATION RECORD
Effective October 1, 2003

Application or Docket Number: 10765487

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS	35	
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	35 minus 20=	* 15
INDEPENDENT CLAIMS	8 minus 3 =	* 5
MULTIPLE DEPENDENT CLAIM PRESENT		☐

* If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY TYPE ☐		OR	OTHER THAN SMALL ENTITY	
RATE	FEE		RATE	FEE
BASIC FEE	385.00	OR	BASIC FEE	770.00
X$ 9=	135	OR	X$18=	
X43=	215	OR	X86=	
+145=		OR	+290=	
TOTAL	735	OR	TOTAL	

CLAIMS AS AMENDED - PART II

AMENDMENT A

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X43=		OR	X86=	
+145=		OR	+290=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT B

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X43=		OR	X86=	
+145=		OR	+290=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 9=		OR	X$18=	
X43=		OR	X86=	
+145=		OR	+290=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. 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.

10765487

Examiner	Art Unit	

√	Rejected	–	(Through numeral) Cancelled	N	Non-Elected	A	Appeal
=	Allowed	+	Restricted	I	Interference	O	Objected

Claim	Date	Claim	Date	Claim	Date
Original		Final / Original		Final / Original	
1		51		101	
2		52		102	
3		53		103	
4		54		104	
5		55		105	
6		56		106	
7		57		107	
8		58		108	
9		59		109	
10		60		110	
11		61		111	
12		62		112	
13		63		113	
14		64		114	
15		65		115	
16		66		116	
17		67		117	
18		68		118	
19		69		119	
20		70		120	
21		71		121	
22		72		122	
23		73		123	
24		74		124	
25		75		125	
26		76		126	
27		77		127	
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41		91		141	
42		92		142	
43		93		143	
44		94		144	
45		95		145	
46		96		146	
47		97		147	
48		98		148	
49		99		149	
50		100		150	

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:	MARIO BOISVERT, ET AL.	Examiner :	N/A
Application No.:	10/765,487	Art Unit:	NOT ASSIGNED
Filed:	JANUARY 27, 2004		
Title:	COLLISION MONITORING SYSTEM		

INFORMATION DISCLOSURE STATEMENT

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

Enclosed is a copy of Information Disclosure Citation Form PTO-1449. Applicants respectfully request that the Examiner consider the listed documents, initial the enclosed Form PTO-1449 to indicate such consideration, and return a copy of the initialed Form PTO-1449 to Applicants.

This Information Disclosure Statement is being submitted pursuant to 37 C.F.R. §1.97(b). Other than listed U.S. Patents, copies of all other listed documents are provided.

I hereby certify that this paper is being deposited today with the U.S. Postal Service as 1st Class Mail addressed to the Assistant Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450
on 11/22/04
By: _____

Pursuant to 37 C.F.R. §1.97(h), the submission of this Information Disclosure Statement shall not be construed to be an admission that any document cited in the Statement is, or is considered to be, material to patentability.

The Commissioner is hereby authorized to charge any required fee under 37 C.F.R. §1.17 in connection with this Information Disclosure Statement to our Deposit Account No. 23-0630.

Respectfully submitted,

Stephen Schultz

Date: November 18, 2004

Stephen J. Schultz, Reg. No. 29,108
WATTS HOFFMANN CO., L.P.A.
1100 Superior Ave., Ste. 1750
Cleveland, Ohio 44114
Phone: (216) 241-6700
Facsimile: (216) 241-8151

USPTO Form 1449 (modified)	U.S. DEPT OF COMMERCE PATENT AND TRADEMARK OFFICE	Attorney Docket No.: 14-733C2D1	Serial No.: 10/765,487
	INFORMATION DISCLOSURE CITATION	Applicant: Mario Boisvert et al.	
	Sheet 1 of 3	Filing Date: January 27, 2004	Group:

U.S. PATENT DOCUMENTS

Examiner Initials		Document Number	Date	Name	Class	Subclass	Filing Date (if appropriate)
		4,514,670	04/30/85	Fassel et al.			
		4,608,637	08/26/86	Okuyama et al.			
		4,641,067	02/03/87	Iizawa et al.			
		4,673,848	06/16/87	Hagiwara et al.			
		4,686,598	08/11/87	Herr			
		4,730,152	03/08/88	Foust et al.			
		4,746,845	05/24/88	Mizuta et al.			
		4,823,059	04/18/89	Compeau et al.			
		4,870,333	09/26/89	Itoh et al.			
		4,980,618	12/25/90	Milnes et al.			
		5,038,087	08/06/91	Archer et al.			
		5,069,000	12/03/91	Zuckerman			
		5,081,586	01/14/92	Barthel et al.			
		5,131,506	07/21/92	Mizuno et al.			

FOREIGN PATENT DOCUMENTS

Examiner Initials		Document Number	Date	Country	Class	Subclass	Translation Yes	Translation No

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)

		Federal Register, Vol. 56, No. 73/Tuesday, April 16, 1991, Rules and Regulations, Department of Transportation, National Highway Trafic Safety Administration, 49 CFR Part 571, pages 15290-15299.

EXAMINER	DATE CONSIDERED

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609
Draw Line through citation if not in conformance and not considered.
Include copy of this form with next communication to Applicant

**Copies of references not provided at the time of this submission.

USPTO Form 1449 (modified)	U.S. DEPT. OF COMMERCE PATENT AND TRADEMARK OFFICE	Attorney Docket No.: 14-733C2D1	Serial No.: 10/765487
	INFORMATION DISCLOSURE CITATION	Applicant: Mario Boisvert et al.	
	Sheet 2 of 3	Filing Date: January 27, 2004	Group:

U.S. PATENT DOCUMENTS

Examiner Initials		Document Number	Date	Name	Class	Subclass	Filing Date (if appropriate)
		5,140,316	08/18/92	DeLand et al.			
		5,162,711	11/10/92	Heckler			
		5,204,592	04/20/93	Huyer			
		5,218,282	06/08/93	Duhame			
		5,278,480	01/11/94	Murray			
		5,334,876	08/02/94	Washeleski et al.			
		5,399,950	03/21/95	Lu et al.			
		5,432,413	07/11/95	Duke et al.			
		5,497,326	03/05/96	Berland et al.			
		5,525,876	06/11/96	Filippi			
		5,530,329	06/25/96	Shigemaatsu et al.			
		5,539,290	07/23/96	Lu et al.			
		5,729,104	03/17/98	Kamishima et al.			
		5,734,245	03/31/98	Terashima et al.			
		5,832,664	11/10/98	Tajima et al.			
		5,952,801	09/14/99	Boisvert et al.			
		6,064,165	05/16/00	Boisvert et al.			
		5,955,854	09/21/99	Zhang et al.			
		5,537,013	07/1996	Toyozumi et al.			

FOREIGN PATENT DOCUMENTS

Examiner Initials		Document Number	Date	Country	Class	Subclass	Translation Yes	Translation No

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)

EXAMINER	DATE CONSIDERED

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**Copies of references not provided at the time of this submission.

USPTO Form 1449 (modified)	U.S. DEPT. OF COMMERCE PATENT AND TRADEMARK OFFICE	Attorney Docket No.: 14-733C2D1	Serial No.: 10/765,487
	INFORMATION DISCLOSURE CITATION	Applicant: Mario Boisvert et al.	
	Sheet 3 of 3	Filing Date: January 27, 2004	Group:

U.S. PATENT DOCUMENTS

Examiner Initials		Document Number	Date	Name	Class	Subclass	Filing Date (if appropriate)
		5,039,925	08/1991	Schap, William W.			
		4,855,653	08/1989	Lemirande, Rodger P.			
		4,831,509	05/1989	Jones et al.			
		4,383,206	05/1983	Matsuoka et al.			
		6,243,635	06/2001	Swan et al.			

FOREIGN PATENT DOCUMENTS

Examiner Initials		Document Number	Date	Country	Class	Subclass	Translation Yes	Translation No

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)

EXAMINER	DATE CONSIDERED

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**Copies of references not provided at the time of this submission.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Mario Boisvert et al		
Serial No.:	10/765,487	Examiner:	M. Fletcher
Filed:	January 27, 2004	Art Unit:	2837
Title:	COLLISION MONITORING SYSTEM		
Docket No.:	14-733C2D1		

PETITION UNDER RULE 102 FOR ADVANCEMENT OF EXAMINATION

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

Sir:

The Commissioner is hereby petitioned to advance the present application due to the following circumstances. The fee set forth in 37 CFR 1.17(h) in the amount of $130.00 accompanies this petition.

In accordance with MPEP section 708.02(II) the basis for advancement of the present application is infringement of one or more claims of this application. A statement of facts on behalf of Nartron Corporation, assignee of the invention, which provide the basis of the assertion accompanies this petition (see Attachment A).

Attachment B hereto contains four sheets of product packaging/components relating to the alleged infringing products recited in the statement of facts.

04/26/2005 AWONDAF1 00000020 10765487
01 FC:1464 130.00 OP

I hereby certify that this paper is being deposited today with the U.S. Postal Service as 1st Class Mail addressed to the Assistant Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450
on 4/20/05
By: [signature]

The Commissioner is hereby authorized to charge deposit account no. 23-0630 for any deficiency or credit that account any excess payment.

Respectfully Submitted,

Ap 20, 2005.
Date

Stephen J. Schultz, Reg. No. 29,108

ATTACHMENT A

(Serial No. 10/765,487)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Mario Boisvert et al		
Serial No.:	10/765,487	Examiner:	M. Fletcher
Filed:	January 27, 2004	Art Unit:	2837
Title:	COLLISION MONITORING SYSTEM		
Docket No.:	14-733C2D1		

STATEMENT IN SUPPORT OF PETITION UNDER RULE 1.102 FOR ADVANCEMENT OF EXAMINATION

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

Sir:

I, John Washeleski, state that:

1. I am the Senior Vice President of Engineering of the assignee, Nartron Corporation of Reed City, Michigan and I am authorized to sign this declaration on behalf of Nartron Corporation.

2. I am familiar with United States Patents and have been named a co-inventor on at least ten issued United States patents during my employment with Nartron Corporation.

3. I have reviewed the present patent application and am familiar with its contents and have also reviewed the pending claims.

4. During evaluation of competitive products, I have become aware of three power window or panel movement control products that sense movement or position of a window or panel and stop movement of a window or panel in response to sensing a condition. These three products are the 702097004 product made and sold by Webasto in the United States , the 0146B00522 product, which upon information and belief is made in Germany and sold by Bosch/Brose in the United States, and the 15163056 product, which upon information and belief is made in Germany and sold by Arvin Meritor in the United States.

5. It is my belief that pending claim 2 of the present application is infringed by the aforementioned Bosch and Arvin Meritor products. More particularly these two products control motion of a motor driven element in a vehicle over a range of motion and alter the motion when undesirable resistance to motion is encountered. Each of the two products measure a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element by taking a multiplicity of measurements as the motor moves the motor driven element over its range of motion. Each of the two products store a number of measurement values based on measurements of the parameter over at least a portion of the range of motion. Each of the two products determine that the parameter is outside a parameter range based on previous stored measurement values as the motor driven element moves over its range of motion. Finally, both products alter motion of the motor driven element in response to a determination that the parameter is outside the parameter range.

6. I have made a comparison of the Arvin Meritor, Bosch and Webasto products and also believe claim 28, which upon information and belief was added in a preliminary amendment filed with the present application, is also infringed by

all three products. Each of the three products control activation of a motor coupled to a motor vehicle window or panel for moving the window or panel along a travel path and deactivates the motor when a predetermined position is encountered by the window or panel. All three products include a sensor for sensing movement of the window or panel and providing a sensor output signal related to a position of the window or panel. The three products all include a switch for controllably actuating the motor by providing an energization signal. All three products include controllers having an interface coupled to the sensor and the switch for controllably energizing the motor wherein each of the controllers of the three products determines a position of the window or panel when power is applied to the controller by monitoring the position of the window or panel by monitoring the sensor output signal from the sensor that is related to a position of the window or panel. Additionally all three products identify the position of the window or panel based on the sensor output from the sensor and output a control signal to the switch to deactivate the motor in response to a sensing of the predetermined position of the window or panel.

7. I have good knowledge of the pertinent prior art already cited in prosecuting the parent application from which this application depends. The parent application is application serial number 10/100,892. Upon information and belief an Information Disclosure statement was filed with the present application on November 22, 2004, wherein references cited in the parent application were made of record in the present application.

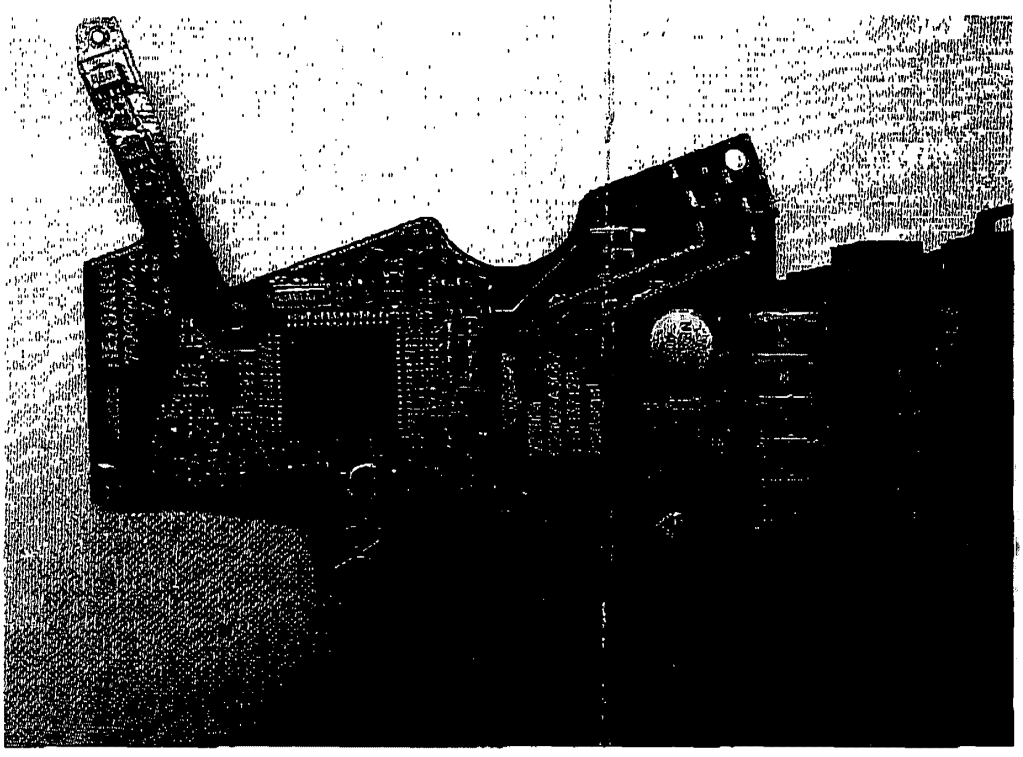
8. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issued thereon.

Date: 4-18-2005

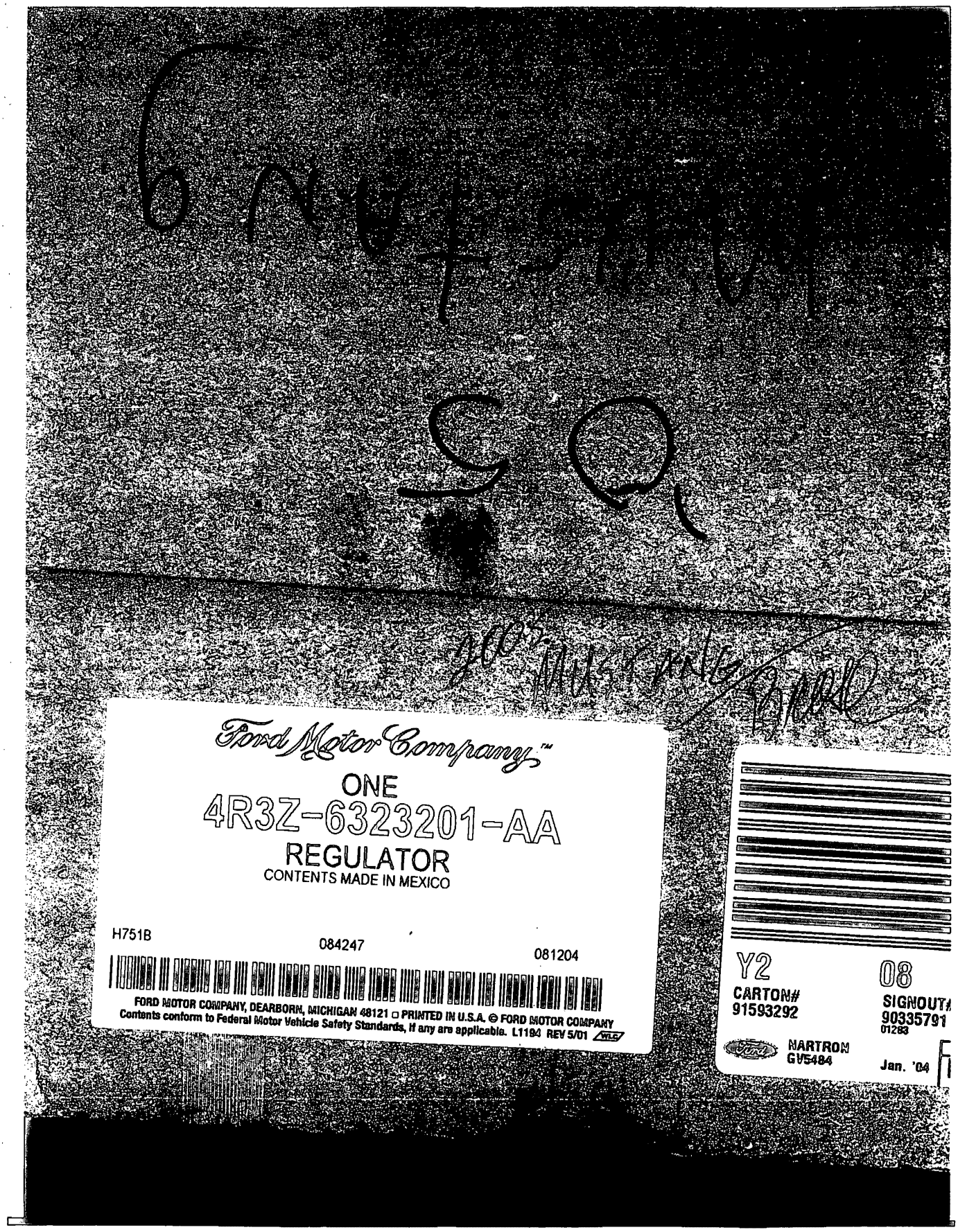
John Washeleski

ATTACHMENT B

(Serial No. 10/765,487)



Webasto SRX Control with positioning and bounce back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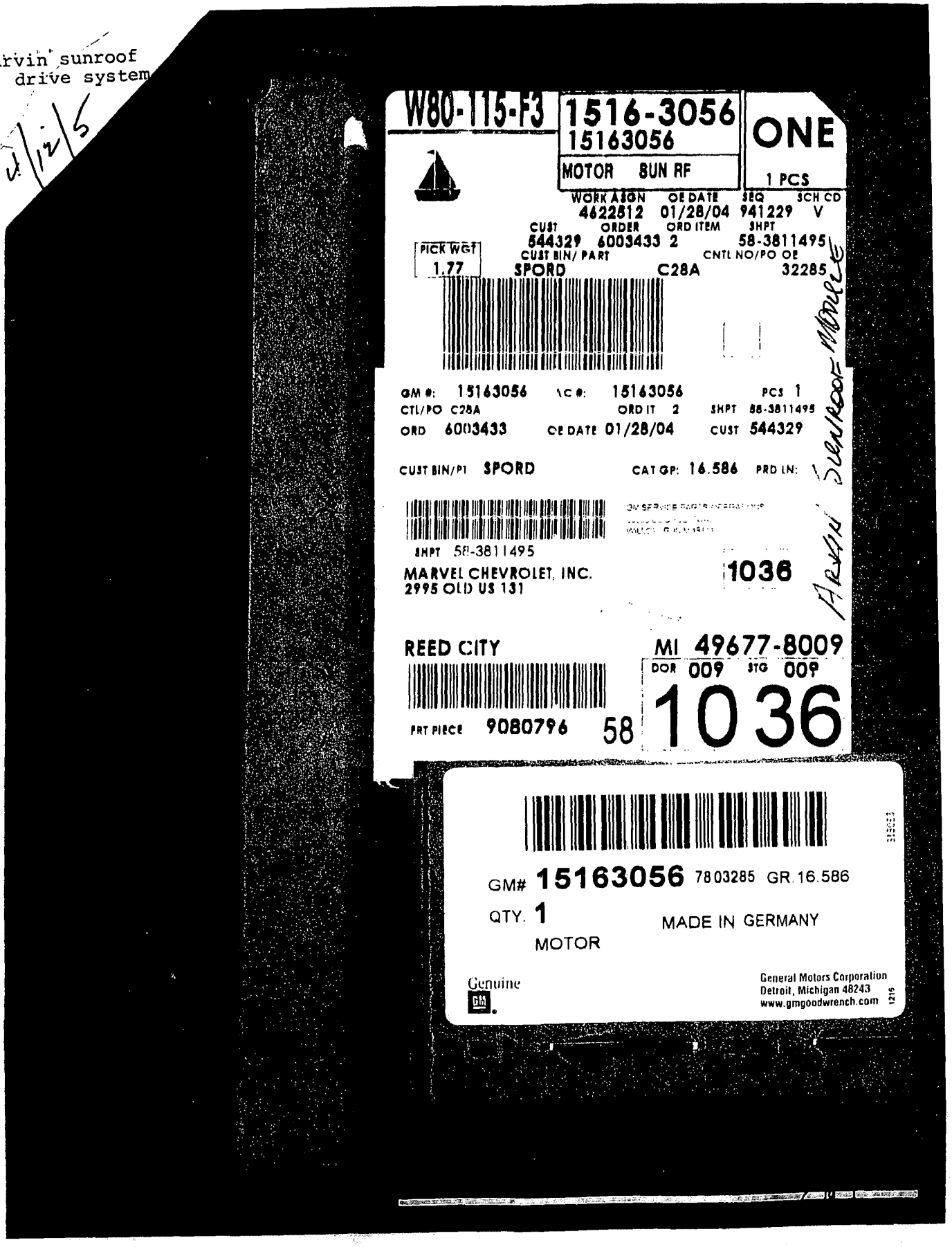
this is a Ford 2005 Mustang power window drive assy by Brose/Bosch

Arvin sunroof drive system



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APPL NO.	FILING OR 371 (c) DATE	ART UNIT	FIL FEE REC'D	ATTY.DOCKET NO	DRAWINGS	TOT CLMS	IND CLMS
10/765,487	01/27/2004	2837	735	14-733C2D1	9	35	8

CONFIRMATION NO. 9537

Stephen J. Schultz
Watts Hoffman Co., LPA
110 Superior Avenue, Suite 1750
Cleveland, OH 44114

REPLACEMENT FILING RECEIPT

OC000000017618098

Date Mailed: 12/08/2005

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. 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 mail to the Commissioner for Patents P.O. Box 1450 Alexandria Va 22313-1450. 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 (if appropriate).**

Applicant(s)

Mario Boisvert, Reed City, MI;
Randall Perrin, Cadillac, MI;

Assignment For Published Patent Application

Nartron Corporation

Power of Attorney:

Stephen Schultz--29108

Domestic Priority data as claimed by applicant

This application is a DIV of 10/100,892 03/18/2002
which is a CIP of 09/562,986 05/01/2000 PAT 6,404,158
which is a CIP of 08/736,786 10/25/1996 PAT 6,064,165
which is a CON of 08/275,107 07/14/1994 ABN
which is a CIP of 07/872,190 04/22/1992 PAT 5,334,876

Foreign Applications

If Required, Foreign Filing License Granted: 06/15/2004

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is US10/765,487

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

Collision monitoring system

Preliminary Class

318

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 (1-866-999-4158).

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 Assets Control, 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).

Attorney's Docket No. 14-733C2D1 *Patent*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:	MARIO BOISVERT, ET AL.	Examiner:	N/A
Application No.:	10/765,487	Art Unit:	NOT ASSIGNED
Filed:	JANUARY 27, 2004		
Title:	COLLISION MONITORING SYSTEM		

CHANGE OF ADDRESS Ed Westin

Commissioner for Patents
Attn: Valarie Kinard, OIPE
P.O. Box 1450
Alexandria, VA 22313-1450

FAX 571-273-1638

We have not yet received our official Filing Receipt for this divisional application. The address on our original application was incorrect. Could you please correct the correspondent's mailing address as noted below and forward to us the official Filing Receipt:

Stephen J. Schultz
Watts Hoffmann Co., LPA
1100 Superior Avenue, Suite 1750
Cleveland, Ohio 44114

Please ~~note~~ change Attorney file # is: 14-733C2D1

Respectfully submitted,

Date: April 12, 2005

Stephen J. Schultz, Reg. No. 29,108

WATTS, HOFFMANN, FISHER & HEINKE CO., L.P.A.

ATTORNEYS AT LAW

U.S. POSTAL ADDRESS:
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TELEPHONE (216) 241-6700
FACSIMILE (216) 241-8151

FACSIMILE TRANSMITTAL

To:	Valerie Kinard
Organization:	United States PTO – Office of Initial Patent Exam (OIPE)
Facsimile No.:	703/308-4113
From:	Stephen J. Schultz
Date:	April 12, 2005
Our File No.:	14-733C2D1
No. of pages: (including this cover pg.)	2

MESSAGE:

☐ (if checked) A confirmation copy of this transmission will follow via DHL.

WATTS HOFFMANN CO., L.P.A.
ATTORNEYS AT LAW

U.S. POSTAL ADDRESS:
P.O. Box 99839
Cleveland, Ohio 44199-0839

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TELEPHONE (216) 241-6700
FACSIMILE (216) 241-8151

FACSIMILE TRANSMITTAL

To:	Ed Westin
Organization:	USPTO
Facsimile No.:	571-273-1638
From:	Steve Schultz
Date:	12/8/05
Our File No.:	14-733C2 D1
No. of pages: (including this cover pg.)	3

MESSAGE: Thanks for the phone call.
Steve Schultz

☐ (if checked) A confirmation copy of this transmission will follow via U.S. mail.

PAGE 1/3 * RCVD AT 12/8/2005 9:25:06 AM [Eastern Standard Time] * SVR:USPTO-EFXRF-6/25 * DNIS:2731638 * CSID:216 241 8151 * DURATION (mm-ss):01-14

UNITED STATES PATENT AND TRADEMARK OFFICE

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Stephen J. Schultz
Watts Hoffman Co., LPA
110 Superior Avenue, Suite 1750
Cleveland, OH 44114

DEC 1 0 2005

In re Application of:
Mario Boisvert et al.
Serial No.: 10/765,487
Filed: January 27, 2004
Attorney Docket No.: 14-733C2D1

DECISION ON PETITION
TO MAKE SPECIAL

This is a decision on the petition filed on April 25, 2005 under 37 C.F.R. § 1.102(d) requesting that the above identified application be granted special status and examined out of turn on the ground of actual infringement as set forth in MPEP § 708.02 II.

The petition is GRANTED.

MPEP § 708.02 II requires, besides a petition, petition fee and a copy of each of the references deemed most closely related to the subject matter encompassed by the claims (if such references are not already of record), a statement by the applicant, assignee, or an attorney/agent registered to practice before the Office alleging:

(A) That there is an infringing device or product actually on the market or method in use;

(B) That a rigid comparison of the alleged infringing device, product or method with the claims of the application has been made, and that in his or her opinion, some of the claims are unquestionably infringed; and

(C) That he or she has made or caused to be made a careful and thorough search of the prior art or has good knowledge of the pertinent prior art.

The petition filed April 25, 2005 has been considered and found to comply with all the requirements set forth in MPEP § 708.02 II.

Any inquiries regarding this decision should be directed to Edward Westin at (571) 272-1638.

Edward Westin

Edward Westin, Special Programs Examiner
Technology Center 2800
Semiconductors, Electrical and
Optical Systems, and Components

IFW

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of: Mario Boisvert et al

Serial No.: 10/765,487

Filed: January 27, 2004 Examiner: M. Fletcher

Art Unit: 2837

For: COLLISION MONITORING SYSTEM

Docket No.: 14-733C2D1

Watts, Hoffmann, Co., L.P.A.
1100 Superior Avenue
Suite 1750
Cleveland, Ohio44114-2518

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

I hereby certify that this paper is being deposited today with the U.S. Postal Service as 1st Class Mail addressed to the Assistant Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450
on December 20, 2005
By: Yolanda S. Tate

CHANGE OF ADDRESS

Dear Sir:

Please change the incorrect street address on the filing receipt for the undersigned attorney of record to the following:

WATTS, HOFFMANN, CO. L.P.A.
1100 Superior Avenue - Suite 1750
Cleveland, Ohio 44114-2518
Telephone (216) 241-6700

Respectfully submitted,

Date: December 20, 2005

Stephen Schultz

Stephen J. Schultz
Reg. No. 29,108

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,487	01/27/2004	Mario Boisvert	14-733C2D1	9537

7590 04/06/2006

Stephen J. Schultz
WATTS, HOFFMANN, CO. L.P.A.
1100 Superior Avenue - Suite 1750
Cleveland, OH 44114-2518

EXAMINER	
FLETCHER, MARLON T	

ART UNIT	PAPER NUMBER
2837	

DATE MAILED: 04/06/2006

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

Office Action Summary	Application No.	Applicant(s)	
	10/765,487	BOISVERT ET AL.	
	Examiner	Art Unit	
	Marlon T. Fletcher	2837	

-- 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 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 *27 January 2004*.

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

3)☐ 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

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-35* is/are rejected.

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

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

Application Papers

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

10)☐ The drawing(s) filed on _____ 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).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).

a)☐ All b)☐ Some * c)☐ None of:

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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 12 and 22 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 22 and 16, respectively of U.S. Patent No. 5,952,801. Although the conflicting claims are not identical, they are not patentably distinct from each other because the subject matter does not vary. Why the claim may be worded slightly different, there is no difference in the subject matter being claimed. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the claim language in either application to cover the same subject matter.

Claim Rejections - 35 USC § 102

3. 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 –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-35 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang (5,982,124).

Wang discloses an apparatus and method for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said apparatus comprising: a sensor (30) for measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element; a memory (50) for storing a number of measurement values from the sensor based on measurements of said parameter over at least a portion of said range of motion; a switch (22) coupled to said controller for controlling energization of the motor with an energization signal; and a controller (24) coupled to the memory for determining to de-activate the motor based on the measurement values stored in the memory as the motor driven element moves over its range of motion; and a controller interface (26) coupled to the motor for altering motion of said motor driven element in response to a determination made by the controller. Wang also discloses an apparatus and method for controlling motion of a motor driven element in a vehicle over

a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said method comprising, measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element by taking a multiplicity of measurements as the motor moves the motor driven element over its range of motion (abstract and colu column 4, line 53 through column 5, line 11); storing a number of measurement values based on measurements of said parameter over at least a portion of said range of motion (column 5, line 56 through column 6, line 11); determining that the parameter is outside a parameter range based on previous stored measurement values as the motor driven element moves over its range of motion (column 4, lines 16-52); and altering motion of said motor driven element in response to a determination that the parameter is outside the parameter range (column 4, lines 16-31 and column 7, lines 35-50). Wang further discloses the method, wherein the motor driven element is a window or panel and additionally comprising reverse actuating the window or panel prior to moving said window or panel in a direction to close the window or panel (abstract; and column 4, lines 15-31). Wang further discloses the method, additionally comprising maintaining a position of the window or panel based on the sensed parameter and the reverse actuation is initiated if a leading edge of the window or panel is near a closed position and wherein movement is first initiated toward a closed position when a leading edge of the window or panel is near the closed position and wherein the reverse actuation is performed upon a sensing 6f an obstacle that is based

on determining the parameter is outside the parameter range (column 3, line 22 through column 4, line 45; and column 5, lines 12-32). Wang discloses the apparatus, wherein the sensor for generating a speed signal comprises a Hall-effect sensor and wherein the sensor for generating a speed signal comprises a magnetic pick-up (column 2, lines 51-59).

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO form 892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marlon T. Fletcher whose telephone number is 571-272-2063. The examiner can normally be reached on M-w, F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paula Bradley can be reached on 571-272-2001. 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).

MTF
April 1, 2006

MARLON T. FLETCHER
PRIMARY EXAMINER

USPTO Form 1449 (modified)	U.S. DEPT OF COMMERCE PATENT AND TRADEMARK OFFICE	Attorney Docket No.: 14-733C2D1	Serial No.: 10/765,487
	INFORMATION DISCLOSURE CITATION	Applicant: Mario Boisvert et al.	
	Sheet 1 of 3	Filing Date: January 27, 2004	Group:

U.S. PATENT DOCUMENTS

Examiner Initials		Document Number	Date	Name	Class	Subclass	Filing Date (if appropriate)
		4,514,670	04/30/85	Fassel et al.			
		4,608,637	08/26/86	Okuyama et al.			
		4,641,067	02/03/87	Iizawa et al.			
		4,673,848	06/16/87	Hagiwara et al.			
		4,686,598	08/11/87	Herr			
		4,730,152	03/08/88	Foust et al.			
		4,746,845	05/24/88	Mizuta et al.			
		4,823,059	04/18/89	Compeau et al.			
		4,870,333	09/26/89	Itoh et al.			
		4,980,618	12/25/90	Milnes et al.			
		5,038,087	08/06/91	Archer et al.			
		5,069,000	12/03/91	Zuckerman			
		5,081,586	01/14/92	Barthel et al.			
		5,131,506	07/21/92	Mizuno et al.			

FOREIGN PATENT DOCUMENTS

Examiner Initials		Document Number	Date	Country	Class	Subclass	Translation Yes	Translation No

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)

		Federal Register, Vol. 56, No. 73/Tuesday, April 16, 1991, Rules and Regulations, Department of Transportation, National Highway Trafic Safety Administration, 49 CFR Part 571, pages 15290-15299.

EXAMINER [signature] DATE CONSIDERED 4/4/06

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609
Draw Line through citation if not in conformance and not considered.
Include copy of this form with next communication to Applicant

**Copies of references not provided at the time of this submission.

USPTO Form 1449 (modified)

U.S. DEPT. OF COMMERCE
PATENT AND TRADEMARK OFFICE

INFORMATION DISCLOSURE CITATION

Sheet 2 of 3

Attorney Docket No.: 14-733C2D1 | Serial No.: 10/765487

Applicant: Mario Boisvert et al.

Filing Date: January 27, 2004 | Group:

U.S. PATENT DOCUMENTS

Examiner Initials		Document Number	Date	Name	Class	Subclass	Filing Date (if appropriate)
		5,140,316	08/18/92	DeLand et al.			
		5,162,711	11/10/92	Heckler			
		5,204,592	04/20/93	Huyer			
		5,218,282	06/08/93	Duhame			
		5,278,480	01/11/94	Murray			
		5,334,876	08/02/94	Washeleski et al.			
		5,399,950	03/21/95	Lu et al.			
		5,432,413	07/11/95	Duke et al.			
		5,497,326	03/05/96	Berland et al.			
		5,525,876	06/11/96	Filippi			
		5,530,329	06/25/96	Shigemaatsu et al.			
		5,539,290	07/23/96	Lu et al.			
		5,729,104	03/17/98	Kamishima et al.			
		5,734,245	03/31/98	Terashima et al.			
		5,832,664	11/10/98	Tajima et al.			
		5,952,801	09/14/99	Boisvert et al.			
		6,064,165	05/16/00	Boisvert et al.			
		5,955,854	09/21/99	Zhang et al.			
		5,537,013	07/1996	Toyozumi et al.			

FOREIGN PATENT DOCUMENTS

Examiner Initials		Document Number	Date	Country	Class	Subclass	Translation Yes	Translation No

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)

EXAMINER [signature] DATE CONSIDERED 4/1/06

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**Copies of references not provided at the time of this submission.

USPTO Form 1449 (modified)

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

INFORMATION DISCLOSURE CITATION

Sheet 3 of 3

Attorney Docket No.: 14-733C2D1 | Serial No.: 10/765,487

Applicant: Mario Boisvert et al.

Filing Date: January 27, 2004 | Group:

U.S. PATENT DOCUMENTS

Examiner Initials		Document Number	Date	Name	Class	Subclass	Filing Date (if appropriate)
MD		5,039,925	08/1991	Schap, William W.			
		4,855,653	08/1989	Lemirande, Rodger P.			
		4,831,509	05/1989	Jones et al.			
		4,383,206	05/1983	Matsuoka et al.			
MD		6,243,635	06/2001	Swan et al.			

FOREIGN PATENT DOCUMENTS

Examiner Initials		Document Number	Date	Country	Class	Subclass	Translation Yes	Translation No

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)

EXAMINER Martin Lefebvre | DATE CONSIDERED 9/1/06

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609
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Include copy of this form with next communication to Applicant

**Copies of references not provided at the time of this submission.

Notice of References Cited	Application/Control No. 10/765,487	Applicant(s)/Patent Under Reexamination BOISVERT ET AL.	
	Examiner Marlon T. Fletcher	Art Unit 2837	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,982,124	11-1999	Wang, John Y.	318/466
*	B	US-5,952,801	09-1999	Boisvert et al.	318/468
*	C	US-5,701,063	12-1997	Cook et al.	318/469
*	D	US-5,723,960	03-1998	Harada, Kouichi	318/469
*	E	US-5,969,637	10-1999	Doppelt et al.	340/825.69
	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
	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	

*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.

UNITED STATES PATENT AND TRADEMARK OFFICE

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CONFIRMATION NO. 9537

SERIAL NUMBER	FILING DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
10/765,487	01/27/2004 RULE	318	2837	14-733C2D1

APPLICANTS

Mario Boisvert, Reed City, MI;

Randall Perrin, Cadillac, MI;

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

This application is a DIV of 10/100,892 03/18/2002
which is a CIP of 09/562,986 05/01/2000 PAT 6,404,158
which is a CIP of 08/736,786 10/25/1996 PAT 6,064,165
which is a CON of 08/275,107 07/14/1994 ABN
which is a CIP of 07/872,190 04/22/1992 PAT 5,334,876

** FOREIGN APPLICATIONS ********** None

IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** SMALL ENTITY **
** 06/15/2004

		STATE OR	SHEETS	TOTAL	INDEPENDENT
Foreign Priority claimed	☐ yes ☑ no	COUNTRY	DRAWING	CLAIMS	CLAIMS
35 USC 119 (a-d) conditions met	☐ yes ☑ no ☐ Met after Allowance	MI	9	35	8
Verified and Acknowledged	Examiner's Signature Initials				

ADDRESS
Stephen J. Schultz
WATTS, HOFFMANN, CO. L.P.A.
1100 Superior Avenue - Suite 1750
Cleveland , OH
44114-2518

TITLE
Collision monitoring system

☐ All Fees
☐ 1.16 Fees (Filing)

Index of Claims

Application/Control No.	Applicant(s)/Patent under Reexamination
10/765,487	BOISVERT ET AL.
Examiner	**Art Unit**
Marlon T. Fletcher	2837

√	Rejected	–	(Through numeral) Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

Claim		Date
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Search Notes	Application/Control No.	Applicant(s)/Patent under Reexamination	
	10/765,487	BOISVERT ET AL.	
	Examiner	Art Unit	
	Marlon T. Fletcher	2837	

SEARCHED			
Class	Subclass	Date	Examiner

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
EAST TEXT SEARCH: SEE SEARCH HISTORY PRINTOUT	4/1/2006	MTF

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Mario Boisvert, et al

Serial No.	10/765,487	Group Art Unit:	2837
Filed:	January 27, 2004	Examiner:	FLETCHER, Marlon T.
For:	COLLISION MONITORING SYSTEM		

Docket No.: 14-733C2D1

MAIL STOP NO FEE AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT TRANSMITTAL

1. Transmitted herewith is a response to an Office Action mailed April 6, 2006 for approval by examiner for this application.

STATUS

2. Applicant is

XX a small entity
___ other than a small entity.

CERTIFICATE OF MAILING (37 CFR 1.8a)

I hereby certify that this paper (along with any referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: "Mail Stop No Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450".

Mary T. Uthoff
(type or print name of person mailing paper)

Date: Wednesday, May 31, 2006

Mary T. Uthoff
(signature of person mailing paper)

EXTENSION OF TERM

3. The proceedings herein are for a patent application and the provisions of 37CFR 1.136 apply.

(complete (a) or (b) as applicable)

(a) ____ Applicant petitions for an extension of time for the total number of months checked below:

	Extension (months)	Fee for Other than Small Entity	Fee For Small Entity
	One-Month	120.00	60.00
	Two-Month	450.00	225.00
	Three-Month	1020.00	510.00
	Four-Month	1590.00	795.00
	Fifth-Month	2160.00	1080.00

Fee $

If an additional extension of time is required please consider this a petition therefor.

(check and complete the next item, if applicable)

____ An extension for _____ months has already been secured and the fee paid therefor of $_____ is deducted from the total fee due for the total months of extension now requested.

Extension fee due with this request $

OR

(b) XXX Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition for extension of time.

FEE FOR CLAIMS

4. The fee for claims has been calculated as shown below:

	Claims Remaining After Amendment		Highest No. Previously Paid For		Present Extra		Rate	Small Entity Additional Fee		Rate		Other Than Small Entity Additional Fee
Total	35	MINUS	35	=	0	X	25.00		X	50.00	=	
Indep.	8	MINUS	8	=	0	X	100.00		X	200.00	=	
First Presentation of Multiple Dependent Claims						X	180.00		X	360.00	=	
					TOTAL		$	- OR -		***Total***		$ 0.00

* If the Highest No. Previously Paid for in this space is less than 20, enter "20".

** If the Highest No. Previously Paid for in this space is less than 3, enter "3".

(c) XX No additional fee is required

OR

(d) ____ Total additional fee required $ 0.00

FEE PAYMENT

____ Attached is a check in the sum of $

_____ Charge Account No. 23-0630 in the sum of $

Fee Deficiency

6. XXX If any additional extension and/or fee is required, this is the request therefor and to charge Account No. 23-0630

And/Or

XXX If any additional fee for claims is required, charge Account No. 23-0630.

(Signature of Attorney)

Stephen J. Schultz

(Type or Print Name of Attorney)

Registration No.: 29,108

Telephone No. 216/241-6700
Facsimile No.: 216/241-8151

WATTS HOFFMANN Co., L.P.A.
1100 Superior Avenue
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Cleveland, OH 44199-0839

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Mario Boisvert and Randall Perrin

Serial No.: 10/765,487

Filing Date: January 27, 2004

Title: COLLISION MONITORING SYSTEM

Examiner: Marlon T. Fletcher

Art Unit: 2837

Docket No.: 14-733C2D1

Watts Hoffmann Co., LPA
Suite 1750
1100 Superior Ave.
Cleveland, OH 44114

I hereby certify that this paper is being deposited today with the U.S. Postal Service as 1st Class Mail addressed to the Assistant Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450
on 5 May 2006
By: Mario G. Witty

MAIL STOP NON-FEE AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Response

In response to the office action having a mailing date of April 6, 2006, please amend this application as follows:

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Mario Boisvert, et al

Serial No.	10/765,487	Group Art Unit:	2837
Filed:	January 27, 2004	Examiner:	FLETCHER, Marlon T.
For:	COLLISION MONITORING SYSTEM		

Docket No.: 14-733C2D1

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

AMENDMENT TRANSMITTAL

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CERTIFICATE OF MAILING (37 CFR 1.8a)

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Mary T. Uthoff
(type or print name of person mailing paper)

Date: Wednesday, May 31, 2006

Mary T. Uthoff
(signature of person mailing paper)

EXTENSION OF TERM

3. The proceedings herein are for a patent application and the provisions of 37CFR 1.136 apply.

(complete (a) or (b) as applicable)

(a) ____ Applicant petitions for an extension of time for the total number of months checked below:

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____ An extension for _____ months has already been secured and the fee paid therefor of $_____ is deducted from the total fee due for the total months of extension now requested.

Extension fee due with this request $

OR

(b) XXX Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition for extension of time.

FEE FOR CLAIMS

4. The fee for claims has been calculated as shown below:

	Claims Remaining After Amendment		Highest No. Previously Paid For		Present Extra		Rate	Small Entity Additional Fee		Rate		Other Than Small Entity Additional Fee
Total	35	MINUS	35	=	0	X	25.00		X	50.00	=	
Indep.	8	MINUS	8	=	0	X	100.00		X	200.00	=	
First Presentation of Multiple Dependent Claims						X	180.00		X	360.00	=	
					TOTAL		$	- OR -		***Total***		$ 0.00

* If the Highest No. Previously Paid for in this space is less than 20, enter "20".

** If the Highest No. Previously Paid for in this space is less than 3, enter "3".

(c) XX No additional fee is required

OR

(d) _____ Total additional fee required $ 0.00

FEE PAYMENT

____ Attached is a check in the sum of $

_____ Charge Account No. 23-0630 in the sum of $

Fee Deficiency

6. XXX If any additional extension and/or fee is required, this is the request therefor and to charge Account No. 23-0630

And/Or

XXX If any additional fee for claims is required, charge Account No. 23-0630.

(Signature of Attorney)

Stephen J. Schultz

(Type or Print Name of Attorney)

Registration No.: 29,108

Telephone No. 216/241-6700
Facsimile No.: 216/241-8151

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OIPE JUN 05 2006 PATENT & TRADEMARK OFFICE

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Mario Boisvert and Randall Perrin

Serial No.: 10/765,487

Filing Date: January 27, 2004

Title: COLLISION MONITORING SYSTEM

Examiner: Marlon T. Fletcher

Art Unit: 2837

Docket No.: 14-733C2D1

Watts Hoffmann Co., LPA
Suite 1750
1100 Superior Ave.
Cleveland, OH 44114

I hereby certify that this paper is being deposited today with the U.S. Postal Service as 1st Class Mail addressed to the Assistant Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450

on 31 May 2006

By: [signature]

MAIL STOP NON-FEE AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Response

In response to the office action having a mailing date of April 6, 2006, please amend this application as follows:

Claim Status

1. (Original) Apparatus for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said apparatus comprising:

a) a sensor for measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element;

b) a memory for storing a number of measurement values from the sensor based on measurements of said parameter over at least a portion of said range of motion;

c) a controller coupled to the memory for determining to de-activate the motor based on the measurement values stored in the memory as the motor driven element moves over its range of motion; and

d) a controller interface coupled to the motor for altering motion of said motor driven element in response to a determination made by the controller.

2. (Original) A method for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said method comprising:

a) measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element by taking a multiplicity of measurements as the motor moves the motor driven element over its range of motion;

b) storing a number of measurement values based on measurements of said parameter over at least a portion of said range of motion;

c) determining that the parameter is outside a parameter range based on previous stored measurement values as the motor driven element moves over its range of motion; and

d) altering motion of said motor driven element in response to a determination

that the parameter is outside the parameter range.

3. (Original) The method of claim 2 wherein the motor driven element is a window or panel and additionally comprising reverse actuating the window or panel prior to moving said window or panel in a direction to close the window or panel.

4. (Original) The method of claim 3 additionally comprising maintaining a position of the window or panel based on the sensed parameter and the reverse actuation is initiated if a leading edge of the window or panel is near a closed position.

5. (Original) The method of claim 4 movement is first initiated toward a closed position when a leading edge of the window or panel is near the closed position and wherein the reverse actuation is performed upon a sensing of an obstacle that is based on determining the parameter is outside the parameter range.

6. (Original) Apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving said window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel, said apparatus comprising:

a) a sensor for sensing movement of the window or panel and providing a sensor output signal related to a speed of movement of the window or panel;

b) a switch for controllably actuating the motor by providing an energization signal; and

c) a controller having an interface coupled to the sensor and the switch for controllably energizing the motor; said controller sensing a collision with an obstruction when power is applied to the controller by:

i) monitoring movement of the window or panel by monitoring a signal from the sensor related to the movement of the window or panel;

ii) identifying a collision of the window or panel with an obstacle due to a change in the signal from the sensor that is related to a change in movement of the window or panel; and

iii) outputting a control signal to said switch to deactivate said motor in response to a sensing of a collision between an obstacle and said window or panel.

7. (Original) The apparatus of claim 6 wherein the controller comprises a programmable controller including a processing unit for executing a control program and including a memory for storing multiple window or panel speed values corresponding to a signal received from the sensor.

8. (Original) The apparatus of claim 6 additionally comprising one or more limit switches for use by the controller to determine window or panel position for use in identifying a collision.

9. (Original) The apparatus of claim 6 wherein the control program adjusts an obstacle detection threshold in real time based on immediate past measures of the signal sensed by the sensor to adapt to varying conditions encountered during operation of the window or panel.

10. (Original) The apparatus of claim 6 wherein the controller maintains a position of a leading edge of the window or panel and further wherein the controller reverse energizes the motor to move the window or panel away from a closure position prior to activating the motor to close the window or panel.

11. (Original) The apparatus of claim 10 wherein the controller reverse energizes the motor in response to a sensing of an obstacle and the reverse energizing and attempt to move the window or panel to a closed position is performed to confirm sensing of the obstacle.

12. (Original) Apparatus for controlling activation of a motor for moving an object along a travel path and de-activating the motor if an obstacle is encountered by the object comprising:

a) a movement sensor for monitoring movement of the object as the motor moves said object along a travel path;

b) a switch for controlling energization of the motor with an energization signal; and

c) a controller including an interface coupled to the switch means for controllably energizing the motor and said interface additionally coupling the controller to the movement sensor for monitoring signals from said movement sensor; said controller comprising a stored program that:

i) determines motor speed from an output signal from the movement sensor;

ii) calculates an obstacle detect threshold based on motor speed of movement detected during at least one prior period of motor operation;

iii) compares a value based on currently sensed motor movement with the obstacle detect threshold; and

iv) outputs a signal from the interface to said switch for stopping the motor if the comparison based on currently sensed motor movement indicates the object has contacted an obstacle.

13 (Original) The apparatus of claim 12 wherein the controller includes a buffer memory for storing successive values of motor movement for use in determining the obstacle detect threshold.

14. (Original) The apparatus of claim 12 wherein the controller includes a clock and an input from the movement sensor is in a form of a sequence of pulses and further wherein the controller counts clock signals occurrences between receipt of pulses to provide an indication of motor speed.

15. (Original) The apparatus of claim 12 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a motor energization sequence a specified minimum time period in response to a short period user actuation of said control inputs to maintain position accuracy in monitoring window or panel movement.

16. (Original) The apparatus of claim 12 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the object and wherein in response to a specified input the controller conducts a calibration motor energization sequence to determine parameters of object.

17. (Original) The apparatus of claim 12 wherein the motor is coupled to a motor vehicle window or panel and wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a position indication which is updated in response movement of the window or panel and further wherein the controller reverse actuations the motor near an end point in an object path of travel to avoid false obstacle detection in the region of closure of the window or panel.

18. (Original) The apparatus of claim 12 wherein the sensor is a current sensor and wherein the controller includes means for adjusting the obstacle threshold based on dynamic motor current as sensed from the current sensor to take into account varying loads experienced by the motor.

19. (Original) Apparatus for controlling activation of a motor for moving a window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel comprising:

a) a sensor for sensing movement of a window or panel along a travel path;

b) a switch for controlling energization of the motor with an energization signal;

and

c) a controller coupled to the switch for controllably energizing the motor and having an interface coupling the controller to the sensor and to the switch; said controller comprising decision making logic for:

i) monitoring a signal from the sensor;

ii) calculating an obstacle detect threshold based on the signal that is detected during at least one prior period of motor operation, or a predetermined threshold;

iii) comparing a value based on a currently sensed motor parameter with the obstacle detect threshold; and

iv) stopping movement of the window or panel by controlling an output to said switch that controls motor energization if the comparison based on a currently sensed motor parameter indicates the window or panel has contacted an obstacle.

20. (Original) Apparatus for controlling activation of a motor for moving a window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel comprising:

a) a sensor for generating signals representative of the window or panel speed as the motor moves the window or panel along a travel path;

b) an obstacle detection controller for monitoring at least a part of the travel path of the window or panel for sensing and generating an obstacle detect signal indicating the presence in said travel path of an obstacle to movement of the window or panel;

c) a switch coupled to said controller for controlling energization of the motor with an energization signal; and

d) said controller including means for processing motor speed and obstacle detection signals and controlling operation of the motor in response to said speed or obstacle detection signals; said controller including:

i) a storage for storing a number of speed signals that vary with motor speed;

ii) a processor for calculating an obstacle detect threshold based on one or more

speed signals stored in said storage;

iii) a logic unit for making a comparison between a value representing window or panel speed based on currently sensed motor speed with the calculated obstacle detect threshold, a predetermined threshold, and generating a control output based on said comparison; and

iv) an interface coupled to said switch for changing the state of the switch to stop the motor.

21. (Original) The apparatus of claim 20 wherein the sensor for generating a speed signal comprises a Hall-effect sensor.

22. (Original) The apparatus of claim 20 wherein the sensor for generating a speed signal comprises a magnetic pick-up.

23. (Original) The apparatus of claim 20 additionally comprising an obstacle detector having an output coupled to the controller that senses a disruption in a region through which the window or panel moves.

24. (Original) The apparatus of claim 23 wherein the obstacle detector comprises a microwave generator and a reflected wave transducer.

25. (Original) The apparatus of claim 23 wherein the obstacle detector comprises an infrared light source and detector.

26. (Renumbered – Original claim 27) The apparatus of claim 23 wherein the obstacle detector comprises a field effect device.

27. (Renumbered – Original claim 28) The apparatus of claim 27 wherein the field

effect device comprises a magnetic field inductive sensor.

28. (previously presented) Apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving said window or panel along a travel path and de-activating the motor when a predetermined position is encountered by the window or panel, said apparatus comprising:

a) a sensor for sensing movement of the window or panel and providing a sensor output signal related to a position of the window or panel;

b) a switch for controllably actuating the motor by providing an energization signal; and

c) a controller having an interface coupled to the sensor and the switch for controllably energizing the motor; said controller determines the position of the window or panel when power is applied to the controller by:

i) monitoring the position of the window or panel by monitoring the sensor output signal from the sensor related to the position of the window or panel;

ii) identifying the position of the window or panel based on the sensor output signal from the sensor; and

29. (previously presented) The apparatus of claim 28 wherein the controller comprises a programmable controller including a processing unit for executing a control program and including a memory for storing multiple window or panel position values corresponding to a signal received from the sensor.

30. (previously presented) The apparatus of claim 28 additionally comprising one or more position limits programmed for use by the controller to determine window or panel position for use in identifying whether the window or panel is closed or open.

31. (previously presented) The apparatus of claim 28 wherein the controller maintains a position of a leading edge of the window or panel and further wherein the

controller reverse energizes the motor to move the window or panel away from a closure position prior to activating the motor to close the window or panel.

32. (previously presented) The apparatus of claim 28 wherein the motor is coupled to a motor vehicle or panel and wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintain a position indication which is updated in response to movement of the window or panel and further wherein the controller reverse actuates the motor near an end point in the travel path of the window or panel to avoid false obstacle detection in a region of closure of the window or panel.

33. (previously presented) Apparatus for controlling activation of a motor for moving a motor driven element in a vehicle over a range of motion and de-activating the motor when undesirable resistance to motion of the element is encountered, the apparatus comprising:

a) a sensor for sensing a speed of the motor and generating an output signal representative of a speed of the motor, a speed of the motor changing when undesirable resistance to motion of the element is encountered;

b) a switch for controlling activation of the motor; and

c) a controller coupled to the sensor and the switch, the controller receiving the sensor output signal from the sensor and outputting a control signal to the switch to de-activate the motor if the sensor output signal indicates that the element has encountered undesirable resistance to motion.

34. (previously presented) The apparatus of claim 33 wherein the sensor includes a Hall effect sensor.

35. (previously presented) The apparatus of claim 33 wherein the apparatus includes a memory for storing values corresponding to the sensor output signal over at

least a portion of the range of motion of the element and the controller analyzes the sensor output signal values stored in the memory to determine if the control signal to de-activate the motor should be output to the switch.

REMARKS

Claims 1 – 35 are pending and reconsideration of those claims is requested. The present application claims priority from (under 35 USC 120) and incorporates by reference the subject matter of application serial number 07/872,190 filed April 22, 1992 which has subsequently issued as US patent number 5,334,876. A copy of the '876 patent is attached (Attachment A) for the convenience of the Examiner. The claim for priority from this application was acknowledged on the replacement filing receipt that accompanies this response and is designated Attachment B.

In rejecting the claims in the last office action, the Examiner cited US patent number 5,982,124 to Wang (herein the '124 patent) having an effective date of August 30, 1995. Thus, if applicants can show support for the presently claimed subject matter in the earlier filed application serial number 07/872,190, the April 6, 2006 rejection based on the '124 patent must be withdrawn.

In discussing the requirements of 37 CFR 1.78 (which the USPTO has already decided have been met) the MPEP, section 201.11, states in part that "If the claims in the later –filed application are not entitled to the benefit of an earlier filing date, the examiner should:

(A) notify applicant that the claims in the later filed application are not entitled to the benefit ... and

(B) conduct a prior art search based on the actual filing date of the application instead of the earlier filing date." See page 200-57 October 2005 edition of MPEP.

The April 6, 2006 office action did not include the language of subsection A, but since the '124 patent has an effective date later than this application's first effective filing date (April 22, 1992) , it is assumed the Examiner was operating under subsection B of MPEP 201.11.

A claim chart comparing each of the pending independent claims to the support for the elements of those claims is presented below. Applicants have inserted references in the pending claim text on the left hand column and noted support in the issued '876 patent in the right hand column. Absent a claim that the subject matter

from the '876 patent was inappropriately added by amendment (no such claim was made during original prosecution) the presently pending claims are entitled to the April 22, 1992 claim of priority and the '124 patent cited by the Examiner is not prior art. Since the '124 is the basis of all rejections pending, this application is in condition for allowance.

1. (Original) Apparatus for controlling motion of a motor driven element (1A)in a vehicle over a range of motion (1B) and for altering said motion when undesirable resistance to said motion is encountered (1C), said apparatus comprising: a) a sensor (1D) for measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element; b) a memory (1E) for storing a number of measurement values from the sensor based on measurements of said parameter over at least a portion of said range of motion; c) a controller (1F) coupled to the memory for determining to de-activate the motor based on the measurement values stored in the memory as the motor driven element moves over its range of motion; and d) a controller interface (1G) coupled to the motor for altering motion of said motor driven element in response to a determination made by the controller.	1A. window or panel, col 2, line 40 1B. range of motion, col 5, lines 60 – col 6, line 9 1C. motor de-energized, col 6, line 65 - 66 1D. op amp 110, col 5, line 19 1E. controller memory, col 6, line 20 1F. controller 22, col 2, line 55 1G. Field Effect Transistor 20, col 2, line 53

2. (Original) A method for controlling motion of a motor driven element (2A) in a vehicle over a range of motion (2B) and for altering said motion when undesirable resistance to said motion is encountered (2C) , said method comprising: a) measuring a parameter (2D) of a motor (2E) coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element (2F) by taking a multiplicity of measurements (2G) as the motor moves the motor driven element over its range of motion; b) storing a number of measurement values (2H) based on measurements of said parameter over at least a portion of said range of motion; c) determining that (2I) the parameter is outside a parameter range based on previous stored measurement values as the motor driven element moves over its range of motion; and d) altering motion of said motor driven element in response to a determination that the parameter is outside the parameter range (2J).	2A. window or panel, col 2, line 40 2B. range of motion, col 5, line 60 – col 6, line 9 2C. motor de-energized, col 6, line 66 2D. voltage drop corresponds to current, col 5, line 15-16 2E. motor 12, col 5, line 14 2F. current used to sense obstruction, col 6, line 36-40 2G. current measured every two millisecs, col 6, line 24 2H. FIFO buffer, col 6, line 50 2I. comparing sensed with compare value from equation, col 6, line 64 2J. stop motor, col 6, line 65

6. (Original) Apparatus for controlling activation of a motor coupled to a motor vehicle window or panel (6A)for moving said window or panel along a travel path (6B) and de-activating the motor if an obstacle is encountered (6C) by the window or panel, said apparatus comprising: a) a sensor (6D) for sensing movement of the window or panel and providing a sensor output signal related to a speed of movement of the window or panel; b) a switch (6E) for controllably actuating the motor by providing an energization signal; and c) a controller (6F) having an interface coupled to the sensor and the switch for controllably energizing the motor; said controller sensing a collision with an obstruction when power is applied to the controller by: i) monitoring movement of the window or panel by monitoring a signal (6G) from the sensor related to the movement of the window or panel; ii) identifying a collision (6H) of the window or panel with an obstacle due to a change in the signal from the sensor that is related to a change in movement of the window or panel; and iii) outputting a control signal to said switch to deactivate (6I) said motor in response to a sensing of a collision between an obstacle and said window or panel.	6A. window or panel, col 2, line 40 6B. range of motion, col 5, line 60 – col 6, line 9 6C. motor de-energized, col 6, line 66 6D. phase inputs 72, 74 from shaft encoder, col 3, line 44, 6E. FET 20, or relay 30, 32, Col 2, line 64, 6F. controller 22, col 2, line 55 6G. position encoder, col 4, line16 6H. Controller detects an obstruction using rate of speed of motor, col 7, line 33, 6I. Motor re-energized, col 4, line 44

12. (Original) Apparatus for controlling activation of a motor for moving an object along a travel path (12B) and (12A) de-activating the motor if an obstacle is encountered by the object comprising: a) a movement sensor for (12C) monitoring movement of the object as the motor moves said object along a travel path; b) a switch for controlling energization of the motor with an energization signal; and c) a controller (12E) including an interface coupled to the switch means for controllably energizing the motor and said interface additionally coupling the controller to the movement sensor for monitoring signals from said movement sensor; said controller comprising a stored program that: i) determines motor speed from an (12F) output signal from the movement sensor; ii) calculates an obstacle detect (12G) threshold based on motor speed of movement detected during at least one prior period of motor operation; iii) compares a value based on (12H) currently sensed motor movement with the obstacle detect threshold; and iv) outputs a signal from the interface (12I) to said switch for stopping the motor (12J) if the comparison based on currently sensed motor movement indicates the object has contacted an obstacle.	12A. Window panel, col 1, line 44 12B. Obstacle, col 4, line 44 12C. Movement sensor, position encoder, col 4, line 16 12D. Switch relay 30, 32, col 2, line 64 12E. Controller 22, col 2, line 55 12F. Motor speed, rate of change of pulses, col 3, line 59 12G. Obstacle detect motor speed, col 7, line 33 12H. col 7, line 33 12I. Interface, col 4, line 1 12J. Stopping motor, braking effect, col 4, line 13

19. Apparatus for controlling activation of a motor for moving a window or panel (19A) along a travel path (19B) and de-activating the motor if an obstacle is encountered (19C) by the window or panel comprising: a) a sensor (19D) for sensing movement of a window or panel along a travel path; b) a switch (19E) for controlling energization of the motor with an energization signal; and c) a controller (19F) coupled to the switch for controllably energizing the motor and having an interface coupling the controller to the sensor and to the switch; said controller comprising decision making logic for: i) monitoring a signal from the sensor; ii) calculating an obstacle detect threshold (19G) based on the signal that is detected during at least one prior period of motor operation, or a predetermined threshold; iii) comparing (19H) a value based on a currently sensed motor parameter with the obstacle detect threshold; and iv) stopping movement (19I) of the window or panel by controlling an output to said switch that controls motor energization if the comparison based on a currently sensed motor parameter indicates the window or panel has contacted an obstacle.	19A , window or panelcol 2, line 40 19B travel path, col 5, line 60 – col 6, line 9 19C de-activating motor, col 6, line 65 - 66 19D op amp 110, col 5, line 19 19E FET 20, col 2 line 53 19F controller 22, col 2 line 55 19G equations at col 6, line 33 and col 6 line 62 19H comparing, col 6, line 38, col 6, line 65 19I, stopping movement, col 6, line 65-66.

20. (Original) Apparatus for controlling activation of a motor for moving a window or panel (20A) along a travel path (20B) and de-activating the motor if an obstacle is encountered by the window or panel comprising: a) a sensor (20C) for generating signals representative of the window or panel speed as the motor moves the window or panel along a travel path; b) an obstacle detection controller (20D) for monitoring at least a part of the travel path of the window or panel for sensing and generating an obstacle detect signal indicating the presence in said travel path of an obstacle to movement of the window or panel; c) a switch (20E) coupled to said controller for controlling energization of the motor with an energization signal; and d) said controller including means for processing motor speed and obstacle detection signals (20F) and controlling operation of the motor in response to said speed or obstacle detection signals; said controller including: i) a storage (20G) for storing a number of speed signals that vary with motor speed; ii) a processor (20H) for calculating an obstacle detect threshold based on one or more speed signals stored in said storage; iii) a logic unit for making a comparison between a value representing window or panel speed (20I) based on currently sensed motor speed (20J) with the calculated obstacle detect threshold, a predetermined threshold, and generating a control output based on said comparison; and iv) an interface (20K) coupled to said switch for changing the state of the switch to stop the motor.	20A. window or panel, col 2, line 40 20B. range of motion, col 5, line 60 – col 6, line 9 20C. encoder, col 4, line 16, col 3, line 44 20D. controller 22, col 2, line 55 20E. FET 20, or relay 30, 32 col 2, line 64 20F. preferred controller is microprocessor having central processing unit, col 2, line 55 20G. microprocessor 22 has storage for storing speed signals shown in Figure 5, col 3, line 59 20H. processor 22 20I. controller outputs controls to ramp up motor speed in controlled fashion col 7, line 30 20J. sensed speed compared with expected based on controlled output, col 7, line 33, 34 20K. controller interfaces with FET 20 or relay, col 2, line 65 19

28. (New) Apparatus for controlling activation of a motor coupled to a motor vehicle window or panel (A28) for moving said window or panel along a travel path (B28) and de-activating the motor when a predetermined position is encountered (C28) by the window or panel, said apparatus comprising: a) a sensor (D28) for sensing movement of the window or panel and providing a sensor output signal related to a position (E28) of the window or panel; b) a switch for controllably actuating the motor by providing an energization signal (F28) ; and c) a controller (G28) having an interface coupled to the sensor (H28) and the switch for controllably energizing the motor; said controller determines the position of the window or panel when power is applied to the controller by: i) monitoring the position of the window or panel by monitoring the sensor output (I28) signal from the sensor related to the position of the window or panel; ii) identifying the position of the window or panel based on the sensor output signal from the sensor; and iii) outputting a control signal to said switch to deactivate (J28) said motor in response to a sensing of the predetermined position of said window or panel.	A28. window or panel, col 2, line 40 B28. path described, col 5, line 60 – col 6, line 9 C28. deactivates at home position, col 5, line 65, col 6, line 1 D28. hall sensor 132, col 5, line 63, and phase inputs 72, 74 from position encoder, col 3 line 44 E28. home position, open position etc col 5, lines 60 – 68, col 6, line 1 F28. FET 20, col 2, line 53 G28 controller 22, col 2, line 55 H28 output from position encoder I28. controller monitors encoder output, col 3, line 44 J28. controller stops the roof at the park, full open and vent positions, col 5, lines 59 – col 6, line 9.

33. (previously presented) Apparatus for controlling activation of a motor for moving a motor driven element in a vehicle (33A) over a range of motion (33B) and de-activating (33C) the motor when undesirable resistance to motion of the element is encountered, the apparatus comprising: a) a sensor (33D) for sensing a speed of the motor and generating an output signal representative of a speed of the motor, a speed of the motor changing when undesirable resistance to motion of the element is encountered; b) a switch (33E) for controlling activation of the motor; and c) a controller (33F) coupled to the sensor and the switch, the controller receiving the sensor output signal from the sensor and outputting a control signal to the switch to de-activate the motor if the sensor output signal indicates that the element has encountered undesirable resistance to motion.	33A, window or panel, col 2, line 40 33B, range of motion, col 5, line 60 – col 6, line 9 33C, de-activating motor, col 6, lines 65-66 33D, shaft encoder, col 3, line 44 33E, FET 20, col 2, line 53 33F, controller 22, col 2, line 55

All claims are believed to be in condition for allowance and prompt issuance of a Notice of Allowance is respectfully requested.

Respectfully submitted,

Date: May 31, 2006

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Encls
Attachment A, US pat no. 5,334,876
Attachment B, copy of replacement filing receipt acknowledging claim for priority

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APPL NO.	FILING OR 371 (c) DATE	ART UNIT	FIL FEE REC'D	ATTY.DOCKET NO	DRAWINGS	TOT CLMS	IND CLMS
10/765,487	01/27/2004	2837	735	14-733C2D1	9	35	8

CONFIRMATION NO. 9537

Stephen J. Schultz
Watts Hoffman Co., LPA
110 Superior Avenue, Suite 1750
Cleveland, OH 44114

REPLACEMENT FILING RECEIPT

OC0000000017618098

Date Mailed: 12/08/2005

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. 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 mail to the Commissioner for Patents P.O. Box 1450 Alexandria Va 22313-1450. 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 (if appropriate).**

Applicant(s)

Mario Boisvert, Reed City, MI;
Randall Perrin, Cadillac, MI;

Assignment For Published Patent Application

Nartron Corporation

Power of Attorney:

Stephen Schultz--29108

Domestic Priority data as claimed by applicant

This application is a DIV of 10/100,892 03/18/2002
which is a CIP of 09/562,986 05/01/2000 PAT 6,404,158
which is a CIP of 08/736,786 10/25/1996 PAT 6,064,165
which is a CON of 08/275,107 07/14/1994 ABN
which is a CIP of 07/872,190 04/22/1992 PAT 5,334,876

Foreign Applications

If Required, Foreign Filing License Granted: 06/15/2004

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is US10/765,487

Projected Publication Date: Not Applicable

ATTACHMENT B

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

Collision monitoring system

Preliminary Class

318

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.

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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 (1-866-999-4158).

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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

ATTACHMENT B

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.

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PTO/SB/06 (06-03)
Approved for use through 7/31/2006. OMB 0651-0032
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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: 10-765,487

CLAIMS AS FILED – PART I

	(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))							
TOTAL CLAIMS (37 CFR 1.16(c))	minus 20 = *	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(b))	minus 3 = *	*	X $ =		OR	X $ =	
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(d))			+ $ =		OR	+ $ =	
* If the difference in column 1 is less than zero, enter "0" in column 2			TOTAL		OR	TOTAL	

CLAIMS AS AMENDED – PART II

6.5.06

AMENDMENT A

	(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
Total (37 CFR 1.16(i))	* 35	Minus	** 35	= —	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	* 8	Minus	*** 8	= —	X $ =		OR	X $ =	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))					+ $ =		OR	+ $ =	
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

AMENDMENT B

	(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
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))					+ $ =		OR	+ $ =	
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

AMENDMENT C

	(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
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))					+ $ =		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 number found in the appropriate box in column 1

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APPLICATION NUMBER	PATENT NUMBER	GROUP ART UNIT	FILE WRAPPER LOCATION
10/765,487		2837	28M1

Correspondence Address / Fee Address Change

The following fields have been set to Customer Number 28060 on 08/02/2006

- Correspondence Address
- Maintenance Fee Address

The address of record for Customer Number 28060 is:
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,487	01/27/2004	Mario Boisvert	14-733C2D1	9537

28060 7590 10/16/2006

WATTS HOFFMANN CO. L.P.A.
1100 SUPERIOR AVE., SUITE 1750
CLEVELAND, OH 44114

EXAMINER	
FLETCHER, MARLON T	
ART UNIT	PAPER NUMBER
2837	

DATE MAILED: 10/16/2006

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

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	10/765,487	BOISVERT ET AL.	
	Examiner	Art Unit	
	Marlon T. Fletcher	2837	

-- 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 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 June 2006*.

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

3)☐ 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

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-35* is/are rejected.

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

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

Application Papers

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

10)☐ The drawing(s) filed on _____ 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).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).

a)☐ All b)☐ Some * c)☐ None of:

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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. 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 –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-20, 23, 25, 28-33, and 35, are rejected under 35 U.S.C. 102(b) as being anticipated by Jones et al. (4,831,509).

As recited in claims 1 and 2, Jones et al. disclose an apparatus for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to the motion is encountered, said apparatus comprising: a sensor for measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element (column 3, lines 7-16); a memory for storing a number of measurement values from the sensor based on measurements of said parameter over at least a portion of the range of motion (abstract; column 3, line 56 through column 4, line 14; and column 5, lines 26-57); a controller (microprocessor', figure 8) coupled to the memory for determining to de-activate the motor based on the measurement values stored in the memory as the motor driven element moves over its range of motion (column 4, lines 49-55); and a controller interface coupled to the motor for altering motion of said motor driven element in response to a determination made by

the controller (column 4, lines 53-57), wherein altering is also in response to a determination that the parameter is outside the parameter range.

As recited in claims 3 and 31, Jones et al. disclose the method, wherein the motor driven element is a window or panel and additionally comprising reverse actuating the window or panel prior to moving said window or panel in a direction to close the window or panel (column 4, lines 55-57).

As recited in claim 4, Jones et al. disclose the method, additionally comprising maintaining a position of the window or panel based on the sensed parameter and the reverse actuation is initiated if a leading edge of the window or panel is near a closed position (column 3, lines 17-28).

As recited in claims 5, 10, and 11, Jones et al. disclose the method, movement is first initiated toward a closed position when a leading edge of the window or panel is near the closed position and wherein the reverse actuation is performed upon a sensing of an obstacle that is based on determining the parameter is outside the parameter range (column 3, lines 17-28; and column 4, lines 49-57).

As recited in claims 6 and 33, Jones et al. disclose an apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving said window or panel along a travel path and deactivating the motor if an obstacle is encountered by the window or panel, said apparatus comprising: a sensor for sensing movement of the window or panel and providing a sensor output signal related to a speed of movement of the window or panel (discussed above; a switch for controllably actuating the motor by providing an energization signal (figure 7), and a controller

having an interface coupled to the sensor and the switch for controllably energizing the motor (figures 7 and 8); said controller sensing a collision with an obstruction when power is applied to the controller by: monitoring movement of the window or panel by monitoring a signal from the sensor related to the movement of the window or panel (column 3, Lines 9-28), identifying a collision of the window or panel with an obstacle due to a change in the signal from the sensor that is related to a change in movement of the window or panel (column 3, line 56 through column 4, line 55); and outputting a control signal to said switch to deactivate said motor in response to a sensing of a collision between an obstacle and said window or panel (column 4, Lines 55-57).

As recited in claims 7, 29, and 35, Jones et al. disclose the apparatus, wherein the controller comprises a programmable controller including a processing unit for executing a control program and including a memory for storing multiple window or panel speed values corresponding to a signal received from the sensor (column 3, line 36 through column 4, line 39).

As recited in claims 8 and 30, Jones et al. disclose the apparatus, additionally comprising one or more limit switches for use by the controller to determine window or panel position for use in identifying a collision (column 5, Lines 26-57).

As recited in claim 9, Jones et al. disclose the apparatus, wherein the control program adjusts an obstacle detection threshold in real time based on immediate past measures of the signal sensed by the sensor to adapt to varying conditions encountered during operation of the window or panel (column 4, Lines 49-68).

As recited in claims 12, 19, 20, and 28, Jones et al. disclose apparatus for controlling activation of a motor for moving an object along a travel path and de-activating the motor if an obstacle is encountered by the object comprising: a) a movement sensor for monitoring movement of the object as the motor moves said object along a travel path (discussed above; a switch for controlling energization of the motor with an energization signal (figure 7); and a controller (microprocessor) including an interface coupled to the switch means for controllably energizing the motor and said interface additionally coupling the controller to the movement sensor for monitoring signals from said movement sensor (discussed above; said controller comprising a stored program that: determines motor speed from an output signal from the movement sensor (column 3, lines 17-28); calculates an obstacle detect threshold based on motor speed of movement detected during at least one prior period of motor operation (column 3, lines 39-47); compares a value based on currently sensed motor movement with the obstacle detect threshold (column 3, lines 48-55., and column 3, Line 56 through column 4, line 14); and outputs a signal from the interface to said switch for stopping the motor if the comparison based on currently sensed motor movement indicates the object has contacted an obstacle (column 4, lines 49-57).

As recited in claim 13, Jones et al. disclose the apparatus, wherein the controller includes a buffer memory for storing successive values of motor movement for use in determining the obstacle detect threshold (column 3, Line 56 through column 4, Line 39).

As recited in claim 14, Jones et al. disclose the apparatus, wherein the controller

includes a clock and an input from the movement sensor is in a form of a sequence of pulses and further wherein the controller counts clock signals occurrences between receipt of pulses to provide an indication of motor speed (column 3, Lines 9-10).

As recited in claim 15, Jones et al. disclose the apparatus, wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a motor energization sequence a specified minimum time period in response to a short period user actuation of said control inputs to maintain position accuracy in monitoring a window or panel movement (column 3, Line 67 through column 4, line 14).

As recited in claim 16, Jones et al. disclose the apparatus, wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the object and wherein in response to a specified input the controller conducts a calibration motor energization sequence to determine parameters of object (column 4, Lines 49 through column 5, Line 6).

As recited in claims 17 and 32, Jones et al. disclose the apparatus, wherein the motor is coupled to a motor vehicle window or panel and wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a position indication which is updated in response movement of the window or panel and further wherein the controller reverse actuations the motor near an end point in an object path of travel to avoid false obstacle detection in the region of closure of the window or panel (column 4, lines 58-68).

As recited in claim 18, Jones et al. disclose the apparatus, wherein the sensor is a current sensor and wherein the controller includes means for adjusting the obstacle threshold based on dynamic motor current as sensed from the current sensor to take into account varying loads experienced by the motor (column 4, Lines 15-46; and column 5, Line 60 through column 6, Line 34).

As recited in claim 23, Jones et al. disclose the apparatus, additionally comprising an obstacle detector having an output coupled to the controller that senses a disruption in a region through which the window or panel moves (discussed above). As recited in claim 25, Jones et al. disclose the apparatus, wherein the obstacle detector comprises an infrared light source and detector (column 3, Lines 9-16).

Claim Rejections - 35 USC § 103

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

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 21, 22, 24, 26, 27, and 34, are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al.

Jones et al. are discussed above. Jones et al. do disclose optoelectronic sensors or transducers. Jones et al. do not disclose a variety of pickups or transducers.

Official notice is taken with respect to it being well known in the are to detect motion, movement, or an obstacle, using any of: a Hall-effect sensor, a magnetic

pick-up, a microwave generator and a reflected wave transducer, and a field effect device which can be a magnetic field inductive sensor.

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize any of the following sensors or detectors with the apparatus of Jones et al., because the teachings merely provide alternate means for providing the same, wherein one could substitute one sensor or detector for another.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marlon T. Fletcher whose telephone number is 571-272-2063. The examiner can normally be reached on M-w, F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on 571-272-2107. 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.

MTF
10/03/06

Marlon Fletcher
Primary Examiner

Notice of References Cited	Application/Control No. 10/765,487	Applicant(s)/Patent Under Reexamination BOISVERT ET AL.	
	Examiner Marlon T. Fletcher	Art Unit 2837	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,218,282	06-1993	Duhame, Dean	318/603
*	B	US-5,039,925	08-1991	Schap, William W.	318/282
*	C	US-4,855,653	08-1989	Lemirande, Rodger P.	318/282
*	D	US-4,831,509	05-1989	Jones et al.	700/90
*	E	US-4,383,206	05-1983	Matsuoka et al.	318/445
	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
	N					
	O					
	P					
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	R					
	S					
	T					

NON-PATENT DOCUMENTS

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

*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.

Index of Claims

Application/Control No.	Applicant(s)/Patent under Reexamination
10/765,487	BOISVERT ET AL.
Examiner	**Art Unit**
Marlon T. Fletcher	2837

√	Rejected	–	(Through numeral) Cancelled	N	Non-Elected	A	Appeal
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Claim		Date
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Search Notes

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Examiner	**Art Unit**	
Marlon T. Fletcher	2837	

SEARCHED			
Class	Subclass	Date	Examiner
318	264-266	10/2/2006	MTF
	280-286		
	460-470		
	565		
	626		
	434		
	139		
	474-477		
	815		
	833		
	903		
701	36	10/2/2006	MTF
	49		

INTERFERENCE SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	DATE	EXMR
EAST	10/2/2006	MTF

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Mario Boisvert and Randall Perrin

Serial No.: 10/765,487

Filing Date: January 27, 2004

Title: COLLISION MONITORING SYSTEM

Examiner: Marlon T. Fletcher

Art Unit: 2837

Docket No.: 14-733C2D1

Tarolli, Sundheim, Covell & Tummino, LLP
Suite 1700
1300 East Ninth Street
Cleveland, OH 44114

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

Amendment

In response to the office action having a mailing date of October 16, 2006, please amend this application as follows:

Claim Status

1. (Currently Amended) Apparatus for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said apparatus comprising:

a) a sensor for measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element;

b) a memory for storing a number of measurement values from the sensor based on immediate past measurements of said parameter over at least a portion of ~~said~~ a present traversal of said motor driven element through said range of motion;

c) a controller coupled to the memory for determining to de-activate the motor based on a most recent sensor measurement of the parameter and the immediate past measurement values stored in the memory as the motor driven element moves over its range of motion; and

d) a controller interface coupled to the motor for altering motion of said motor driven element in response to a determination made by the controller.

2. (Original) A method for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said method comprising:

a) measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element by taking a multiplicity of measurements as the motor moves the motor driven element over its range of motion;

b) storing a number of measurement values based on measurements of said parameter over at least a portion of said range of motion;

c) determining that the parameter is outside a parameter range based on previous stored measurement values as the motor driven element moves over its range of motion; and

d) altering motion of said motor driven element in response to a determination that the parameter is outside the parameter range.

3. (Original) The method of claim 2 wherein the motor driven element is a window or panel and additionally comprising reverse actuating the window or panel prior to moving said window or panel in a direction to close the window or panel.

4. (Original) The method of claim 3 additionally comprising maintaining a position of the window or panel based on the sensed parameter and the reverse actuation is initiated if a leading edge of the window or panel is near a closed position.

5. (Original) The method of claim 4 movement is first initiated toward a closed position when a leading edge of the window or panel is near the closed position and wherein the reverse actuation is performed upon a sensing of an obstacle that is based on determining the parameter is outside the parameter range.

6. (Currently Amended) Apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving said window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel, said apparatus comprising:

a) a sensor for sensing movement of the window or panel and providing a sensor output signal related to a speed of movement of the window or panel;

b) a switch for controllably actuating the motor by providing an energization signal; and

c) a controller having an interface coupled to the sensor and the switch for controllably energizing the motor; said controller sensing a collision with an obstruction when power is applied to the controller by:

i) monitoring movement of the window or panel by monitoring a signal from the sensor related to the movement of the window or panel;

ii) adjusting an obstacle detection threshold in real time based on immediate past measurements of the signal sensed by the sensor to adapt to varying conditions encountered during operation of the window or panel;

~~ii~~ iii) identifying a collision of the window or panel with an obstacle due to a change in the signal from the sensor that is related to a change in movement of the window or panel by comparing a value based on a most recent signal from the sensor with the obstacle detection threshold; and

~~iii~~ iv) outputting a control signal to said switch to deactivate said motor in response to a sensing of a collision between an obstacle and said window or panel.

7. (Original) The apparatus of claim 6 wherein the controller comprises a programmable controller including a processing unit for executing a control program and including a memory for storing multiple window or panel speed values corresponding to a signal received from the sensor.

8. (Original) The apparatus of claim 6 additionally comprising one or more limit switches for use by the controller to determine window or panel position for use in identifying a collision.

Please cancel claim 9 without prejudice or disclaimer.

9. (Cancelled)

10. (Original) The apparatus of claim 6 wherein the controller maintains a position of a leading edge of the window or panel and further wherein the controller reverse energizes the motor to move the window or panel away from a closure position prior to activating the motor to close the window or panel.

11. (Original) The apparatus of claim 10 wherein the controller reverse energizes the motor in response to a sensing of an obstacle and the reverse energizing and attempt to move the window or panel to a closed position is performed to confirm sensing of the

obstacle.

12. (Currently Amended) Apparatus for controlling activation of a motor for moving an object along a travel path and de-activating the motor if an obstacle is encountered by the object comprising:

a) a movement sensor for monitoring movement of the object as the motor moves said object along a travel path;

b) a switch for controlling energization of the motor with an energization signal; and

c) a controller including an interface coupled to the switch ~~means~~ for controllably energizing the motor and said interface additionally coupling the controller to the movement sensor for monitoring signals from said movement sensor; said controller comprising a stored program that:

i) determines motor speed of movement from an output signal from the movement sensor ;

ii) calculates an obstacle detect threshold based on motor speed of movement detected during ~~at least one~~ a present run of said motor driven element ~~prior period of motor operation~~;

iii) compares a value based on currently sensed motor speed of movement with the obstacle detect threshold; and

iv) outputs a signal from the interface to said switch for stopping the motor if the comparison based on currently sensed motor movement indicates the object has contacted an obstacle.

13 (Original) The apparatus of claim 12 wherein the controller includes a buffer memory for storing successive values of motor movement for use in determining the obstacle detect threshold.

14. (Original) The apparatus of claim 12 wherein the controller includes a clock and

an input from the movement sensor is in a form of a sequence of pulses and further wherein the controller counts clock signals occurrences between receipt of pulses to provide an indication of motor speed.

15. (Original) The apparatus of claim 12 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a motor energization sequence a specified minimum time period in response to a short period user actuation of said control inputs to maintain position accuracy in monitoring window or panel movement.

16. (Original) The apparatus of claim 12 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the object and wherein in response to a specified input the controller conducts a calibration motor energization sequence to determine parameters of object.

17. (Original) The apparatus of claim 12 wherein the motor is coupled to a motor vehicle window or panel and wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a position indication which is updated in response movement of the window or panel and further wherein the controller reverse actuations the motor near an end point in an object path of travel to avoid false obstacle detection in the region of closure of the window or panel.

18. (Original) The apparatus of claim 12 wherein the sensor is a current sensor and wherein the controller includes means for adjusting the obstacle threshold based on dynamic motor current as sensed from the current sensor to take into account varying loads experienced by the motor.

19. (Currently Amended) Apparatus for controlling activation of a motor for moving a

window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel comprising:

a) a sensor for sensing movement of a window or panel along a travel path;

b) a switch for controlling energization of the motor with an energization signal; and

c) a controller coupled to the switch for controllably energizing the motor and having an interface coupling the controller to the sensor and to the switch; said controller comprising decision making logic for:

i) monitoring a signal from the sensor;

ii) calculating ~~an~~ a real time obstacle detect threshold based on the signal that is detected during at least one prior period of motor operation during movement along a present or current path of travel of said window or panel ~~, or a predetermined threshold~~;

iii) comparing a value based on a currently sensed motor parameter with the obstacle detect threshold; and

iv) stopping movement of the window or panel by controlling an output to said switch that controls motor energization if the comparison based on a currently sensed motor parameter indicates the window or panel has contacted an obstacle.

20. (Currently Amended) Apparatus for controlling activation of a motor for moving a window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel comprising:

a) a sensor for generating speed signals representative of the window or panel speed as the motor moves the window or panel along a travel path;

b) an obstacle detection controller for monitoring at least a part of the travel path of the window or panel for sensing and generating an obstacle detect signal indicating the presence in said travel path of an obstacle to movement of the window or panel;

c) a switch coupled to said controller for controlling energization of the motor

with an energization signal; and

d) said controller ~~including means~~ for processing ~~motor~~ speed signals and obstacle detection signals and controlling operation of the motor in response to said speed or obstacle detection signals; said controller including:

i) a storage for storing a number of speed signals that vary with motor speed;

ii) a processor for calculating an obstacle detect threshold based on one or more speed signals stored in said storage obtained in real time based on immediate past measures of the speed signal sensed by the sensor to adapt to varying conditions encountered during movement along a present path of travel of said window or panel;

iii) a logic unit for making a comparison between a value representing window or panel speed based on a currently sensed motor speed signal with the calculated obstacle detect threshold, ~~a predetermined threshold,~~ and generating a control output if an obstacle is detected based on said comparison; and

iv) an interface coupled to said switch for changing the state of the switch to stop the motor.

21. (Original) The apparatus of claim 20 wherein the sensor for generating a speed signal comprises a Hall-effect sensor.

22. (Original) The apparatus of claim 20 wherein the sensor for generating a speed signal comprises a magnetic pick-up.

23. (Original) The apparatus of claim 20 additionally comprising an obstacle detector having an output coupled to the controller that senses a disruption in a region through which the window or panel moves.

24. (Original) The apparatus of claim 23 wherein the obstacle detector comprises a microwave generator and a reflected wave transducer.

25. (Original) The apparatus of claim 23 wherein the obstacle detector comprises an infrared light source and detector.

26. (Previously Presented) The apparatus of claim 23 wherein the obstacle detector comprises a field effect device.

27. (Previously Presented) The apparatus of claim 27 wherein the field effect device comprises a magnetic field inductive sensor.

28. (Currently Amended) Apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving said window or panel along a travel path and de-activating the motor when a predetermined position is encountered by the window or panel, said apparatus comprising:

a) a sensor for sensing movement of the window or panel and providing a sensor output signal related to a position of the window or panel;

b) a switch for controllably actuating the motor by providing an energization signal; and

c) a controller having an interface coupled to the sensor and the switch for controllably energizing the motor; said controller ~~determines~~ determining the position of the window or panel when power is applied to the controller by:

i) monitoring the position of the window or panel by monitoring the sensor output signal from the sensor related to the position of the window or panel;

ii) identifying the position of the window or panel based on the sensor output signal from the sensor; and

iii) outputting a control signal to said switch to deactivate said motor in response to a sensing of the predetermined position of said window or panel.

29. (Previously Presented) The apparatus of claim 28 wherein the controller

comprises a programmable controller including a processing unit for executing a control program and including a memory for storing multiple window or panel position values corresponding to a signal received from the sensor.

30. (Previously Presented) The apparatus of claim 28 additionally comprising one or more position limits programmed for use by the controller to determine window or panel position for use in identifying whether the window or panel is closed or open.

31. (Previously Presented) The apparatus of claim 28 wherein the controller maintains a position of a leading edge of the window or panel and further wherein the controller reverse energizes the motor to move the window or panel away from a closure position prior to activating the motor to close the window or panel.

32. (Currently Amended) The apparatus of claim 28 ~~wherein the motor is coupled to a motor vehicle or panel and~~ wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the motor vehicle window or panel and wherein the controller maintain a position indication which is updated in response to movement of the window or panel and further wherein the controller reverse actuates the motor near an end point in the travel path of the window or panel to avoid false obstacle detection in a region of closure of the window or panel.

33. (Previously Presented) Apparatus for controlling activation of a motor for moving a motor driven element in a vehicle over a range of motion and de-activating the motor when undesirable resistance to motion of the element is encountered, the apparatus comprising:

a) a sensor for sensing a speed of the motor and generating an output signal representative of a speed of the motor, a speed of the motor changing when undesirable resistance to motion of the element is encountered;

b) a switch for controlling activation of the motor; and

c) a controller coupled to the sensor and the switch, the controller receiving the

sensor output signal from the sensor and outputting a control signal to the switch to de-activate the motor if the sensor output signal indicates that the element has encountered undesirable resistance to motion.

34. (Previously Presented) The apparatus of claim 33 wherein the sensor includes a Hall effect sensor.

35. (Previously Presented) The apparatus of claim 33 wherein the apparatus includes a memory for storing values corresponding to the sensor output signal over at least a portion of the range of motion of the element and the controller analyzes the sensor output signal values stored in the memory to determine if the control signal to de-activate the motor should be output to the switch.

Please add new claims 36 and 37 as follows:

36. (New) The apparatus of claim 1 wherein the immediate past measurements of said parameter were taken within a forty millisecond interval prior to the most recent sensor measurement.

37. (New) The apparatus of claim 6 wherein the immediate past measurements of said signal are sensed within a forty millisecond interval prior to the most recent signal from the sensor.

REMARKS

Reconsideration of pending claims 1 – 8 and 10 – 37 is requested.

Claim 1 features apparatus for controlling motion of a motor driven element in a vehicle over a range of motion and for altering that motion when undesirable resistance to motion is encountered. A sensor measures a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element. *A memory is used to store a number of measurement values from the sensor based on immediate past measurements of the parameter over at least a portion of a present path of travel of the motor driven element through its range of motion.* A controller coupled to the memory determines whether to de-activate the motor based on *a most recent sensor measurement of the parameter and the immediate past measurement values stored in the memory* as the motor driven element moves over its range of motion. A controller interface coupled to the motor alters motion of the motor driven element in response to a determination made by the controller.

The controller featured in claim 1 performs its collision detection based on real time data obtained during a present run of the window or panel. Unlike the invention featured in claim 1, the Jones et al system disclosed in US 4,831,509 uses training data stored by the control during a training run to signal a collision between a door and an obstacle and therefore neither shows nor suggests the structure of claim 1.

At column 3, line 17, Jones et al notes, "In order to determine a door travel characteristic the processing means samples the time taken for the door curtain to travel a fixed distance and therefrom determines changes in the speed of the door." At column 4, line 49 Jones et al states "As stated above the stored running average of peak speed changes for a segment is regularly compared with the calculated peak speed change for the same segment on a present run of the door. If this new value exceeds the stored value, the door controller will consider an obstruction to have been detected in the travel path of the door."

These two statements from columns 3 and 4 must be interpreted in light of the

Jones et al definition of a 'segment' found at column 3, line 20. The Jones et al system works "by notationally dividing the door travel into a plurality of segments and further sub-dividing each segment into a plurality of secto[r]s (*sic*) and producing a running average of peak speed changes for each sector."

Returning to the Jones et al collision detection scheme defined at column 4 and assume a collision is encountered sometime during a run, i.e. during a one way traversal by the door in its travel path. Specifically, assume the time it takes to traverse a sector (recall multiple sectors make up a segment) is dramatically greater than previously encountered. Jones et al assumes such dramatic change in speed is due to a collision.

The Jones et al control compares the dramatic speed change of that sector (sector x, for example) with an average peak speed change for the segment (16 consecutive sectors) in which sector x is located. The controller can not calculate the average peak speed change for the segment containing the sector x on a real time basis as featured in claim 1. All sectors within the segment have not been encountered or traversed. Stated another way, the Jones et al collision detected must be based on old data. Jones et al must be using old data from a prior door run (sometimes referred to as a training run) and hence neither shows nor suggests applicants invention.

The advantages achieved through practice of the invention are significant. Assume weeks go by between operation of a vehicle sunroof for example. The temperature could have changed dramatically. The roof might have been closed with the vehicle parked during its last run sequence and therefore the drag encountered due to wind resistance was different. On the present run, the sunroof is closed as the car is traveling down the highway at a reasonable rate and the temperature is much higher. How will the controller react if it is relying on old data? The Jones et al system must use old data and hence may not react properly. This fact highlights the fact that a system satisfactory for use as a garage door control may not work as effectively in a motor vehicle control for a window or panel of a motor vehicle. Jones et al neither anticipates nor renders obvious the subject matter of claim 1 and this claim is patentable.

New claim 36 depends on allowable claim 1 and is also allowable. This claim features the apparatus of claim 1 wherein the immediate past measurements used in determining a threshold are taken within a forty millisecond interval prior to the most recent sensor measurement. Since Jones et al relies on old data observed during an old run or sequence, there is no suggestion of this feature and therefore this claim is patentable.

Claim 2 features a method for controlling motion of a *motor driven element in a vehicle* over a range of motion and for altering the motion when undesirable resistance to the motion is encountered. The method is performed by *measuring a parameter of a motor coupled to the motor driven element* that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element by taking a multiplicity of measurements as the motor moves the motor driven element over its range of motion. A number of measurement values are stored based on measurements of the motor parameter over at least a portion of its range of motion. If the parameter is determined to be outside a parameter range based on previous stored measurement values as the motor driven element moves over its range of motion, the method of claim 2 alters motion of said motor driven element.

Claim 2 was rejected in the last office action as being anticipated under 35 USC 102(b) on the basis of Jones et al (US 4,831,509).

The Court of Appeals for the Federal Circuit has held that language found in the preamble of a claim that is also included in the body of the claim limits the claim "by virtue of its inclusion." *Catalina Marketing,* 62 USPQ2d at 1787; *see also British Telecommunications v. Prodigy Communs.*, 217 F.Supp.2d 399, 413 (S.D.N.Y. 2002) (finding that a preamble term limited the claim because it was also found in the body of the claim). In the *Telecommunications* decision it was held that the preamble provided structure to the claim body, a "central computer" being the terms at issue. The *Telecommunications* decision differs somewhat from *Catalina Marketing* where the claim language was concentrated on use, reciting "a plurality of free standing terminals *located at predesignated sites such as consumer stores*". *Catalina Marketing,* 62

USPQ2d at 1783 (emphasis added on terms at issue). The Federal Circuit even articulated such by identifying the claim language as defining an intended use, stating, "the location of the terminals in stores merely gives an intended use for the claimed terminals." *Id.*, at 1786-87. But, the Court held the same language in claim 25 limited the claim because it was found the language in both the preamble and body of the claim.

In the present instance claim 2 calls for, in part *a motor driven element in a vehicle*. Whether this term is interpreted as a use or a structure, weight must be given to its recitation since it is used again in the claim body, i.e. the recitation of the motor driven element is found throughout the claim. Since Jones et al neither shows nor suggests a motor driven element in a vehicle, this claim is not properly rejected either as being anticipated or rendered obvious by Jones et al. Stated another way a *prima facie* basis of rejection is not found in Jones et al.

Claim 2 also recites *measuring a parameter of a motor coupled to the motor driven element.* Turning to Jones et al, at column 3, line 7 , Jones et al states that "the door curtain position relative to the door opening is obtained from an encoder coupled *to the door drum*. (emphasis added) Pulses are provided to the encoder from optoelectronic sensors appropriately placed or positioned in relation to a set of spinning blades coupled to the drive means for the roller door."

In Jones et al the speed and position of the door increase when lowered due to the added affect of gravity and the speed and position decrease as the door is raised. Jones teaches a door position encoder "for providing signals indicative of the position of the door curtain relative to the door opening". column 1 line 53 of Jones et al, but there is no teaching or suggestion of measuring a parameter of a motor coupled to a motor driven element. By noting that the motor load "is dependent on the position of the door" as a criticism of using motor load monitoring devices, Jones et al explicitly teaches away from measuring a parameter of the motor and using that parameter to determine if the parameter is outside a range as featured in claim 2.

For the foregoing reasons, claim 2 is not anticipated nor rendered obvious in the

prior art patent to Jones et al and is therefore allowable. Claims 3 – 5 depend on allowable claim 2 and are also allowable.

Claim 6 features apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving the window or panel along a travel path. The panel or window movement is stopped in the event an obstacle is encountered by the window or panel. The apparatus includes a sensor that senses movement of the window or panel and provides a sensor output signal related to a speed of movement of the window or panel. A switch controls actuation of the motor by providing an energization signal and a controller has an interface coupled to the sensor and the switch to control energization of the motor.

The controller of claim 6 implements real time collision sensing better suited (than Jones et al) to use with a controller moving a window or panel mounted in a motor vehicle. The exemplary controller:

i) monitors movement of the window or panel by monitoring a signal from the sensor related to the movement of the window or panel;

ii) adjusts an obstacle detection threshold in *real time based on immediate past measurements of the signal sensed by the sensor to adapt to varying conditions encountered during operation of the window or panel;*

iii) identifies a collision of the window or panel with an obstacle due to a change in the signal from the sensor that is related to a change in movement of the window or panel by comparing a value based on a most recent signal from the sensor with the obstacle detection threshold; and

iv) outputs a control signal to the switch to deactivate the motor in response to a sensing of a collision between an obstacle and the window or panel.

As discussed above, the Jones et al patent neither shows nor suggests the italicized features of claim 6 and accordingly this claim is allowable.

Claims 7, 8, 10, 11 and 37 depend from allowable claim 6 and are also allowable. The comments above regarding new claim 36 are also applicable to claim 37.

Claim 12 features apparatus for controlling activation of a motor for moving an

object along a travel path and de-activating the motor if an obstacle is encountered by the object. A movement sensor monitors movement of the object as the motor moves the object along a travel path. A switch controls energization of the motor with an energization signal and a controller includes an interface coupled to the switch for controllably energizing the motor. The interface also couples the controller to the movement sensor for monitoring signals from said movement sensor. The controller has a stored program that:

i) determines motor speed of movement from an output signal from the movement sensor;

ii) *calculates an obstacle detect threshold based on motor speed of movement detected during a present run of said motor driven element*;

iii) compares a value based on currently sensed motor speed of movement with the obstacle detect threshold; and

iv) outputs a signal from the interface to said switch for stopping the motor if the comparison based on currently sensed motor movement indicates the object has contacted an obstacle.

Jones et al neither shows nor suggests calculating an obstacle detect threshold based on motor speed of movement detected during a present run of the motor driven element and for this reason claim 12 is allowable.

Claims 13 – 18 depend on allowable claim 12 and are also allowable.

Claim 19 features apparatus for controlling activation of a motor for moving a window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel. A sensor senses movement of a window or panel along a travel path and a switch controls energization of the motor with an energization signal.

Claim 19 also includes a controller coupled to the switch for controllably energizing the motor and having an interface coupling the controller to the sensor and to the switch. The controller implements decision making logic for:

i) monitoring a signal from the sensor;

ii) *calculating a real time obstacle detect threshold based on the signal that is detected during at least one prior period of motor operation during movement along a present or current path of travel of said window or panel*;

iii) comparing a value based on a currently sensed motor parameter with the obstacle detect threshold; and

iv) stopping movement of the window or panel by controlling an output to said switch that controls motor energization if the comparison based on a currently sensed motor parameter indicates the window or panel has contacted an obstacle.

Jones et al neither shows nor suggests the italicized features of the controller recited in claim 19 and this claim is allowable.

Claim 20 features apparatus for controlling activation of a motor for moving a window or panel along a travel path. An obstacle detection controller monitors at least a part of the travel path of the window or panel for sensing and generating an obstacle detect signal indicating the presence in said travel path of an obstacle to movement of the window or panel.

The controller processes speed signals and obstacle detection signals and controls operation of the motor in response to either the speed or obstacle detection signals. The controller includes:

i) a storage for storing a number of speed signals that vary with motor speed;

ii) a processor for calculating *an obstacle detect threshold based on one or more speed signals stored in said storage obtained in real time based on immediate past measures of the signal sensed by the sensor to adapt to varying conditions encountered during movement along a present path of travel* of the window or panel;

iii) a logic unit makes a comparison between a value representing window or panel speed based on currently sensed motor speed with the calculated obstacle detect threshold, a predetermined threshold, and generating a control output if an obstacle is detected based on said comparison; and

iv) an interface coupled to said switch for changing the state of the switch to stop the motor.

The obstacle detect threshold is based on one or more speed signals stored in said storage obtained in real time based on immediate past measures of the signal. This feature allows the controller to adapt to varying conditions encountered during movement along a present path of travel of said window or panel. These aspects of the invention are neither shown nor suggested by the patent to Jones et al. Accordingly claim 20 and dependent claims 21 – 27 are allowable

Additionally claim 23 features an obstacle detector having an output coupled to the controller that senses a disruption in a region through which the window or panel moves. This redundant obstacle detection feature is neither shown nor suggested in the art and for this additional reason claims 23 – 27 are allowable.

Claim 28 features apparatus for controlling activation of a motor coupled to a *motor vehicle window or panel* for moving said window or panel along a travel path and de-activating the motor when a predetermined position is encountered by the window or panel. A sensor senses movement of the window or panel and providing a sensor output signal related to a position of the window or panel. A switch controllably actuates the motor by providing an energization signal. A controller having an interface is coupled to the sensor and the switch for controllably energizing the motor. The controller determines the position of the window or panel when power is applied to the controller by monitoring the position of the window or panel by monitoring the sensor output signal from the sensor related to the position of the window or panel. The controller also identifies the position of the window or panel based on the sensor output signal from the sensor and outputs a control signal to the switch to deactivate said motor in response to a sensing of the predetermined position of said window or panel.

The Jones et al patent (US 4,831,509) is not a proper anticipatory reference under 35 USC 102 since Jones et al do not disclose a motor vehicle window or panel and those terms appear in both in the preamble and the claim body. See the discussion above with regard to claim 2. Reconsideration of claim 28 and dependent claims 29 – 32 is requested.

Claim 33 features apparatus for controlling activation of a motor for moving a

motor driven element in a vehicle over a range of motion and de-activating the motor when undesirable resistance to motion of the element is encountered. The apparatus has a sensor for sensing *a speed of the motor* and generating an output signal representative of a speed of the motor that changes when undesirable resistance to motion of the element is encountered. The arguments that the Jones et al patent is not a proper anticipatory reference made with regard to claim 2 are appropriate with respect to claim 33 as well. Jones et al does not show a motor drive element in a vehicle nor does it teach a sensor for sensing speed of the motor. Reconsideration of that rejection and the rejections of claims 34 and 35 is requested.

All claims are believed to be in condition for allowance and prompt issuance of a Notice of Allowance is respectfully requested. If any fees are determined to be due, the commissioner is authorized to charge those fees to deposit account no 20-0090.

Respectfully submitted,

Date: Dec 13, 2006

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Electronic Acknowledgement Receipt	
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First Named Inventor/Applicant Name:	Mario Boisvert
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1	Amendment - After Non-Final Rejection	14-733c2d1amend.pdf	144817	no	20
Warnings:					

Information:	
Total Files Size (in bytes):	144817

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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.

Document code: WFEE

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 10-765,487

CLAIMS 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))							
TOTAL CLAIMS (37 CFR 1.16(c))	minus 20 = *		x $ =		OR	x $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(b))	minus 3 = *		x $ =		OR	x $ =	
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(d))			+ $ =		OR	+ $ =	
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL		OR	TOTAL	

CLAIMS AS AMENDED – PART II

6.5.06

AMENDMENT A	(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
Total (37 CFR 1.16(i))	* 35	Minus	** 35	* —	x $ =		OR	x $ =	
Independent (37 CFR 1.16(h))	* 8	Minus	*** 8	* —	x $ =		OR	x $ =	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))					+ $ =		OR	+ $ =	
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

12-22-06

AMENDMENT B	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE	ADDITIONAL FEE	OR	RATE	ADDITIONAL FEE
Total (37 CFR 1.16(i))	* 36	Minus	** 35	* 1	x $ =	25.00	OR	x $ =	
Independent (37 CFR 1.16(h))	* 8	Minus	*** 8	* —	x $ =		OR	x $ =	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))					+ $ =		OR	+ $ =	
					TOTAL ADD'L FEE	25.00	OR	TOTAL ADD'L FEE	

1, 2, 6, 12, 19, 20, 28, 33

AMENDMENT C	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE	ADDITIONAL FEE	OR	RATE	ADDITIONAL FEE
Total (37 CFR 1.16(i))	*	Minus	**	*	x $ =		OR	x $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	*	x $ =		OR	x $ =	
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(d))					+ $ =		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 number found in the appropriate box in column 1.

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S5	12358	obstruct$4 and (detect$4 or sens$4) and window and (stor$4 or memor$4) and ($5process$4 or mpu or cpu or $5computer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/03/29 18:16
S6	12358	obstruct$4 and (detect$4 or sens$4) and window and (stor$4 or memor$4) and ($5process$4 or mpu or cpu or $5computer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/03/29 18:20
S7	5636	S6 and motor	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/03/29 18:20
S8	4075	S7 and speed	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/03/29 18:20
S9	1700	S8 and (motor same speed)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/03/29 18:38
S10	1248	S9 and (revers$4 or travers$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/03/29 18:40

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,487	01/27/2004	Mario Boisvert	14-733C2D1	9537

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EXAMINER	
FLETCHER, MARLON T	
ART UNIT	PAPER NUMBER
2837	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/10/2007	PAPER

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

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/765,487	BOISVERT ET AL.	
	Examiner	Art Unit	
	Marlon T. Fletcher	2837	

-- 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 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 *13 December 2006*.

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

3)☐ 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

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-37* is/are rejected.

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

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

Application Papers

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

10)☐ The drawing(s) filed on _____ 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).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).

a)☐ All b)☐ Some * c)☐ None of:

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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Claim Rejections - 35 USC § 103

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

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-37, are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al. (4,831,509) in view of Wrenbeck et al. (5,436,539).

As recited in claims 1 and 2, Jones et al. disclose an apparatus for controlling motion of a motor driven element over a range of motion and for altering said motion when undesirable resistance to the motion is encountered, said apparatus comprising: a sensor for measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element (column 3, lines 7-16); a memory for storing a number of measurement values from the sensor based on measurements of said parameter over at least a portion of the range of motion (abstract; column 3, line 56 through column 4, line 14; and column 5, lines 26-57); a controller (microprocessor; figure 8) coupled to the memory for determining to de-activate the motor based on the measurement values stored in the memory as the motor driven element moves over its range of motion (column 4, lines 49-55); and a controller interface coupled to the motor for altering motion of said motor driven element in response to a determination made by the controller (column 4, lines 53-57), wherein altering is also in response to a determination that the parameter is outside the parameter range.

As recited in claims 3 and 31, Jones et al. disclose the method, wherein the motor driven element is a window or panel and additionally comprising reverse actuating the window or panel prior to moving said window or panel in a direction to close the window or panel (column 4, lines 55-57).

As recited in claim 4, Jones et al. disclose the method, additionally comprising maintaining a position of the window or panel based on the sensed parameter and the reverse actuation is initiated if a leading edge of the window or panel is near a closed position (column 3, lines 17-28).

As recited in claims 5, 10, and 11, Jones et al. disclose the method, movement is first initiated toward a closed position when a leading edge of the window or panel is near the closed position and wherein the reverse actuation is performed upon a sensing of an obstacle that is based on determining the parameter is outside the parameter range (column 3, lines 17-28; and column 4, lines 49-57).

As recited in claims 6 and 33, Jones et al. disclose an apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving said. window or panel along a travel path and deactivating the motor if an obstacle is encountered by the window or panel, said apparatus comprising: a sensor for sensing movement of the window or panel and providing a sensor output signal related to a speed of movement of the window or panel (discussed above; a switch for controllably actuating the motor by providing an energization signal (figure 7), and a controller having an interface coupled to the sensor and the switch for controllably energizing the motor (figures 7 and 8); said controller sensing a collision with an obstruction when

power is applied to the controller by: monitoring movement of the window or panel by monitoring a signal from the sensor related to the movement of the window or panel (column 3, Lines 9-28), identifying a collision of the window or panel with an obstacle due to a change in the signal from the sensor that is related to a change in movement of the window or panel (column 3, line 56 through column 4, line 55); and outputting a control signal to said switch to deactivate said motor in response to a sensing of a collision between an obstacle and said window or panel (column 4, Lines 55-57).

As recited in claims 7, 29, and 35, Jones et al. disclose the apparatus, wherein the controller comprises a programmable controller including a processing unit for executing a control program and including a memory for storing multiple window or panel speed values corresponding to a signal received from the sensor (column 3, line 36 through column 4, line 39).

As recited in claims 8 and 30, Jones et al. disclose the apparatus, additionally comprising one or more limit switches for use by the controller to determine window or panel position for use in identifying a collision (column 5, Lines 26-57).

As recited in claim 9, Jones et al. disclose the apparatus, wherein the control program adjusts an obstacle detection threshold in real time based on immediate past measures of the signal sensed by the sensor to adapt to varying conditions encountered during operation of the window or panel (column 4, Lines 49-68)

As recited in claims 12, 19, 20, and 28, Jones et al. disclose apparatus for controlling activation of a motor for moving an object along a travel path and de-activating the motor if an obstacle is encountered by the object comprising: a)

movement sensor for monitoring movement of the object as the motor moves said object along a travel path (discussed above; a switch for controlling energization of the motor with an energization signal (figure 7); and a controller (microprocessor) including an interface coupled to the switch means for controllably energizing the motor and said interface additionally coupling the controller to the movement sensor for monitoring signals from said movement sensor (discussed above; said controller comprising a stored program that: determines motor speed from an output signal from the movement sensor (column 3, lines 17-28); calculates an obstacle detect threshold based on motor speed of movement detected during at least one prior period of motor operation (column 3, lines 39-47); compares a value based on currently sensed motor movement with the obstacle detect threshold (column 3, lines 48-55., and column 3, Line 56 through column 4, line 14); and outputs a signal from the interface to said switch for stopping the motor if the comparison based on currently sensed motor movement indicates the object has contacted an obstacle (column 4, lines 49-57).

As recited in claim 13, Jones et al. disclose the apparatus, wherein the controller includes a buffer memory for storing successive values of motor movement for use in determining the obstacle detect threshold (column 3, Line 56 through column 4, Line 39).

As recited in claim 14, Jones et al. disclose the apparatus, wherein the controller includes a clock and an input from the movement sensor is in a form of a sequence of pulses and further wherein the controller counts clock signals occurrences between receipt of pulses to provide an indication of motor speed (column 3, Lines 9-10).

As recited in claim 15, Jones et al. disclose the apparatus, wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a motor energization sequence a specified minimum time period in response to a short period user actuation of said control inputs to maintain position accuracy in monitoring a window or panel movement (column 3, Line 67 through column 4, line 14).

As recited in claim 16, Jones et al. disclose the apparatus, wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the object and wherein in response to a specified input the controller conducts a (calibration motor energization sequence to determine parameters of object (column 4, Lines 49 through column 5, Line 6).

As recited in claims 17 and 32, Jones et al. disclose the apparatus, wherein the motor is coupled to a motor vehicle window or panel and wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a position indication which is updated in response movement of the window or panel and further wherein the controller reverse actuations the motor near an end point in an object path of travel to avoid false obstacle detection in the region of closure of the window or panel (column 4, lines 58-68).

As recited in claim 18, Jones et al. disclose the apparatus, wherein the sensor is a current sensor and wherein the controller includes means for adjusting the obstacle threshold based on dynamic motor current as sensed from the current sensor to take

into account varying loads experienced by the motor (column 4, Lines 15-46; and column 5, Line 60 through column 6, Line 34).

As recited in claim 23, Jones et al. disclose the apparatus, additionally comprising an obstacle detector having an output coupled to the controller that senses a disruption in a region through which the window or panel moves (discussed above).

As recited in claim 25, Jones et al. disclose the apparatus, wherein the obstacle detector comprises an infrared light source and detector (column 3, Lines 9-16).

Jones does not disclose that the motor driven element is in a vehicle. Jones et al. does not disclose **immediate** past measurements.

However, Wrenbeck et al. disclose an apparatus for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered (abstract; and column 1, lines 5-9), said apparatus comprising: a sensor (20) for measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element; a memory (MEM) for storing a number of measurement values from the sensor based on immediate past measurements of said parameter over at least a portion of a present traversal of said motor driven element throuqh said range of motion (abstract; column 3, lines 51-59); a controller (CPU) coupled to the memory (MEM) for determining to de-activate the motor based on a most recent sensor measurement of the parameter and the immediate past measurement values stored in the memory as the motor driven element moves over its range of motion; and a controller interface coupled to the motor for

altering motion of said motor driven element in response to a determination made by the controller (figure 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the teachings of Wrenbeck et al. with the teachings of Jones et al., because while Jones et al. does not disclose the panel being used in a vehicle, this is merely intended use, wherein Wrenbeck et al. provides the same for a window in a vehicle. As for the immediate past measurements, this limitation is not really defined. Even taken as the last past measurement, the fact that Jones et al. provides past measurements, it is obvious that the ability to measure and use the immediate past measurement is obtainable. Further Wrenbeck et al. provide the use of the immediate past measurement.

With respect to claims 21, 22, 24, 26, 27, and 34, Jones et al. do disclose optoelectronic sensors or transducers. Jones et al. do not disclose a variety of pickups or transducers.

Wrenbeck et al. disclose a Hall-effect sensor and a magnetic pick-up (column 3, lines 27-37).

It would be obvious to use any type of sensor, because the teachings merely provide alternate means for providing the same, wherein one could substitute one sensor or detector for another.

With respect to claims 36 and 37, Jones et al in view of Wrenbeck et al. disclose the claimed invention except for the range in which the measurements are taken (40 milliseconds). It would have been obvious to one having ordinary skill in the art at the

time the invention was made to provide measurements at forty millisecond interval, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Response to Arguments

Applicant's arguments with respect to claims 1-35 have been considered but are moot in view of the new ground(s) of rejection.

The applicant argued that the claims provided the panel or window being in a vehicle. While this is merely intended use, a reference has been provided to show this obvious teaching. The applicant further argues that the prior art does not provide the immediate past measurements from the sensors. However, the fact that past measurements can be taken, makes it obvious to one skilled in the art to provide measurements at any time in the past. The applicant also argues that speed of the motor is not measured, but rather speed of the motor driven element is measured. However, it is all relative, since the speed of the motor drives the movement of the motor driven element. Wrenbeck et al. further provide measuring motor speed. In light of the new rejection, it believed that the claims are met by the prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marlon T. Fletcher whose telephone number is 571-272-2063. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lincoln Donovan can be reached on 571-272-1988. 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.

MTF
03/18/2006

Marlon Fletcher
Primary Examiner

Notice of References Cited	Application/Control No. 10/765,487	Applicant(s)/Patent Under Reexamination BOISVERT ET AL.	
	Examiner Marlon T. Fletcher	Art Unit 2837	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,436,539	07-1995	Wrenbeck et al.	318/265
*	B	US-4,608,637	08-1986	Okuyama et al.	701/49
*	C	US-5,039,925	08-1991	Schap, William W.	318/282
	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
	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	

*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.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10765487	BOISVERT ET AL.
	Examiner	Art Unit
	Fletcher, Marlon T	2837

✓	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	03/30/2007								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
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	35	✓								
	36	✓								

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10765487	BOISVERT ET AL.
	Examiner	Art Unit
	Fletcher, Marlon T	2837

✓	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	03/30/2007								
	37	✓								

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10765487	BOISVERT ET AL.
	Examiner	Art Unit
	Fletcher, Marlon T	2837

SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST TEXT SEARCH: SEE SEARCH HISTORY PRINTOUT	03/29/2007	MTF

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

Interview Summary	Application No.	Applicant(s)	
	10/765,487	BOISVERT ET AL.	
	Examiner	Art Unit	
	Marlon T. Fletcher	2837	

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

(1) *Marlon T. Fletcher*. (3)_____.

(2) *Steve Schultz*. (4)_____.

Date of Interview: *30 May 2007*.

Type: a)☐ Telephonic b)☐ Video Conference
c)☒ Personal [copy given to: 1)☐ applicant 2)☒ applicant's representative]

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

Claim(s) discussed: *1-37*.

Identification of prior art discussed: *Jones et al. and Wrenbeck et al.*.

Agreement with respect to the claims f)☒ was reached. g)☐ was not reached. h)☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: *See Continuation Sheet*.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

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. See Summary of Record of Interview requirements on reverse side or on attached sheet.

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

Examiner's signature, if required

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.

Continuation of Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: It was agreed that Jones et al. do not disclose the feature of storing immediate past measurements, in order to determine to deactivate the motor controlling the motor driven element. The immediate past measurements are defined as measurements take during the operation of motion of the motor driven element. The applicant has provided evidence that the current application has priority over Wrenbeck et al., which was used to show immediate past measurements. This evidence from the parent patent will be reviewed to determine if the claim language is supported by the parent. If this is found to be the case, the application will further searched and updated to see if there is any prior art that can read on the present claims containing this limitation. If no prior art is found to read on claims 1, 6, 12, 19 and 20, these claims and their dependents will be allowed. As for the remaining claims, which do not include this feature, if support for the claims language of these claims is found in the parent patent used to establish priority, the rejection to these claims will be changed in lieu of the fact that Wrenbeck et al no longer precedes the priority date.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Mario Boisvert and Randall Perrin

Serial No.: 10/765,487

Filing Date: January 27, 2004

Title: COLLISION MONITORING SYSTEM

Examiner: Marlon T. Fletcher

Art Unit: 2837

Docket No.: 14-733C2D1

Tarolli, Sundheim, Covell & Tummino, LLP
Suite 1700
1300 East Ninth Street
Cleveland, OH 44114

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

Amendment

In response to the office action having a mailing date of April 10, 2007, please amend this application as follows:

Claim Status

1. (Previously Presented) Apparatus for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said apparatus comprising:

a) a sensor for measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element;

b) a memory for storing a number of measurement values from the sensor based on immediate past measurements of said parameter over at least a portion of a present traversal of said motor driven element through said range of motion;

c) a controller coupled to the memory for determining to de-activate the motor based on a most recent sensor measurement of the parameter and the immediate past measurement values stored in the memory as the motor driven element moves over its range of motion; and

d) a controller interface coupled to the motor for altering motion of said motor driven element in response to a determination made by the controller.

2. (Original) A method for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said method comprising:

a) measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element by taking a multiplicity of measurements as the motor moves the motor driven element over its range of motion;

b) storing a number of measurement values based on measurements of said parameter over at least a portion of said range of motion;

c) determining that the parameter is outside a parameter range based on previous stored measurement values as the motor driven element moves over its range

of motion; and

d) altering motion of said motor driven element in response to a determination that the parameter is outside the parameter range.

3. (Original) The method of claim 2 wherein the motor driven element is a window or panel and additionally comprising reverse actuating the window or panel prior to moving said window or panel in a direction to close the window or panel.

4. (Original) The method of claim 3 additionally comprising maintaining a position of the window or panel based on the sensed parameter and the reverse actuation is initiated if a leading edge of the window or panel is near a closed position.

5. (Original) The method of claim 4 movement is first initiated toward a closed position when a leading edge of the window or panel is near the closed position and wherein the reverse actuation is performed upon a sensing of an obstacle that is based on determining the parameter is outside the parameter range.

6. (Previously Presented) Apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving said window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel, said apparatus comprising:

a) a sensor for sensing movement of the window or panel and providing a sensor output signal related to a speed of movement of the window or panel;

b) a switch for controllably actuating the motor by providing an energization signal; and

c) a controller having an interface coupled to the sensor and the switch for controllably energizing the motor; said controller sensing a collision with an obstruction when power is applied to the controller by:

i) monitoring movement of the window or panel by monitoring a signal from the

sensor related to the movement of the window or panel;

ii) adjusting an obstacle detection threshold in real time based on immediate past measurements of the signal sensed by the sensor to adapt to varying conditions encountered during operation of the window or panel;

iii) identifying a collision of the window or panel with an obstacle due to a change in the signal from the sensor that is related to a change in movement of the window or panel by comparing a value based on a most recent signal from the sensor with the obstacle detection threshold; and

iv) outputting a control signal to said switch to deactivate said motor in response to a sensing of a collision between an obstacle and said window or panel.

7. (Original) The apparatus of claim 6 wherein the controller comprises a programmable controller including a processing unit for executing a control program and including a memory for storing multiple window or panel speed values corresponding to a signal received from the sensor.

8. (Original) The apparatus of claim 6 additionally comprising one or more limit switches for use by the controller to determine window or panel position for use in identifying a collision.

9. (Cancelled)

10. (Original) The apparatus of claim 6 wherein the controller maintains a position of a leading edge of the window or panel and further wherein the controller reverse energizes the motor to move the window or panel away from a closure position prior to activating the motor to close the window or panel.

11. (Original) The apparatus of claim 10 wherein the controller reverse energizes the motor in response to a sensing of an obstacle and the reverse energizing and attempt

to move the window or panel to a closed position is performed to confirm sensing of the obstacle.

12. (Previously Presented) Apparatus for controlling activation of a motor for moving an object along a travel path and de-activating the motor if an obstacle is encountered by the object comprising:

a) a movement sensor for monitoring movement of the object as the motor moves said object along a travel path;

b) a switch for controlling energization of the motor with an energization signal; and

c) a controller including an interface coupled to the switch for controllably energizing the motor and said interface additionally coupling the controller to the movement sensor for monitoring signals from said movement sensor; said controller comprising a stored program that:

i) determines motor speed of movement from an output signal from the movement sensor ;

ii) calculates an obstacle detect threshold based on motor speed of movement detected during a present run of said motor driven element ;

iii) compares a value based on currently sensed motor speed of movement with the obstacle detect threshold; and

iv) outputs a signal from the interface to said switch for stopping the motor if the comparison based on currently sensed motor movement indicates the object has contacted an obstacle.

13. (Original) The apparatus of claim 12 wherein the controller includes a buffer memory for storing successive values of motor movement for use in determining the obstacle detect threshold.

14. (Original) The apparatus of claim 12 wherein the controller includes a clock and

an input from the movement sensor is in a form of a sequence of pulses and further wherein the controller counts clock signals occurrences between receipt of pulses to provide an indication of motor speed.

15. (Original) The apparatus of claim 12 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a motor energization sequence a specified minimum time period in response to a short period user actuation of said control inputs to maintain position accuracy in monitoring window or panel movement.

16. (Original) The apparatus of claim 12 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the object and wherein in response to a specified input the controller conducts a calibration motor energization sequence to determine parameters of object.

17. (Original) The apparatus of claim 12 wherein the motor is coupled to a motor vehicle window or panel and wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a position indication which is updated in response movement of the window or panel and further wherein the controller reverse actuations the motor near an end point in an object path of travel to avoid false obstacle detection in the region of closure of the window or panel.

18. (Original) The apparatus of claim 12 wherein the sensor is a current sensor and wherein the controller includes means for adjusting the obstacle threshold based on dynamic motor current as sensed from the current sensor to take into account varying loads experienced by the motor.

19. (Previously Presented) Apparatus for controlling activation of a motor for moving

a window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel comprising:

a) a sensor for sensing movement of a window or panel along a travel path;

b) a switch for controlling energization of the motor with an energization signal; and

c) a controller coupled to the switch for controllably energizing the motor and having an interface coupling the controller to the sensor and to the switch; said controller comprising decision making logic for:

i) monitoring a signal from the sensor;

ii) calculating a real time obstacle detect threshold based on the signal that is detected during at least one prior period of motor operation during movement along a present or current path of travel of said window or panel ;

iii) comparing a value based on a currently sensed motor parameter with the obstacle detect threshold; and

iv) stopping movement of the window or panel by controlling an output to said switch that controls motor energization if the comparison based on a currently sensed motor parameter indicates the window or panel has contacted an obstacle.

20. (Previously Presented) Apparatus for controlling activation of a motor for moving a window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel comprising:

a) a sensor for generating speed signals representative of the window or panel speed as the motor moves the window or panel along a travel path;

b) an obstacle detection controller for monitoring at least a part of the travel path of the window or panel for sensing and generating an obstacle detect signal indicating the presence in said travel path of an obstacle to movement of the window or panel;

c) a switch coupled to said controller for controlling energization of the motor with an energization signal; and

d) said controller for processing speed signals and obstacle detection signals and controlling operation of the motor in response to said speed or obstacle detection signals; said controller including:

i) a storage for storing a number of speed signals that vary with motor speed;

ii) a processor for calculating an obstacle detect threshold based on one or more speed signals stored in said storage obtained in real time based on immediate past measures of the speed signal sensed by the sensor to adapt to varying conditions encountered during movement along a present path of travel of said window or panel;

iii) a logic unit for making a comparison between a value representing window or panel speed based on a currently sensed motor speed signal with the calculated obstacle detect threshold, and generating a control output if an obstacle is detected based on said comparison; and

iv) an interface coupled to said switch for changing the state of the switch to stop the motor.

21. (Original) The apparatus of claim 20 wherein the sensor for generating a speed signal comprises a Hall-effect sensor.

22. (Original) The apparatus of claim 20 wherein the sensor for generating a speed signal comprises a magnetic pick-up.

23. (Original) The apparatus of claim 20 additionally comprising an obstacle detector having an output coupled to the controller that senses a disruption in a region through which the window or panel moves.

24. (Original) The apparatus of claim 23 wherein the obstacle detector comprises a microwave generator and a reflected wave transducer.

25. (Original) The apparatus of claim 23 wherein the obstacle detector comprises an

infrared light source and detector.

26. (Previously Presented) The apparatus of claim 23 wherein the obstacle detector comprises a field effect device.

27. (currently amended) The apparatus of claim ~~27~~ 26 wherein the field effect device comprises a magnetic field inductive sensor.

28. (Previously Presented) Apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving said window or panel along a travel path and de-activating the motor when a predetermined position is encountered by the window or panel, said apparatus comprising:

a) a sensor for sensing movement of the window or panel and providing a sensor output signal related to a position of the window or panel;

b) a switch for controllably actuating the motor by providing an energization signal; and

c) a controller having an interface coupled to the sensor and the switch for controllably energizing the motor; said controller determining the position of the window or panel when power is applied to the controller by:

i) monitoring the position of the window or panel by monitoring the sensor output signal from the sensor related to the position of the window or panel;

ii) identifying the position of the window or panel based on the sensor output signal from the sensor; and

iii) outputting a control signal to said switch to deactivate said motor in response to a sensing of the predetermined position of said window or panel.

29. (Previously Presented) The apparatus of claim 28 wherein the controller

comprises a programmable controller including a processing unit for executing a control program and including a memory for storing multiple window or panel position values corresponding to a signal received from the sensor.

30. (Previously Presented) The apparatus of claim 28 additionally comprising one or more position limits programmed for use by the controller to determine window or panel position for use in identifying whether the window or panel is closed or open.

31. (Previously Presented) The apparatus of claim 28 wherein the controller maintains a position of a leading edge of the window or panel and further wherein the controller reverse energizes the motor to move the window or panel away from a closure position prior to activating the motor to close the window or panel.

32. (Previously Presented) The apparatus of claim 28 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the motor vehicle window or panel and wherein the controller maintain a position indication which is updated in response to movement of the window or panel and further wherein the controller reverse actuates the motor near an end point in the travel path of the window or panel to avoid false obstacle detection in a region of closure of the window or panel.

33. (Previously Presented) Apparatus for controlling activation of a motor for moving a motor driven element in a vehicle over a range of motion and de-activating the motor when undesirable resistance to motion of the element is encountered, the apparatus comprising:

a) a sensor for sensing a speed of the motor and generating an output signal representative of a speed of the motor, a speed of the motor changing when undesirable resistance to motion of the element is encountered;

b) a switch for controlling activation of the motor; and

c) a controller coupled to the sensor and the switch, the controller receiving the sensor output signal from the sensor and outputting a control signal to the switch to de-activate the motor if the sensor output signal indicates that the element has encountered undesirable resistance to motion.

34. (Previously Presented) The apparatus of claim 33 wherein the sensor includes a Hall effect sensor.

35. (Previously Presented) The apparatus of claim 33 wherein the apparatus includes a memory for storing values corresponding to the sensor output signal over at least a portion of the range of motion of the element and the controller analyzes the sensor output signal values stored in the memory to determine if the control signal to de-activate the motor should be output to the switch.

36. (Previously Presented) The apparatus of claim 1 wherein the immediate past measurements of said parameter were taken within a forty millisecond interval prior to the most recent sensor measurement.

37. (Previously Presented) The apparatus of claim 6 wherein the immediate past measurements of said signal are sensed within a forty millisecond interval prior to the most recent signal from the sensor.

REMARKS

Reconsideration of pending claims 1 – 8 and 10 – 37 is requested. Applicants thank Examiner Fletcher for the opportunity to discuss this application during the interview of May 30th 2007. Claim charts are discussed below and if for any reason the Examiner would like to discuss the support for a claim element found in United States patent 5,334,876, he is encouraged to call the undersigned attorney.

Claim 1 features apparatus for controlling motion of a motor driven element in a vehicle over a range of motion and for altering that motion when undesirable resistance to motion is encountered. A sensor measures a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element. A memory is used to store a number of measurement values from the sensor based on immediate past measurements of the parameter over at least a portion of a present path of travel of the motor driven element through its range of motion. A controller coupled to the memory determines whether to de-activate the motor based on a most recent sensor measurement of the parameter and the immediate past measurement values stored in the memory as the motor driven element moves over its range of motion. A controller interface coupled to the motor alters motion of the motor driven element in response to a determination made by the controller.

In determining patentability, the United States Supreme Court's decision in KSR Int'l Co v. Teleflex Inc. 127 S. Ct. 1727, 82 USPQ.2d 1385 (2007) has recently reaffirmed the tests for patentability under section 103 (the only basis for rejection presently asserted by the Examiner) as stated in Graham v. John Deere Co. of Kansas City, 383 U.S. 1 (1966):

"Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background the obviousness or nonobviousness of the subject matter is determined. Such secondary

considerations as commercial success, long felt but unsolved needs, failure of others, *etc.*, might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented." Deere, 383 U.S. at 17-18.

The controller featured in claim 1 performs its collision detection based on real time data obtained during a present run of the window or panel. Unlike the invention featured in claim 1, the Jones *et al.* system disclosed in U.S. Patent No.: 4,831,509 uses training data stored by the controller during a training run to signal a collision between a door and an obstacle and therefore neither anticipates nor renders obvious the structure of claim 1. This lack of teaching was acknowledged by the Examiner in the last office action wherein the Examiner states "Jones does not disclose that the motor driven element is in a vehicle. Jones *et al.* does not disclose immediate past measurements." *See also* the interview summary record of the May 30th, 2007 patent office interview.

The Office action dated April 10, 2007 rejected claim 1 under 35 U.S.C §103(a) as being unpatentable over Jones *et al.* U.S. Patent No.: 4,831,509 in view of Wrenbeck *et al.* U.S. Patent No.: 5,436,539 having a filing date of August 30, 1993. Note, as asserted and accepted in the response filed May 31, 2006, the original pending independent claims are all supported by the specification of the parent application having a filing date of April 22, 1992 now U.S. Patent No.: 5,334,876 (hereinafter the '876 Patent) from which this application claims priority. Since claim 1 was amended subsequent to the May 31, 2006 amendment, a claim chart showing support in the '876 patent specification (referring to column and line numbers) is presented below.

CLAIM NO.	CLAIM LANGUAGE	SUPPORT IN 5,334,876 PATENT
1	Apparatus for controlling motion of a motor driven element (1A) in a vehicle over a range of motion and for altering said motion (1B) when undesirable resistance to said motion is encountered (1C), said apparatus comprising:	1A. Window or Panel Col. 2, Line 40; 1B. Range of Motion Col. 5, Lines 60 – Col. 6, Line 9; 1C. Motor de-energized Col. 6, Lines 65-66.
1(a)	a) a sensor (1D) for measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element;	1D. Op-amp 110, Col. 5, Line 19
1(b)	a memory (1E) for storing a number of measurements values from the sensor based on immediate past measurements of said parameter over at least a portion of a present traversal (1F) of said motor driven element through said range of motion	1E. Control Circuit with memory that compares sensed motor current with calibrated current Col. 1, Lines 65-66 -- see also Col. 6, Lines 20-24 1F. col 6, line 46-63
1(c)	a controller (1G) coupled to the memory for determining to de-activate the motor based on a most recent sensor measurement of the parameter and the immediate past measurement values stored in the memory as the motor driven element moves over its range of motion	1G. Control circuit determines 'compare value' at col 6, line 62 and the motor is de-energized if presently sensed current is greater than the 'compare value', col 6, line 64-66.
1(d)	d) a controller interface (1H) coupled to the motor for altering motion of said motor driven element in response to a determination made by the controller.	1H. Field effect transistor 20 Col. 2, Line 53.

35 USC § 102(e) states that a person shall be entitled to a patent unless "the invention was described in - (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for the purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language." For purposes of citation against applicants' claims, therefore, the effective date of the Wrenbeck *et al.* '539 patent is its filing date, *i.e.* August 30, 1993. This date is well after the filing date of April 22, 1992 of the '876 patent and therefore Wrenbeck *et al.* cannot be used in combination with Jones *et al.* to reject the subject matter of claim 1. Subject to confirmation of support for the elements of claim 1 in the '876 patent specification, Examiner Fletcher agreed with this position during the May 30, 2007 interview.

Close scrutiny of the Wrenbeck patent specification indicates that even if the Examiner is of the opinion Wrenbeck is citable as prior art, the combination of Wrenbeck with Jones *et al.* does not suggest applicants' invention featured in claim 1.

The April 10, 2007 office action cites Wrenbeck to cure the deficiencies of Jones *et al.* Applicants fail to find, however, any teaching or suggestion in Wrenbeck in which a memory is provided for storing a number of measurement values from a sensor based on immediate past measurements. Accordingly, the rejection based on the combination of Jones *et al.* and Wrenbeck is traversed on a second independent basis.

The April 10, 2007 office action particularly states that Wrenbeck includes "a memory (MEM) for storing a number of measurement values from the sensor based on immediate past measurements of said parameter over at least a portion of a present traversal of said motor driven element through said range of motion" citing the Wrenbeck abstract and col 3, line 51 – 59. *See* office action at page 7. However, Wrenbeck is replete with comparisons being made against a "stored value". *See e.g.*,

abstract; col 3, lines 56-57, col 4, lines 54-55; col 4, lines 62-64, col 5, lines 20-21, col 5, lines 25-26, and col 5, lines 49-50. The stored value in the memory of Wrenbeck is not from measurements values obtained from the sensor based on immediate past measurements as featured in claim 1. Wrenbeck only modifies the stored value COUNTS at the end of a complete window cycle. *See*, col 4, lines 30-36. As such, Wrenbeck clearly fails to remedy the admitted deficiency of Jones *et al.* and claim 1 is allowable for this additional reason.

Claim 2 features a method for controlling motion of a *motor driven element in a vehicle* over a range of motion and for altering the motion when undesirable resistance to the motion is encountered. The method is performed by *measuring a parameter of a motor coupled to the motor driven element* that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element by taking a multiplicity of measurements as the motor moves the motor driven element over its range of motion. A number of measurement values are stored based on measurements of the motor parameter over at least a portion of its range of motion. If the parameter is determined to be outside a parameter range based on previous stored measurement values as the motor driven element moves over its range of motion, the method of claim 2 alters motion of said motor driven element.

Claim 2 was rejected in the last office action as being obvious in view of the combined teaching of US Jones *et al.* (US 4,831,509) and Wrenbeck *et al.* (US 5,436,539). Claim 2 is original and the Examiner has already agreed that claim 2 is entitled to benefit of the April 22, 1992 priority date. (Note, response to May 31, 2006 amendment.)

Claim 2 remains in its original form as filed and as indicated in the chart below finds support dating back to April 22, 1992 in the '876 Patent from which priority is claimed.

CLAIM NO.	CLAIM LANGUAGE	SUPPORT IN 5,334,876 PATENT
2	A method for controlling motion of a motor driven element (2A) in a vehicle over a range of motion (2B) and for altering said motion when undesirable resistance to said motion is encountered (2C), said method comprising:	2A. Window or Panel Col. 2, Line 40; 2B. Range of Motion Col. 5, Lines 60 – Col. 6, Line 9; 2C. Motor de-energized Col. 6, Lines 65-66.
2(a)	a) measuring a parameter (2D) of a motor (2E) coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element (2F) by taking a multiplicity of measurements (2G) as the motor moves the motor driven element over its range of motion;	2D. Voltage drop corresponds to current, Col. 5, Lines 15-16; 2E. motor 12, Col. 5, Line 14; 2F. current used to sense obstruction Col. 6, Lines 36-40; 2G. current measured every two milliseconds Col. 6, Line 24;
2(b)	b) storing a number of measurement values (2H) based on measurements of said parameter over at least a portion of said range of motion;	2H. FIFO buffer, Col. 6, Line 50
2(c)	c) determining that (2I) the parameter is outside a parameter range based on previous stored measurement values as the motor driven element moves over its range of motion; and	2I. comparing sensed with compare value from equation Col. 6, Line 64.
2(d)	d) altering motion of said motor driven element in response to a determination that the parameter is outside the parameter range (2J).	2J. Stop motor, Col. 6, Line 65

In the present instance, claim 2 calls for, in part *a motor driven element in a vehicle*. Whether this term is interpreted as a use or a structure, weight must be given to its recitation since it is used again in the claim body, *i.e.* the recitation of the motor driven element is found throughout the claim. Since Jones *et al.* neither shows nor

suggests a motor driven element in a vehicle, this claim is not properly rejected either as being anticipated or rendered obvious by Jones *et al.* Stated another way a *prima facie* basis of rejection is not found in Jones *et al.*

Claim 2 also recites *measuring a parameter of a motor coupled to the motor driven element.* Turning to Jones *et al.*, at column 3, line 7, Jones *et al.* states that "the door curtain position relative to the door opening is obtained from an encoder coupled *to the door drum.* (emphasis added). Pulses are provided to the encoder from optoelectronic sensors appropriately placed or positioned in relation to a set of spinning blades coupled to the drive means for the roller door."

In Jones *et al.* the speed and position of the door increase when lowered due to the added affect of gravity and the speed and position decrease as the door is raised. Jones *et al.* teaches a door position encoder "for providing signals indicative of the position of the door curtain relative to the door opening". Column 1, line 53 of Jones *et al.*, but there is no teaching or suggestion of measuring a parameter of a motor coupled to a motor driven element. By noting that the motor load "is dependent on the position of the door" as a criticism of using motor load monitoring devices, Jones *et al.* explicitly teaches away from measuring a parameter of the motor and using that parameter to determine if the parameter is outside a range as featured in claim 2.

For the foregoing reasons, claim 2 is not anticipated nor rendered obvious in the prior art patent to Jones *et al.* Wrenbeck et al is admittedly not prior art. Claims 3 – 5 depend on allowable claim 2 and are also allowable. Additional claim charts are provided below for the remaining independent claims illustrating the support found in the '876 Patent for those claims.

CLAIM NO.	CLAIM LANGUAGE	SUPPORT IN THE '876 Patent
6	Apparatus for controlling activation of a motor coupled to a motor vehicle window or panel (6A) for moving said window or panel along a travel path (6B) and de-activating the motor if an obstacle is encountered (6C) by the window or panel, said apparatus comprising:	6A. Window or panel, col 2, line 40 6B. Range of motion, col 5, line 60-col 6, line 9 6C. Motor de-energized, col 6, line 66
6(a)	a) a sensor (6D) for sensing movement of the window or panel and providing a sensor output signal related to a speed of movement of the window or panel;	6D. Phase inputs 72, 74 from shaft encoder, col 3, line 44
6(b)	b) a switch (6E) for controllably actuating the motor by providing an energization signal; and	6E. FET 20, or relay 30, 32, Col 2, line 64
6(c)	c) a controller (6F) having an interface coupled to the sensor and the switch for controllably energizing the motor; said controller sensing a collision with an obstruction when power is applied to the controller by:	6F. Controller 22, col 2, line 55
6(c)(i)	i) monitoring movement of the window or panel by monitoring a signal (6G) from the sensor related to the movement of the window or panel;	6G. Position encoder, col 4, line 16 Col 6, line 14, absolute position of the sunroof, and the speed at which the roof is traveling. Col 6, lines 39-40 response time of the algorithm versus the speed of the sunroof.

6(c)(ii)	ii) adjusting (6H) an obstacle detection threshold in real time (6I) based on immediate past measurements of the signal sensed by the sensor to adapt to varying conditions encountered during operation of the window or panel;	6H. after the first 50 ms, col 7 line 28 6I. 50ms – 450 ms, col 7, lines 28-34
6(c)(iii)	iii) identifying a collision (6J) of the window or panel with an obstacle due to a change in the signal from the sensor that is related to a change in movement of the window or panel by comparing a value based on a most recent signal from the sensor with the obstacle detection threshold; and	6J. Controller detects an obstruction using rate of speed of motor, col 7, line 33
6(c)(iv)	iv) outputting a control signal to said switch to deactivate (6K) said motor in response to a sensing of a collision between an obstacle and said window or panel.	6K. Motor re-energized, col 4, line 44

CLAIM NO.	CLAIM LANGUAGE	SUPPORT IN THE '876 patent
12	Apparatus for controlling activation of a motor for moving an object along a travel path (12B) and (12A) de-activating the motor if an obstacle is encountered by the object comprising:	12A. Window panel, col 1, line 44 12B. Obstacle, col 4, line 44
12(a)	a) a movement sensor for (12C) monitoring movement of the object as the motor moves said object along a travel path;	12C. Movement sensor, position encoder, col 4, line 16
12(b)	b) a switch (12D) for controlling energization of the motor with an energization signal; and	12D. Switch relay 30, 32, col 2, line 64

12(c)	c) a controller (12E) including an interface coupled to the switch for controllably energizing the motor and said interface additionally coupling the controller to the movement sensor for monitoring signals from said movement sensor; said controller comprising a stored program that:	12E. Controller 22, col 2, line 55
12(c)(i)	i) determines motor speed of movement from an (12F) output signal from the movement sensor ;	12F. Motor speed, rate of change of pulses, col 3, line 59
12(c)(ii)	ii) calculates an obstacle detect (12G) threshold based on motor speed of movement detected during a present run of said motor driven element ;	12G. Obstacle detect motor speed, col 7, line 33
12(c)(iii)	iii) compares a value based on (12H) currently sensed motor speed of movement with the obstacle detect threshold; and	12H. Col 7, line 33
12(c)(iv)	iv) outputs a signal from the interface (12I) to said switch for stopping the motor (12J) if the comparison based on currently sensed motor movement indicates the object has contacted an obstacle.	12I. Interface, col 4, line 1 12J. Stopping motor, braking effect, col 4, line 13

CLAIM NO.	CLAIM LANGUAGE	SUPPORT IN THE 10/765,487 APPLICATION
19	Apparatus for controlling activation of a motor for moving a window or panel (19A) along a travel path (19B) and de-activating the motor if an obstacle is encountered (19C) by the window or panel comprising:	19A. Window or panel col 2, line 40 19B. Travel path, col 5, line 60-col 6, line 9 19C. De-activating motor, col 6, line 65-66
19(a)	a) a sensor (19D) for sensing movement of a window or panel along a travel path;	19D. Op amp 110, col 5, line 19
19(b)	b) a switch (19E) for controlling energization of the motor with an energization signal; and	19E. FET 20, col 2 line 53
19(c)	c) a controller (19F) coupled to the switch for controllably energizing the motor and having an interface coupling the controller to the sensor and to the switch; said controller comprising decision making logic for:	19F. Controller 22, col 2 line 55
19(c)(i)	i) monitoring a signal from the sensor;	
19(c)(ii)	ii) calculating a real time obstacle detect threshold (19G) based on the signal that is detected during at least one prior period of motor operation during movement along a present or current path of travel of said window or panel;	19G. Equation at col 6, line 62
19(c)(iii)	iii) comparing (19H) a value based on a currently sensed motor parameter with the obstacle detect threshold; and	19H. Comparing, col 6, line 65

19(c)(iv)	iv) stopping movement (19I) of the window or panel by controlling an output to said switch that controls motor energization if the comparison based on a currently sensed motor parameter indicates the window or panel has contacted an obstacle.	19I. Stopping movement, col 6, line 65-66.

CLAIM NO.	CLAIM LANGUAGE	SUPPORT IN THE '876 patent
20	Apparatus for controlling activation of a motor for moving a window or panel (20A) along a travel path (20B) and de-activating the motor if an obstacle is encountered by the window or panel comprising:	20A. Window or panel, col 2, line 40 20B. Range of motion, col 5, line 60-col 6, line 9
20(a)	a) a sensor (20C) for generating speed signals representative of the window or panel speed as the motor moves the window or panel along a travel path;	20C. Encoder, col 4, line 16, col 3, line 44
20(b)	b) an obstacle detection controller (20D) for monitoring at least a part of the travel path of the window or panel for sensing and generating an obstacle detect signal indicating the presence in said travel path of an obstacle to movement of the window or panel;	20D. Controller 22, col 2, line 55
20(c)	c) a switch (20E) coupled to said controller for controlling energization of the motor with an energization signal; and	20E. FET 20, or relay 30, 32 col 2, line 64

20(d)	d) said controller for processing speed signals and obstacle detection signals (20F) and controlling operation of the motor in response to said speed or obstacle detection signals; said controller including:	20F. Preferred controller is microprocessor having central processing unit, col 2, line 55
20(d)(i)	i) a storage (20G) for storing a number of speed signals that vary with motor speed;	20G. Microprocessor 22 has storage for storing speed signals shown in Figure 5, col 3, line 59
20(d)(ii)	ii) a processor (20H) for calculating an obstacle detect threshold based on one or more speed signals stored in said storage obtained in real time (20I) based on immediate past measures of the speed signal sensed by the sensor to adapt to varying conditions encountered during movement along a present path of travel of said window or panel;	20H. Processor 22 20I. 50ms – 450 ms, col 7, lines 28 - 34
20(d)(iii)	iii) a logic unit for making a comparison between a value representing window or panel speed (20J) based on a currently sensed motor speed (20K) with the calculated obstacle detect threshold, and generating a control output if an obstacle is detected based on said comparison; and	20J. Controller outputs controls to ramp up motor speed in controlled fashion col 7, line 30 20K. Sensed speed compared with expected based on controlled output, col7, line 33, 34
20(d)(iv)	iv) an interface (20L) coupled to said switch for changing the state of the switch to stop the motor.	20L. Controller interfaces with FET 20 or relay, col 2, line 65

CLAIM NO.	CLAIM LANGUAGE	SUPPORT IN THE 10/765,487 APPLICATION
28	Apparatus for controlling activation of a motor coupled to a motor vehicle window or panel (28A) for moving said window or panel along a travel path (28B) and de-activating the motor when a predetermined position is encountered (28C) by the window or panel, said apparatus comprising:	28A. Window or panel, col 2, line 40 28B. Path described, col 5, line 60-col 6, line 9 28C. Deactivates at home position, col 5, line 65, col 6, line 1
28(a)	a) a sensor (28D) for sensing movement of the window or panel and providing a sensor output signal related to a position (28E) of the window or panel;	28D. Hall sensor 132, col 5, line 63, and phase inputs 72, 74 from position encoder, col 3 line 44 28E. Home position, open position etc col 5, lines 60-68, col 6, line 1
28(b)	b) a switch for controllably actuating the motor by providing an energization signal (28F); and	28F. FET 20, col 2, line 53
28(c)	c) a controller (28G) having an interface coupled to the sensor (28H) and the switch for controllably energizing the motor; said controller determining the position of the window or panel when power is applied to the controller by:	28G. Controller 22, col 2, line 55 28H. Output from position encoder
28(c)(i)	i) monitoring the position of the window or panel by monitoring the sensor output (28I) signal from the sensor related to the position of the window or panel;	28I. Controller monitors encoder output, col 3, line 44
28(c)(ii)	ii) identifying the position of the window or panel based on the sensor output signal from the sensor; and	

28(c)(iii)	iii) outputting a control signal to said switch to deactivate (28J) said motor in response to a sensing of the predetermined position of said window or panel.	28J. Controller stops the roof at the park, full open and vent positions, col 5, lines 59-col 6, line 9.

CLAIM NO.	CLAIM LANGUAGE	SUPPORT IN THE 10/765,487 APPLICATION
33	Apparatus for controlling activation of a motor for moving a motor driven element in a vehicle (33A) over a range of motion (33B) and de-activating (33C) the motor when undesirable resistance to motion of the element is encountered, the apparatus comprising:	33A. Window or panel, col 2, line 40 33B. Range of motion, col 5, line 60-col 6, line 9 33C. De-activating motor, col 6, lines 65-66
33(a)	a) a sensor (33D) for sensing a speed of the motor and generating an output signal representative of a speed of the motor, a speed of the motor changing when undesirable resistance to motion of the element is encountered;	33D. Shaft encoder, col 3, line 44
33(b)	b) a switch (33E) for controlling activation of the motor; and	33E. FET 20, col 2, line 53
33(c)	c) a controller (33F) coupled to the sensor and the switch, the controller receiving the sensor output signal from the sensor and outputting a control signal to the switch to de-activate the motor if the sensor output signal indicates that the element has encountered undesirable resistance to motion.	33F. Controller 22, col 2, line 55

As mentioned in the interview, independent claims 1,6,12,19, and 20 claim use of immediate past measurements and since there is support for those claims (as indicated by the above claim charts), they along with their dependent claims are allowable.

Independent claims 2, 28, and 33 do not include the immediate past measurement limitation. Those claims are supported by the specification of the '876 patent, however, and therefore are not rejectable over the combination of Jones *et al.* and Wrenbeck. Those claims along with their dependent claims are therefore allowable.

All claims are believed to be in condition for allowance and prompt issuance of a Notice of Allowance is respectfully requested. If any fees are determined to be due, the commissioner is authorized to charge those fees to deposit account no 20-0090.

Respectfully submitted,

Date: June 20, 2007

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Electronic Acknowledgement Receipt	
EFS ID:	1889597
Application Number:	10765487
International Application Number:	
Confirmation Number:	9537
Title of Invention:	Collision monitoring system
First Named Inventor/Applicant Name:	Mario Boisvert
Customer Number:	28060
Filer:	Stephen J. Schultz
Filer Authorized By:	
Attorney Docket Number:	14-733C2D1
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Time Stamp:	09:45:45
Application Type:	Utility

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)	Multi Part /.zip	Pages (if appl.)
1		14733C2D1Amend.pdf	6406999	yes	27

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment - After Non-Final Rejection	1	1
	Claims	2	11
	Applicant Arguments/Remarks Made in an Amendment	12	27
Warnings:			
Information:			
	Total Files Size (in bytes):	6406999	

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
Effective December 8, 2004

10/765,487

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
TOTAL CLAIMS*		
FOR	NUMBER FILED	NUMBER EXTRA
TOTAL CHARGEABLE CLAIMS	minus 20=	*
INDEPENDENT CLAIMS	minus 3 =	*
MULTIPLE DEPENDENT CLAIM PRESENT		☐

*If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY TYPE ☐			OR	OTHER THAN SMALL ENTITY	
RATE	FEE			RATE	FEE
BASIC FEE	150.00		OR	BASIC FEE	300.00
X$ 25=			OR	X$50=	
X100=			OR	X200=	
+180=			OR	+360=	
TOTAL			OR	TOTAL	

CLAIMS AS AMENDED - PART II

AMENDMENT A	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	* 36	Minus	** 36	=
Independent	* 8	Minus	*** 8	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

SMALL ENTITY			OR	OTHER THAN SMALL ENTITY	
RATE	ADDITIONAL FEE			RATE	ADDITIONAL FEE
X$ 25=			OR	X$50=	
X100=			OR	X200=	
+180=			OR	+360=	
TOTAL ADDIT. FEE			OR	TOTAL ADDIT. FEE	

AMENDMENT B	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 25=		OR	X$50=	
X100=		OR	X200=	
+180=		OR	+360=	
TOTAL ADDIT. FEE		OR	TOTAL ADDIT. FEE	

AMENDMENT C	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA
Total	*	Minus	**	=
Independent	*	Minus	***	=
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM				☐

RATE	ADDITIONAL FEE		RATE	ADDITIONAL FEE
X$ 25=		OR	X$50=	
X100=		OR	X200=	
+180=		OR	+360=	

IFW

Practitioner's Docket No. 14-733C2D1 *PATENT*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Mario Boisvert, Randall Perrin, and John Washeleski

Application No.: 10/765,487
Filed: January 27, 2004
For: Collision Monitoring System

Group No.: 2837
Examiner: Marlon Fletcher

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

STATEMENT BY OMITTED INVENTOR

I, John Washeleski state that:

1.) I am now and have since the time of filing parent application serial no. 09/562,986 on May 1, 2000 been employed by Nartron Corporation.

2.) I have helped Mr. Schultz in prosecuting the present application, serial no. 10/765,487 and more particularly executed a declaration dated April 18, 2005 seeking accelerated examination and as such I am familiar with the pending claims.

3.) I believe I am a co-inventor of one or more pending claims of this application.

4.) I believe my omission or error as a named co-inventor occurred without deceptive intent by me, my co-inventors and the assignee, Nartron Corporation.

5.) I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Sec. 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issued thereon.

John Washeleski

07/03/2007 HBLANCO 00000004 10765487
01 FC:1464 130.00 OP

Practitioner's Docket No. 14-733C2D1 *PATENT*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Mario Boisvert, Randall Perrin, and John Washeleski

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Group No.: 2837
Examiner: Marlon Fletcher

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

STATEMENT UNDER 37 C.F.R. § 3.73(b)-- ESTABLISHING RIGHT OF ASSIGNEE TO TAKE ACTION

1. The assignee(s) of the entire right, title and interest hereby seek(s) to take action in the PTO in this matter.

IDENTIFICATION OF ASSIGNEE

2. Name of assignee: Nartron Corporation
   Type of assignee: Corporation

PERSON AUTHORIZED TO SIGN

3. Name of person authorized to sign on behalf of assignee: Norman Rautiola
   Title of person authorized to sign: Chairman

CERTIFICATION UNDER 37 C.F.R. §§ 1.8(a) and 1.10*

*(When using Express Mail, the Express Mail label number is **mandatory**; Express Mail certification is optional.)*

I hereby certify that, on the date shown below, this correspondence is being:

MAILING

X deposited with the United States Postal Service in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

37 C.F.R. § 1.8(a)

X with sufficient postage as first class mail.

Carrie A. Patchin
Signature

Date: 6-29-07

Carrie A. Patchin
(type or print name of person certifying)

** Only the date of filing (' 1.6) will be the date used in a patent term adjustment calculation, although the date on any certificate of mailing or transmission under ' 1.8 continues to be taken into account in determining timeliness. See ' 1.703(f). Consider "Express Mail Post Office to Addressee" (' 1.10) or facsimile transmission (' 1.6(d)) for the reply to be accorded the earliest possible filing date for patent term adjustment calculations.*

I, the person signing below, state that I am empowered to sign this statement on behalf of the assignee.

BASIS OF ASSIGNEE'S INTEREST

Ownership by the assignee is established as follows:

A.

1. An assignment from the inventor(s) of the matter identified above, which was recorded in the PTO at Reel 012715, Frame 0149.

COPIES OF DOCUMENTS IN CHAIN OF TITLE

The evidence of the chain of title was submitted on March 18, 2002 for recordation pursuant to §3.11.

Norman Rautiola
Chairman

Date: June 29, 2007

Signature of Practitioner
Stephen J. Schultz
Tarolli, Sundheim, Covell & Tummino LLP
1300 East Ninth Street
Suite 1700
Cleveland, OH 44114

Reg. No.: 29,108
Tel. No.: 216-621-2234
Customer No.: 26,294

Practitioner's Docket No. 14-733C2D1 ***PATENT***

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Mario Boisvert, Randall Perrin and John Washeleski

Application No.: 10/765,487
Filed: 01/27/2004
For: Collision Monitoring System

Group No.: 2837
Examiner: Marlon Fletcher

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

ASSENT OF ASSIGNEE TO CORRECTION AND/OR ADDITION OF INVENTOR(S)

Name of Assignee:

Nartron Corporation

Address of Assignee:

5000 N. US Highway 131
Reed City, MI 49677
Assignment was recorded on March 18, 2002 at:

Reel 012715
Frame 0149

Assignee hereby assents to the correction of inventorship filed herewith.

CERTIFICATE OF MAILING/TRANSMISSION (37 C.F.R. § 1.8(a))

I hereby certify that this correspondence is, on the date shown below, being:

MAILING

X deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

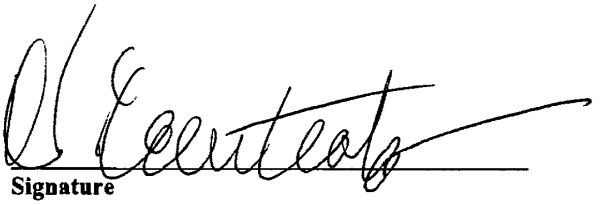
Carrie A. Patchin
Signature

Date: 6-29-07

Carrie A. Patchin
(type or print name of person certifying)

RIGHT OF ASSIGNEE TO TAKE ACTION

A "STATEMENT UNDER 37 C.F.R. § 3.73(b)" is attached.



Signature

Norman Rautiola, Chairman

Practitioner's Docket No. 14733C2D1 *PATENT*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Mario Boisvert, Randall Perrin and John Washeleski

Application No.: 10/765,487
Filed: 01/27/2004
For: Collision Monitoring System

Group No.: 2837
Examiner: Marlon Fletcher

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

REQUEST TO CORRECT INVENTORSHIP

Applicants hereby request that John Washeleski be added as an inventor to the above-identified application. Mr. Washeleski's statement is attached. Credit card authorization for the fee required by 37 CFR 1.48 is also enclosed.

If any additional fee is required, permission is hereby given to charge Account No. 20-0090.

Date: June 29, 2007

Stephen Schultz
Signature of Practitioner

Reg. No.: 29,108
Tel. No.: 216-621-2234
Customer No.: 26,294

Stephen J. Schultz
Tarolli, Sundheim, Covell & Tummino LLP
1300 East Ninth Street
Suite 1700
Cleveland, OH 44114

07/03/2007 MBLANCO 00000004 10765487
01 FC:1464 130.00 OP

For Application
10/765487

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below-named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

COLLISION MONITORING SYSTEM

the specification of which:

__X__ was filed on 1/27/04 as United States Patent Application Number 10/765,487 and was amended on 1/27/04, 5/31/06 and 12/13/06.

I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the United States Patent and Trademark Office information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, sec 1.56. Under that section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and (1) it establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim; or (2) it refutes, or is inconsistent with, a position the applicant takes in: (i) opposing an argument of unpatentability relied on by the United States Patent and Trademark Office, or (ii) asserting an argument of patentability.

I hereby claim foreign priority benefits under Title 35, United States Code, sec 119(a)-(d) or sec 365(b) of any foreign application(s) for patent or inventor's certificate, or sec 365(a) of any PCT international application(s) which designated at least one country other than the United States, listed below. I have also identified below any corresponding foreign application(s) for patent or inventor's certificate or any corresponding PCT international application(s) having a filing date before that of the application(s) on which priority is claimed.

Prior Foreign Application(s)

Number	Country	Filing Date (mm/dd/yyyy)	Priority Claimed (Yes or No)

I hereby claim the benefit under Title 35, United States Code, 119(e) of any United States provisional application(s) listed below.

United States Provisional Application(s)

Application Number	Filing Date (mm/dd/yyyy)	Status (abandoned, pending, patent number)
60/169,061	12/06/1999	Abandoned

I hereby claim the benefit under Title 35, United States Code, sec 120 of any United States application(s) or sec 365(c) of any PCT international application(s) designating the United States, listed below. Insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application(s) in the manner provided by the first paragraph of Title 35, United States Code, sec 112, I acknowledge the duty to disclose to the United States Patent and Trademark Office information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, sec 1.56 which became available between the filing date of the prior application(s) and the national or PCT international filing date of this application.

United States Application(s) Upon Which Priority is Claimed

Number	Country	Filing Date (mm/dd/yyyy)	Priority Claimed (yes or no)
09/562,986	US	05/01/2000	yes
08/736,786	US	10/25/1996	yes
08/275,107	US	07/14/1994	yes
07/872,190	US	04/22/1992	yes

I hereby appoint the attorney(s) and/or agent(s) associated with **Customer Number 26,294** to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith:

and I hereby designate the foregoing Stephen J. Schultz, Reg. No. 29,108, principal attorney.

This appointment shall include all power to prosecute and transact all business relating to all applications corresponding to this application in all countries, including all regional and international patent offices, such as, but not limited to, the European Patent Office and all offices and bureaus established in accordance with the Patent Cooperation Treaty.

I hereby further designate and appoint any officer of Tarolli, Sundheim, Covell & Tummino LLP my attorney in fact with full power of substitution and revocation, including power to designate a substitute principal attorney.

Address all correspondence to:
Stephen J. Schultz
Tarolli, Sundheim, Covell & Tummino LLP
1300 East Ninth St, Suite 1700
Cleveland, OH 44114

Direct all telephone calls to Stephen J. Schultz at (216) 621-2234 and direct all facsimile correspondence to (216) 241-8151.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Sec. 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issued thereon.

Full Name of Sole or First Joint Inventor: Mario Boisvert	
Inventor's Signature: Mario Pierre Boisvert	Date: 6-25-2007
Residence: Reed City, MI	Citizenship: Canadian
Post Office Address: 43 Old US 131, Reed City, MI 49677	

Full Name of Second Joint Inventor: Randall Perrin	
Inventor's Signature:	Date: 6-20-2007
Residence: Grawn, MI	Citizenship: U.S.A.
Post Office Address: 4074 Central Park Drive, Grawn, MI 49637	

Full Name of Third Joint Inventor: John Washeleski	
Inventor's Signature:	Date: 6/25/2007
Residence: Cadillac, MI	Citizenship: U.S.A.
Post Office Address: 656 Holly Drive, Cadillac, MI 49601	

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S5	12358	obstruct$4 and (detect$4 or sens$4) and window and (stor$4 or memor$4) and ($5process$4 or mpu or cpu or $5computer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/10/25 20:17
S6	12358	obstruct$4 and (detect$4 or sens$4) and window and (stor$4 or memor$4) and ($5process$4 or mpu or cpu or $5computer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/03/29 19:20
S7	5636	S6 and motor	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/03/29 19:20
S8	4075	S7 and speed	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/03/29 19:20
S9	1700	S8 and (motor same speed)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/03/29 19:38
S10	1248	S9 and (revers$4 or travers$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/03/29 19:40
S11	212	S10 and ("318"/$7.ccls. or "701"/$7.ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/03/29 19:41

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
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,487	01/27/2004	Mario Boisvert	14-733C2D1	9537

28060 7590 10/31/2007
TAROLLI, SUNDHELM, COVELL & TUMMINO, LLP
1300 EAST NINTH STREET
SUITE 1700
CLEVELAND, OH 44114

EXAMINER	
FLETCHER, MARLON T	
ART UNIT	PAPER NUMBER
2837	

MAIL DATE	DELIVERY MODE
10/31/2007	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.	Applicant(s)	
	10/765,487	BOISVERT ET AL.	
	Examiner	Art Unit	
	Marlon T. Fletcher	2837	

-- 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 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 *20 June 2007*.

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

3)☐ 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

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-37* is/are rejected.

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

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

Application Papers

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

10)☐ The drawing(s) filed on _____ 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).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).

a)☐ All b)☐ Some * c)☐ None of:

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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. 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 –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-23 and 28-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Okuyama et al. (4,608,637)

As recited in claims 1 and 2, Okuyama et al. disclose an apparatus for controlling motion of a motor driven element over a range of motion and for altering said motion when undesirable resistance to the motion is encountered, said apparatus comprising: a sensor (6a, 6ab, 6d, 6da) for measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element (column 7, lines 49-62); a memory for storing a number of measurement values from the sensor based on measurements of said parameter over at least a portion of the range of motion (column 8, line 51-64); a controller (microcomputer 9) coupled to the memory for determining to de-activate the motor based on the measurement values stored in the memory as the motor driven element moves over its range of motion; and a controller interface coupled to the motor (Ma, Md, Mab, Mda) for altering motion of said motor driven element in response to a

determination made by the controller (column 5, lines 9-60), wherein altering is also in response to a determination that the parameter is outside the parameter range.

As recited in claims 3 and 31, Jones et al. disclose the method, wherein the motor driven element is a window or panel and additionally comprising reverse actuating the window or panel prior to moving said window or panel in a direction to close the window or panel (column 6, lines 24-33).

As recited in claim 4, Jones et al. disclose the method, additionally comprising maintaining a position of the window or panel based on the sensed parameter and the reverse actuation is initiated if a leading edge of the window or panel is near a closed position (column 6, lines 24-33).

As recited in claims 5, 10, and 11, Jones et al. disclose the method, movement is first initiated toward a closed position when a leading edge of the window or panel is near the closed position and wherein the reverse actuation is performed upon a sensing of an obstacle that is based on determining the parameter is outside the parameter range (column 7, lines 49-62).

As recited in claims 6 and 33, Jones et al. disclose an apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving said. window or panel along a travel path and deactivating the motor if an obstacle is encountered by the window or panel, said apparatus comprising: a sensor for sensing movement of the window or panel and providing a sensor output signal related to a speed of movement of the window or panel (discussed above; column 7, lines 30-37), and a controller having an interface coupled to the sensor and the switch for controllably

energizing the motor (figure 4a); said controller sensing a collision with an obstruction when power is applied to the controller by: monitoring movement of the window or panel by monitoring a signal from the sensor related to the movement of the window or panel (column 7, lines 6-23; and column 8, lines 35-50), identifying a collision of the window or panel with an obstacle due to a change in the signal from the sensor that is related to a change in movement of the window or panel (Abstract; and column 8, lines 51-64); and outputting a control signal to said switch to deactivate said motor in response to a sensing of a collision between an obstacle and said window or panel (column 8, line 65 – column 9, line 7).

As recited in claims 7, 29, and 35, Jones et al. disclose the apparatus, wherein the controller comprises a programmable controller including a processing unit for executing a control program and including a memory for storing multiple window or panel speed values corresponding to a signal received from the sensor (column 6, lines 52-60).

As recited in claims 8 and 30, Jones et al. disclose the apparatus, additionally comprising one or more limit switches (11) for use by the controller to determine window or panel position for use in identifying a collision.

As recited in claim 9, Jones et al. disclose the apparatus, wherein the control program adjusts an obstacle detection threshold in real time based on immediate past measures of the signal sensed by the sensor to adapt to varying conditions encountered during operation of the window or panel (column 8, lines 65 – column 9, line 7).

As recited in claims 12, 19, 20, and 28, Jones et al. disclose apparatus for

controlling activation of a motor for moving an object along a travel path and de-activating the motor if an obstacle is encountered by the object comprising: a) a movement sensor for monitoring movement of the object as the motor moves said object along a travel path (discussed above; a switch for controlling energization of the motor with an energization signal (column 6, lines 52-60); and a controller (microcomputer 9) including an interface coupled to the switch means for controllably energizing the motor and said interface additionally coupling the controller to the movement sensor for monitoring signals from said movement sensor (discussed above; said controller comprising a stored program that: determines motor speed from an output signal from the movement sensor; calculates an obstacle detect threshold based on motor speed of movement detected during at least one prior period of motor operation (column 7, lines 6-36); compares a value based on currently sensed motor movement with the obstacle detect threshold; and outputs a signal from the interface to said switch for stopping the motor if the comparison based on currently sensed motor movement indicates the object has contacted an obstacle.

As recited in claim 13, Jones et al. disclose the apparatus, wherein the controller includes a buffer memory for storing successive values of motor movement for use in determining the obstacle detect threshold (column 8, lines 51-53).

As recited in claim 14, Jones et al. disclose the apparatus, wherein the controller includes a clock and an input from the movement sensor is in a form of a sequence of pulses and further wherein the controller counts clock signals occurrences between receipt of pulses to provide an indication of motor speed (column 7, lines 30-37).

As recited in claim 15, Jones et al. disclose the apparatus, wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a motor energization sequence a specified minimum time period in response to a short period user actuation of said control inputs to maintain position accuracy in monitoring a window or panel movement (column 7, lines 49-62).

As recited in claim 16, Jones et al. disclose the apparatus, wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the object and wherein in response to a specified input the controller conducts a (calibration motor energization sequence to determine parameters of object (column 7, lines 6-29).

As recited in claims 17 and 32, Jones et al. disclose the apparatus, wherein the motor is coupled to a motor vehicle window or panel and wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a position indication which is updated in response movement of the window or panel and further wherein the controller reverse actuations the motor near an end point in an object path of travel to avoid false obstacle detection in the region of closure of the window or panel.

As recited in claim 18, Jones et al. disclose the apparatus, wherein the sensor is a current sensor and wherein the controller includes means for adjusting the obstacle threshold based on dynamic motor current as sensed from the current sensor to take into account varying loads experienced by the motor (inherent via discussion above).

With respect to claims 21, 22, and 34, Okuyama et al. a Hall-effect sensor (6a-) and a magnetic pick-up (7a-).

As recited in claim 23, Jones et al. disclose the apparatus, additionally comprising an obstacle detector having an output coupled to the controller that senses a disruption in a region through which the window or panel moves (discussed above).

Claim Rejections - 35 USC § 103

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

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 24-27, 36, and 37, are rejected under 35 U.S.C. 103(a) as being unpatentable over Okuyama et al.

As recited in claim 24-27, Okuyama et al. do not disclose the apparatus, wherein the obstacle detector comprises an infrared light source and detector .

However, Official Notice is taken with respect to infrared light sources being well known in the art to detect movement of an object.

It would be obvious to use any type of sensor, because the teachings merely provide alternate means for providing the same, wherein one could substitute one sensor or detector for another.

With respect to claims 36 and 37, Okuyama et al. disclose the claimed invention except for the range in which the measurements are taken (40 milliseconds). It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide measurements at forty millisecond interval, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Response to Arguments

Applicant's arguments with respect to claims 1-37 have been considered but are moot in view of the new ground(s) of rejection.

The applicant argued that Wrenbeck et al. were not prior art. The examiner agrees. However, this required further search. The search reveal another reference which better read on the claims. The claims are rejected based on the newly cited reference.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marlon T. Fletcher whose telephone number is 571-272-2063. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lincoln Donovan can be reached on 571-272-1988. 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.

MTF
10/25/2007

Marlon Fletcher
Primary Examiner

Notice of References Cited	Application/Control No. 10/765,487	Applicant(s)/Patent Under Reexamination BOISVERT ET AL.	
	Examiner Marlon T. Fletcher	Art Unit 2837	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-4,608,637	08-1986	Okuyama et al.	701/49
	B	US-			
	C	US-			
	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
	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	

*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.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10765487	BOISVERT ET AL.
	Examiner	**Art Unit**
	Fletcher, Marlon T	2837

✓	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	10/25/2007								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
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	35	✓								
	36	✓								

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10765487	BOISVERT ET AL.
	Examiner	**Art Unit**
	Fletcher, Marlon T	2837

✓	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	10/25/2007								
	37	✓								

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10765487	BOISVERT ET AL.
	Examiner	**Art Unit**
	Fletcher, Marlon T	2837

SEARCHED			
Class	**Subclass**	**Date**	**Examiner**

SEARCH NOTES		
Search Notes	**Date**	**Examiner**
EAST TEXT SEARCH: SEE SEARCH HISTORY PRINTOUT	10/25/2007	MTF

INTERFERENCE SEARCH			
Class	**Subclass**	**Date**	**Examiner**

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Mario Boisvert *et al.*

Serial No.: 10/765,487

Filing Date: January 27, 2004

Title: COLLISION MONITORING SYSTEM

Examiner: Marlon T. Fletcher

Art Unit: 2837

Docket No.: 14-733C2D1

Tarolli, Sundheim, Covell & Tummino, LLP
Suite 1700
1300 East Ninth Street
Cleveland, OH 44114

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

Amendment

In response to the office action having a mailing date of October 31, 2007, please amend this application as follows:

Claim Status

1. (Currently Amended) Apparatus for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said apparatus comprising:

a) a sensor for measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element;

b) a memory for storing a number of measurement values from the sensor based on immediate past measurements of said parameter over at least a portion of a present traversal of said motor driven element through said range of motion;

c) a controller coupled to the memory for determining to de-activate the motor based on a most recent sensor measurement of the parameter and the immediate past measurement values stored in the memory ~~as the motor driven element moves over its~~ obtained during a present run through the motor driven element range of motion; and

d) a controller interface coupled to the motor for altering motion of said motor driven element during the present run in response to a determination made by the controller.

2. (Currently Amended) A method for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said method comprising:

a) measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element by taking a multiplicity of measurements as the motor moves the motor driven element over its range of motion;

b) storing a number of measurement values based on measurements of said parameter over ~~at least a~~ an immediate past portion of a present run through said range of motion;

c) determining that the parameter is outside a parameter range based on ~~previous~~ stored measurement values obtained during the immediate past portion as the motor driven element moves over its range of motion; and

d) altering motion of said motor driven element during the present run in response to a determination that the parameter is outside the parameter range.

3. (Original) The method of claim 2 wherein the motor driven element is a window or panel and additionally comprising reverse actuating the window or panel prior to moving said window or panel in a direction to close the window or panel.

4. (Original) The method of claim 3 additionally comprising maintaining a position of the window or panel based on the sensed parameter and the reverse actuation is initiated if a leading edge of the window or panel is near a closed position.

5. (Original) The method of claim 4 movement is first initiated toward a closed position when a leading edge of the window or panel is near the closed position and wherein the reverse actuation is performed upon a sensing of an obstacle that is based on determining the parameter is outside the parameter range.

6. (Previously Presented) Apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving said window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel, said apparatus comprising:

a) a sensor for sensing movement of the window or panel and providing a sensor output signal related to a speed of movement of the window or panel;

b) a switch for controllably actuating the motor by providing an energization signal; and

c) a controller having an interface coupled to the sensor and the switch for controllably energizing the motor; said controller sensing a collision with an obstruction

when power is applied to the controller by:

i) monitoring movement of the window or panel by monitoring a signal from the sensor related to the movement of the window or panel;

ii) adjusting an obstacle detection threshold in real time based on immediate past measurements of the signal sensed by the sensor to adapt to varying conditions encountered during operation of the window or panel;

iii) identifying a collision of the window or panel with an obstacle due to a change in the signal from the sensor that is related to a change in movement of the window or panel by comparing a value based on a most recent signal from the sensor with the obstacle detection threshold; and

iv) outputting a control signal to said switch to deactivate said motor in response to a sensing of a collision between an obstacle and said window or panel.

7. (Original) The apparatus of claim 6 wherein the controller comprises a programmable controller including a processing unit for executing a control program and including a memory for storing multiple window or panel speed values corresponding to a signal received from the sensor.

8. (Original) The apparatus of claim 6 additionally comprising one or more limit switches for use by the controller to determine window or panel position for use in identifying a collision.

9. (Cancelled)

10. (Original) The apparatus of claim 6 wherein the controller maintains a position of a leading edge of the window or panel and further wherein the controller reverse energizes the motor to move the window or panel away from a closure position prior to activating the motor to close the window or panel.

11. (Original) The apparatus of claim 10 wherein the controller reverse energizes the motor in response to a sensing of an obstacle and the reverse energizing and attempt to move the window or panel to a closed position is performed to confirm sensing of the obstacle.

12. (Previously Presented) Apparatus for controlling activation of a motor for moving an object along a travel path and de-activating the motor if an obstacle is encountered by the object comprising:

a) a movement sensor for monitoring movement of the object as the motor moves said object along a travel path;

b) a switch for controlling energization of the motor with an energization signal; and

c) a controller including an interface coupled to the switch for controllably energizing the motor and said interface additionally coupling the controller to the movement sensor for monitoring signals from said movement sensor; said controller comprising a stored program that:

i) determines motor speed of movement from an output signal from the movement sensor ;

ii) calculates an obstacle detect threshold based on motor speed of movement detected during a present run of said motor driven element;

iii) compares a value based on currently sensed motor speed of movement with the obstacle detect threshold; and

iv) outputs a signal from the interface to said switch for stopping the motor if the comparison based on currently sensed motor movement indicates the object has contacted an obstacle.

13. (Original) The apparatus of claim 12 wherein the controller includes a buffer memory for storing successive values of motor movement for use in determining the obstacle detect threshold.

14. (Original) The apparatus of claim 12 wherein the controller includes a clock and an input from the movement sensor is in a form of a sequence of pulses and further wherein the controller counts clock signals occurrences between receipt of pulses to provide an indication of motor speed.

15. (Original) The apparatus of claim 12 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a motor energization sequence a specified minimum time period in response to a short period user actuation of said control inputs to maintain position accuracy in monitoring window or panel movement.

16. (Original) The apparatus of claim 12 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the object and wherein in response to a specified input the controller conducts a calibration motor energization sequence to determine parameters of object.

17. (Original) The apparatus of claim 12 wherein the motor is coupled to a motor vehicle window or panel and wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a position indication which is updated in response movement of the window or panel and further wherein the controller reverse actuations the motor near an end point in an object path of travel to avoid false obstacle detection in the region of closure of the window or panel.

18. (Original) The apparatus of claim 12 wherein the sensor is a current sensor and wherein the controller includes means for adjusting the obstacle threshold based on dynamic motor current as sensed from the current sensor to take into account varying loads experienced by the motor.

19. (Currently Amended) Apparatus for controlling activation of a motor for moving a window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel comprising:

a) a sensor for sensing movement of a window or panel along a travel path;

b) a switch for controlling energization of the motor with an energization signal; and

c) a controller coupled to the switch for controllably energizing the motor and having an interface coupling the controller to the sensor and to the switch; said controller comprising decision making logic for:

i) monitoring a signal from the sensor;

ii) calculating a real time obstacle detect threshold based on the signal that is detected during at least one prior period of motor operation during movement along a present or current run through a path of travel of said window or panel ;

iii) comparing a value based on a currently sensed motor parameter with the obstacle detect threshold; and

iv) stopping movement of the window or panel by controlling an output to said switch that controls motor energization if the comparison based on a currently sensed motor parameter indicates the window or panel has contacted an obstacle.

20. (Previously Presented) Apparatus for controlling activation of a motor for moving a window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel comprising:

a) a sensor for generating speed signals representative of the window or panel speed as the motor moves the window or panel along a travel path;

b) an obstacle detection controller for monitoring at least a part of the travel path of the window or panel for sensing and generating an obstacle detect signal indicating the presence in said travel path of an obstacle to movement of the window or panel;

c) a switch coupled to said controller for controlling energization of the motor with an energization signal; and

d) said controller for processing speed signals and obstacle detection signals and controlling operation of the motor in response to said speed or obstacle detection signals; said controller including:

i) a storage for storing a number of speed signals that vary with motor speed;

ii) a processor for calculating an obstacle detect threshold based on one or more speed signals stored in said storage obtained in real time based on immediate past measures of the speed signal sensed by the sensor to adapt to varying conditions encountered during movement along a present path of travel of said window or panel;

iii) a logic unit for making a comparison between a value representing window or panel speed based on a currently sensed motor speed signal with the calculated obstacle detect threshold, and generating a control output if an obstacle is detected based on said comparison; and

iv) an interface coupled to said switch for changing the state of the switch to stop the motor.

21. (Original) The apparatus of claim 20 wherein the sensor for generating a speed signal comprises a Hall-effect sensor.

22. (Original) The apparatus of claim 20 wherein the sensor for generating a speed signal comprises a magnetic pick-up.

23. (Original) The apparatus of claim 20 additionally comprising an obstacle detector having an output coupled to the controller that senses a disruption in a region through which the window or panel moves.

24. (Original) The apparatus of claim 23 wherein the obstacle detector comprises a microwave generator and a reflected wave transducer.

25. (Original) The apparatus of claim 23 wherein the obstacle detector comprises an infrared light source and detector.

26. (Previously Presented) The apparatus of claim 23 wherein the obstacle detector comprises a field effect device.

27. (Previously Presented) The apparatus of claim 26 wherein the field effect device comprises a magnetic field inductive sensor.

28. (Currently Amended) Apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving said window or panel along a travel path and de-activating the motor when the window or panel is within an acceptable range of a predetermined position ~~is encountered by the window or panel~~, said apparatus comprising:

a) a sensor for sensing movement of the window or panel and providing a sensor output signal related to a position of the window or panel;

b) a switch for controllably actuating the motor by providing an energization signal; and

c) a controller having an interface coupled to the sensor and the switch for controllably energizing the motor; said controller determining the position of the window or panel when power is applied to the controller by:

i) ~~monitoring the position of the window or panel by~~ monitoring the sensor output signal from the sensor related to the position of the window or panel;

ii) identifying the position of the window or panel based on the sensor output signal from the sensor; and

iii) outputting a control signal to said switch to deactivate said motor in

response to a sensing of ~~the predetermined position of~~ said window or panel within the acceptable range.

29. (Previously Presented) The apparatus of claim 28 wherein the controller comprises a programmable controller including a processing unit for executing a control program and including a memory for storing multiple window or panel position values corresponding to a signal received from the sensor.

30. (Currently Amended) The apparatus of claim 28 additionally comprising ~~one or more~~ multiple position limits that define the acceptable range programmed for use by the controller to determine ~~window or panel position for use in identifying~~ whether the window or panel is closed or open.

31. (Previously Presented) The apparatus of claim 28 wherein the controller maintains a position of a leading edge of the window or panel and further wherein the controller reverse energizes the motor to move the window or panel away from a closure position prior to activating the motor to close the window or panel.

32. (Previously Presented) The apparatus of claim 28 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the motor vehicle window or panel and wherein the controller maintain a position indication which is updated in response to movement of the window or panel and further wherein the controller reverse actuates the motor near an end point in the travel path of the window or panel to avoid false obstacle detection in a region of closure of the window or panel.

33. (Previously Presented) Apparatus for controlling activation of a motor for moving a motor driven element in a vehicle over a range of motion and de-activating the motor when undesirable resistance to motion of the element is encountered, the apparatus comprising:

a) a sensor for sensing a speed of the motor and generating an output signal representative of a speed of the motor, a speed of the motor changing when undesirable resistance to motion of the element is encountered;

b) a switch for controlling activation of the motor; and

c) a controller coupled to the sensor and the switch, the controller receiving the sensor output signal from the sensor and outputting a control signal to the switch to de-activate the motor if the sensor output signal indicates that the element has encountered undesirable resistance to motion.

34. (Previously Presented) The apparatus of claim 33 wherein the sensor includes a Hall effect sensor.

35. (Previously Presented) The apparatus of claim 33 wherein the apparatus includes a memory for storing values corresponding to the sensor output signal over at least a portion of the range of motion of the element and the controller analyzes the sensor output signal values stored in the memory to determine if the control signal to de-activate the motor should be output to the switch.

36. (Previously Presented) The apparatus of claim 1 wherein the immediate past measurements of said parameter were taken within a forty millisecond interval prior to the most recent sensor measurement.

37. (Previously Presented) The apparatus of claim 6 wherein the immediate past measurements of said signal are sensed within a forty millisecond interval prior to the most recent signal from the sensor.

REMARKS

Claims 1, 2, 19, 28, and 30 are amended. Claim 9 has been cancelled without prejudice or disclaimer. Claims 1-8 and 10-37 are currently pending. Reconsideration of pending claims in view of the above amendments and following remarks is respectfully requested.

Claim 1 features apparatus for controlling motion of a motor driven element in a vehicle over a range of motion and for altering that motion when undesirable resistance to motion is encountered. A sensor measures a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element. A memory is used to store a number of measurement values from the sensor based on immediate past measurements of the parameter over at least a portion of a present path of travel of the motor driven element through its range of motion. A controller coupled to the memory determines whether to de-activate the motor based on a most recent sensor measurement of the parameter and the immediate past measurement values stored in the memory that were obtained during a present run through the motor driven element the range of motion. A controller interface coupled to the motor alters motion of the motor driven element during the present run in response to a determination made by the controller.

A system constructed in accordance with the features of claim 1 allows the controller to adjust collision detection based on real time data obtained during a present run of the window or panel through its range of motion and this is clearly neither shown nor suggested by the prior art patent to Okuyama *et al.* (US 4,608,637).

Analysis regarding anticipation rejection of claim 1.

Okuyama *et al*. fails to anticipate claim 1 as "[a] claim is anticipated only if each and every element as set forth in the claim is found." *Verdegaal Bros. v. Union Oil Co.,* 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The controller featured in claim 1 performs collision detection based on *real time data obtained during a present run* of the window

or panel. This is to be contrasted with the system disclosed by the Okuyama *et al.* system, which uses training data stored by the controller during a previous run to signal a collision between a window and an obstacle. For this reason the Okuyama *et al.* patent neither anticipates nor renders obvious the structure of claim 1.

There are two situations disclosed in the '637 patent for stopping the motor. During normal operation, when the motor has driven the window to a so called goal position it is stopped. *See* col. 18, lines 35 – 40. A second condition for stopping the motor occurs when an overcurrent condition is sensed. The sensed motor current is compared with a table of stored values. *See* table 8 of Okuyama *et al.*

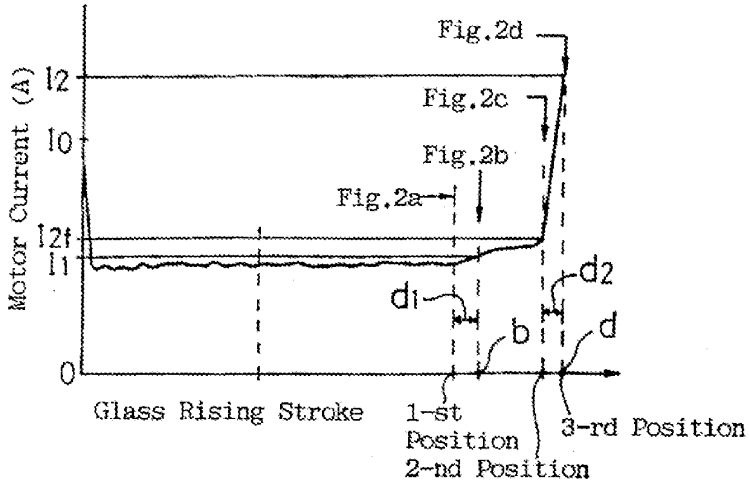
The Examiner's anticipation rejection of claim 1 is articulated at page 2 of the October 31, 2007 office action. The examiner states that the sensors 6a, 6ab *etc.* can be interpreted to be the sensors for measuring "a parameter of a motor" and then states that the Okuyama *et al.* patent at column 7, lines 49 – 62 shows measuring this parameter as the parameter varies in response to a resistance to motion. As an initial comment, the sensors 6a *etc.* of the '637 patent generate pulses rather than providing a means for measuring a parameter.

The parameter referred to by the Examiner at column 7, lines 49 – 62 (col. 7) is an overload current derived from an A/D converter. This motor current parameter is most definitely **not** monitored by the sensors 6a, 6ab *etc.* to which the Examiner refers. It is requested that the Examiner identify which parameter (position or motor current) he is referring to in the reference to col. 7, lines 49 – 62. This inconsistency makes the Examiner's rejection difficult to interpret.

A memory is also referred to by the Examiner whose function is described at column 8, lines 51 – 64 and whose contents are stored in table 6. This memory is for storing three positions per window (note since four windows are referenced, there are a total of 12 positions stored) in terms of counts from a zero position. Depending on the direction of motion, each pulse from the sensor (6a for example) increments or decrements a value corresponding to the then current position. The contents of table 6, *i.e.* 1st position, 2nd position and 3rd position, (*See* column 8, lines 51 – 64, referenced

by the Examiner) are count totals (obtained from the sensor 6a for example) described in reference to Figure 3a which is reproduced below.

Fig.3a



The Examiner's reference to the parameter as being both position (table 6) and motor current, (col. 7, lines 49 – 62) is confusing. Claim 1, however, patentably distinquishes from any possible interpretation of the '637 patent.

Returning to the language of claim 1, the claim calls for "a memory for storing *a* number of measurement values from the sensor based on immediate past measurements of said parameter" as well as "a controller coupled to the memory for determining to de-activate the motor *based on a most recent sensor measurement of the parameter and the immediate past measurement values stored in the memory obtained during a present run through the motor driven element's range of motion*."

There is no teaching in the '637 patent for the italicized features of claim 1. If the measurement values stored in memory are position values (since two out of the three text references identified by the Examiner in the claim 1 rejection relate to position this is perhaps the Examiner's intent), then clearly these features are not shown (nor are they suggested) by the '637 patent. Under the Examiner's interpretation, receipt of a

sensor generated pulse by the '637 system could shut down the motor based on the value of an immediate past stored position value. This is not the case since the values stored in table 6 are stored during a calibration run rather than during an immediate past measurement stored in the memory as the motor driven element moves over its range of motion. For this reason claim 1 is neither shown, nor is it suggested by the '637 patent.

Additional claim analysis

Claim 2 features a method for controlling motion of a motor driven element in a vehicle over a range of motion and for altering the motion when undesirable resistance to the motion is encountered. The method is performed by measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element by taking a multiplicity of measurements as the motor moves the motor driven element over its range of motion. A number of measurement values are stored based on measurements of the motor parameter over *an immediate past portion of the present run through* its range of motion. If the parameter is determined to be outside a parameter range based on previous stored measurement values as the motor driven element moves over its range of motion, the method of claim 2 alters motion of said motor driven element.

The distinctions noted above with regard to claim 1 are pertinent to claim 2. There is no teaching or suggestion of the italicized reference to a motor parameter obtained during an immediate past portion of the present run being stored nor used to make a determination and therefore claim 2 is allowable.

Claims 3 – 5 depend from allowable claim 2 and are also allowable. As a point of clarification, the summary of the rejection for these claims mention the '637 patent to Okuyama *et al.* but the detailed rejection, (*See* page 3, line 3 of the office action) mention a prior art patent to Jones *et al.* Clarification is requested.

Claim 6 features apparatus for controlling activation of a motor coupled to a

motor vehicle window or panel that moves the window or panel along a travel path and de-activates if an obstacle is encountered by the window or panel.

The apparatus includes a sensor for sensing movement of the window or panel and providing a sensor output signal related to a speed of movement of the window or panel; a switch for controllably actuating the motor by providing an energization signal; and a controller having an interface coupled to the sensor and the switch for controllably energizing the motor.

The controller senses a collision with an obstruction when power is applied to the controller by:

i) monitoring movement of the window or panel by monitoring a signal from the sensor related to the movement of the window or panel;

ii) *adjusting an obstacle detection threshold in real time based on immediate past measurements of the signal sensed by the sensor to adapt to varying conditions encountered during operation of the window or panel*;

iii) identifying a collision of the window or panel with an obstacle due to a change in the signal from the sensor that is related to a change in movement of the window or panel by comparing a value based on a most recent signal from the sensor with the obstacle detection threshold; and

iv) outputting a control signal to said switch to deactivate said motor in response to a sensing of a collision between an obstacle and said window or panel.

It is assumed that although the Jones *et al.* patent is mentioned at page 3, line 16, the Examiner intends to use the Okuyama *et al.* patent especially in view of the recitation of the same column and line numbers from Okuyama *et al.* used in discussing claims 1 and 2.

The italicized portions of the paraphrased portions of claim 6 relating to real time measurements of a signal to adjust a threshold are neither shown nor suggested by the prior art cited. For this reason claim 6 is allowable.

Claims 7, 8, 10 and 11 depend from allowable claim 6 and are also allowable.

Claim 12 features apparatus for controlling activation of a motor to move an

object along a travel path. The motor is de-activated if an obstacle is encountered by the object. A movement sensor monitors movement of the object as the motor moves the object along a travel path. A switch controls energization of the motor with an energization signal.

A controller has an interface coupled to the switch for controllably energizing the motor. The interface also couples the controller to the movement sensor to monitor signals from the movement sensor. The controller has a stored program that:

i) determines motor speed of movement from an output signal from the movement sensor;

ii) calculates an obstacle detect threshold based on motor speed of movement detected during a present run of said motor driven element;

iii) compares a value based on currently sensed motor speed of movement with the obstacle detect threshold; and

iv) outputs a signal from the interface to said switch for stopping the motor if the comparison based on currently sensed motor movement indicates the object has contacted an obstacle.

The Examiner asserts the italicized portion of claim 12 relating to a determination of motor speed is taught at col. 7, lines 6 – 36 of Okuyama *et al.* Reading of this portion of the ''637 patent fails to disclose this feature, nor does is suggest this feature. For at least this reason claim 12 is patentable. Claims 13 – 18 depend from allowable claim 12 and are also allowable.

Claim 19 features apparatus for controlling activation of a motor for moving a window or panel along a travel path. The motor is de-activated if an obstacle is encountered by the window or panel. A sensor senses movement of a window or panel along a travel path. A switch controls energization of the motor with an energization signal. A controller coupled to the switch for controllably energizing the motor and having an interface coupling the controller to the sensor and to the switch. The controller comprises decision making logic for:

i) monitoring a signal from the sensor;

ii) *calculating a real time obstacle detect threshold based on the signal that is detected during at least one prior period of motor operation during movement along a present or current run along a path of travel of said window or panel ;*

iii) comparing a value based on a currently sensed motor parameter with the obstacle detect threshold; and

iv) stopping movement of the window or panel by controlling an output to said switch that controls motor energization if the comparison based on a currently sensed motor parameter indicates the window or panel has contacted an obstacle.

Since the Okuyama *et al.* prior art patent neither shows nor suggested the italicized portion of the claim relating to a real time obstacle detection threshold, this claim is allowable.

Claim 20 features apparatus for controlling activation of a motor for moving a window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel. A sensor generates speed signals representative of the window or panel speed as the motor moves the window or panel along a travel path. An obstacle detection controller monitors at least a part of the travel path of the window or panel to sense and generate an obstacle detect signal indicating the presence in said travel path of an obstacle to movement of the window or panel. A switch coupled to said controller for controls energization of the motor with an energization signal.

The controller featured in claim 20 processes speed signals and obstacle detection signals and controls operation of the motor in response to said speed or obstacle detection signals. The controller has

i) a storage for storing a number of speed signals that vary with motor speed;

ii) a processor for calculating an obstacle detect threshold based on one or more speed signals stored in said storage obtained in real time based on immediate past measures of the speed signal sensed by the sensor to adapt to varying conditions encountered during movement along a present path of travel of said window or panel;

iii) a logic unit for making a comparison between a value representing window or

panel speed based on a currently sensed motor speed signal with the calculated obstacle detect threshold, and generating a control output if an obstacle is detected based on said comparison; and

iv) an interface coupled to said switch for changing the state of the switch to stop the motor.

The '637 patent to Okuyama *et al.* does not show or suggest the italicized features of claim 20. The only potential speed signals that are received are the pulses transmitted by the sensors 6a *etc.* to the controller. These signals are not stored in memory, however, but are instead used to increment or decrement a position indicator that relates to the number of counts from a zero position for the window. For at least this reason, claim 20 is not anticipated.

Claims 21 – 27 depend from allowable claim 20 and are also allowable.

Analysis regarding obviousness rejection of claims 24 – 27, 36, and 37.

The Office Action stated that claims 24-27, 36 and 37 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okuyama *et al.* The M.P.E.P. sets forth the criteria for a rejection for obviousness as follows:

> [t]o establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure.

See, MPEP § 706.02(j) *citing In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Okuyama *et al.* fails to satisfy the above *prima facie* criteria set fourth above and as such, the rejection is respectfully traversed.

In particular, the Office Action states that Official Notice is taken with respect to

claims 24-27, stating "that Okuyama *et al.* does not disclose the apparatus, wherein the obstacle detector comprises an infrared light source and detector" and that "Official Notice is taken with respect to infrared light sources being well known in the art to detect movement of an object." *See* Office Action at page 7. It is respectfully pointed out that *only* claim 25 discusses an infrared light source and detector. Therefore, the rejection with respect to claims 24 and 26-27, respectfully remain unaddressed and are assumed to be in allowable condition.

The Examiner's reliance on Official Notice with respect to claim 25 is respectfully misplaced as it is not considered to be common knowledge to use an infrared light source and detector as an obstacle detector in an apparatus for controlling the movement of a window. Accordingly, the rejection with respect to claim 25 is respectfully traversed. "If the examiner is relying on personal knowledge to support the finding of what is known in the art, the examiner must provide an affidavit or declaration setting forth specific factual statements and explanation to support the finding." *See* M.P.E.P. 2144.03(C) citing 37 C.F.R. 1.104(d)(2). Further, claims 24-27, 36, and 37 depend either directly or indirectly from nonobvious independent claim 20, 1, and 6, respectively, and are allowable as a result of their dependency and because of their own distinctive features. Accordingly, claims 24-27, 36 and 37 are in condition for allowance and a notice to that effect is respectfully requested.

Claim 28 features apparatus for controlling activation of a motor coupled to a motor vehicle window or panel as the window or panel moves along a travel path. The motor is de-activated when the window or panel is within an acceptable range of a predetermined position. A sensor senses movement of the window or panel and provides a sensor output signal related to a position of the window or panel. A switch controllably actuates the motor by providing an energization signal.

A controller has an interface coupled to the sensor and the switch for controllably energizing the motor. The controller determines the position of the window or panel when power is applied to the controller by monitoring the sensor output signal from the sensor related to the position of the window or panel and identifying the position of the

window or panel based on the sensor output signal from the sensor. The controller outputs a control signal to the switch to deactivate the motor in response to a sensing of said window or panel within the acceptable range.

Support for the additional recitations added by amendment to claim 28 is found in the current application at, for example Page 40, Lines 10-14; and Page 28, Last Line – Page 29, Lines 1-3 and these features are neither shown nor are they suggested in the prior art.

Claims 29 – 32 depend from allowable claim 28 and are allowable.

Claim 33 features apparatus for controlling activation of a motor for moving a motor driven element in a vehicle over a range of motion and de-activating the motor when undesirable resistance to motion of the element is encountered. *The apparatus includes a sensor for sensing a speed of the motor and generating an output signal representative of a speed of the motor*, a speed of the motor changing when undesirable resistance to motion of the element is encountered. A switch controls activation of the motor.

A controller is coupled to the sensor and the switch and receives the sensor output signal from the sensor and outputs a control signal to the switch to de-activate the motor if the sensor output signal indicates that the element has encountered undesirable resistance to motion.

The reference to col. 7, lines 30 – 37 of Okuyama *et al.* (See page 3, line 21 of office action) fails to teach or suggested the italicized features of claim 33 relating to sensing speed of movement and therefore this claim is allowable.

Claims 34 and 35 depend from allowable claim 33 and are allowable.

All claims are believed to be in condition for allowance and prompt issuance of a Notice of Allowance is respectfully requested. If any fees are determined to be due, the commissioner is authorized to charge those fees to deposit account no 20-0090.

Respectfully submitted,

Date: January 10, 2008

/Stephen J. Schultz/

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Electronic Acknowledgement Receipt	
EFS ID:	2697505
Application Number:	10765487
International Application Number:	
Confirmation Number:	9537
Title of Invention:	Collision monitoring system
First Named Inventor/Applicant Name:	Mario Boisvert
Customer Number:	28060
Filer:	Stephen J. Schultz
Filer Authorized By:	
Attorney Docket Number:	14-733C2D1
Receipt Date:	10-JAN-2008
Filing Date:	27-JAN-2004
Time Stamp:	13:45:03
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		14733C2D1Amendment.pdf	191952 fff364834561e56f47bb34ad61b6c5c2e953241e	yes	22

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment - After Non-Final Rejection	1	1
	Claims	2	11
	Applicant Arguments/Remarks Made in an Amendment	12	22
Warnings:			
Information:			
	Total Files Size (in bytes):	191952	

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 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 10/765,487	Filing Date 01/27/2004	☐ To be Mailed

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☒		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			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 $250 ($125 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			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	01/10/2008	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 36	Minus	** 36	= 0	X $25 =	0	OR	X $ =	
	Independent (37 CFR 1.16(h))	* 8	Minus	***8	= 0	X $105 =	0	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	0	OR	TOTAL ADD'L FEE	

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
	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 number found in the appropriate box in column 1.

Legal Instrument Examiner:
/WANDA D. MITCHELL/

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.
10/765,487	01/27/2004	Mario Boisvert	14-733C2D1	9537

28060 7590 05/30/2008
TAROLLI, SUNDHELM, COVELL & TUMMINO, LLP
1300 EAST NINTH STREET
SUITE 1700
CLEVELAND, OH 44114

EXAMINER	
FLETCHER, MARLON T	
ART UNIT	PAPER NUMBER
2837	
MAIL DATE	DELIVERY MODE
05/30/2008	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.	Applicant(s)	
	10/765,487	BOISVERT ET AL.	
	Examiner	Art Unit	
	Marlon T. Fletcher	2837	

-- 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* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 January 2008*.

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

3)☐ 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

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-32,36 and 37* is/are allowed.

6)☒ Claim(s) *33-35* is/are rejected.

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

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

Application Papers

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

10)☐ The drawing(s) filed on _____ 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).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).

a)☐ All b)☐ Some * c)☐ None of:

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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. 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 –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 33-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Okuyama et al. (4,608,637).

Okuyama et al. disclose an apparatus for controlling motion of.a motor driven element over a range of motion and for altering said motion when undesirable resistance to the motion is encountered, said apparatus comprising: a sensor (6a, 6ab, 6d, 6da) for measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element (column 7, lines 49-62); a memory for storing a number of measurement values from the sensor based on measurements of said parameter over at least a portion of the range of motion (column 8, line 51-64); a controller (microcomputer 9) coupled to the memory for determining to de-activate the motor based on the measurement values stored in the memory as the motor driven element moves over its range of motion; and a controller interface coupled to the motor (Ma, Md, Mab, Mda) for altering motion of said motor driven element in response to a determination made by the controller (column 5, lines 9-60), wherein altering is also in response to a determination that the parameter is outside the parameter range.

As recited in claim 33, Okuyama et al. disclose an apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving said. window or panel along a travel path and deactivating the motor if an obstacle is encountered by the window or panel, said apparatus comprising: a sensor for sensing movement of the window or panel and providing a sensor output signal related to a speed of movement of the window or panel (discussed above; column 7, lines 30-37), and a controller having an interface coupled to the sensor and the switch for controllably energizing the motor (figure 4a); said controller sensing a collision with an obstruction when power is applied to the controller by: monitoring movement of the window or panel by monitoring a signal from the sensor related to the movement of the window or panel (column 7, lines 6-23; and column 8, lines 35-50), identifying a collision of the window or panel with an obstacle due to a change in the signal from the sensor that is related to a change in movement of the window or panel (Abstract; and column 8, lines 51-64); and outputting a control signal to said switch to deactivate said motor in response to a sensing of a collision between an obstacle and said window or panel (column 8, line 65 - column 9, line 7).

With respect to claims 34, Okuyama et al. a Hall-effect sensor (6a-) and a magnetic pick-up (7a-).

As recited in claim 35, Okuyama et al. disclose the apparatus, wherein the controller comprises a programmable controller including a processing unit for executing a control program and including a memory for storing multiple window or panel speed values corresponding to a signal received from the sensor (column 6, lines 52-60).

Allowable Subject Matter

3. Claims 1-32 and 36-37 are allowed.

Response to Arguments

Applicant's arguments filed 1/10/2008 have been fully considered but they are not persuasive.

Applicant's arguments are mostly persuasive. However, with regards to claims 33-35, the examiner believes that there is no distinction over the prior art. Therefore the rejection to those claims remain.

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 Marlon T. Fletcher whose telephone number is 571-272-2063. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lincoln Donovan can be reached on 571-272-1988. 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.

MTF
05/27/2008

/Marlon T Fletcher/
Primary Examiner, Art Unit 2837

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10765487	BOISVERT ET AL.
	Examiner	Art Unit
	Fletcher, Marlon T	2837

✓	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	05/27/2008								
	1	=								
	2	=								
	3	=								
	4	=								
	5	=								
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	26	=								
	27	=								
	28	=								
	29	=								
	30	=								
	31	=								
	32	=								
	33	✓								
	34	✓								
	35	✓								
	36	=								

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10765487	BOISVERT ET AL.
	Examiner	**Art Unit**
	Fletcher, Marlon T	2837

✓	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	05/27/2008								
	37	=								

PTO/SB/08b (01-08)
Approved for use through 06/30/2008. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 2 of 2

	Complete if Known
Application Number	10/765,487
Filing Date	01/27/2004
First Named Inventor	Mario Boisvert
Art Unit	2837
Examiner Name	Marlon T. Fletcher
Attorney Docket Number	14-733C2D1

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
		Provisional Application No. 60/152,605 filed on September 8, 1999, to which Patent No. 6,377,009, issued on April 23, 2002 claims priority	
		9 pages total - cover sheet (2 pages), specification (4 pages), drawings (3 pages)	

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.98. 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 2 hours 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, 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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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.

PTO/SB/30EFS (03/08)
Approved for use through 05/31/2008. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	10765487	Filing Date	2004-01-27	Docket Number (if applicable)	14-733C2D1	Art Unit	2837
First Named Inventor	Mario Boisvert			Examiner Name	Marlon T. Fletcher		

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 200090

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (03/08)
Approved for use through 05/31/2008. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Signature of Registered U.S. Patent Practitioner			
Signature	/Stephen J. Schultz/	Date (YYYY-MM-DD)	2008-06-05
Name	Stephen J. Schultz	Registration Number	29108

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.

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

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 the Freedom of Information Act requires disclosure of these record s.

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 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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF ELECTRONIC TRANSMISSION

I hereby certify that this Amendment is being filed today with the U.S. Patent and Trademark Office *via* electronic filing using the U.S. Patent Office's EFS Web System.

On: June 5, 2008

By: /Carrie A. Lewis/
Carrie A. Lewis

Application of: Mario Boisvert *et al.*

Serial No.: 10/765,487

Filing Date: January 27, 2004

Title: *COLLISION MONITORING SYSTEM*

Examiner: Marlon T. Fletcher

Art Unit: 2837

Docket No.: 14-733C2D1

Tarolli, Sundheim, Covell
& Tummino, LLP
1300 East Ninth Street, Suite 1700
Cleveland, OH 44114

AMENDMENT

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

Dear Sir:

Pursuant to the Request for Continued Examination that is filed herewith, entry and consideration of the present Amendment that is responsive to the Final Office Action mailed May 30, 2008, is requested.

In the Claims:

1. (Previously Presented) Apparatus for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said apparatus comprising:

a) a sensor for measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element;

b) a memory for storing a number of measurement values from the sensor based on immediate past measurements of said parameter over at least a portion of a present traversal of said motor driven element through said range of motion;

c) a controller coupled to the memory for determining to de-activate the motor based on a most recent sensor measurement of the parameter and the immediate past measurement values stored in the memory obtained during a present run through the motor driven element range of motion; and

d) a controller interface coupled to the motor for altering motion of said motor driven element during the present run in response to a determination made by the controller.

2. (Previously Presented) A method for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said method comprising:

a) measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element by taking a multiplicity of measurements as the motor moves the motor driven element over its range of motion;

b) storing a number of measurement values based on measurements of said parameter over an immediate past portion of a present run through said range of motion;

c) determining that the parameter is outside a parameter range based on stored measurement values obtained during the immediate past portion as the motor driven element moves over its range of motion; and

d) altering motion of said motor driven element during the present run in response to a determination that the parameter is outside the parameter range.

3. (Original) The method of claim 2 wherein the motor driven element is a window or panel and additionally comprising reverse actuating the window or panel prior to moving said window or panel in a direction to close the window or panel.

4. (Original) The method of claim 3 additionally comprising maintaining a position of the window or panel based on the sensed parameter and the reverse actuation is initiated if a leading edge of the window or panel is near a closed position.

5. (Original) The method of claim 4 movement is first initiated toward a closed position when a leading edge of the window or panel is near the closed position and wherein the reverse actuation is performed upon a sensing of an obstacle that is based on determining the parameter is outside the parameter range.

6. (Previously Presented) Apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving said window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel, said apparatus comprising:

a) a sensor for sensing movement of the window or panel and providing a sensor output signal related to a speed of movement of the window or panel;

b) a switch for controllably actuating the motor by providing an energization signal; and

c) a controller having an interface coupled to the sensor and the switch for controllably energizing the motor; said controller sensing a collision with an obstruction

when power is applied to the controller by:

i) monitoring movement of the window or panel by monitoring a signal from the sensor related to the movement of the window or panel;

ii) adjusting an obstacle detection threshold in real time based on immediate past measurements of the signal sensed by the sensor to adapt to varying conditions encountered during operation of the window or panel;

iii) identifying a collision of the window or panel with an obstacle due to a change in the signal from the sensor that is related to a change in movement of the window or panel by comparing a value based on a most recent signal from the sensor with the obstacle detection threshold; and

iv) outputting a control signal to said switch to deactivate said motor in response to a sensing of a collision between an obstacle and said window or panel.

7. (Original) The apparatus of claim 6 wherein the controller comprises a programmable controller including a processing unit for executing a control program and including a memory for storing multiple window or panel speed values corresponding to a signal received from the sensor.

8. (Original) The apparatus of claim 6 additionally comprising one or more limit switches for use by the controller to determine window or panel position for use in identifying a collision.

9. (Cancelled) without prejudice or disclaimer.

10. (Original) The apparatus of claim 6 wherein the controller maintains a position of a leading edge of the window or panel and further wherein the controller reverse energizes the motor to move the window or panel away from a closure position prior to activating the motor to close the window or panel.

11. (Original) The apparatus of claim 10 wherein the controller reverse energizes the motor in response to a sensing of an obstacle and the reverse energizing and attempt to move the window or panel to a closed position is performed to confirm sensing of the obstacle.

12. (Previously Presented) Apparatus for controlling activation of a motor for moving an object along a travel path and de-activating the motor if an obstacle is encountered by the object comprising:

a) a movement sensor for monitoring movement of the object as the motor moves said object along a travel path;

b) a switch for controlling energization of the motor with an energization signal; and

c) a controller including an interface coupled to the switch for controllably energizing the motor and said interface additionally coupling the controller to the movement sensor for monitoring signals from said movement sensor; said controller comprising a stored program that:

i) determines motor speed of movement from an output signal from the movement sensor ;

ii) calculates an obstacle detect threshold based on motor speed of movement detected during a present run of said motor driven element;

iii) compares a value based on currently sensed motor speed of movement with the obstacle detect threshold; and

iv) outputs a signal from the interface to said switch for stopping the motor if the comparison based on currently sensed motor movement indicates the object has contacted an obstacle.

13. (Original) The apparatus of claim 12 wherein the controller includes a buffer memory for storing successive values of motor movement for use in determining the obstacle detect threshold.

14. (Original) The apparatus of claim 12 wherein the controller includes a clock and an input from the movement sensor is in a form of a sequence of pulses and further wherein the controller counts clock signals occurrences between receipt of pulses to provide an indication of motor speed.

15. (Original) The apparatus of claim 12 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a motor energization sequence a specified minimum time period in response to a short period user actuation of said control inputs to maintain position accuracy in monitoring window or panel movement.

16. (Original) The apparatus of claim 12 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the object and wherein in response to a specified input the controller conducts a calibration motor energization sequence to determine parameters of object.

17. (Original) The apparatus of claim 12 wherein the motor is coupled to a motor vehicle window or panel and wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a position indication which is updated in response movement of the window or panel and further wherein the controller reverse actuations the motor near an end point in an object path of travel to avoid false obstacle detection in the region of closure of the window or panel.

18. (Original) The apparatus of claim 12 wherein the sensor is a current sensor and wherein the controller includes means for adjusting the obstacle threshold based on dynamic motor current as sensed from the current sensor to take into account varying loads experienced by the motor.

19. (Previously Presented) Apparatus for controlling activation of a motor for moving a window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel comprising:

a) a sensor for sensing movement of a window or panel along a travel path;

b) a switch for controlling energization of the motor with an energization signal; and

c) a controller coupled to the switch for controllably energizing the motor and having an interface coupling the controller to the sensor and to the switch; said controller comprising decision making logic for:

i) monitoring a signal from the sensor;

ii) calculating a real time obstacle detect threshold based on the signal that is detected during at least one prior period of motor operation during movement along a present or current run through a path of travel of said window or panel ;

iii) comparing a value based on a currently sensed motor parameter with the obstacle detect threshold; and

iv) stopping movement of the window or panel by controlling an output to said switch that controls motor energization if the comparison based on a currently sensed motor parameter indicates the window or panel has contacted an obstacle.

20. (Previously Presented) Apparatus for controlling activation of a motor for moving a window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel comprising:

a) a sensor for generating speed signals representative of the window or panel speed as the motor moves the window or panel along a travel path;

b) an obstacle detection controller for monitoring at least a part of the travel path of the window or panel for sensing and generating an obstacle detect signal indicating the presence in said travel path of an obstacle to movement of the window or panel;

c) a switch coupled to said controller for controlling energization of the motor with an energization signal; and

d) said controller for processing speed signals and obstacle detection signals and controlling operation of the motor in response to said speed or obstacle detection signals; said controller including:

i) a storage for storing a number of speed signals that vary with motor speed;

ii) a processor for calculating an obstacle detect threshold based on one or more speed signals stored in said storage obtained in real time based on immediate past measures of the speed signal sensed by the sensor to adapt to varying conditions encountered during movement along a present path of travel of said window or panel;

iii) a logic unit for making a comparison between a value representing window or panel speed based on a currently sensed motor speed signal with the calculated obstacle detect threshold, and generating a control output if an obstacle is detected based on said comparison; and

iv) an interface coupled to said switch for changing the state of the switch to stop the motor.

21. (Original) The apparatus of claim 20 wherein the sensor for generating a speed signal comprises a Hall-effect sensor.

22. (Original) The apparatus of claim 20 wherein the sensor for generating a speed signal comprises a magnetic pick-up.

23. (Original) The apparatus of claim 20 additionally comprising an obstacle detector having an output coupled to the controller that senses a disruption in a region through which the window or panel moves.

24. (Original) The apparatus of claim 23 wherein the obstacle detector comprises a microwave generator and a reflected wave transducer.

25. (Original) The apparatus of claim 23 wherein the obstacle detector comprises an infrared light source and detector.

26. (Previously Presented) The apparatus of claim 23 wherein the obstacle detector comprises a field effect device.

27. (Previously Presented) The apparatus of claim 26 wherein the field effect device comprises a magnetic field inductive sensor.

28. (Previously Presented) Apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving said window or panel along a travel path and de-activating the motor when the window or panel is within an acceptable range of a predetermined position, said apparatus comprising:

a) a sensor for sensing movement of the window or panel and providing a sensor output signal related to a position of the window or panel;

b) a switch for controllably actuating the motor by providing an energization signal; and

c) a controller having an interface coupled to the sensor and the switch for controllably energizing the motor; said controller determining the position of the window or panel when power is applied to the controller by:

i) monitoring the sensor output signal from the sensor related to the position of the window or panel;

ii) identifying the position of the window or panel based on the sensor output signal from the sensor; and

iii) outputting a control signal to said switch to deactivate said motor in response to a sensing of said window or panel within the acceptable range.

29. (Previously Presented) The apparatus of claim 28 wherein the controller comprises a programmable controller including a processing unit for executing a control program and including a memory for storing multiple window or panel position values corresponding to a signal received from the sensor.

30. (Previously Presented) The apparatus of claim 28 additionally comprising multiple position limits that define the acceptable range programmed for use by the controller to determine whether the window or panel is closed or open.

31. (Previously Presented) The apparatus of claim 28 wherein the controller maintains a position of a leading edge of the window or panel and further wherein the controller reverse energizes the motor to move the window or panel away from a closure position prior to activating the motor to close the window or panel.

32. (Previously Presented) The apparatus of claim 28 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the motor vehicle window or panel and wherein the controller maintain a position indication which is updated in response to movement of the window or panel and further wherein the controller reverse actuates the motor near an end point in the travel path of the window or panel to avoid false obstacle detection in a region of closure of the window or panel.

33. (Cancelled) without prejudice or disclaimer.

34. (Cancelled) without prejudice or disclaimer.

35. (Cancelled) without prejudice or disclaimer.

36. (Previously Presented) The apparatus of claim 1 wherein the immediate past measurements of said parameter were taken within a forty millisecond interval prior to the most recent sensor measurement.

37. (Previously Presented) The apparatus of claim 6 wherein the immediate past measurements of said signal are sensed within a forty millisecond interval prior to the most recent signal from the sensor.

REMARKS

Claims 9 and 33-35 have been cancelled without prejudice or disclaimer. Claims 1-8, 10-32, and 36-37 are currently pending and indicated as being allowed. Reconsideration of pending claims in view of the following remarks is respectfully requested.

This Request for Continued Examination is being filed for the purpose of adding to the references already cited U.S. Patent No.: 6,377,009 issued to Phillipp and its provisional application from which the '009 patent claims priority to, namely U.S. Provisional Application Serial No. 60/152,605 attached to PTO form 1449, which is enclosed with this Request for Continued Examination.

In the Final Office Action mailed May 30, 2008, all currently pending claims namely, 1-8, 10-32, and 36-37 where allowed and rejected claims 33-35 have been cancelled by the amendment above, leaving all the currently pending claims in allowable condition.

Accordingly, all claims are believed to be in condition for allowance and prompt issuance of a Notice of Allowance is respectfully requested. If any fees are determined to be due, the commissioner is authorized to charge those fees to deposit account No. 20-0090.

Respectfully submitted,

Date: June 5, 2008

/Stephen J. Schultz/

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Electronic Patent Application Fee Transmittal	
Application Number:	10765487
Filing Date:	27-Jan-2004
Title of Invention:	Collision monitoring system
First Named Inventor/Applicant Name:	Mario Boisvert
Filer:	Stephen J. Schultz
Attorney Docket Number:	14-733C2D1
Filed as Small Entity	

Utility Filing Fees

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($)
Miscellaneous:				
Request for continued examination	2801	1	405	405
		Total in USD ($)		**405**

Electronic Acknowledgement Receipt	
EFS ID:	3408706
Application Number:	10765487
International Application Number:	
Confirmation Number:	9537
Title of Invention:	Collision monitoring system
First Named Inventor/Applicant Name:	Mario Boisvert
Customer Number:	28060
Filer:	Stephen J. Schultz
Filer Authorized By:	
Attorney Docket Number:	14-733C2D1
Receipt Date:	05-JUN-2008
Filing Date:	27-JAN-2004
Time Stamp:	14:18:18
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$405
RAM confirmation Number	10174
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)

1	Request for Continued Examination (RCE)	14733C2D1RCE.pdf	29909 a0132cda41fc31295c45353479bdf4aa0e305f34	no	3
Warnings:					
This is not a USPTO supplied RCE SB30 form.					
Information:					
2	NPL Documents	ProvApp.pdf	669023 da396ba71a9ea642749fa548b408062be7d35d80	no	9
Warnings:					
Information:					
3	Information Disclosure Statement (IDS) Filed	14733C2D1IDS.pdf	85757 f88a1c137ca586756925d52d16c2a84b428b4e6f	no	2
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
4	Information Disclosure Statement (IDS) Filed	14733C2D1IDS2.pdf	88534 918d922083398f318a4d94ca30ae3caabd10691e	no	2
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Information:					
This is not an USPTO supplied IDS fillable form					
5	Information Disclosure Statement Letter	14733C2D1IDSletter.pdf	388562 f6cff2a117c7ffce5b535642a6447a9cc2219769	no	2
Warnings:					
Information:					
6	Amendment Submitted/Entered with Filing of CPA/RCE	14733C2D1Amendment.pdf	61210 4c0da9dca6471cf9dde642465c8b5bb352305e26	no	12
Warnings:					
Information:					
7	Fee Worksheet (PTO-06)	fee-info.pdf	8145 e1747a9d7c13b0b54c890ceb6e9e870566e4cb9a	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1331140		

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/08a (01-08)
Approved for use through 06/30/2008. 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 contains a valid OMB control number.

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 2

Complete if Known	
Application Number	10/765,487
Filing Date	01/27/2004
First Named Inventor	Mario Boisvert
Art Unit	2837
Examiner Name	Marlon T. Fletcher
Attorney Docket Number	14-733C2D1

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US- 6,377,009	04-23-2002	Philipp	
		US-			
		US-			
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		US-			
		US-			
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FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. 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 2 hours 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, 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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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.

DOCKET NO. 14-733C2D1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of: Mario Boisvert *et al.*

Applicant:	Mario Boisvert *et al.*
Serial No.:	10/765,487
Filed:	January 27, 2004
Title:	*COLLISION MONITORING SYSTEM*
Art Unit:	2837
Examiner:	Marlon T. Fletcher

INFORMATION DISCLOSURE STATEMENT

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

Sir:

1. Pursuant to 37 C.F.R. 1.97 and 1.98, and in compliance with 37 C.F.R. 1.56, the Office's attention is directed to the patents, publications and other information listed on the attached PTO-1449. A copy of each listed foreign patent document and other publication is enclosed. No U.S. Patents nor any published U.S. Patent Applications are enclosed.

Regarding any document, publication or other information for which a date is not given on the attached PTO-1449, Applicant(s) believe(s) the same may qualify as "prior" art to this application and should be treated accordingly, although Applicant(s) reserve(s) the right to contest the prior art status of any document, publication or information, should issue arise.

2. Regarding each listed document that is not in the English language, an English-language translation accompanies this Statement as indicated on the attached PTO-1449 or a concise explanation of the relevance of the document is set forth in the following document(s):

(a)____ Copy of each English language version of a search report indicating the degree of relevance found by the foreign office of each document being submitted from the search report.

(b)____ Attachment entitled "Concise Explanation of Relevance of Non-English Language Documents".

3. Pursuant to 37 C.F.R. 1.97(b) this Statement is being filed (one must be checked):

(a) _X_ Within 3 months of the filing date or date of entry into the National Stage or with the Filing of a Request for Continued Examination.

(b)____ Before the mailing date of a first Office Action on the merits. If this Statement is not filed before the mailing date of a first Office Action on the merits, the required certification is given below or, in the absence thereof, the Office is authorized to charge the required fee set forth in 37 C.F.R. 1.17(p) to Deposit Account No. 20-0090 for consideration of this Statement.

(c)____ After the period set forth in 37 C.F.R. 1.97(b) but before the mailing date of either a final action or a notice of allowance.

(1)____ The required certification is given below, or

(2)____ Enclosed is a check covering the fee set forth in 37 C.F.R. 1.17(p) for consideration of this Statement, or

(3)____ Charge the fee set forth in 37 C.F.R. 1.17(p) to Deposit Account No. 20-0090.

(d)____ After the mailing date of either a final action or a notice of allowance, but before payment of the issue fee. Petition hereby is made for consideration of this Statement and the required certification is indicated below.

(1)____ Enclosed is a check covering the fee set forth in 37 C.F.R. 1.17(i)(1), or

(2)____ Charge the fee set forth in 37 C.F.R. 1.17(i)(1) to Deposit Account No. 20-0090.

4. Certification (if applicable)

(a)____ The undersigned hereby certifies that each item of information contained in this Statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than 3 months prior to the filing of this Statement.

(b)____ The undersigned hereby certifies that no item of information contained in this Statement was cited in a communication from a foreign patent office in a counterpart foreign application or, to the undersigned's knowledge after making reasonable inquiry, was known to any individual designated in 37 C.F.R. 1.56(c) more than 3 months prior to the filing of this Statement.

5. The Commissioner is hereby authorized to charge any additional fees or credit any overpayment to Deposit Account No. 20-0090.

Respectfully Submitted,

Date: 5 June 2008

By: _____
John A. Yirga
Reg. No. 56,480

CUSTOMER NUMBER: 26,294

TAROLLI, SUNDHEIM, COVELL & TUMMINO LLP
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PTO/SB/06 (07-06)
Approved for use through 1/31/2007. 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	Filing Date	☐ To be Mailed
10/765,487	01/27/2004	

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			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			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 $250 ($125 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			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	06/05/2008	(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 ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 33	Minus	** 36	= 0	X $25 =	0	OR	X $ =	
	Independent (37 CFR 1.16(h))	* 7	Minus	***8	= 0	X $105 =	0	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	0	OR	TOTAL ADD'L FEE	

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
	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".
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Legal Instrument Examiner:
/PAULA S. BRITTON/

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IFW

DOCKET NO. 14-733C2D1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of: Mario Boisvert *et al.*

Applicant:	Mario Boisvert *et al.*
Serial No.:	10/765,487
Filed:	January 27, 2004
Title:	*COLLISION MONITORING SYSTEM*
Art Unit:	2837
Examiner:	Marlon T. Fletcher

INFORMATION DISCLOSURE STATEMENT

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P.O. Box 1450
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5. The Commissioner is hereby authorized to charge any additional fees or credit any overpayment to Deposit Account No. 20-0090.

Respectfully Submitted,

Date: June 13, 2008

By: Stephen Schultz
Stephen J. Schultz
Reg. No. 29,108

CUSTOMER NUMBER: 26,294

TAROLLI, SUNDHEIM, COVELL & TUMMINO LLP
1300 East Ninth Street – Suite 1700
Cleveland, OH 44114
Phone: (216) 621-2234

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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.
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PTO/SB/08a (01-08)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 1

Complete if Known	
Application Number	10/765,487
Filing Date	01/27/2004
First Named Inventor	Mario Boisvert
Art Unit	2837
Examiner Name	Marlon T. Fletcher
Attorney Docket Number	14-733C2D1

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US-			
		US-			
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FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]
		GB2189906A	11-04-1987	Byrne and Davidson Doors		
		2502679	03-23-1982	Societe Gebr. Bode		
		WO 92/20891	11-26-1992	Volex Group		
		EP0581509A1	02-02-1994	The General Electric Co.		

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English language Translation is attached.

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number : **0 581 509 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number : **93305672.3**

(51) Int. Cl.[5] : **H02H 7/085**

(22) Date of filing : **19.07.93**

(30) Priority : **29.07.92 GB 9216092**

(43) Date of publication of application :
02.02.94 Bulletin 94/05

(84) Designated Contracting States :
BE DE ES FR GB IT NL SE

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(74) Representative : **Pope, Michael Bertram Wingate**
The General Electric Company, p.l.c. GEC Patent Department Waterhouse Lane
Chelmsford, Essex CM1 2QX (GB)

(54) A system for controlling movement of a member driven by an electric motor.

(57) This invention relates to a control system for controlling movement of a member moveable between two limit positions by means operable by an electric motor. The control system includes means to determine successive positions of said member during movement thereof between said limit positions, each of said successive positions representing a distance from one of said limit positions and monitoring means for monitoring current used by the motor when said member is at each of said successive positions. The system further includes a memory in which is stored a table for a) values of monitored current taken during the preceding operation of said member or values representing average of monitored current values taken during at least two preceding operations of said member and b) successive positions at which said values of monitored current are taken. The monitored current value for a given position taken during the current operation is compared to the corresponding monitored current value in said table for the same given position and when the monitored current value exceeds the corresponding current value taken from the table, the motor is cut off to stop movement of the member. The monitored current values taken during the current operation are used to update the table in said memory.

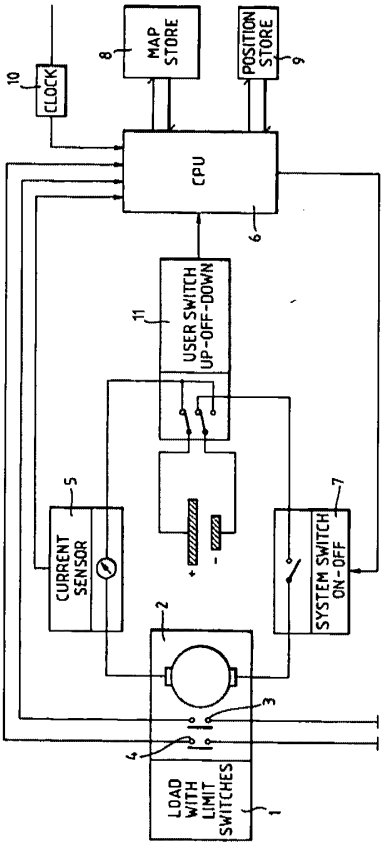


Fig.3.

EP 0 581 509 A1

The invention relates to a system for controlling movement of a member driven by an electric motor. The invention is particularly directed to a system for controlling a window of a motor vehicle which is lowered or raised by means operable by an electric motor.

A common problem with such systems is obstruction of the load mechanism by extraneous objects. When the movement of the mechanism is arrested in an abnormal fashion it may be damaged by the abnormal physical stresses which develop, and the motor and its associated circuitry may be damaged by the abnormally large current that flows. If the obstruction is caused by a person, a serious injury may result to the person causing the obstruction. This is particularly relevant in the example of a car window system.

It is a common practice to deal with such situations by incorporating means to detect the increased current flow, or the consequent increase in temperature, and switch off the power supply to the motor. Such methods are usually adequate to prevent damage to the motor mechanism. However, they are often not sufficiently sensitive to prevent personal injury; this is because the current drawn by the motor vehicle varies considerably even in normal operation. The load on the motor will, in general, vary during the cycle of operation; this variation can be plotted as a graph of current versus either time or position. The exact shape of this graph will differ for each installation of the system owing to manufacturing tolerances. Furthermore, the shape of the graph for any one installation will change with time as wear develops and dirt accumulates. Changes may also occur as a result of changes in temperature, or other environmental factors. Figure 1 of the accompanying drawing is an example of such graphs. A simple cut-out arrangement as described above is set to operate when the current, or temperature, exceeds the highest level ever likely to occur at any time in the life of any installation of the system; in most circumstances, this level will only be reached after some delay following obstruction, as shown in Figure 2 of the accompanying drawings. During this delay the force exerted by the motor can cause considerable damage to a person or a fragile object obstructing the movement of the mechanism.

It is an object of this invention to overcome this difficulty by "mapping" the motor current against one or more variables which define the state of the system.

According to the invention there is provided a control system for controlling movement of a member moveable between two limit positions by means operable by an electric motor, the control system including means to monitor current used by the electric motor during movement of the member between said limit positions, means to compare each monitored current value with a corresponding predetermined value and means to stop movement of the member when a monitored current value exceeds its corresponding predetermined value.

The predetermined values against which the monitored current values are compared are taken from multi-dimensional maps of current values taken during the previous operations of the moveable member versus one or more variables which define the state of the moveable member. Whilst such multi-dimensional maps become difficult to visualise, they can be easily manipulated with computers. In the present case, the simplest form of map is the graph already shown in Figure 1; this is a 2-dimensional map, showing normal current as a function of time or position. It is also possible to record a 3-dimensional map showing normal current as a function of both time and position. The latter is a trivial exercise if the operating cycle is always run to completion at a constant speed, so that a given position is always associated with a given time.

In one embodiment of the invention, the control system includes means to determine successive positions of said member during movement thereof between said limit positions, each of said successive positions representing a distance from one of said limit positions, said monitoring means monitoring current used by the motor when said member is at each of said successive positions and a memory in which is stored a table of a) values of monitored current taken during the preceding operation of said member or values representing average of monitored current values taken during at least two preceding operations of said member and b) successive positions at which said values of monitored current are taken. The monitored current value for a given position taken during the current operation is compared to the corresponding monitored current value (the corresponding predtermined value) in said table for the same given position and the monitored current values taken during the current operation is used to update the table in said memory.

The system embodying the invention further includes a limit switch which is activated to stop said motor when said member reaches one of said limit positions. The control system also includes a store in which is stored net-elapsed-time (NET) representing current position of the moveable member, said store being continuously updated during movement of said member between the limit position and being reset when said limit switch is activated. The net-elapse-time (NET) is the time taken by the member in reaching the current position from one of the limit positions. Preferably the position determining means includes a timer which is allowed to run when a user switch is turned on to determine the net-elapsed-time representing the current position of the member.

In a control system embodying the invention, the

motor current at a given time is compared with the mapped value. If the mapped value is exceeded by a significant margin appropriate action can be taken, such as switching off the power. Two advantages are immediately apparent; firstly, the variation in normal current during the cycle of operation is now taken into account; secondly, a computer can be used to control more sophisticated reponses than a simple cut-out. The map is revised every time a successful operation is completed. This means that the map represents the normal operation of the specific installation at the current stage of its life and updating of the map takes into account both differences between individual installations and changes caused by environmental factors. Obstruction, or any other cause of overload, can therefore be detected much more quickly than with previous systems, before large forces are exerted against the obstruction.

More modifications for dealing with the overload condition are also possible with a computer employed in the system. For example, the mechanism may reverse to free the obstruction. In car windows it may be desirable to include an override feature for security purposes i.e. to continue operation against deliberate obstruction by an assailant.

The invention will now be described further by way of example with reference to the accompanying drawings in which:-

Figure 1 is a graph of current used by an electric motor versus time during movement thereof between two limit positions;

Figure 2 shows a current versus time graph of the moveable member when an obstruction occurs during movement thereof;

Figure 3 illustrates a control system embodying the present invention; and

Figure 4 shows a flow chart depicting various steps of operation of the control system ilustrated in Figure 3.

Referring to Figure 3, there is shown a load 1 such as a window of a motor vehicle which is lowered or raised by a member (not shown) operable by an electric motor 2. An upper limit switch 3 is activated to stop the motor when the window moving upwardly reaches a fully raised position. A lower limit switch 4 is activated to stop the motor when the window moving downwardly reaches a fully down position.

The control system illustrated in Figure 3 controls the movement of the window so that if during operation of the window any obstruction occurs, the motor is stopped to avoid or minimize any damage to a person or an object obstructing the movement of the window. A current sensor 5 is provided to monitor current used by the motor 3. The current sensor senses the current at a number of successive positions of the window during its upward or downward movment. The current sensor may be, for example, a small value resistor in the current path with a voltmeter connected across it. Further, the sensor 5 includes an analogue-to digital convertor to change the current values into digital form so as to provide a digital input of the current values to a CPU 6. A system switch 7 is connected between the motor 2 and the CPU 6 to switch the motor ON or OFF in response to a signal provided by the CPU 6. The switch 7 is normally kept ON. The CPU 6 has a non-volatile store 8 in which is stored the current-vs-time map and a store 9 in which is stored the net-elapsed-time (position) of the window during its upward or downward movement. There is also stored in the CPU read only memory a programme corresponding to the flow chart of Figure 4.

The net-elapsed-time is the variable used to index the current-vs-time map. In the embodiment illustrated in Figure 3, the system does not include any means to measure directly the position of the window, so the stage of operation reached has to be inferred, from the running time provided by a timer 10. One extremity of operation, say, 'fully down' is taken as the starting point and in such operation, when the timer starts to run, the NET is set to zero Further, whenever the lower limit switch is actuated, the NET is set to zero and whenever the upper limit switch is actuated the NET is set to maximum. The timer 10 is reset when the window is stopped. Whenever the window starts to move, the previous NET is read from the store, and the timer begins to run. During upward movement of the window, the NET is continuously incremented and stored, and during downward movement 4 of the window, the NET is continuously decremented and stored. The NET thus represents the position of the window at any time and is referred to as "position" in Figures 3 and 4. When the window stops in an intermediate position, the corresponding NET remains in the store and updating resumes from the same value next time the systems moves.

Figure 4 shows a flowchart indicating the logical operation of the CPU 6. In the normal state when the system switch 7 is ON, as shown at the top of the flowchart of Figure 4, and the user switch 10 is OFF, the system idles in the user switch monitoring loop ("Reset-Timer"/"User-Switch-OFF"/"STOP") as shown at the top of the flowchart of Figure 4 with the continuously-running timer held at zero.

When the user switch is turned ON i.e. UP or DOWN, the timer is allowed to run and the previous NET is recalled ("Read-Elapsed-Time"). Until a STOP occurs, the NET or "position" is continually updated and re-stored in store 9.

When the user switch 10 is UP, the updating of the NET is followed by checking the map; if the current does not exceed the corresponding current in the map, the map is updated. Thereafter the limit switches are checked and, if neither is ON the programme returns to check the user switch again and if this is still not OFF, the operation continues.

If current at a particular position (net-elapsed-ti-

me) exceeds the corresponding current in the map, the system switch is set OFF, and the system waits for a suitable period for the fault to be cleared (e.g. an obstruction removed) before returning to the user switch monitoring loop. When the current does not exceed the corresponding current in the map but either limit switch is ON, the stored position, or NET is reset as described above, the motor is stopped and the system waits and returns to the monitoring loop.

Many strategies are available for the update-map function. The simplest is to overwrite the previous map entry with the latest current value. It may often be desirable to apply a more sophisticated strategy such as a "rolling average" in which the new value is a weighted average of the latest value and the previous one - i.e.:

NEW = PRESENT/K + OLDx(K - 1)/K

where K is a suitable weighting factor and the stored value in the map is an integration of all previous values, changing slowly (large K = more slowly) to reflect consistent trends as the system ages, but largely ignoring "one-off" fluctuations.

In the embodiment described above the map is provided for the movement of the window in the upward direction so that if the obstruction occurs during upward movement, the motor is stopped thereby avoiding any damage to a person or object causing obstruction.

In this embodiment, no map is provided for the downward movement of the window. It is assumed that no considerable damage would be caused to a person or object during downward movement of the window. However, a map can be prepared for downward movement of the window and the programme stored in the CPU can be altered accordingly so that the downard movement follows the same step as depicted in the flowchart for the upward movement of the window.

Claims

1. A control system for controlling movement of a member moveable between two limit positions by means operable by an electric motor, the control system including means to monitor current used by the electric motor during movement of the member between said limit positions, means to compare each monitored current value with a corresponding predetermined value and means to stop movement of the member when a monitored current value exceeds its corresponding predetermined value.

2. A control system according to Claim 1, including means to determine successive positions of said member during movement thereof between said limit positions, each of said successive positions representing a distance from one of said limit positions, said monitoring means monitoring current used by the motor when said member is at each of said successive positions and a memory in which is stored a table of a) values of monitored current taken during the preceding operation of said member or values representing average of monitored current values taken during at least two preceding operations of said member and b) successive positions at which said values of monitored current are taken, a monitored current value for a given position taken during the current operation being compared to the corresponding monitored current value (the corresponding predtermined value) in said table for the same given position and the monitored current values taken during the current operation being used to update the table in said memory.

3. A control system according to Claim 2, including a limit switch which is activated to stop said motor when said member reaches one of said limit positions.

4. A control system according to Claim 3, including a store in which is stored net-elapsed-time representing current position of the moveable member, said store being continuously updated during movement of said member between the limit positions and being reset when said limit switch is activated, the net-elapse-time being the time taken by the member in reaching the current position from one of the limit positions.

5. A control system according to Claim 4, including a user switch operable to move said member between said limit positions and wherein said position determining means includes a timer which is allowed to run when the switch is on to determine the net-elapsed-time.

6. A control system according to any one of the preceding claims, in which said moveable member is a window which is lowered or raised between the two vertically located spaced apart limit positions.

7. A window of a motor vehicle including a control system as claimed in Claim 6.

Fig.1.

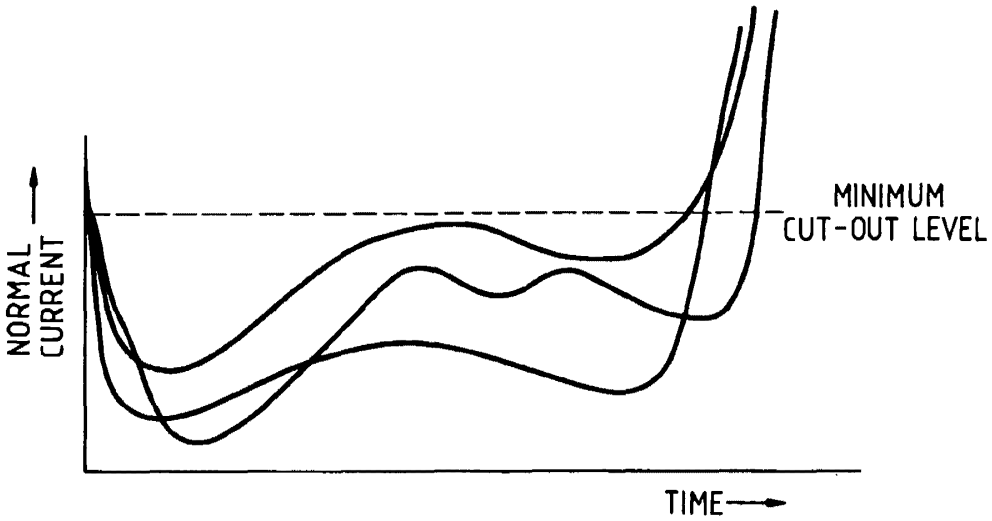

NORMAL CURRENT
MINIMUM CUT-OUT LEVEL
TIME

Fig.2.

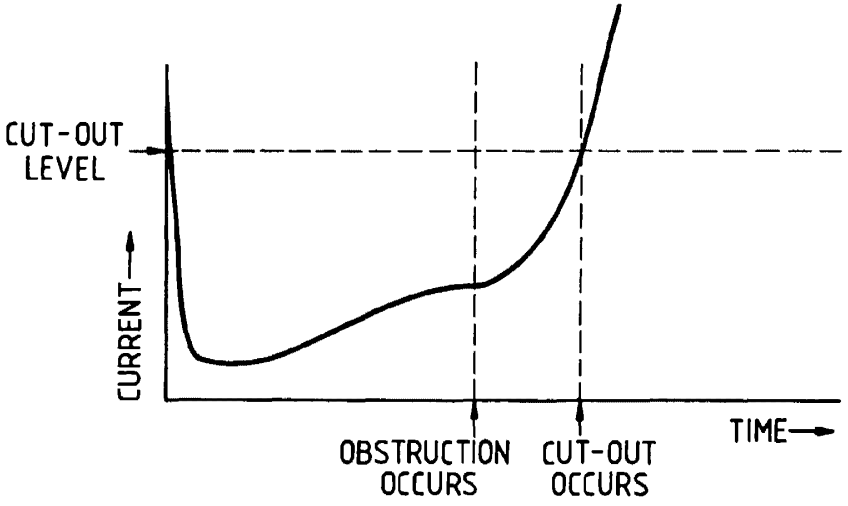

CUT-OUT LEVEL
CURRENT
TIME
OBSTRUCTION OCCURS
CUT-OUT OCCURS

Fig.3.

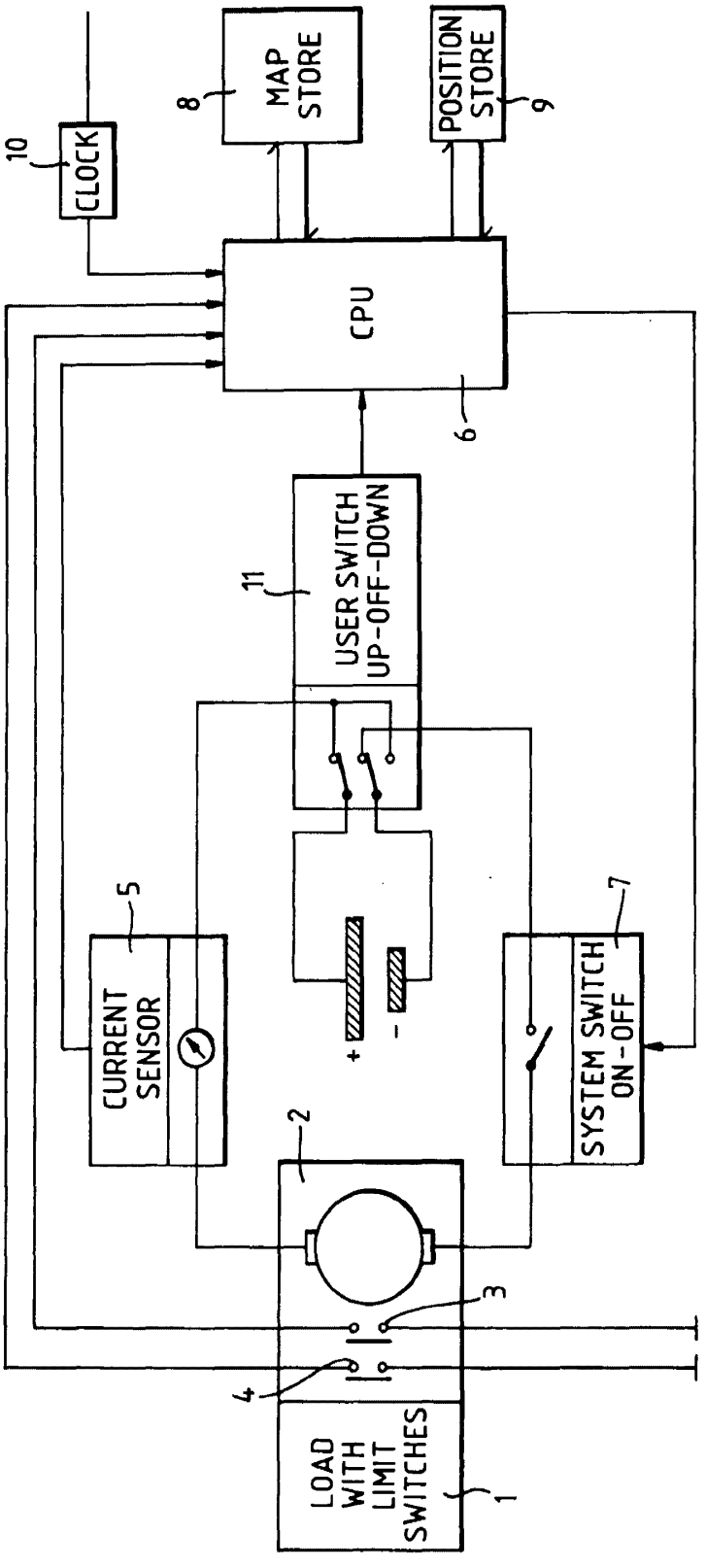
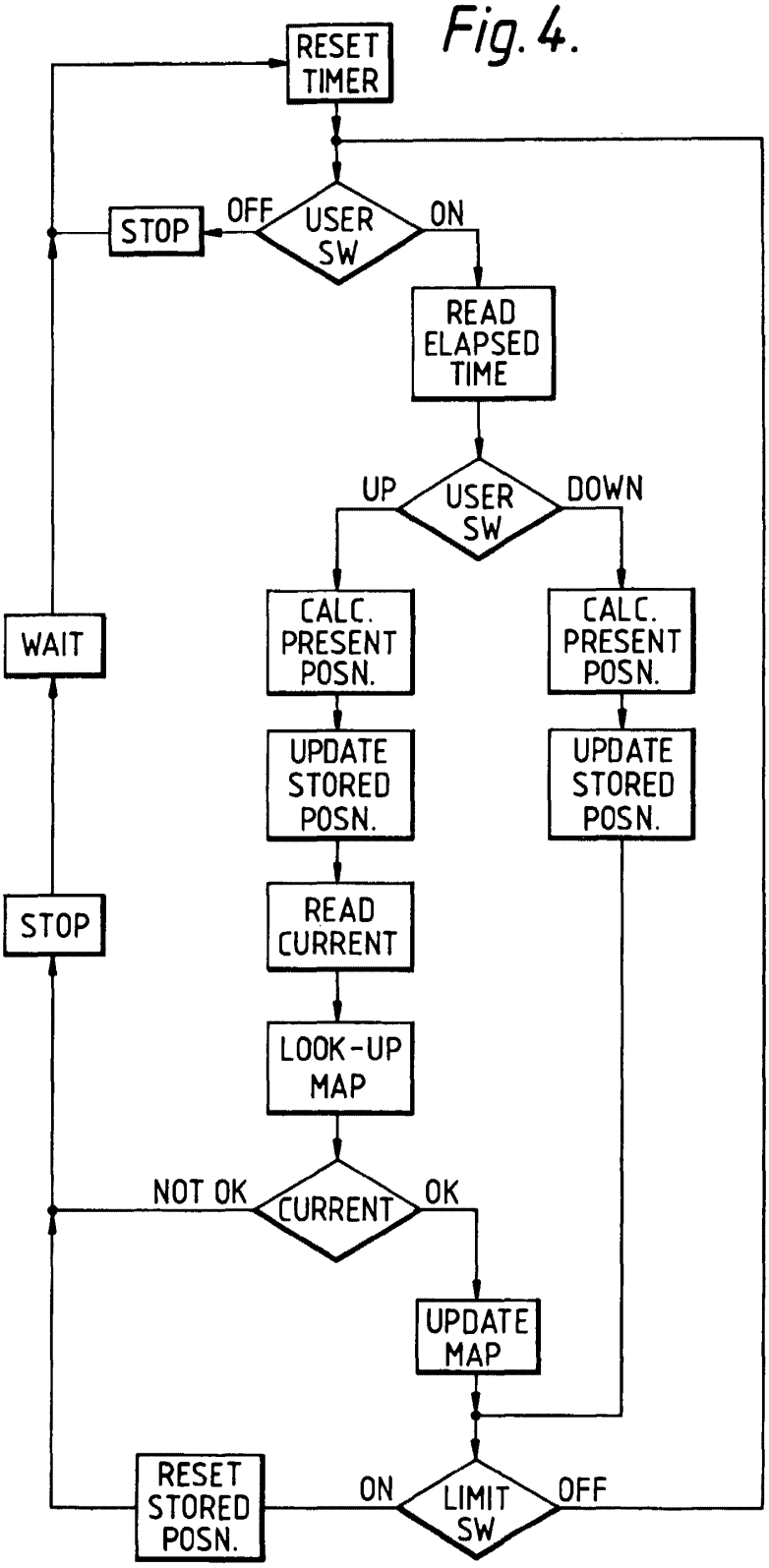

MAP STORE
8
POSITION STORE
9
10
CLOCK
CPU
6
USER SWITCH UP-OFF-DOWN
11
5
CURRENT SENSOR
+
-
7
SYSTEM SWITCH ON-OFF
2
3
4
LOAD WITH LIMIT SWITCHES
1

Fig. 4.


RESET TIMER
USER SW
OFF
STOP
ON
READ ELAPSED TIME
USER SW
UP
DOWN
CALC. PRESENT POSN.
CALC. PRESENT POSN.
UPDATE STORED POSN.
UPDATE STORED POSN.
WAIT
STOP
READ CURRENT
LOOK-UP MAP
CURRENT
NOT OK
OK
UPDATE MAP
LIMIT SW
ON
OFF
RESET STORED POSN.

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 93 30 5672

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
X Y	DE-A-35 39 265 (AUDI) * the whole document * ---	1-3,6,7 4,5	H02H7/085
Y	GB-A-2 152 243 (ALPS ELECTRIC) * abstract * ---	4,5	
P,X	EP-A-0 525 788 (BITRON VIDEO) * column 4, line 31 - line 55; figures 1,2 * -----	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.5)
H02H E05F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	29 October 1993	SALM, R

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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L : document cited for other reasons

& : member of the same patent family, corresponding document

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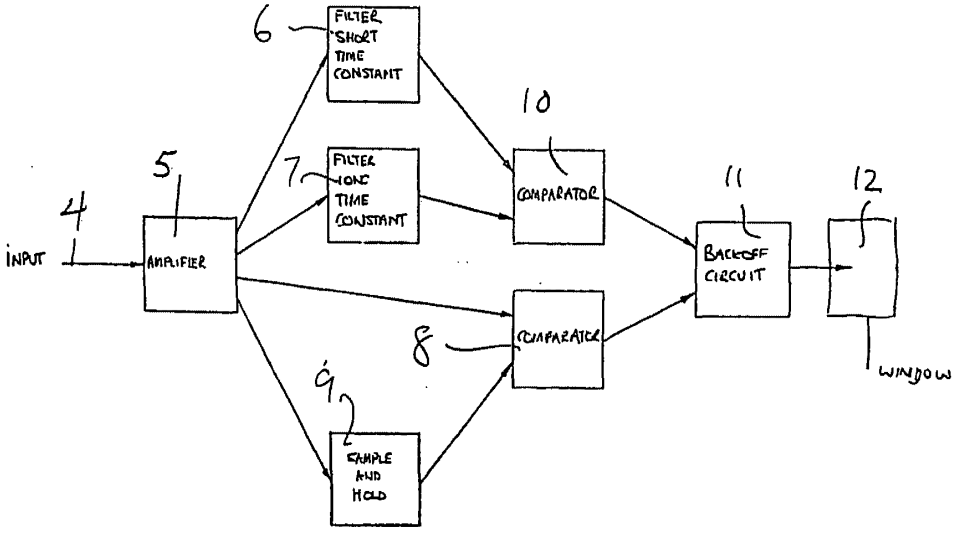
(54) Title: A MOTOR REVERSE SYSTEM



(57) Abstract

A motor reverse system for a motor driven vehicle closure member such as a window comprises filters (6 and 7), comparators (8 and 10), a sample and hold circuit (9) and a backoff circuit (11). The backoff circuit is activated to reverse the motor through a further circuit (12) in two modes of operation. In the first mode, activation occurs when the signal in the motor exceeds that from the sample and hold circuit produced by storing the peak stall current on motor switch on. In the second mode, activation occurs when the output from the filters cross over. The first and second modes correspond to resistance to member closure due to the presence of a soft and hard obstacle respectively.

A MOTOR REVERSE SYSTEM

The present invention relates to a motor reverse system.

The system is particularly, but not exclusively, applicable to closure members such as motor driven doors, windows and sunroofs.

Reverse mechanisms for motor driven automobile window back-off are already known but such mechanisms can impart an unacceptable force to a trapped limb, for example, and may be susceptible to wear in the mechanism during its life affecting operation.

According to the present invention, there is provided a motor reverse system comprising means for sensing the current in the motor to which the system is in use connected, first and second means for sensing resistance to the motion of an object being driven by the motor, said first means comprising a peak current detector for determining current instantaneously drawn by the motor or switch on, comparator means for comparing the peak current detected with the actual motor current value during normal operation, a backoff circuit arranged to operate when the actual motor current equals or exceeds the peak current, said second means comprising filter means arranged to

provides two variables from the motor current one of which responds faster than the other to rates of change of motor current whereby if the motor slows and the rate of change of motor current is sufficient such that said one variable crosses said other variable, the backoff circuit operates.

In mathematical terms, the said one variable (Iinst) is less than the said other variable (Inom) by a variable K where K = Inom - X% Iinst and the backoff circuit operates when

$$\frac{d\ Iinst}{dt} > K > \frac{d\ Inom}{dt}$$

The "backoff" function can be implemented in a number of ways

When the backoff circuit operates the current to the motor is reversed for a time.

In a preferred embodiment of the invention, the current in the motor is sensed by a current sensing track. This track forms in conjunction with the motor a potential divider from which a signal is fed to an amplifier. The output from the amplifier is fed directly and simultaneously to the input of the filter means and sample and hold means. In a first operating mode for an automobile window wind up mechanism, the sample and hold means store the peak stall

current on motor switch on. This may vary depending on the mechanical condition of the mechanism and the automobile battery condition. If that stored signal is subsequently reached indicating a soft obstacle, a signal to activate the backoff means and associated further circuit to back off the window by a nominal amount. The window can then only be moved by switching the normal motor switch on again (either up or down).In a second operating mode, the other variable tracks the first mentioned variable. When a hard obstacle is encountered by the window, the slower reacting variable can no longer keep up with the other variable and the outputs from the two crossover. This is detected and the back off system activated as before. A limit switch deactivates the system as the window approaches the closed position to prevent back off as the window closes.

In order that the invention may be more clearly understood, one embodiment thereof will now be described, by way of example, with reference to the accompanying drawings, in which:-

Figure 1 shows a circuit arrangement for measuring a window winder motor current consumption,

Figure 2 shows a block circuit diagram of an arrangement for controlling a backoff for the motor of Figure 1,

Figure 3 shows variation of current with time for the motor of Figures 1 and 2 for a first given operating condition.

Figure 4 shows variation of current with time for the motor of Figures 1 and 2 for a second given operating condition.

Figure 5 shows variation of filter outputs with time in circuit of Figure 1 for the second operating condition of Figure 4. and

Figure 6 shows a partial, closed position, view of a window to be driven by the motor of Figure 1 and 2.

Referring to Figures 1 and 2, a window winder motor 1, draws current in operation from the usual 12v battery supply 2 of the vehicle. This current is monitored using a current sensing track 3 disposed in this supply circuit. The motor 1 and track 3 create a voltage divider and the output 4 from this divider representing the current drawn by the motor forms the input to an amplifier 5.

The output from the amplifier is fed to a low pass filter 6 having a short time constant, a low pass filter 7 having a long time constant, a comparator 8 and a sample and

hold circuit 9. The outputs from the two filters 6 and 7 are fed to a second comparator 10. The first mentioned comparator also receives an input from the sample and hold circuit 9. The outputs from comparators 8 and 10 are fed to a backoff circuit 11 which, in conjunction with a further circuit 9, controls the backoff operation of the window (not shown in Figure 2).

The operation of the system is as follows. The voltage at the output of the amplifier 5 is used in two different ways. As the motor 1 starts up it is effectively in stall condition until it is at working speed. The output voltage on power up will be slightly lower than that at stall. This initial voltage is stored in the sample and hold circuit 9. In the first mode of operation, if the voltage at the output of the amplifier 5 rises above that at the output of the sample and hold circuit indicating a soft obstacle in the way of the window being wound up then the comparator 8 reacts by initiating the backoff circuit 11 to operate the further circuit 12 to stop and reverse the motor 1 for a preset time. As the start up current/voltage is sampled every time the window is wound up the system adjusts automatically to variations in the mechanical elements of the system caused by wear and tear and to battery condition.

Motor current I variation with time t during this operation is shown in Figure 3. As the motor runs up to

speed, current rises rapidly from point A to point B producing a start up current peak B from which, during normal operation, the current falls back to level C. When the obstacle is encountered current begins to rise again until it exceeds the stored start up peak level B when the motor is reversed by reversing the current for a preset time. The reversal point is shown at D and the reverse current at E.

When the motor 1 is in reverse, the circuits which detect motor stall are deactivated. The backoff circuit and the window will not operate again until the switch controlling the window is released, and another signal is given via the motor switch (either up or down).

The output of the amplifier 5 is also fed into the two low pass filters 6 and 7. Filter 6 is fast reacting and is used mainly to rid the input signal of high frequency noise generated by the motor 1. This signal is then reduced by a certain percentage. Filter 7 is an integrating filter which tracks the output of the filter 6 with a delay due to the longer time constant. If the level of current taken by the motor rises slowly the output from filter 7 can track the output from filter 6. If the output from filter 6 rises at a greater rate, suggesting an obstruction, the output from filter 7 cannot keep up. The output from filter 6 crosses the output from filter 7. This condition is shown

graphically in Figure 5, the output from filter 6 being referenced F6, that from filter 7 being referenced F7 and the crossover point CP. F6 and F7 are both plots against time. The plot of motor current against time for this mode of operation is shown in Figure 4. This is similar to that of Figure 3. Window wind up begins at point G, and current rises rapidly to point H. Normally winding takes place until point I when a fast rate of change indicates a hard obstacle. The current at this point is at a much lower level than that at H which is the stall position which indicates that the rate of change of current demand has increased sufficiently to activate the window back off circuit 11. Operation of this circuit 11 and further circuit 12 is as before and as before the window will not operate after backoff until the switch is released and pressed again.

Referring to Figure 6, to prevent the backoff circuit operating when the window 19 reaches the normally closed position, a limit switch 20 is disposed for operation by the window just before the window hits the end stop in the window frame 21. Operation of the switch 20 sends a signal to deactivate the input to the backoff circuitry allowing the window to close without backing off. It will be noted that the position of the switch 20 is such that no significant gap is left to allow anything to be caught in the window.

The above arrangement enables different types of obstacles to normal window closure to be catered for and also accommodates changes due to wear and tear and battery condition.

It will be appreciated that the above embodiment has been described by way of example only and that many variations are possible without departing from the scope of the invention. Although described in relation to a window wind up motor, the back off arrangement could be used in any circumstance where the normal operation of a motor needs to be reversed to deal with an abnormal condition such as an obstacle. The arrangement may be implemented in software as well as hardware or a combination of the two.

CLAIMS

1. A motor reverse system comprising means for sensing the current in the motor to which the system is in use connected, first and second means for sensing resistance to the motion of an object being driven by the motor, said first means comprising a peak current detector for determining current instantaneously drawn by the motor or switch on, comparator means for comparing the peak current detected with the actual motor current value during normal operation, a backoff circuit arranged to operate when the actual motor current equals or exceeds the peak current, said second means comprising filter means arranged to provides two variables from the motor current one of which responds faster than the other to rates of change of motor current whereby if the motor slows and the rate of change of motor current is sufficient such that said one variable crosses said other variable, the backoff circuit operates.

2. A motor reverse system as claimed in claim 1, in which when the backoff circuit operates the current to the motor is reversed for a time.

3. A motor reverse system as claimed in claim 1 or 2, in which the means for sensing comprise a current sensing track.

4. A motor reverse system as claimed in claim 3, in which the track forms in conjunction with the motor a potential divider from which, in operation a signal is fed to an amplifier.

5. A motor reverse system as claimed in claim 4, in which the output from the amplifier is connected to the input to the filter means and to sample and hold means.

6. A motor reverse system as claimed in claim 5, in which the sample and hold means are operative to store the peak stall current on motor switch on.

7. A motor reverse system as claimed in claim 6, in which, the comparator means is operative to compare the voltage at the output from the amplifier with the voltage at the output of the sample and hold means and to activate the backoff circuit when the amplifier output voltage exceeds the output voltage of the sample and hold circuit in a first mode of operation of the system.

8. A motor reverse system as claimed in claim 7, in which a further circuit is provided for stopping and reversing the motor when the backoff circuit is activated.

9. A motor reverse system as claimed in any preceding claim, in which the filter means comprises a first fast

reacting filter and a second integrating filter operative to track the output of the first filter with a delay whereby in operation to provide the two variables from the motor current.

10. A motor reverse system as claimed in any preceding claim, in which a limit switch is associated with the backoff circuit operative to deactivate the input to the backoff circuit when an element driven by the motor reaches a predetermined position.

11. A closure system for a vehicle comprising a closure member, a motor for driving the closure member between open and closed positions and a motor reverse system for controlling the motor as claimed in any preceding claim.

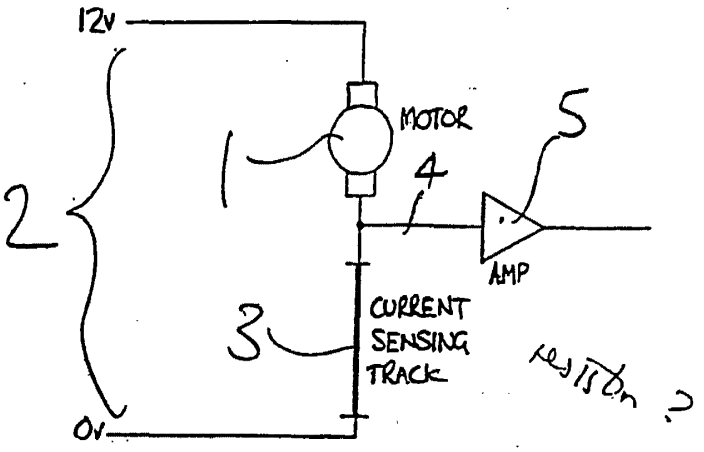

12v
MOTOR
1
2
3
4
5
AMP
CURRENT SENSING TRACK
0v

FIG 1.

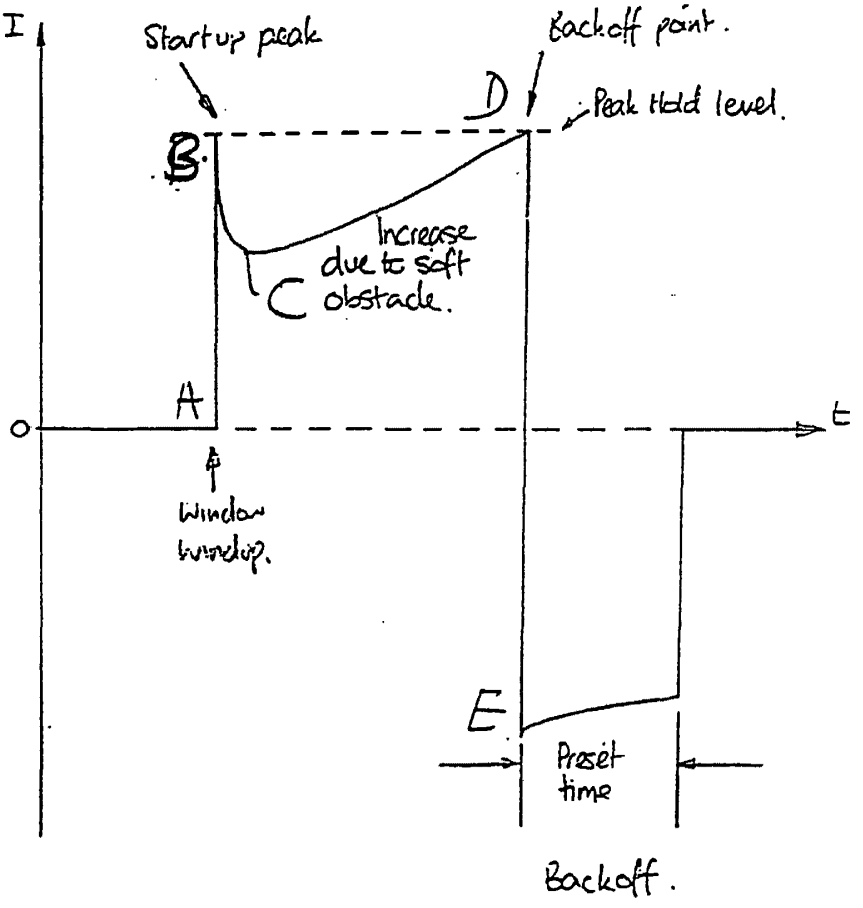

I
Startup peak
Backoff point.
D
Peak Hold level.
B
Increase due to soft obstacle.
C
A
O
t
Window windup.
E
Preset time
Backoff.

FIG 3.

Block Diagram;

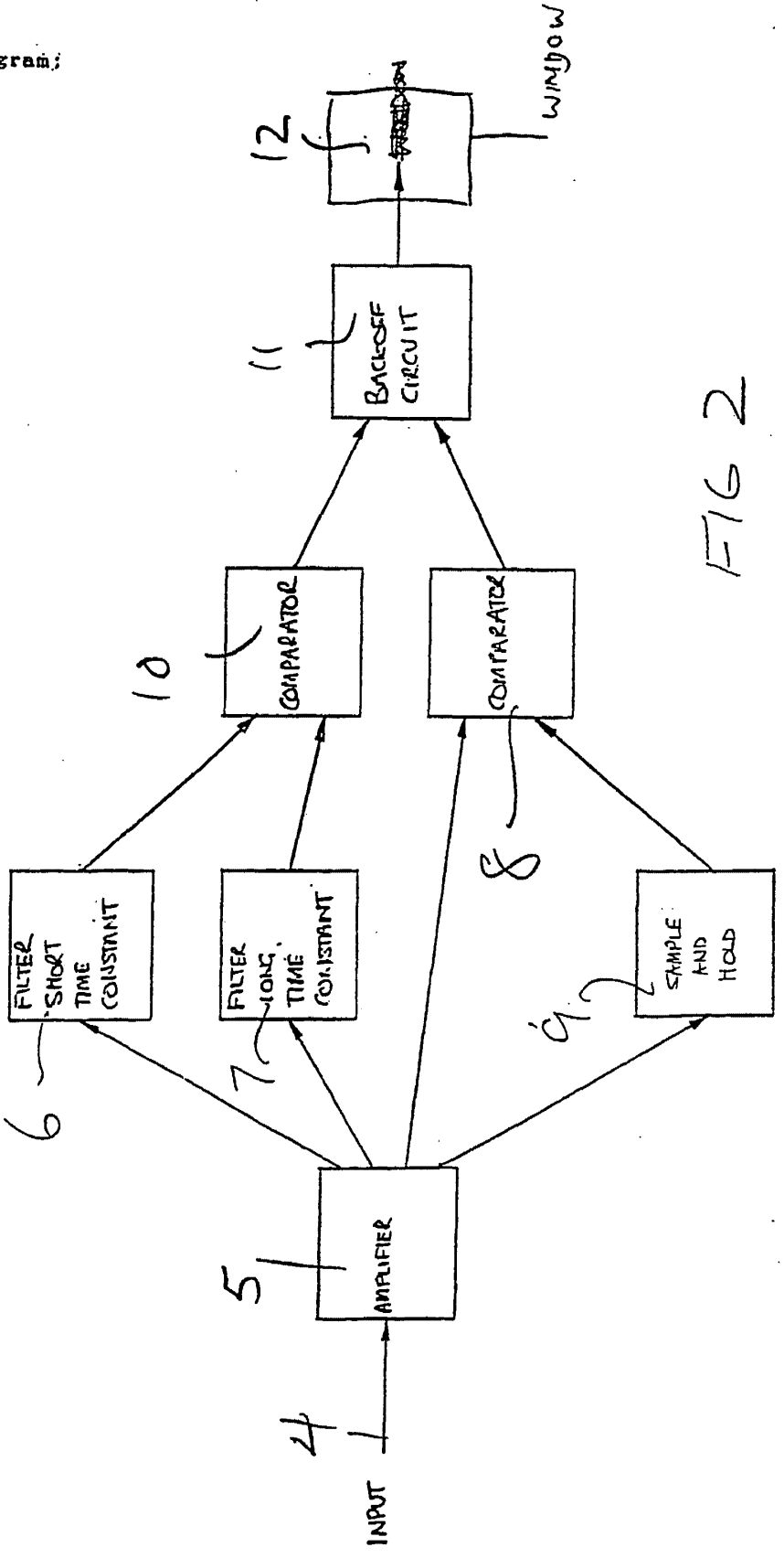


FIG 2

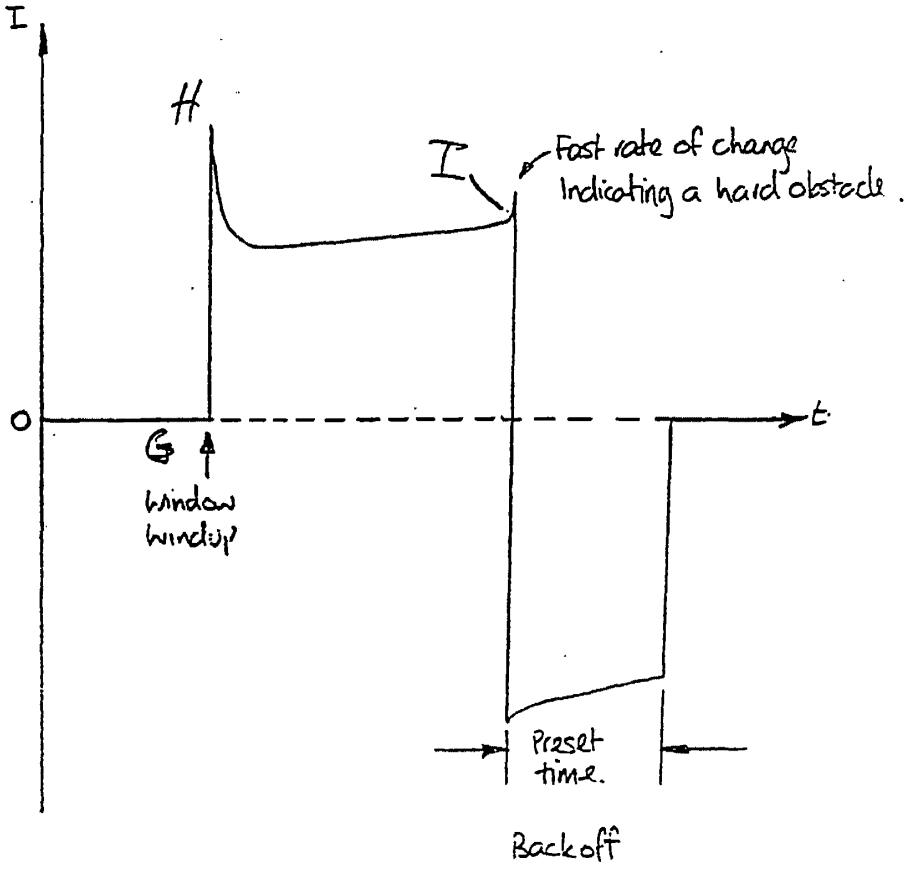

I
H
I
Fast rate of change
Indicating a hard obstacle.
0
t
G
Window
Windup
Preset
time.
Backoff

FIG 4

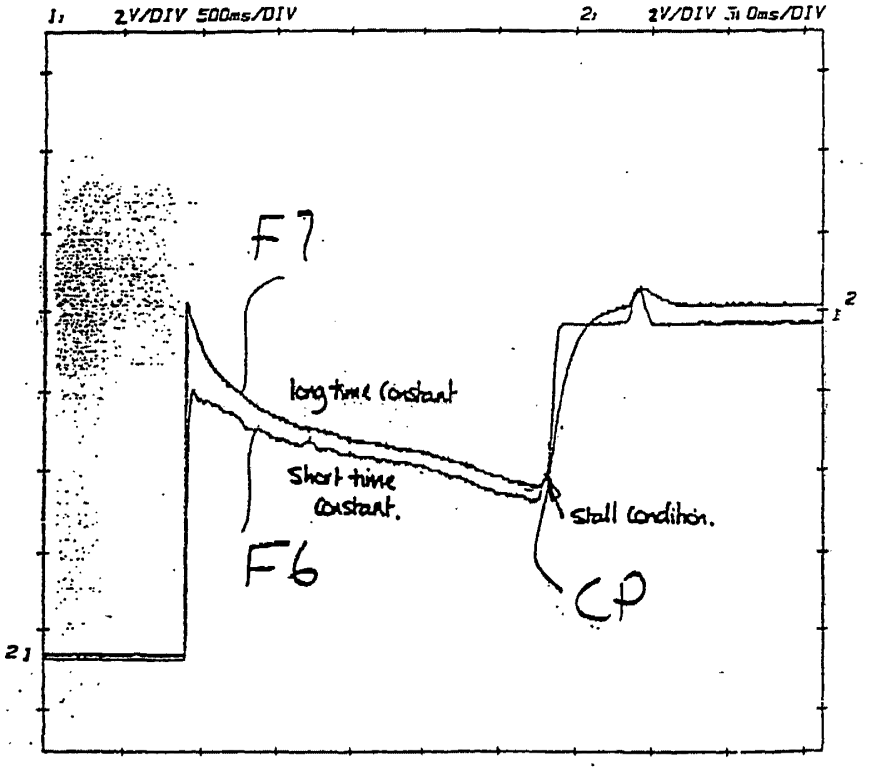

1, 2V/DIV 500ms/DIV
2, 2V/DIV 50ms/DIV
F7
long time constant
short time constant.
F6
stall condition.
CP
2

FIG. 5

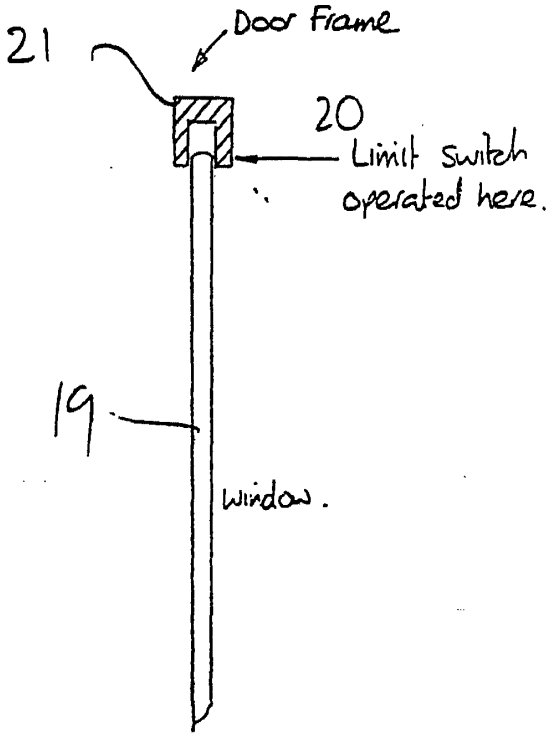


FIG 6

INTERNATIONAL SEARCH REPORT

International Application No PCT/GB 92/00862

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)[6]

According to International Patent Classification (IPC) or to both National Classification and IPC

Int.Cl. 5 E05F15/00; H02P7/00

II. FIELDS SEARCHED

Minimum Documentation Searched[7]

Classification System	Classification Symbols
Int.Cl. 5	E05F ; H02P

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched[8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT[9]

Category °	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No.[13]
A	DE,A,3 832 941 (ALPS ELECTRIC CO.) 13 April 1989 see the whole document	1-3,10, 11
A	US,A,4 581 900 (M.M. LOWE ET AL) 15 April 1986 see abstract; figures 1,5	1
A	EP,A,0 267 064 (DAV) 11 May 1988 see abstract; figure 3	1,11
A	DE,A,3 532 078 (FUJITSU LTD) 17 April 1986 see abstract; figure 1	1,11
A	DE,A,3 332 813 (KUSTER & CO GMBH) 28 March 1985 see abstract; figures 1,3	1,11

° Special categories of cited documents : [10]

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

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"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
12 AUGUST 1992	28 [illegible]
International Searching Authority	**Signature of Authorized Officer**
EUROPEAN PATENT OFFICE	BEYER F.

Form PCT/ISA/210 (second sheet) (January 1985)

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO. GB 9200862 SA 59350

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on
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		CA-A- 1264802	23-01-90
		US-A- 4641067	03-02-87
DE-A-3332813	28-03-85	None	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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DEMANDE DE BREVET D'INVENTION

(21) **N° 82 05266**

(54) **Dispositif de sécurité anti-pincement pour portes ou fenêtres à manœuvre automatique, en particulier sur véhicules.**

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D Vente des fascicules à l'IMPRIMERIE NATIONALE, 27, rue de la Convention — 75732 PARIS *CEDEX 15*

Dispositif de sécurité anti-pincement pour portes ou fenêtres à manoeuvre automatique, en particulier sur véhicules

La présente invention concerne un dispositif de sécurité anti-pincement pour portes ou fenêtres à manoeuvre automatique, en particulier sur véhicules.

Dans les autobus, les tramways, les métros et les moyens de transport similaires, les portes sont, en règle générale, ouvertes et fermées par un signal provenant du poste de conduite. Pour empêcher les accidents, des dispositifs de sécurité sont nécessaires, qui permettent d'éviter que les passagers ou leurs vêtements, leurs bagages, etc., se prennent dans les portes lors de leur fermeture, ou bien que les portes restent à moitié ouvertes.

On connait déjà divers dispositifs de sécurité, par exemple des barrières lumineuses, qui sont disposées parallèlement à la course de fermeture de la porte, ou des interrupteurs de fin de course, qui sont disposés dans les joints en caoutchouc équipant les chants de porte. Comme ces dispositifs de sécurité, d'une part, ne procurent pas une sécurité suffisante, d'autre part sont sensibles aux perturbations, il a étéproposé antérieurement, dans la demande de brevet allemand n° 3003877, de coupler à la porte ou à la commande de porte un émetteur de signaux électriques, qui émet un signal électrique de position chaque fois que la porte atteint une position prédéterminée, et ces signaux électriques de position sont envoyés dans des éléments de mémoire, dans lesquels ils sont comparés à des intervalles de temps prédéterminés. Si le déplacement de la porte se trouve ralenti par le coincement d'un objet quelconque, si bien que l'intervalle de temps qui s'écoule entre deux signaux de position est plus long que l'intervalle de temps prédéterminé, il est émis, dans ce dispositif , un signal de commande qui provoque un arrêt ou une inversion du sens de la marche de la porte. La comparaison des intervalles de temps mesurés entre les signaux de position avec un intervalle de temps prédéterminé se fait donc par l'intermédiaire d'éléments de mémoire.Ce dispositif de sécurité proposé antérieurement fonctionne d'une manière sûre et permet également au dispositif de sécurité de s'adapter à la vitesse d'ouverture ou

de fermeture d'une porte, car les intervalles de temps prédéterminés des éléments de mémoire peuvent être règlés de manière correspondante. Pourtant, ce dispositif a encore l'inconvénient que les éléments de mémoire doivent impérativement être règlés individuellement pour chaque porte particulière, ce qui entraîne une augmentation correspondante des frais de main d'oeuvre lors du montage, et l'inconvénient que les vitesses avec lesquelles les portes s'ouvrent et se ferment, non seulement sont différentes individuellement d'une porte à l'autre, mais aussi sont dépendantes encore de circonstances extérieures, en particulier de la température. Si les portes sont règlées pour la température ambiante normale, il peut arriver qu'aux basses températures hivernales les portes s'ouvrent tellement plus lentement que les intervalles de temps règlés soient dépassés, si bien que le signal de commande qui provoque l'arrêt ou l'inversion du sens de la marche des portes est déclenché.

La présente invention a pour objet un dispositif de sécurité anti-pincement qui fonctionne de manière sûre indépendamment des influences extérieures, donc en particulier indépendamment des oscillations de température. L'invention repose sur le fait que, tout comme dans l'invention précédente, à la porte ou à la commande de porte est couplé un émetteur de signaux électriques, qui émet un signal électrique de position chaque fois que la porte atteint une position prédéterminée, et que les intervalles de temps qui s'écoulent entre deux signaux successifs sont mesurés et sont comparés à des intervalles de temps prédéterminés, un signal de commande provoquant un arrêt ou une inversion du sens de la marche de la porte quand les intervalles de temps précités ne concordent pas. Selon l'invention, on utilise comme intervalle de temps prédéterminé avec lequel l'intervalle mesuré est comparé, l'intervalle de temps qui a été mesuré chaque fois lors du déplacement correspondant précédent de la porte entre les mêmes positions. On obtient ainsi ce résultat que le dispositif s'adapte automatiquement à des influences environnantes changeantes. Si, en effet, par temps estival chaud, les portes se ferment rapidement, des intervalles de temps d'autant plus courts qui s'écoulent entre les positions de la porte sont mesurés et mis en mémoire, et le dispositif de sécurité se déclenchera lorsque ces intervalles de temps relativement courts seront dépassés du fait d'un incident, par exemple du fait du

coincement d'un objet. Si au contraire, aux basses températures, les portes se ferment lentement, des intervalles de temps d'autant plus lc sont mis en mémoire, et le dispositif de sécurité réagit lorsque ces intervalles de temps plus longs sont dépassés. Ainsi,il n'est pas non plus nécessaire, lors du montage de chaque porte individuelle, de procèder à un règlage, puisque selon l'invention le dispositif de sécurité s'adapte bien automatiquement aux déplacements de chaque porte individuelle.

Si le signal de commande était déclenché dés que le temps mesuré n'est plus long que d'une toute petite quantité que l'intervalle de temps mis en mémoire lors du déplacement précédent de la porte, le dispositif réagirait dés qu'il se produit un très faible ralentissement du déplacement de la porte, par exemple du fait d'une baisse de température, c'est à dire que le dispositif serait alors trop sensible. Pour éviter cela,il est prévu que le signal de commande n'est déclenché que lorsque l'intervalle de temps mesuré entre deux signaux de position est plus long d'une valeur supérieure à une tolérance prédéterminée, que l'intervalle de temps mis en mémoire lors du déplacement de la porte correspondant précédent. Cette détermination de tolérance peut être obtenue en augmentant le temps mesuré chaque fois d'une valeur fixe, et en mettant en mémoire cette valeur augmentée en tant qu'intervalle de temps prédéterminé.

Les temps qu'une porte met à parcourir la distance entre deux positions sont différents, suivant que la porte s'ouvre ou se ferme, car dans la plupart des constructions de portes connues, les portes ne se déplacent pas à vitesse constante, mais à vitesse accélérée, c'est-à-dire que la porte parcourt les premiers tronçons entre les deux positions à une vitesse sensiblement plus faible que les derniers tronçons. Pour chaque tronçon, le temps que met la porte pour s'ouvrir, et le temps que met la porte pour se fermer, sont mis en mémoire,et les dispositifs de commande doivent impérativement pouvoir distinguer si les signaux de position ont étéémis lors de l'ouverture ou lors de la fermeture de la porte. Pour parvenir à ce résultat,on peut donner aux signaux de position une "balance" telle que,selon la nouvelle invention,la balance des signaux de position successifs est comparée, et à partir de cette comparaison, il est émis un signal qui indique si la porte s'ouvre ou se ferme. Cette balance peut être donnée aux signaux de position sous forme numérique ou analogique. Il convient en particulier de

donner à l'émetteur de signaux un nombre de positions, qui sont des puissances de 2, et qui peuvent être donc représentées par des nombres binaires. Il s'est révélé particulièrement approprié de donner à l'émetteur de signaux 8 positions, si bien que la balance peut être fixée par des nombres binaires à trois chiffres. Si la balance est ainsi fixée que lors de l'ouverture de la porte le premier signal de position a la plus petite balance et le dernier signal de position la plus grande balance, et inversement, si lors de la fermeture de la porte le premier signal de position a la plus grande balance et le dernier signal de position la plus petite balance, il en résulte, lors de la comparaison des balances, sans plus, que, lorsque le signal suivant a une plus grande balance que le signal précédent, la porte s'ouvre, et inversement, lorsque le signal suivant a une plus petite balance que le signal précédent, la porte se ferme.

Mais cette attribution de balances aux signaux de position permet également de comparer les intervalles de temps qui sont mesurés lors du déplacement de la porte, aux intervalles de temps voulus qui ont été mis en mémoire, lorsque par suite d'un incident la porte ne s'est pas ouverte ou fermée complètement avant de se remettre en mouvement.

On peut utiliser comme émetteur de signaux tout type connu d'interrupteurs.Il convient d'utiliser des éléments de circuit fonctionnant sans contact, par exemple les dispositifs de coupure de courant manoeuvrables par des aimants permanents, connus sous le nom d'interrupteur I.L.S. "Reed", ou bien, encore mieux , des interruteurs à effet Hall, qui sont actionnés par un aimant restant en liaison avec la porte. Ces interrupteurs à effet Hall ont l'avantage d'être très fiables, de fonctionner sans à-coups et d'être insensibles à l'encrassement et à la corrosion, si bien qu'une longue durée de vie se trouve garantie.

Comme le temps mesuré entre deux signaux de position est chaque fois comparé à l'intervalle de temps qui a été mesuré lors du déplacement correspondant précédent de la porte, tous les intervalles de temps mis en mémoire antérieurement doivent impérativement être annulés. Pour que, à la suite d'un incident, c'est-à-dire donc après qu'un intervalle de temps trop long entre deux signaux de positions a été mesuré, le dispositif recommence à fonctionner parfai-

tement, il peut en outre être prévu que les intervalles de temps mis en mémoire ne seront annulés que lorsque l'intervalle de temps mesuré concorde avec l'intervalle de temps mis en mémoire à l'intérieur de la marge de tolérance, à la suite de quoi le nouvel intervalle de temps sera mis en mémoire, tandis qu'en cas de non concordance l'intervalle de temps précédent, qui correspond donc à un déplacement normal de la porte, reste en mémoire.

Dans les portes à deux battants, il conviendra de munir chaque battant de porte d'un dispositif de sécurité anti-pincement indépendant, car il est possible qu'un seul des battants de porte soit gêné dans son déplacement par un obstacle. Mais pour que les objets ou les personnes coincés dans les portes puissent être libérés immédiatement, les deux montages peuvent être reliés l'un à l'autre de manière qu'un signal de commande provoquant un arrêt ou une inversion du sens de déplacement agissent dans le même sens sur les deux battants de la porte.

Des exemples de réalisation d'un dispositif de sécurité anti-pincement selon l'invention sont représentés aux dessins ci-joints, dans lesquels :

La figure 1 est un schéma-bloc d'une porte à deux battants; et

la figure 2 est un schéma-bloc de la partie de ce dispositif qui est essentielle pour la mesure.

On voit sur le schéma de la figure 1 qu'il s'agit d'une porte à deux battants dont les battants sont désignés par A et B. A chacun des battants de la porte est associé un émetteur de signaux SG, dont les contacts sont actionnés par un aimantM. Le chemin que parcourt la porte lors de son ouverture et de sa fermeture est subdivisé en sept tronçons, et en conséquence l'émetteur de signaux comporte 8 contacts. Les signaux de position émis par cet émetteur vont dans le montage PE, qui permet de connaître les différentes positions de la porte, y compris ses positions ouverte ou fermée. De ce montage, les signaux de position sont transmis à la mémoire SP des valeurs mesurées et au registre de commande ST. Le registre de commande reçoit, par l'intermédiaire du contact de conducteur FK, qui en règle générale est commun aux deux battants de la porte et, dans les véhicules à plusieurs portes, à toutes les portes, le signal d'ouverture ou de fermeture de la porte.

De la mémoire des valeurs mesurées, les signaux vont à l'électronique de calcul EL, dans laquelle les intervalles de temps mesurés sont comparés, et de cette électronique de calcul un signal de commande va à l'étage de sortie ES, qui est réalisé de manière à résister aux court-circuits, lorsque la comparaison indique que la porte est gênée dans son déplacement. Si ce signal de commande se produit lors de la fermeture de la porte et si un objet quelconque vient alors à se coinçer dans la porte, la valve de commutation UV se déclenche, ce qui provoque une réouverture immédiate de la porte. Si le signal se produit lors de l'ouverture de la porte, cela constitue une indication qu'une personne ou un objet s'est trouvé coincé par le chant postérieur de la porte en cours d'ouverture. Il ne serait dans de tel cas pas utile que la porte se referme immédiatement, c'est donc la valve d'étranglement SV qui est excitée, par laquelle l'air se trouve évacué des chambres des cylindres de manoeuvre de la porte, si bien que la porte reste en place, mais peut facilement être poussée. Si dans ces conditions le contact du conducteur est actionné, l'aimant de la valve d'étranglement DV reçoit une impulsion, la porte s'ouvre lentement, car la pression ne s'est pas encore entièrement rétablie dans les chambres évacuées d'air, et le contact du conducteur reste en outre inopérant tant que la pression de service normal ne s'est pas rétablie au niveau de la valve d'étranglement DV. Un claquement des battants de la porte se trouve ainsi évité.

Dans une porte à deux battants il arrive fréquemment qu'en cas de coincement d'une personne ou d'un objet, le premier battant de la porte se heurte le premier à la résistance ainsi rencontrée, et le second battant ne se heurtant qu'un peu plus tard à cette résistance. Dans ce cas, il convient que les deux battants de la porte se rouvrent ou bien restent immobiles dès que le premier battant s'est heurté à une résistance. Dans ce but, il est prévu deux connexions Q par lesquelles un signal de commande, qui provient de l'électronique de la porte A, est également transmis à l'étage de sortie de la porte B, et inversement un signal de commande, qui provient de l'électronique de la porte B, est transmis à l'étage de sortie de la porte A.

La figure 2 représente, également sous la forme d'un schéma-bloc, le montage qui permet de connaître la position et le sens de déplacement de la porte, et de mettre en mémoire les valeurs mesu-

rées.SG est, ici encore, l'émetteur de signaux à huit interrupteurs de position. Les numéros des interrupteurs sont transformés en nombres binaires à trois chiffres, et il est convenu d'attribuer à l'interrupteur 1 le nombre binaire 000 et à l'interrupteur 8 le nombre binaire 111, si bien que les balances binaires s'élèvent de l'interrupteur 1 à l'interrupteur 8. Les signaux de position des interrupteurs sont transmis, par les lignes A, B et C au comparateur VG1 et à la mémoire SP1. Dans la mémoire SP1, les balances mesurées par le compteur Z1 sont mis en mémoire, et dans le comparateur VG1, la balance d'un signal d'entrée est comparée à la balance du signal précédent, fournie par la mémoire. Si alors la balance du signal qui arrive est plus grande que la balance du signal précédent, cela signifie que la porte se déplace dans le sens de l'interrupteur 1 vers l'interrupteur 8, et s'il est convenu que la porte se ferme dans le sens de la gauche vers la droite, cela signifie le déplacement de fermeture de la porte. Si inversement la balance du signal d'entrée est plus petite que la balance du signal précédemment mis en mémoire, cela signifie que la porte se déplace dans le sens de l'interrupteur 8 vers l'interrupteur 1, et donc qu'elle s'ouvre. Du comparateur VG1 part alors un signal correspondant vers la bascule FF, et de celle-ci les signaux d'ouverture ou de fermeture de la porte vont, par les lignes a, b, dans l'électronique de calcul EL qui n'est pas représenté ici. En outre, le signal sortant de la bascule FF va, par la ligne c, dans l'enregistreur de lecture-écriture équipé d'une mémoire à accès sélectif (RAM). La valeur binaire contenue dans la mémoire SP1 est fournie à la RAM d'enregistrement des valeurs mesurées, en tant qu'adresse, par les lignes d, et cette adresse est complètée par le signal qui arrive par la ligne c et qui indique si la porte s'ouvre ou se ferme, si bien qu'on a à présent une adresse binaire à quatre chiffres, à partir de laquelle on peur fixer quelle valeur enregistrée correspond au déplacement précédent de la porte sur le même tronçon de parcours.

Si la porte se sépare du premier contact d'un tronçon, le compteur Z2 se met en marche, l'impulsion d'un rythmeur T est transmise et s'arrête lorsque l'interrupteur immédiatement suivant est atteint, le temps de parcours étant mesuré. La valeur

ainsi reçue est fournie sous forme de valeurs binaires, par les trois lignes g, au comparateur VG2, qui reçoit en même temps de l'enregisteur RAM la valeur mise en mémoire antérieurement pour le même tronçon, et la comparaison a lieu. Si la comparaison indique la concordance à l'intérieur de la marge de tolérance la nouvelle valeur mesurée est augmentée de la valeur de tolérance, par exemple de deux impulsions du rythmeur, et cette valeur augmentée est alors introduite dans l'enregistreur RAM et y est mise en mémoire, tandis que la valeur antérieurement mise en mémoire est annulée. Mais si la valeur du temps mesuré excède la valeur mise en mémoire d'une valeur supérieure à la valeur de tolérance, il est fourni par la ligne f un signal de commande à l'électronique de calcul EL, qui alors, suivant que le signal transmis sur les lignes a et b correspond à la fermeture ou à l'ouverture de la porte, excite la valve de commutation UV (sur la figure 1), si bien que le sens de déplacement de la porte est inversé, ou bien la valve de blocage SV, si bien que la porte reste immobile, puis s'ouvre lentement après l'excitation de la valve d'étranglement DV. Dans ce cas, la valeur du temps mesuré n'est pas mise en mémoire, mais c'est la valeur enregistrée antérieurement pour le déplacement non perturbé de la porte qui est conservée dans l'enregistreur. Comme on peut facilement s'en rendre compte, lors de l'inversion du sens de déplacement de la porte, le changement de sens du déplacement de la porte est également annoncé par la bascule FF à l'électronique de calcul EL et à l'enregistreur RAM, si bien que les signaux de positions et les intervalles de temps mesurés lors d'un nouveau déplacement de la porte sont comparés aux valeurs enregistrése voulues.

De la sorte, une mesure de temps dynamique se trouve garantie, et l'ensemble du système s'étalonne de lui-même, c'est-à-dire que les intervalles de temps prédéterminés pour le déplacement de la porte sont toujours ceux qui correspondent à chaque état de la porte et aux influences environnantes, sans qu'il soit nécessaire de mesurer individuellement ces influences environnantes et de les introduire dans l'électronique.

REVENDICATIONS

1.- Dispositif de sécurité anti-pincement pour portes ou fenêtres à manoeuvre automatique, en particulier sur véhicules, dans lequel un émetteur de signaux électriques, qui est couplé à la porte ou à son mécanisme de commande, émet, chaque fois que la porte atteint une position prédéterminée, un signal électrique de position, et ce signal de position est transmis à un dispositif de mesure électrique dans lequel les intervalles de temps qui s'écoulent entre deux signaux successifs sont mesurés et comparés à des intervalles de temps prédéterminés avec pour résultat un signal de commande provoquant un arrêt ou une inversion du sens de déplacement de la porte lorsque les intervalles de temps ne concordent pas, caractérisé en ce qu'on utilise chaque fois comme intervalle de temps prédéterminé celui qui a été mesuré lors du déplacement de la porte correspondant précédent entre les deux mêmes positions.

2.- Dispositif selon la revendication 1, caractérisé en ce que le signal de commande est déclenché lorsqu'un intervalle de temps entre deux signaux de position est plus long, d'une valeur supérieurs à une marge de tolérance prédéterminée, que l'intervalle de temps mis en mémoire lors du déplacement correspondant précédent de la porte.

3.- Dispositif selon la revendication 2, caractérisé en ce que, pour déterminer ladite marge de tolérance, on augmente chaque fois d'une valeur fixe le temps mesuré, et cette valeur augmentée est mise en mémoire en tant qu'intervalle de temps prédéterminé.

4.- Dispositif selon l'une quelconque des revendications 1 à 3, caractérisé en ce que les balances de deux signaux de position successifs sont comparées et il en est dérivé un signal qui indique si la porte s'ouvre ou se ferme.

5.- Dispositif selon la revendication 4, caractérisé en ce que ledit émetteur de signaux contient 8 positions, dont la balance est fixée par des nombres binaires à trois chiffres.

6.- Dispositif selon l'une quelconque des revendications 1 à 5, caractérisé en ce que ledit émetteur de signaux électriques

comporte des interrupteurs à effet Hall, sur lesquels agit un aimant qui reste en liaison avec la porte.

7.- Dispositif selon l'une quelconque des revendications 1 à 6, caractérisé en ce que les intervalles de temps mis en mémoire sont annulés lorsque l'intervalle de temps mesuré concorde avec l'intervalle de temps mis en mémoire à l'intérieur de ladite marge de tolérance, et que le nouvel intervalle de temps est alors mis en mémoire.

8.- Dispositif selon l'une quelconque des revendications 1 à 7, caractérisé en ce que le signal de commande provoque, lors du mouvement de fermeture de la porte, une inversion du sens de déplacement, lors du mouvement d'ouverture de la porte, un arrêt du mécanisme de commande de la porte, et dans le cas d'un mécanisme de commande pneumatique une évacuation de l'air contenu dans le cylindre du mécanisme.

9.- Dispositif selon l'une quelconque des revendications 1 à 8, caractérisé en ce que, dans le cas d'une porte à deux battants, chaque porte est munie d'un dispositif de sécurité anti-pincement indépendant, et que les deux montages sont reliés l'un à l'autre de manière qu'un signal de commande provoquant un arrêt ou une inversion du sens de déplacement agit dans le même sens sur les deux battants de la porte.

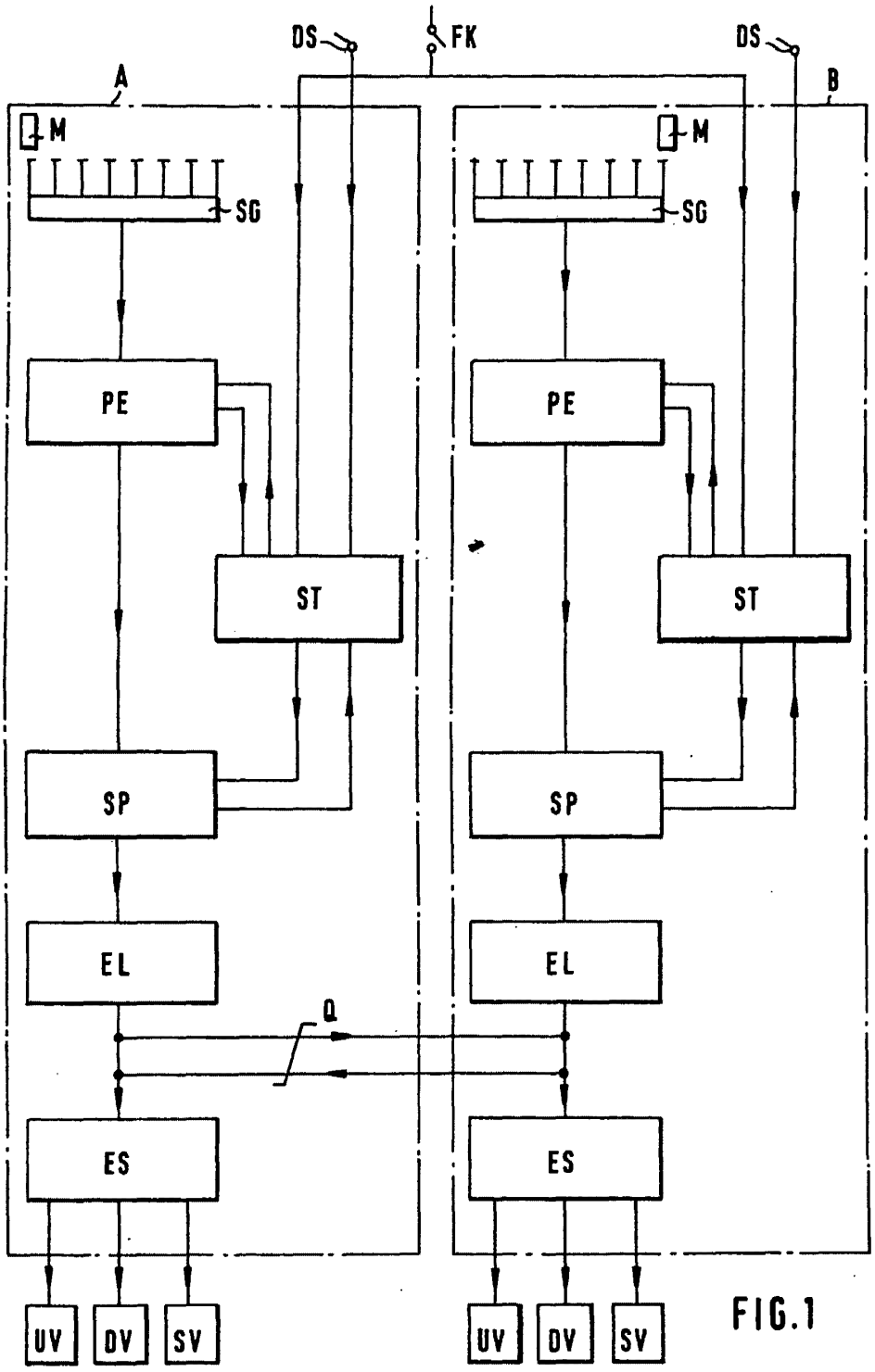
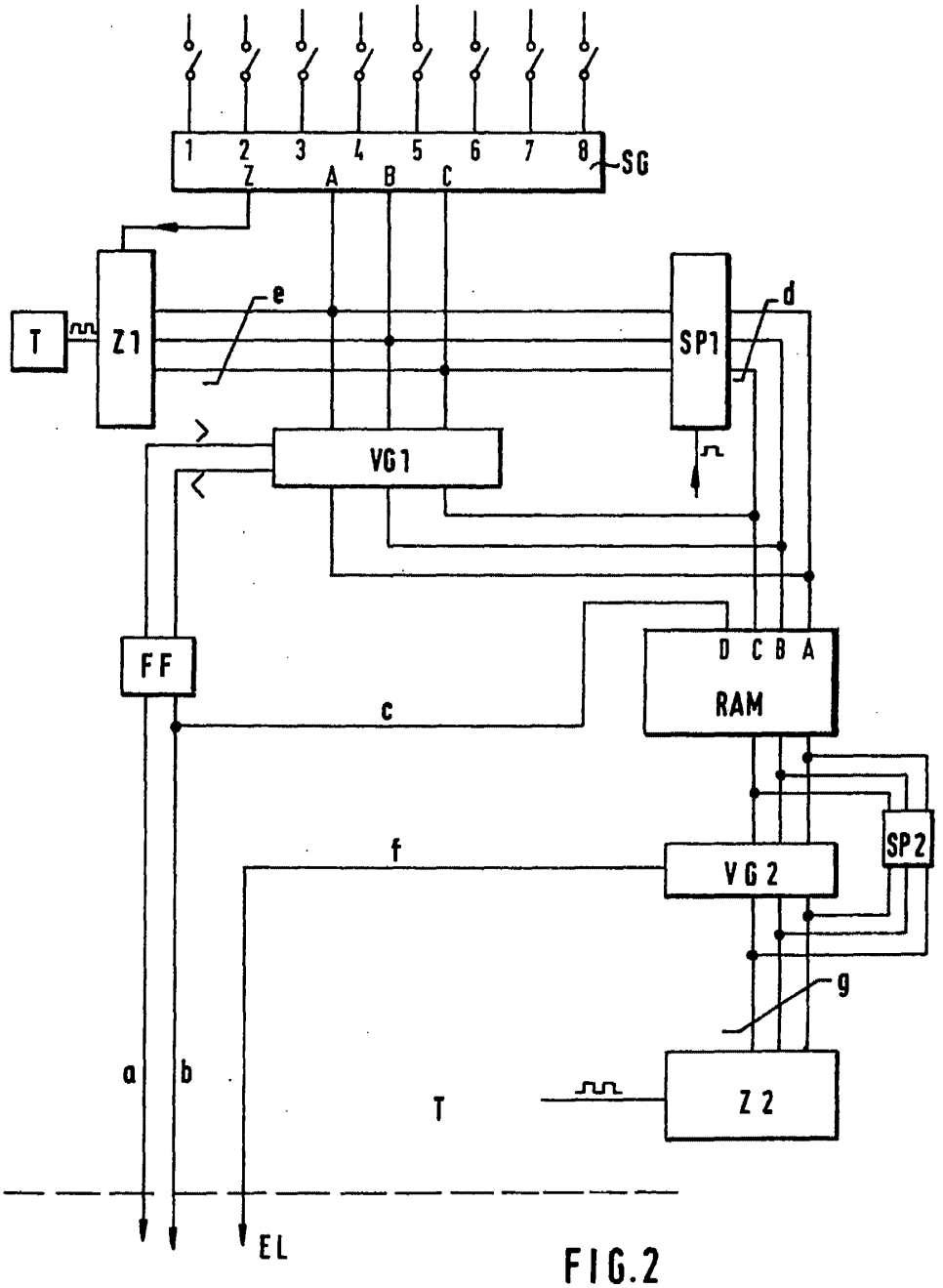


FIG.1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SP1
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RAM
c
f
VG2
SP2
g
a
b
T
Z2
EL

FIG.2

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(43) Application published 4 Nov 1987

(21) Application No 8708360

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(51) INT CL⁴
E05F 15/20

(52) Domestic classification (Edition I):
G3N 374 381 397 403 404 GCA4A
U1S 1715 G3N

(56) Documents cited
None

(58) Field of search
G3N
Selected US specifications from IPC sub-class E05F

(54) Door controller

(57) A microprocessor measures and stores values related to the door operating effort over segments of the door travel to generate a door travel characteristic. This characteristic enables the door controller to accurately assess obstruction conditions by comparing a real time characteristic with a stored characteristic. The microprocessor also stores electronically the upper and lower limits of door travel. The microprocessor monitors electric motor duty cycle to avoid overheating of the motor and possible burnout while also controlling locking of the drive mechanism when the motor is inoperative. The microprocessor is also used to set the ratio control signal code used to activate the door drive mechanism, the setting procedure allows for immediate verification of the set code.

GB 2 189 906 A

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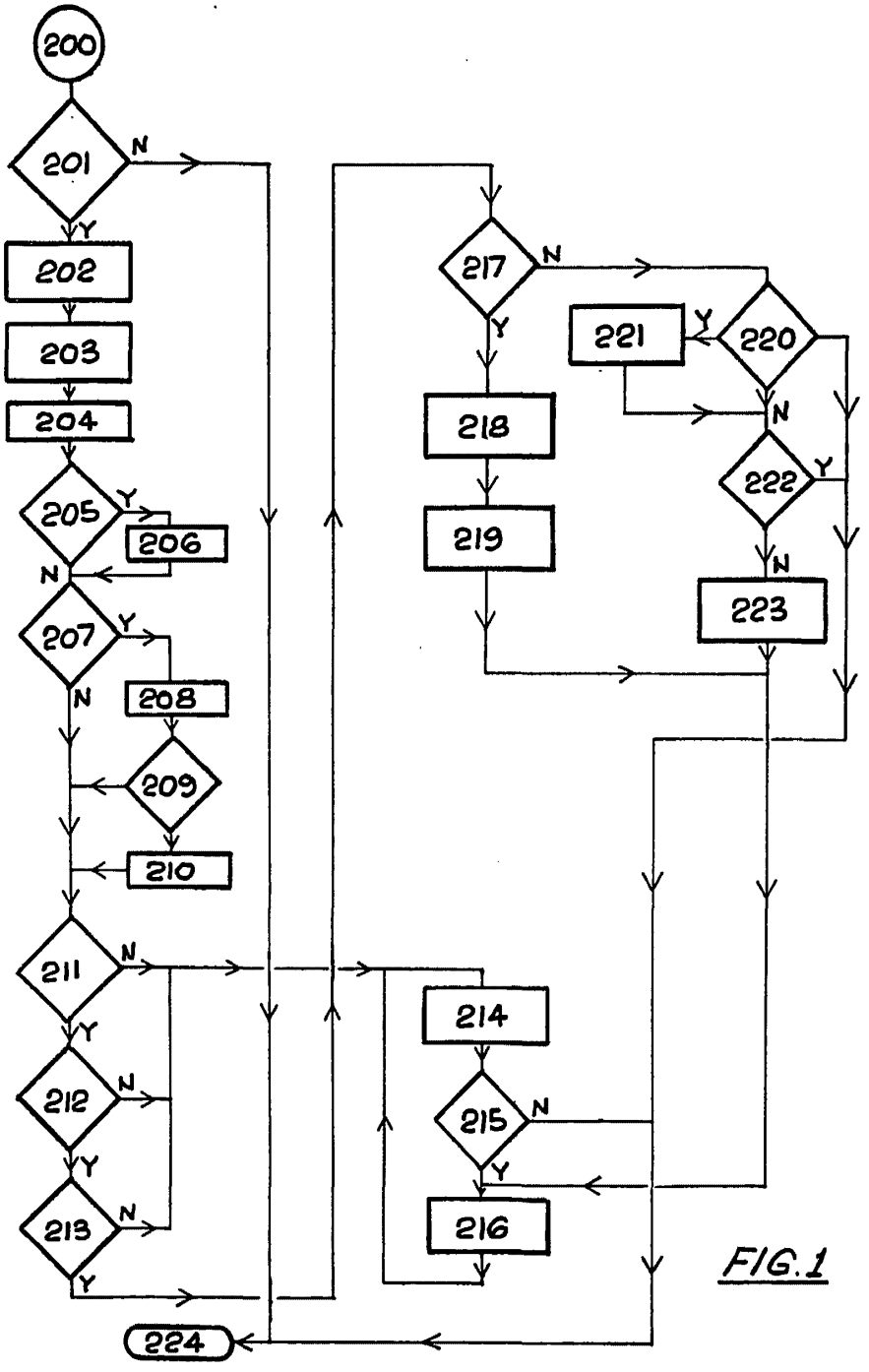
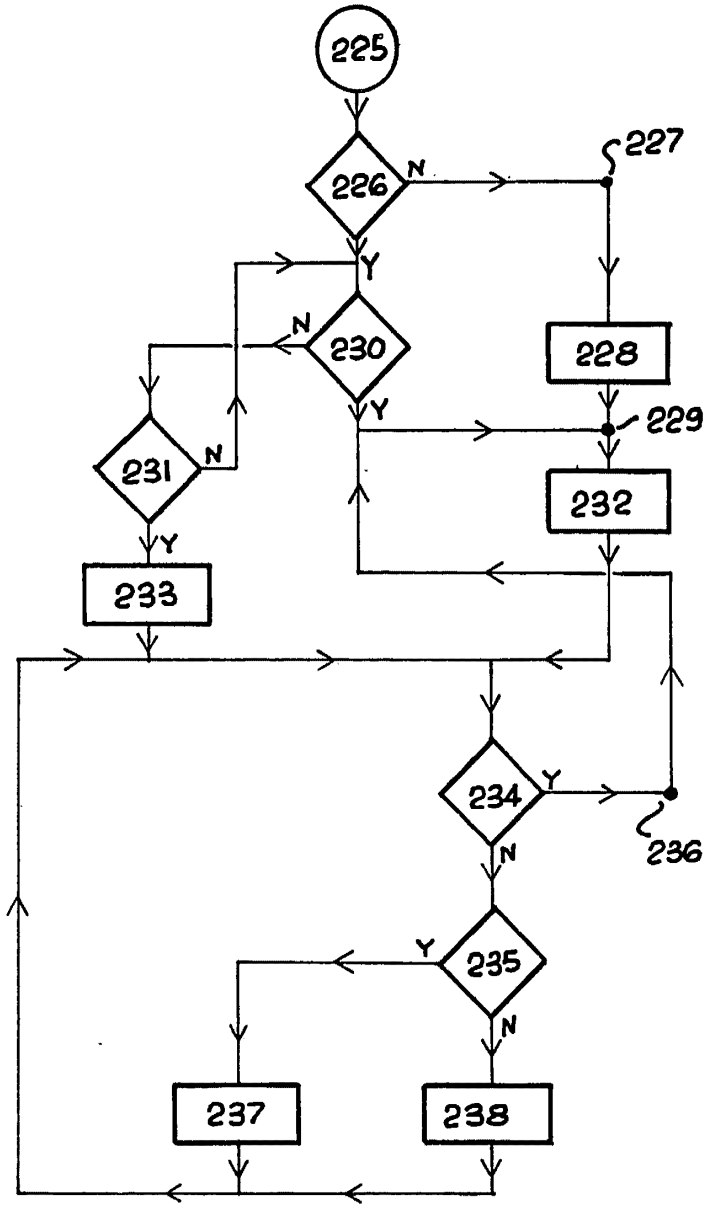


FIG. 1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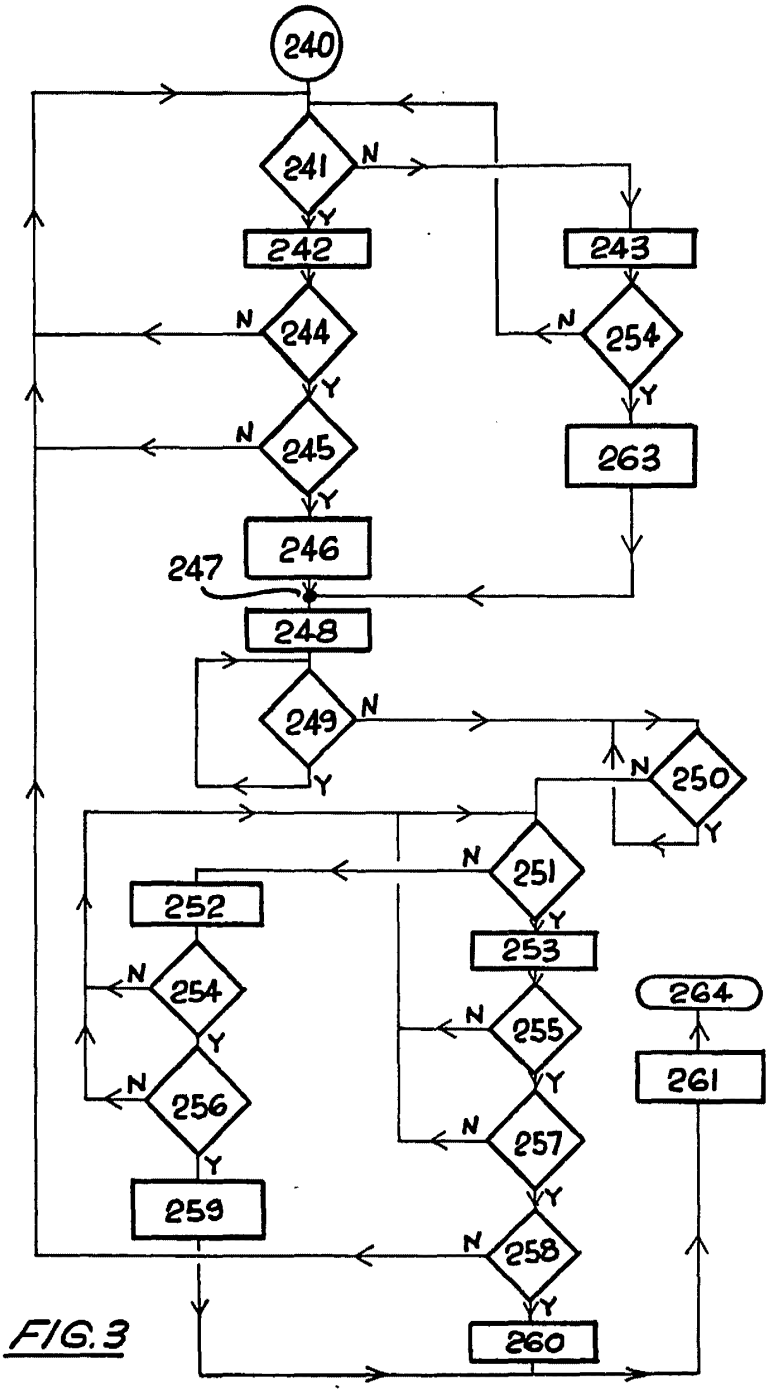
N
237
238

FIG. 2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252
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FIG. 3

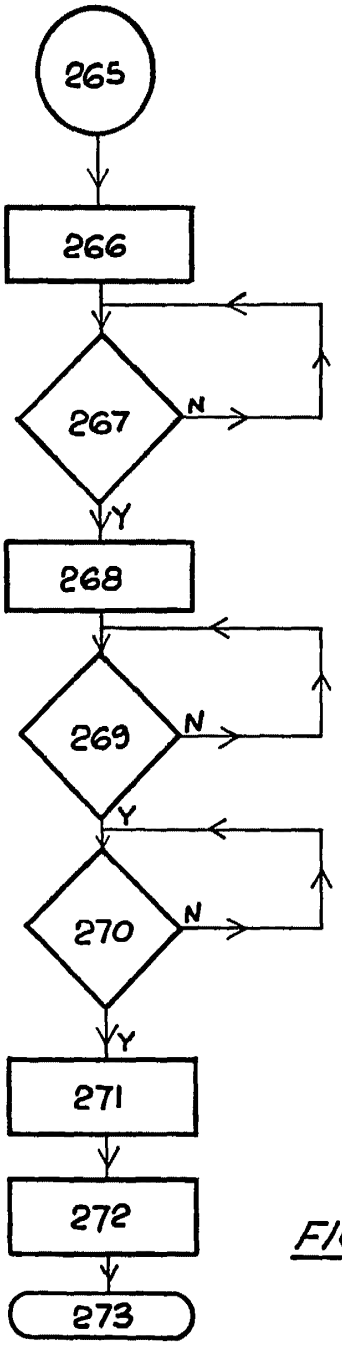
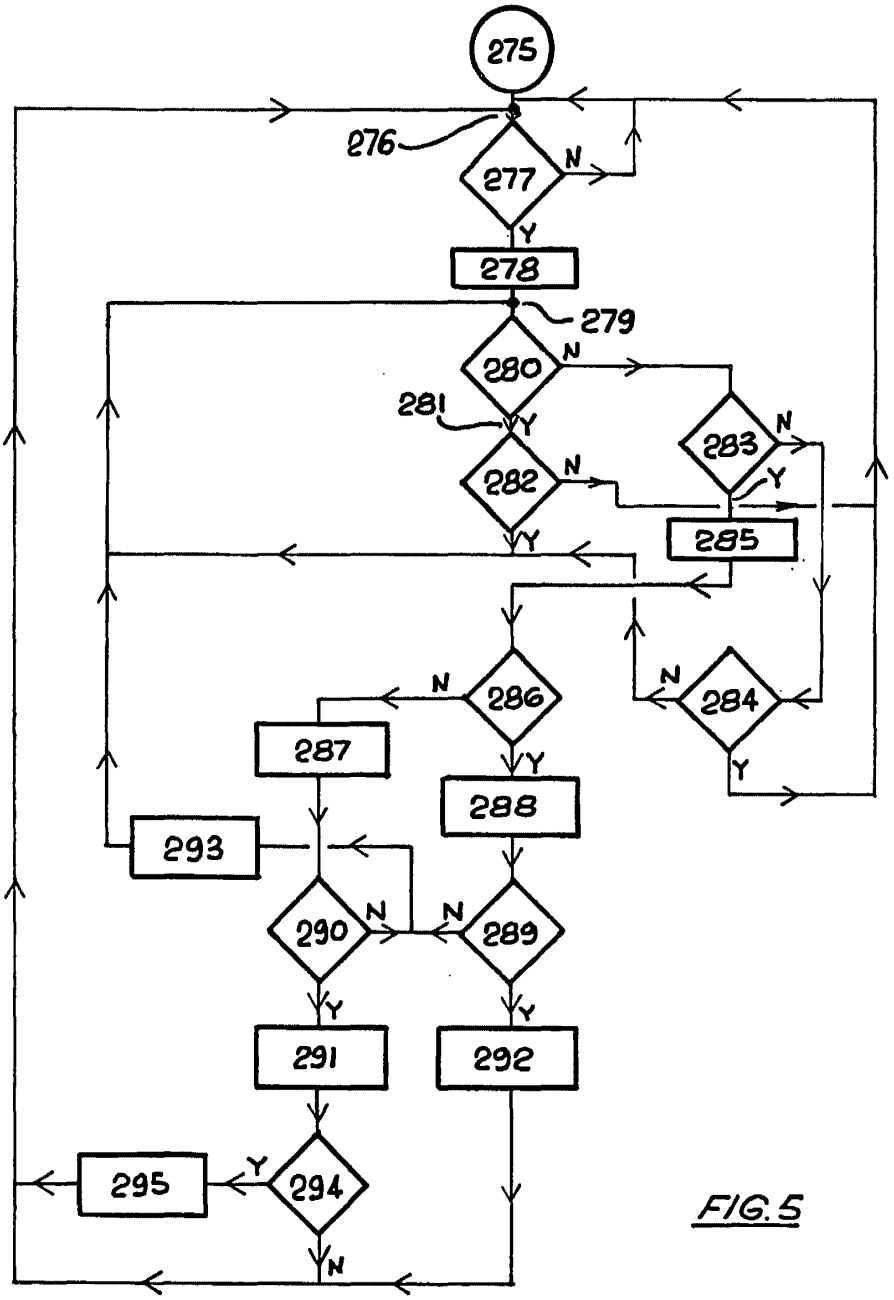


FIG.4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291
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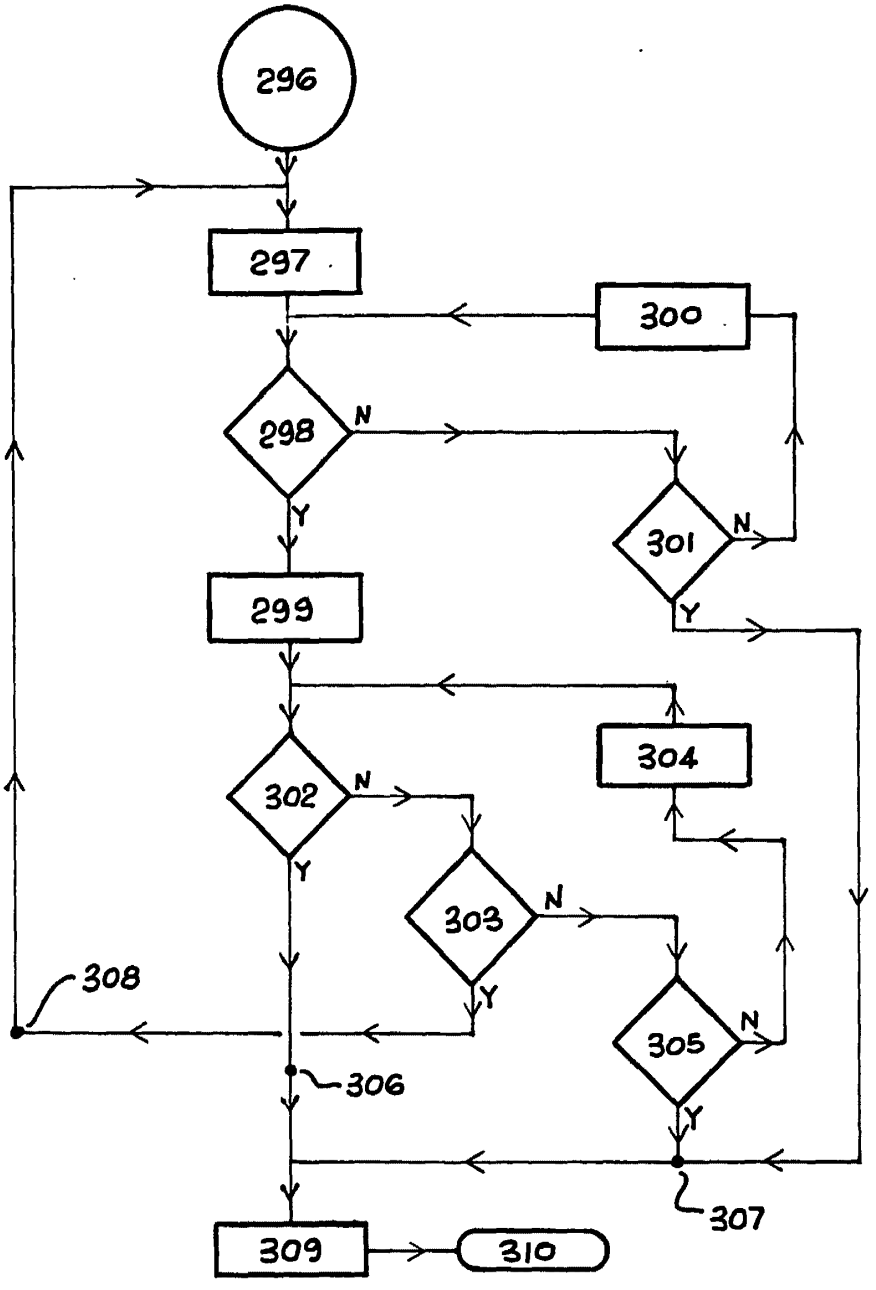
294
N

FIG. 5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Y
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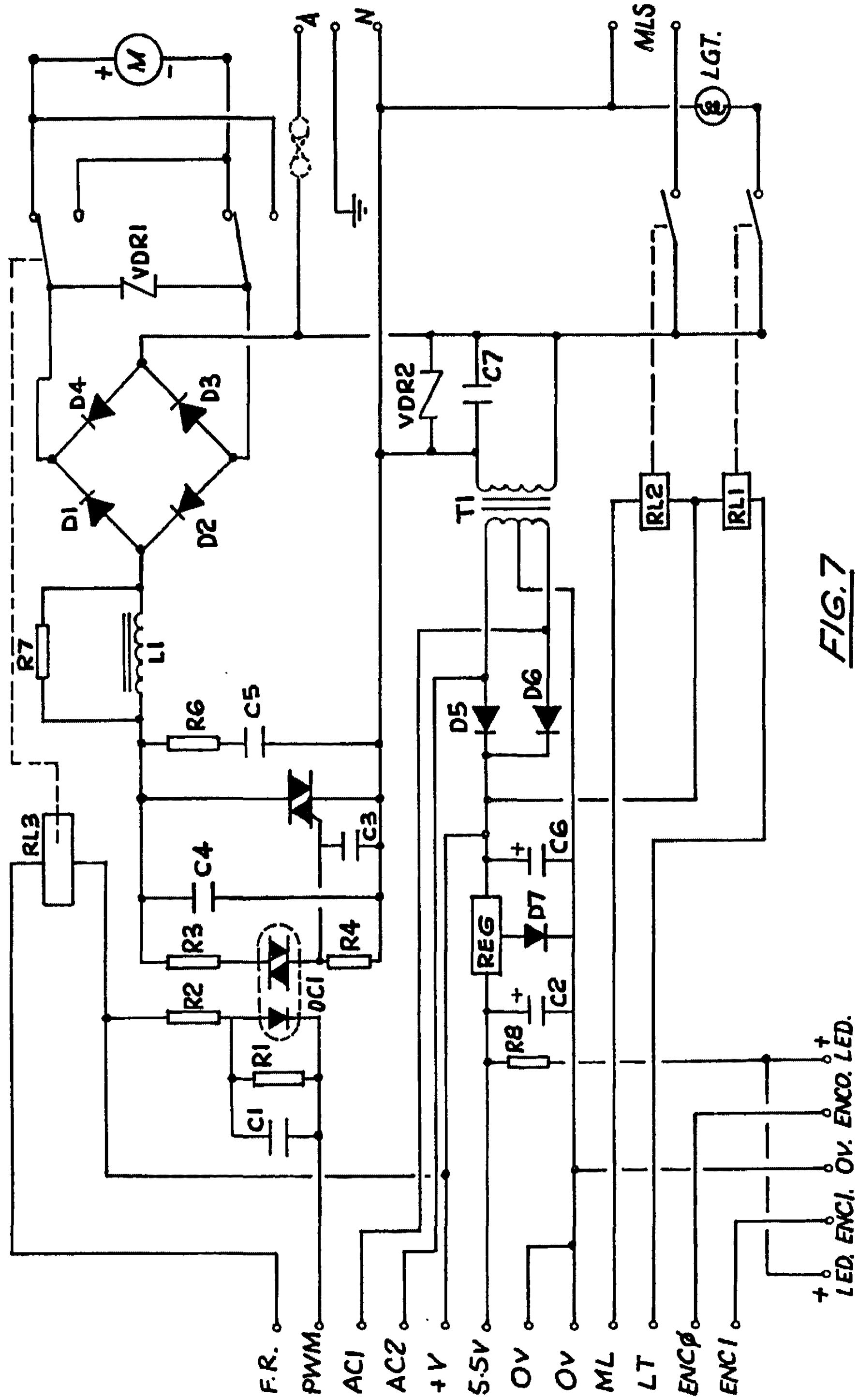
309
310

FIG.6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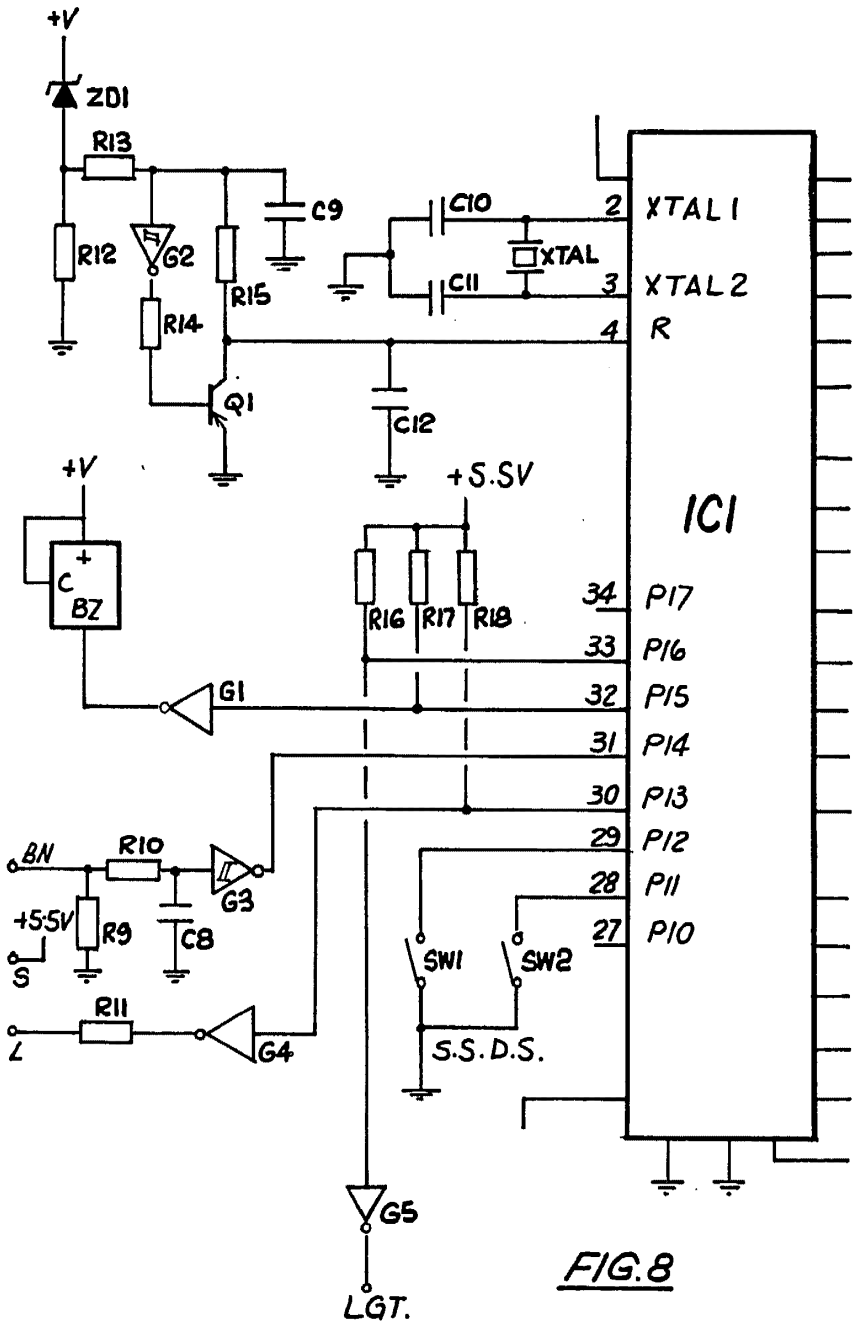
N
MLS
LGT.
M
VDR1
D1
D2
D3
D4
VDR2
C7
T1
RL1
RL2
RL3
R7
L1
R6
C5
C3
C4
R3
R4
R2
OC1
R1
C1
D5
D6
C6
REG
D7
C2
R8
F.R.
PWM
AC1
AC2
+V
5.5v
Ov
Ov
ML
LT
ENCØ
ENC1
+ LED.
ENCI.
Ov.
ENCO.
LED. +

FIG.7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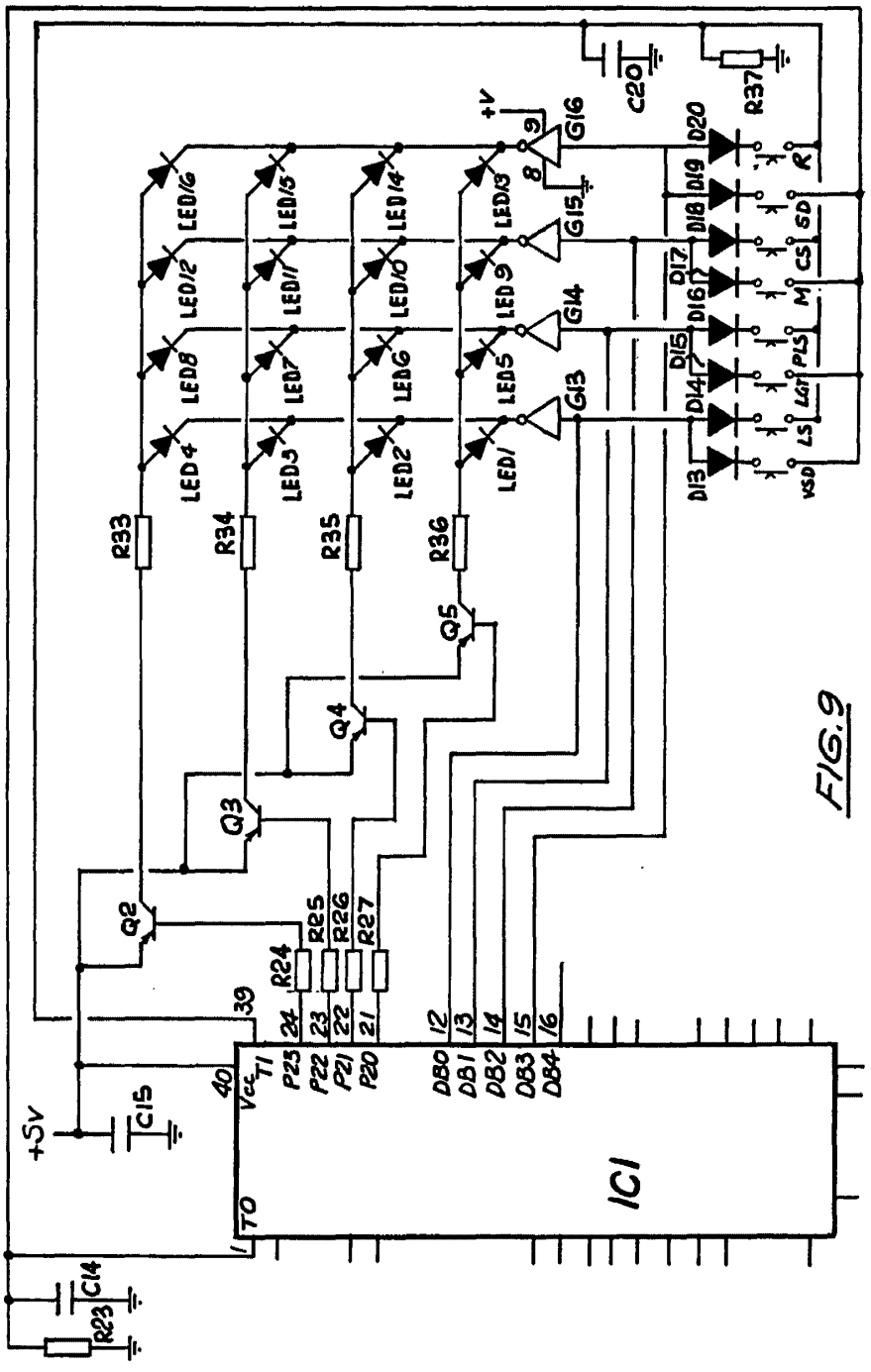
ZD1
R13
R12
G2
C9
R15
C10
XTAL
C11
2
XTAL1
3
XTAL2
4
R
R14
Q1
C12
+V
+S.5V
IC1
C
BZ
R16
R17
R18
34
P17
33
P16
32
P15
31
P14
30
P13
29
P12
28
P11
27
P10
G1
BN
R10
G3
+5·5V
R9
C8
S
SW1
SW2
S.S.D.S.
R11
L
G4
G5
LGT.

FIG.8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C20
R37
G16
G15
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G13
D20
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D18
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D16
D15
D14
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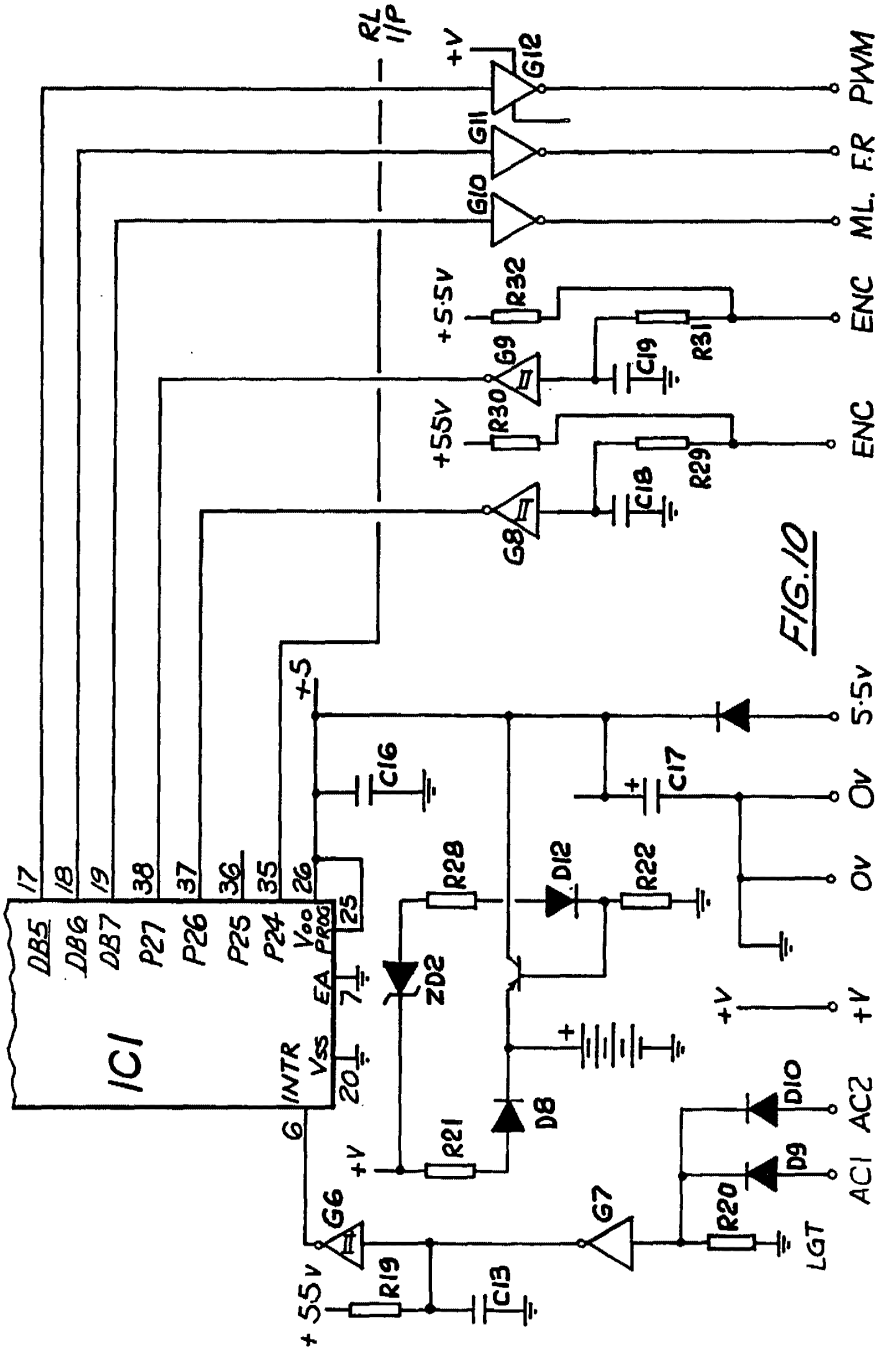
CS
M
PLS
LAT
LS
VSD
LED16
LED15
LED14
LED13
LED12
LED11
LED10
LED9
LED8
LED7
LED6
LED5
LED4
LED3
LED2
LED1
R33
R34
R35
R36
Q5
Q4
Q3
Q2
R25
R26
R27
R24
39
24
23
22
21
12
13
14
15
16
40
T1
Vcc
P23
P22
P21
P20
DB0
DB1
DB2
DB3
DB4
IC1
1
T0
+5V
C15
C14
R23

FIG. 9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+V
G12
G11
G10
PWM
FR
ML.
ENC
ENC
+5·5V
R32
R31
C19
G9
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R29
C18
G8
+5V
+5
C16
C17
5·5v
0v
0v
R28
D12
R22
ZD2
IC1
DB5
DB6
DB7
P27
P26
P25
P24
Vpp PROG
EA
Vss
INTR
17
18
19
38
37
36
35
26
25
7
20
6
+V
+V
D10
D9
AC2
AC1
R21
D8
R20
LGT
G6
G7
+5·5v
R19
C13

FIG.10

SPECIFICATION

Door controller

BACKGROUND OF THE INVENTION

The present invention relates to an improved door controller for motor driven doors and the like.

The term "door curtain" as used throughout the specification refers to any closure means adapted to be positioned across a door aperture. Some well known examples of such curtains include:

1. Continuous sheet rolling doors where corrugations are pressed into a sheet and two or three sheets are lockseamed to make a door curtain.

2. Slat shutters, whereby individual slats of approximately 50–100mm width are rollformed and are allowed to pivot one on the other to allow the door curtain to be rolled up.

3. Sectional overhead doors where panels of between 450 and 700mm are hinged together with a horizontal axis to allow the door curtain to move vertically upwards and horizontally back along a set of tracks.

4. Tilt type doors which are a single panel door curtain with a bracket arrangement to allow an up and over movement of the door panel.

5. Mesh or grille type security curtains.

The invention will be described in relation to its application to roller type doors however it is equally applicable to other forms of door and is not limited to the specific application described.

Roller type doors are well known and comprise a flexible door curtain which can be raised and lowered from a drum located above the door aperture. It is also well known to employ a pair of end drums rotatably mounted on a fixed axle extending horizontally across the top of the door aperture. The curtain is secured at its upper end to each of the spaced end drums and a ring gear is secured to one drum and provided with a motor drive for rotating the drums and thereby raising or lowering the door.

Door controllers of the type having a remote control transmitter which sends a coded signal to a controller coupled to the door drive means for controlling raising and lowering the door are also well known. These controllers usually operate in conjunction with mechanically operated upper and lower limit switches and obstruction detection devices. The forms of obstruction detection are many and include mechanical sensors in the lower portion of the door curtain, motor load monitoring devices, and run time monitors.

Each of these systems has inherent disadvantages and particular problems have been found with the type of door described above where the downward movement of the door is dependent upon the weight of the door curtain causing the door curtain to fall into the door opening. In such doors the changes in motor load will be dependent on the position of the door. Furthermore, the relationship between motor load and door position will vary with door age, climatic conditions and track condition. Thus setting of load monitoring device to only detect actual obstructions is difficult as each of these variations must be compensated for in order to avoid false tripping of the door mechanism.

SUMMARY OF THE INVENTION

The present invention seeks to overcome or at least ameliorate these problems by providing an improved door controller which can "learn" the characteristics of a particular door. The door characteristic according to the present invention is a function of door operating effort. Operating effort may be related to load on the drive means for the door which in turn may be related to the speed of the door and the energy input to the drive means.

According to a first aspect, the present invention provides a door controller comprising:

means for driving a door curtain between open and closed positions in response to received door operation command signals,

door position encoder means for providing signals indicative of the position of the door curtain relative to the door opening,

load sensing means coupled to said means for driving and responsive to sense the load thereon,

processing means responsive to said encoder means and said load sensing means for producing a representation of a door travel characteristic relating door curtain position to load on said means for driving,

memory means coupled to processing means for storing said representation of a door travel characteristic.

Preferably, said load sensing means comprises means for sensing the electrical current supplied to a motor used to drive the door.

According to a second aspect, the present invention provides a door controller comprising:–

means for driving a door curtain between open and closed positions in response to received

door position encoder means for providing signals indicative of the position of the door curtain relative to the door opening;

timing means for providing timing signals for said controller;

processing means responsive to said encoder means and said timing means for producing a representation of a door travel characteristic relating door curtain position and door curtain speed;

memory means coupled to said processing means for storing said representation of a door travel characteristic.

According to a third aspect, the present invention provides a door controller according to said first or second aspect wherein said processing means is adapted to compare the door travel characteristic for each run of the door between its open and closed positions or vice versa with the previously stored characteristic and being responsive to the difference in said characteristics exceeding a predetermined margin to indicate an obstruction condition.

Preferably, said means for driving the door curtain is further responsive to detection of an obstruction condition to reverse the direction of travel of the door curtain for a predetermined period and then stop travel of said door curtain.

According to a fourth aspect, the present invention provides a door controller comprising:–

means for driving a door curtain between open and closed position in response to received door operation command signals,

door position encoder means for providing signals indicative of the position of the door curtain relative to the door opening,

first memory means coupled to said door position encoder for storing signals representative of a desired closed position of the door curtain,

second memory means coupled to said door position encoder for storing signals representative of a desired open position of said door curtain,

said means for driving the door curtain being responsive to said signals stored in said first and second memory means to limit door curtain travel to between these stored positions.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the invention will now be described by way of example only with reference to the accompanying drawings in which:–

Figure 1 shows a flow chart of the processor operations used to control the door characteristic function and reversing function of the door controller according to the invention;

Figure 2 shows a flow chart of the main control program of the processor used in the door controller according to the invention;

Figure 3 shows a flow chart of the programs subroutine for the limit setting function of the door controller according to the invention;

Figure 4 shows a flow chart of the program subroutine for the warm start function of the door controller according to the invention;

Figure 5 shows a flow chart of the program subroutine for the radio control input decoding function of the door controller according to the invention;

Figure 6 shows a flow chart of the program subroutine for the code setting function of the door controller according to the invention;

Figure 7 shows a circuit diagram of the power supply circuit for the door controller according to the invention;

Figures 8, 9 and 10 show a circuit diagram of the main control unit for the door controller according to the invention.

DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS

The door controller according to the embodiments of the invention provides several different features which will be described separately hereunder. These can be summarized as follows:–

(1) Door Characteristic Learning
(2) Reversing and Obstruction Detection
(3) Limit Setting
(4) Warm Start Function
(5) Code Setting and Decoding
(6) Motor Protection
(7) Door Locking

Door Characteristic Learning

In order to understand the characteristic learning function of the door controller the general concept of achieving such a function will first be described followed by one preferred implementation of this concept.

ately placed or positioned in relation to a set of spinning blades coupled to the drive means for the roller door. In this way the encoder can produce signals indicative of the position of the door curtain. For preference, at least two optoelectronic sensors are used so as to enable the direction of door travel to be sensed.

In order to determine a door travel characteristic the processing means samples the time taken for the door curtain to travel a fixed distance and therefrom determines changes in the speed of the door. Preferably this is done by notionally dividing the door travel into a plurality of segments and further sub-dividing each segment into a plurality of sectors and producing a running average of peak speed changes for each sector and storing this average for each segment of the door travel. This running average of peak speed changes for each segment is used to represent the door travel speed characteristic.

The running average is regularly updated with each run of the door unless the value of peak speed change is outside predetermined limits indicating an error in the system or detection of an obstruction. Thus over a period of time the processing means learns a door travel speed characteristic for the particular door being controlled.

Referring to Fig. 1 a particular example of a program implementation of the door travel characteristic learning function will be described.

In order to determine the time taken for the door to travel a fixed distance the processor determines whether a fixed number of encoder transitions have occurred, in this example sixteen, if they have not, the subroutine returns to main program and awaits the next test. When the number of transitions have occurred, that is the door has travelled a predetermined distance, the processor calculates the time period to travel this distance by summing the last sixteen encoder periods.

This time summation is then compared with a previously stored time sum for the particular sector of interest. This comparison takes the form of subtracting the old time summation from the newly calculated time sum. If the difference is negative, that is the new value is less than the old value, the difference value is set to zero. If the difference is positive or zero the program drops through to the next test.

The next test compares the newly calculated difference value for the particular sector with a previously stored peak difference value. If the new difference value is greater than the old peak difference value, it replaces the old value and is stored. The new difference value is then compared with a value representing an 8% speed change. This value represents the upper limit of speed change considered acceptable, any higher value is considered an error or obstruction. If the new difference is above the 8% speed change value, it is replaced by this upper limit value.

The processor next tests whether the values of peak difference are suitable for updating the sector sensitivity characteristic. This is done by testing whether the door curtain is travelling downward, and has been for more than a predetermined period, in this example 2 seconds. If either of these tests is not satisfied, the peak difference value is reinitialized to a value representing a 1% speed change. If the door movement satisfies these two conditions a further test is made to determine whether the door curtain is approaching its lower limit, in this example within 25 mm of its lower limit. If the door curtain is not close to its lower limit the subroutine considers the value of peak difference for a particular sector to be suitable for further processing. If the door is close to its lower limit the peak difference value is again reinitialized to a 1% speed change value.

Once reinitialization has taken place the processor tests whether the sector number presently being reinitialized is greater than the previously stored sector number, if it is not, the subroutine is exited. If it is greater, then the old sector number is replaced by the present sector number and the program loops back to reinitialize the value of the peak difference.

If further processing of the peak difference value is indicated by the above tests the subroutine compares the new difference value with a previously stored sector sensitivity value. If the new difference value is greater than the stored sector sensitivity value, this indicates the detection of an obstruction and the subroutine steps in relation to this result will be described later. If the new difference value is not greater than the previously stored sector sensitivity value, the door position is tested to determine whether it is close to its lower limit. If it is within 50 mm of the lower limit the sector number is set to a value of zero and the value of sector number is then compared with the old stored sector number. If the sector sensitivity value has already been updated, that is the present sector number equals the old stored sector number, then the subroutine is again exited.

If the sector sensitivity is to be updated, a running average technique is used, in this particular embodiment, the new sector sensitivity is set to 75% of the old sensitivity value plus half the new peak difference value. The old stored sector number is then replaced with the present sector number and the peak difference value is reinitialized before the subroutine is exited.

Reversing and Obstruction Detection

compared with the calculated peak speed change for the same segment on a present run of the door. If this new value exceeds the stored value, the door controller will consider an obstruction to have been detected in the travel path of the door. The detection of an obstruction will preferably cause the door to stop and reverse away from the obstruction. This can be done preferably for either direction of travel of the door. When an obstruction condition occurs the value of the running average for the particular segment is not updated to the value detected but is modified by a predetermined margin which serves to desensitise the door in order to minimise the occurrence of false obstruction detection conditions. This margin would preferably be of the order of 1%. In contrast if no obstruction detection conditions occur over a period of time the door will gradually reach maximum sensitivity for a particular door travel characteristic.

The learning of the door travel characteristic and the regular updating of this characteristic enables the door controller to make an accurate assessment of the correct operation of the door, and appropriate action to be taken should this operation deviate from the characteristic learned by the controller.

Limit Setting

As the door controller is provided with information from the door position encoder, in order to ensure correct operation of the door this position information must in some way be referred to door curtain position in relation to the door opening. This requires setting the limits of the door travel within the opening.

In the past this has been done by providing detectors at the lowermost limit of door travel, usually ground level, and at the uppermost limit of door travel, usually near the top of the door opening. This has in most cases required accurate manual adjustment by the installer of the door limit detectors.

The embodiments of the present invention overcome the need for adjustment of such detectors and also do away with the need for separate limit detectors by enabling the limits of door travel to be set within the memory of the door controller.

The limit setting function is performed as follows. The door curtain is driven down into the floor or lower limit of the door opening by activation of a first switch until an overload condition is detected and the motor cut-out activated. A second switch is then operated to cause the lower limit to be stored in a memory register of the controller. In the case where an overload condition has been detected a number or count representing the lower limit setting is reduced by several counts so that the lower limit is a predetermined distance above the overload condition point.

An alternative form of lower limit setting can be also performed by manually moving the door to a desired lower limit point and operating the second switch to store the limit setting in a memory register. In this case the count representing the lower limit is not altered as no overload condition has occurred.

Once the lower limit has been set the first switch is again operated and causes the door curtain to travel upward until the door curtain reaches the upper door stops and an overload condition is again detected and the motor de-activated. A similar procedure is then followed to set the upper limit. Manual adjustment of the door is again possible if an overload condition has not been caused.

In normal operation a door position counter holding a count representative of the door curtain position is regularly compared with the limit setting counts stored in the appropriate memory registers. When an equality with either stored count is detected the door curtain will be considered to have reached the upper or lower limit of travel and the drive motor will be stopped.

A particular example of a processor subroutine for performing the limit set function will now be described.

The subroutine begins by testing whether the power limit button has been pressed. If the button is pressed the motor is activated and drives down towards the lower limit or floor. The subroutine then tests for the period of time the motor has been running. If this period is below a predetermined value, in this example 25 seconds, the program loops back to the start of the subroutine. If the predetermined time value is exceeded the subroutine tests for a motor overload. If a motor overload is detected the door position register is initialized, thus setting the lower limit. The motor is then turned off and depression of the limit set button is tested for, if the button is depressed the subroutine loops back and waits for release of the button before proceeding to the next test which tests for release of the power limit button.

Once the power limit button is released the subroutine proceeds to the upper limit setting program. The state of the power limit button is again tested and if it is depressed the motor is activated in an upward direction and its running time is monitored and the program loops back continually to test for depression of the power limit button until the running time exceeds a

occurs. When this condition is satisfied the door position is tested. If the door is not a predetermined distance above the lower limit when an overload occurs, in this example 500 mm, the program returns to the begining of the limit setting procedure. If the door is above the predetermined distance, the door size register is set, the motor is deactivated and the upper limit setting completed, followed by return by the subroutine tothe main program.

If the power limit button is not depressed once the upper limit setting program is entered, the motor is deactivated and the state of the limit set button is tested. When the limit set button is detected as being depressed and the door is a predetermined distance above the lower limit, the door register size is set allowing for door overrun and the motor is deactivated and the subroutine exited.

Warm Start Function

The warm start function relates to the requirement to reset door operation parameters following an unexpected event such as a power failure. The door controller is preferably provided with emergency power in the form of battery backup. In the event of power failure the door controller will lose track of the door curtain position relative to the door opening.

The controller overcomes this problem by providing automatic seeking of the lower door travel limit once power is restored and at the next activation of the door by an operator. On initial operation of the door following a power failure the door curtain preferably goes up a short distance and then drives down to the floor and stops. The initial upward movement of the door curtain is to allow the door to reach normal running speed when driving into the floor and thus provide a consistent lower limit setting irrespective of where the door curtain stops during a power interruption.

The controller detects a speed fall below a predetermined limit as the lower floor limit and resets the counter holding the door position counts. Preferably a visual indicator, for example an LED, is used to tell the operator that a power interruption or fault has occurred and this indicator will go out once the door position counter has been reinitialized by the door controller.

A specific example of the warm start function is shown in the flow chart of Fig. 4.

The subroutine begins by activating the motor to drive upwards and testing for a predetermined time elapsed interval, in this particular example, two seconds. When this time interval has elapsed the motor is reversed and drives the door downwards. After a predetermined time period, again in this example, two seconds, the subroutine tests for a motor overload. That is, it tests for the door curtain reaching floor level.

Once an overload is detected, the motor is deactivated and the door position register is reinitialized to the lower limit value. The subroutine then returns to the main control program.

Code Setting and Decoding

The processor performs several functions when setting the codes used for radio-controlled activation of the door motor. The processor is required to decode incoming signals, filter out unwanted signals, set the code if necessary and verify the code setting. These functions are performed by two related subroutines which will be described below.

Referring to Fig. 5 the radio control decoding subroutine is shown. The subroutine begins with a testing loop which continually tests for a positive transition of the radio control input. When a positive transition is detected a data bit counter is reset to enable the subroutine to count the number of data bits detected and thus determine when transmission has been completed.

Once the counter has been reset the subroutine again tests for a positive transition on the radio control input. If no transition has occurred and a predetermined period has elapsed since the last detected positive transition, the processor samples the state of the radio control input. It then tests a register within the processor to determine whether a code setting flag has been set. This flag controls the code setting operation, if it is not set the subroutine proceeds to the normal decoding operation. This comprises comparing each bit of the input code with the stored code, testing to determine whether the code transmission is complete, setting a flag if it is and then determining whether the whole received code is equivalent to the stored code. If the codes are equivalent a "code valid" flag is set and the subroutine loops back to await the start of the next transmission. If the codes are not equivalent the subroutine ignores the transmission and returns to await the next code transmission.

If the code setting flag is set, the processor stores the current remote control input state in a code storage register and then tests for end of code transmission. If the transmission is completed, a flag is set and the subroutine returns to await the start of the next transmission.

If the tests for end of tranmission are negative the subroutine increments the data bit counter and loops back to test for a positive transition on the radio control input.

The code setting subroutine is shown in Fig. 6. The subroutine begins by setting a flag indicating code setting is taking place and then tests for the end of a code transmission. If the transmission is complete the "code setting" flag is reset and the subroutine proceeds to a

loop which tests the state of a code setting button. If the button is not depressed the subroutine decodes and stores a piece of the new code and returns to test for completion of the code transmission. This looping continues until the end of the code transmission or the code setting button is depressed, manually terminating the code setting procedure.

The code verification loop comprises a code validity check which compares the originally learnt code with the new code transmission. If the code is not valid, that is the comparison fails, the subroutine tests the time period which has elapsed since the original code was received. If this period exceeds a predetermined value, in this example, one second, the verification is considered to have failed and the subroutine loops back to its beginning. If the predetermined period has not elapsed and the code setting has not been manually terminated by depression of the code setting button, the subroutine again decodes the input and compares the code for validity. This loop continues until a valid code is verified or the time period for successful verification elapses.

When the code is verified or the coding setting procedure is manually terminated, the "code setting" flag is reset and the subroutine returns to the main program.

Motor Protection

Motors used to drive the doors under discussion are normally required to have a high torque and be compact so as to fit within the confines of the door roll. Such motors normally are only rated for intermittent operation and thus must be protected against excessive operation which may result in motor "burn out".

According to a further aspect of the present invention, the door controller provides means to monitor the duty cycle of the driving motor and in response to said means indicating the duty cycle has been exceeded preventing operation of the motor until a predetermined time period has elapsed, said time period being related to the run time of the motor prior to the duty cycle being exceeded.

For example, consider that the motor can only be operated for up to 160 seconds of consecutive cycle from "cold" condition. Once this period has been exceeded the motor is prevented from operating further until a "cooling off" period has been allowed and the motor is considered to have returned to a "cold" condition. In this particular example for each 1 second of running time the motor needs 4 seconds of cooling time. Thus if the motor has run for 160 seconds, a period of 640 seconds is allowed for the motor to reach a "cold" condition before the motor can be reactivated.

In the embodiments of the invention the duty cycle of the motor is monitored by the processor provided in the door controller and the processor inhibits operation of the motor for the desired cooling time. For preference, a visual indication is also given that the motor duty cycle has been exceeded and the motor is inoperable. This indication will cease once the cooling period has elapsed and the motor is reenabled.

Door Locking

The form of drive train usually provided with power operated doors of the type under discussion, has a worm drive having a gear profile which provides self-locking of the door when the motor drive is deactivated.

Such drive trains have been found to be too large and inefficient when using high torque motors and it is desirable to use other means to lock the motor and thus the door. The use of a processor in the door controller of the present invention enables door locking to done by means of a solenoid operated motor lock.

The processor monitors the motor operation and if the motor is off for more than a predetermined time period, for example 2 seconds, the solenoid is engaged. For preference, engagement is done by de-energizing the solenoid. When a command is given for the motor to be started, the solenoid is energized and a small time delay allowed for the solenoid lock to disengage before the motor is activated. A delay is also applied when the motor is reversed in order to avoid damage to the motor control circuitry.

Main Control Program

The subroutine for providing various functions of the preferred embodiments have been described above. These subroutines are "called" by a main control program, an example of which is shown in Fig. 2.

The program begins by testing whether the data memory security code is intact. If it is not, this indicates data has been lost during a power interruption and the program reloads the data memory security code. It then calls the limit setting subroutine previously described.

If the memory security code is intact the program tests for depression of the limit set button, if this button is depressed it calls the limit setting subroutine. If the limit set button is not depressed the program tests the condition of the start button. If the start button is not

Following completion of the warm start subroutine in the limit setting subroutine the program tests for manual actuation of the limit setting routine by testing the condition of the limit set button. If it is depressed the limit setting subroutine is called. If it is not depressed the program tests whether code setting is required by examining the condition of the code set button. If this button is depressed the code setting subroutine is called. If not the main program is re-entered. On completion of the main program or code setting subroutine the program returns to test for manual situation of limit setting.

Control Circuitry

Referring to Fig. 7, the power supply circuitry for the door controller and motor drive is shown.

A 240V A.C. supply is fed to the active and neutral terminals of the circuit marked A and N. This supply is branched, with one branch feeding the motor lock solenoid and door light via relays RL2 and RL1 respectively. A further branch of the A.C. supply is connected to a full wave bridge rectifier constituted by diodes D1-D4. The rectified voltage is fed to the motor via a pair of contacts operated by relay RL3. These contacts serve to reverse the polarity of the D.C. voltage applied to the motor and thus the direction of motor drive. A voltage dependent resistor VDR1 is connected in parallel with the output terminals of the bridge rectifier to provide surge and back emf protection.

The voltage input to the bridge circuit is controlled by a variable A.C. control circuit. The circuit comprises a triac switch which switches the A.C. voltage under the control of a optically coupled triac circuit. The switched output is smoothed by means of R-C network R6 and C5 and inductance L1 having a shunt resistor R7. A pulse width modulation signal is fed to the A.C. control circuit via a low pass network comprising R2, C1 and R1. This circuit initiates the triggering of the optically coupled triac which in turn controls the timing of switching of the triac and the A.C. voltage duty ratio supplied to the bridge rectifier.

A further branch of the A.C. voltage supply is fed to transformer T1 which steps the voltage down to 12V which is then connected through a full wave rectifier comprising diodes D5 and D6 to a voltage regulator circuit comprising integrated circuit regulator REG and capacitors C6 and C2 connected to the input and outputs of the regulator respectively. Diode D7 modifies the regulator output to provide desired 5.5V output. The regulated output of 5.5V D.C. is used to power the microprocessor and associated electronic circuitry. A voltage dependent resistor VDR2 is coupled across the primary winding of transformer T1 together with capacitor C7 to provide surge protection.

Referring to Fig. 8, the microprocessor circuit and its associated interface and control circuitry is shown. Power supply to the microprocessor is provided in the form of regulated 5.5 volts D.C. This voltage is connected to the VDD terminal of the microprocessor via diode D11. Diode D11 prevents discharge of back-up power supply during power interruption. A smoothing capacitor C17 is connected from the output of the diode to ground.

A backup battery supply is also connected in parallel with the regulated supply to provide power to the microprocessor if the mains power supply fails or is temporarily interrupted. The backup supply in this example comprises 4 nicad cells connected in series however other suitable battery sources may be used. The cells are connected between ground and the emitter of transistor Q6. The collector of transistor Q6 is connected to the VDD terminal and its base is connected between a series connected diode D12 and resistor R22. Diode D12 and resistor R22 from part of a series network comprising zener diode ZD2, resistor R28, diode D12 and resistor R22 connected between the unregulated 12V D.C. supply provided by the half wave rectifier network D5-D6 and ground. This network is arranged to switch the transistor Q6 on and thus supply battery voltage to the processor and associated circuitry when a drop in A.C. power supply voltage is detected. The circuit also provides for charging of the backup battery source during normal A.C. supply. 12V D.C. is fed to the battery source via resistor R21 and blocking diode D8. The blocking diode presents discharge of the battery source through the charging path when the A.C. power supply fails.

The internal timing and clocking of the microprocessor is controlled by a crystal XTAL connected across terminals 2 and 3 of the microprocessor and series capacitors C10 and C11 coupled to ground.

A reset input R is provided to the microprocessor by means of a transistor switch Q1 having its collector coupled to the reset input, its emitter connected to ground and its base driven by a Schmitt trigger gate G2 via a resistor R14. The Schmitt trigger detects the presence of a voltage from the 12V D.C. power supply circuit by means of series connected zener diode ZD1 and resistor R12 connected across said power supply and having their series connection point coupled to the input of the Schmitt trigger G2 via a resistor R13. On receipt of sufficient input voltage the Schmitt trigger switches applying a current to the base of transistor Q1 which in turn switches on taking the reset input 4 of the microprocessor to ground.

Encoder inputs (ENC) from the opto-electronic blade encoder previously described are fed to

inputs P26 and P27 via similarly configured interface networks. These networks comprise a Schmitt trigger gate G8 (G9) and lowpass networks comprising a series resistor R29 (R31) and parallel connected capacitor C18 (C19) connected to ground. The encoder input line is biased by resistor R30 (R32) coupled to a regulated D.C. voltage source.

Function indicating LED's, LED 1-LED 13 are driven by outputs P20-P23 of the microprocessor IC1. The driver lines are connected to the respective base electrodes of transistors Q2-Q5, all of which have their emitters coupled to a source of D.C. voltage. The collectors of each transistor drive one terminal of each of four LED's. These LED's are further scanned by signals provided by scanning lines DB0-DB3 of the microprocessor which connect to the other terminals of each LED via inverting gates G13-G16. The combination of these scanning signals and driver signals can be used to switch on appropriate LED's in the display array so as to indicate particular functions or conditions of the controller.

Scanning lines DB0-DB3 are also used to scan inputs for various push button switches SW3-SW10 which are used to control the functions of the microprocessor IC1 and thus the actions of the door controller.

The radio link input is provided directly to input P24 of the microprocessor. Speed control inputs for the motor control are provided by DIP switches SW1 and SW2 which selectively connect inputs P11 and P10 of the microprocessor to ground.

Motor control outputs from the microprocessor are provided by outputs DB5-DB7 which respectively control the motor lock (ML), forward/reverse (F/R) and speed functions (PWM) of the motor. These outputs are coupled to the motor control via interface gates G10-G12.

A light control output (LGT) is provided on microprocessor line P16 via interface gate G5. A buzzer BZ1 for providing audible signals is coupled to output P15 of the microprocessor via interface gate G1.

A remote input (BN) to the microprocessor is provided to input P14 of the microprocessor via a Schmitt trigger gate G3. The input is fed to this gate via a time constant network comprising series connected resistor R10 and parallel connected resistor R9 and capacitor C8. A LED output (L) to the remote switch is provided by output P13 via interface gate G4 and resistor R11.

The A.C. power supply timing is monitored by means of outputs AC1 and AC2 of transformer T1 which are coupled to an interrupt input INTR of the microprocessor circuit IC1. Diodes D9 and D10 rectify the A.C. voltage and gate G7 drives Schmitt trigger G6 via parallel connected R-C network R19 and C13. The output of the Schmitt trigger is connected to interrupt input INTR.

It will be apparent to those skilled in the art that various program arrangements and control circuitry can be used to achieve the functions of the controller required and the invention is not limited to the particular embodiments described or the particular examples given.

It will be further apparent to those skilled in the art that other embodiments of the invention described are possible without departing from the spirit or scope of the invention.

INDEX TO FLOW CHART DIAGRAMS

BLOCK NO.	CONTENTS
200	Start of decelerate learning and reversing logic.
201	Have 16 encoder transitions occurred since last difference calculation?
202	Sum last 16 encoder periods.
203	Calculate difference = time sum - old time sum
204	Old time sum = time sum
205	Is difference negative
206	Set difference = zero
207	Is difference greater than peak difference?
208	Set peak difference = Difference
209	Is difference greater than value corresponding to 8% speed change?
210	Set peak difference = 8%
211	Is door motoring down?
212	Has door been motoring down for more than 2 seconds?

BLOCK NO.	CONTENTS
213	Is door curtain within 25mm of lower limit?
214	Set Peak difference =1%
215	Is sector no. greater than old sector no.?
216	Set old sector no.= Sector no.
217	Is difference greater than sector sensitivity?
218	Reverse door
219	Add 1% to Sector sensitivity.
220	Is door within 50mm of lower limit?
221	Set sector No. = ZERO
222	Is sector no. = Old sector no.?
223	Set sector sensitivity=3/4 sector sensitivity + 1/2 peak difference.
224	Return.
225	Start - Micro computer power Up.
226	Is data memory security code intact.
227	Data memory contents lost during power down.

BLOCK NO.	CONTENTS
228	Reload data memory security code.
229	Automatic limit setting activation following loss of memory during extended power down.
230	Is limit set button depressed?
231	Is start button depressed?
232	Limit setting subroutine.
233	Warm start subroutine.
234	Is limit set button depressed?
235	Is code set button depressed?
236	Manual activation of limit setting.
237	Code setting subroutine
238	Main program.
240	Start of limit setting subroutine.
241	Is power limit button depressed?
242	Motor down.
243	Motor off.
244	Has motor been on for 2 seconds or more?

BLOCK NO.	CONTENTS
245	Is motor overloaded?
246	Initialize door position register.
247	Lower limit set.
248	Motor off
249	Is limit set button depressed?
250	Is power limit button depressed?
251	Is power limit button depressed?
252	Motor off.
253	Motor up.
254	Is limit set button depressed?
255	Has motor been off for 2 seconds or more?
256	Is door more than 500mm above lower limit?
257	Is motor overloaded?
258	Is door more than 500 mm above lower limit?
259	Set door size register (allowing for door overrun)
260	Set door size register.
261	Motor off.

BLOCK NO.	CONTENTS
262	Upper limit set.
263	Initialize door position register (allowing for overrun)
264	Return.
265	Start of warm start subroutine.
266	Motor upwards.
267	Has 2 seconds elapsed since motor start?
268	Motor downwards.
269	Has 2 seconds elapsed since motor start downwards?
270	Is motor overloaded?
271	Turn motor off.
272	Initialize door position register.
273	Return.
275	Start of radio control decoding subroutine.
276	Await transmission start.
277	Has positive transition occurred on receiver input?
278	Reset data bit counter.
279	Transmission started.
280	Has positive transition occurred on receiver input?
281	Data bit start selected.

BLOCK NO.	CONTENTS
282	Has more than 7.5m seconds elapsed since last positive transition?
283	Has more than 7.5m seconds elapsed since last positive transition?
284	Has 20m seconds elapsed since last positive transition?
285	Sample receiver input state.
286	Is code setting flag set?
287	Compare input state with stored code.
288	Store current input state in code storage register.
289	Is transmission complete (is data bit counter = 18)?
290	Is transmission complete?
291	Flag "Transmission complete".
292	Flag "Transmission complete".
293	Increment data bit counter.
294	Is received code = stored code?
295	FLAG "code valid"
296	Start code setting subroutine.
297	Set "Code setting" flag.
298	Is transmission complete?

BLOCK NO.	CONTENTS
299	Reset "Code setting" flag.
300	Decode and store new code.
301	Is "Code setting" button depressed?
302	Is code valid?
303	Has 1 second elapsed since first code received?
304	Decode and compare code.
305	Is "code setting" button depressed?
306	Code received and verified.
307	Manual termination of code setting.
308	Verification failed, await new transmission.
309	Reset "code setting" flag.
310	Return.

CLAIMS

1. A door controller comprising:
means for driving a door curtain between open and closed positions in response to received door operation command signals,
door position encoder means for providing signals indicative of the position of the door curtain relative to the door opening,
load sensing means coupled to said means for driving and responsive to sense the load thereon,
processing means responsive to said encoder means and said load sensing means for producing a representation of a door travel characteristic relating door curtain position to load on said means for driving,
memory means coupled to processing means for storing said representation of a door travel characteristic.

2. A door controller comprising:
means for driving a door curtain between open and closed positions in response to received door operation command signals,
door position encoder means for providing signals indicative of the position of the door curtain relative to the door opening,
timing means for providing timing signals for said controller;
processing means responsive to said encoder means and said timing means for producing a representation of a door travel characteristic relating door curtain position and door curtain speed;
memory means coupled to said processing means for storing said representation of a door

3. A door controller according to claim 1 or 2 wherein said processing means compares the door travel characteristic for each run of the door between its open and closed positions or vice versa with a previously stored characteristic in said memory means and being responsive to the difference in said characteristics exceeding a predetermined value to indicate an obstruction condition.

4. A door controller according to claim 3 wherein said means for driving the door curtain is responsive to the detection of an obstruction condition by said processing means to reverse the direction of travel of the door curtain for a predetermined period of time and then stop travel of said door curtain.

5. A door controller according to claim 2 wherein said processing means samples the time taken for the door curtain to travel a predetermined fixed distance, such that differences in the time taken to travel said fixed distance represent changes in the speed of the door curtain.

6. A door controller according to claim 5 wherein said processing means notionally divides the door travel distance into a plurality of segments and further sub-divides each of these segments into a plurality of sectors and produces a running average of the peak speed changes for each sector and stores this running average of peak speed changes for each segment in said memory means as said door speed characteristic.

7. A door controller according to claim 1 wherein said processing means notionally divides the door travel distance into a plurality of segments and further sub-divides each of these segments into a plurality of sectors and produces a running average of the peak load changes for each sector and stores this running average of peak load changes for each segment in said memory means as said door travel characteristic.

8. A door controller according to claim 1 or any one claim dependent therefrom wherein said means for driving comprises an electric motor and said load sensing means comprises means for sensing the electrical current supplied to said motor.

9. A door controller according to anyone of the preceding claims further including a radio receiver, said processing means including code setting means for setting a code specific to said door controller, means for comparing a received signal from said radio receiver and the code signal from the code setting means and means for producing a door operation command signal to operate said door curtain when a comparision is detected by said comparing means between said received signal and said code signal.

10. A door controller according to claim 9 wherein said code setting means is responsive to a coded signal received by said radio receiver from a remote source to set said specific code during a code setting mode.

11. A door controller according to claim 10 said processing means include code verification means operable to compare a received coded signal with said specific code in said code setting means during said code setting mode such that a comparison indicates a verified code and a non-comparison indicates an invalid set code.

12. A code controller comprising:–

means for driving a door curtain between open and closed positions in response to received door operation command signals,

door position encoder means for providing signals indicative of the position of the door curtain relative to the door opening,

first memory means coupled to said door position encoder for storing signals representative of a desired closed position of the door curtain,

second memory means coupled to said door position encoder for storing signals representative of a desired open position of the door curtain,

said means for driving the door curtain being responsive to said signals in said first and second memory means to limit door curtain travel to between the positions stored therein.

13. A door controller according to claim 12 including position counter means coupled to said encoder means for storing a count representative of the door curtain position, comparator means for comparing the contents of said position counter means with said stored signals in said first and second memories, said comparison indicating whether the door curtain has reached its upper or lower limit position respectively.

14. A door controller according to claim 13 including overload sensing means which senses an overload condition of said means for driving the door curtain.

15. A door controller according to claim 14 wherein said first and second memory means are coupled to said sensing means and responsive to detection of said overload condition to store a signal from said encoder means representative of the door curtain position at either a fully open overload position or a fully closed overload position.

16. A door controller according to claim 14 including power failure detecting means, control means responsive to a received door command signal following detection of a power failure to cause said means for driving the door curtain to drive said curtain in a predetermined direction

position counter means a counter representative of said overload position.

17. A door controller according to claim 16 wherein said predetermined direction is a direction towards an open position of said door curtain.

18. A door controller including electric motor means for driving a door curtain between open and closed positions in response to received door operation command signals,

monitor means coupled to said electric motor for monitoring the duty cycle thereof.

processing means coupled to said monitor means and responsive to a signal therefrom indicating that said duty cycle has been exceeded, to inhibit further operation of said electric motor until a predetermined time period has elapsed, said time period being related to the run time of the electric motor prior to the duty cycle being exceeded.

19. A door controller according to claim 18 including visual indication means for indicating that the duty cycle has been exceeded and that said motor operation is inhibited, and said indication ceasing once said predetermined time period has elapsed.

20. A door controller including:

a motor for driving a door curtain between open and closed positions in response to received door operation command signals,

locking means operable to lock said gear train means and said door curtain in a fixed position,

processing means operable to control said locking means in accordance with said received door operation command signals.

21. A door controller according to claim 20 wherein said processing means monitors said motor operation and activates said locking means if said motor is deactivated for a predetermined time period, and deactivates said locking means prior to said motor being activated.

22. A door controller according to claim 3 wherein said predetermined value is increased by a predetermined factor at each detection of an obstruction condition or decreased by a further predetermined factor for each run of the door when no obstruction condition is detected.

23. A door controller according to Claim 1 and substantially as hereinbefore described with reference to and as shown in the accompanying drawings.

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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.	Applicant(s)	
	10/765,487	BOISVERT ET AL.	
	Examiner	Art Unit	
	Marlon T. Fletcher	2837	

-- 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* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 *18 June 2008*.

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

3)☐ 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

4)☒ Claim(s) *1-8,10-32,36 and 37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,10-32,36 and 37* is/are rejected.

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

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

Application Papers

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

10)☐ The drawing(s) filed on _____ 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).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).

a)☐ All b)☐ Some * c)☐ None of:

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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *06/18/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

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

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-8, 10-32 and 36-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okuyama et al. (4,608,637) in view of Bamford (EP 0 581 509).

As recited in claims 1 and 2, Okuyama et al. disclose an apparatus for controlling motion of a motor driven element over a range of motion and for altering said motion when undesirable resistance to the motion is encountered, said apparatus comprising: a sensor (6a, 6ab, 6d, 6da) for measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element (column 7, lines 49-62); a memory for storing a number of measurement values from the sensor based on measurements of said parameter over at least a portion of the range of motion (column 8, line 51-64); a controller (microcomputer 9) coupled to the memory for determining to de-activate the motor based on the measurement values stored in the memory as the motor driven element moves over its range of motion; and a controller interface coupled to the motor (Ma, Md, Mab, Mda) for altering motion of said motor driven element in response to a determination made by the controller (column 5, lines 9-60), wherein altering is also in response to a determination that the parameter is outside the parameter range.

As recited in claims 3 and 31, Okuyama et al. disclose the method, wherein the motor driven element is a window or panel and additionally comprising reverse actuating the window or panel prior to moving said window or panel in a direction to close the window or panel (column 6, lines 24-33).

As recited in claim 4, Okuyama et al. disclose the method, additionally comprising maintaining a position of the window or panel based on the sensed parameter and the reverse actuation is initiated if a leading edge of the window or panel is near a closed position (column 6, lines 24-33).

As recited in claims 5, 10, and 11, Okuyama et al. disclose the method, movement is first initiated toward a closed position when a leading edge of the window or panel is near the closed position and wherein the reverse actuation is performed upon a sensing of an obstacle that is based on determining the parameter is outside the parameter range (column 7, lines 49-62).

As recited in claims 6 and 33, Okuyama et al. disclose an apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving said window or panel along a travel path and deactivating the motor if an obstacle is encountered by the window or panel, said apparatus comprising: a sensor for sensing movement of the window or panel and providing a sensor output signal related to a speed of movement of the window or panel (discussed above; column 7, lines 30-37), and a controller having an interface coupled to the sensor and the switch for controllably energizing the motor (figure 4a); said controller sensing a collision with an obstruction when power is applied to the controller by: monitoring movement of the window or

panel by monitoring a signal from the sensor related to the movement of the window or panel (column 7, lines 6-23; and column 8, lines 35-50), identifying a collision of the window or panel with an obstacle due to a change in the signal from the sensor that is related to a change in movement of the window or panel (Abstract; and column 8, lines 51-64); and outputting a control signal to said switch to deactivate said motor in response to a sensing of a collision between an obstacle and said window or panel (column 8, line 65 – column 9, line 7).

As recited in claims 7, 29, and 35, Okuyama et al. disclose the apparatus, wherein the controller comprises a programmable controller including a processing unit for executing a control program and including a memory for storing multiple window or panel speed values corresponding to a signal received from the sensor (column 6, lines 52-60).

As recited in claims 8 and 30, Okuyama et al. disclose the apparatus, additionally comprising one or more limit switches (11) for use by the controller to determine window or panel position for use in identifying a collision.

Okuyama et al. disclose the apparatus, wherein the control program adjusts an obstacle detection threshold in real time based on immediate past measures of the signal sensed by the sensor to adapt to varying conditions encountered during operation of the window or panel (column 8, lines 65 – column 9, line 7).

As recited in claims 12, 19, 20, and 28, Okuyama et al. disclose apparatus for controlling activation of a motor for moving an object along a travel path and de-activating the motor if an obstacle is encountered by the object comprising: a) a

movement sensor for monitoring movement of the object as the motor moves said object along a travel path (discussed above; a switch for controlling energization of the motor with an energization signal (column 6, lines 52-60); and a controller (microcomputer 9) including an interface coupled to the switch means for controllably energizing the motor and said interface additionally coupling the controller to the movement sensor for monitoring signals from said movement sensor (discussed above; said controller comprising a stored program that: determines motor speed from an output signal from the movement sensor; calculates an obstacle detect threshold based on motor speed of movement detected during at least one prior period of motor operation (column 7, lines 6-36); compares a value based on currently sensed motor movement with the obstacle detect threshold; and outputs a signal from the interface to said switch for stopping the motor if the comparison based on currently sensed motor movement indicates the object has contacted an obstacle.

As recited in claim 13, Okuyama et al. disclose the apparatus, wherein the controller includes a buffer memory for storing successive values of motor movement for use in determining the obstacle detect threshold (column 8, lines 51-53).

As recited in claim 14, Okuyama et al. disclose the apparatus, wherein the controller includes a clock and an input from the movement sensor is in a form of a sequence of pulses and further wherein the controller counts clock signals occurrences between receipt of pulses to provide an indication of motor speed (column 7, lines 30-37).

As recited in claim 15, Okuyama et al. disclose the apparatus, wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a motor energization sequence a specified minimum time period in response to a short period user actuation of said control inputs to maintain position accuracy in monitoring a window or panel movement (column 7, lines 49-62).

As recited in claim 16, Okuyama et al. disclose the apparatus, wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the object and wherein in response to a specified input the controller conducts a (calibration motor energization sequence to determine parameters of object (column 7, lines 6-29).

As recited in claims 17 and 32, Okuyama et al. disclose the apparatus, wherein the motor is coupled to a motor vehicle window or panel and wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a position indication which is updated in response movement of the window or panel and further wherein the controller reverse actuations the motor near an end point in an object path of travel to avoid false obstacle detection in the region of closure of the window or panel.

As recited in claim 18, Okuyama et al. disclose the apparatus, wherein the sensor is a current sensor and wherein the controller includes means for adjusting the obstacle threshold based on dynamic motor current as sensed from the current sensor

to take into account varying loads experienced by the motor (inherent via discussion above).

With respect to claims 21, 22, and 34, Okuyama et al. a Hall-effect sensor (6a-) and a magnetic pick-up (7a-).

As recited in claim 23, Okuyama et al. disclose the apparatus, additionally comprising an obstacle detector having an output coupled to the controller that senses a disruption in a region through which the window or panel moves (discussed above).

Okuyama et al. do not disclose storing immediate past measurements over a present traversal of the motor.

However, Bamford discloses an apparatus for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said apparatus comprising: a sensor (5) for measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element; a memory (9) for storing a number of measurement values from the sensor based on immediate past measurements of said parameter over at least a portion of a present traversal of said motor driven element through said range of motion; a controller (6) coupled to the memory for determining to de-activate the motor based on a most recent sensor measurement of the parameter and the immediate past measurement values stored in the memory obtained during a present run through the motor driven element range of motion; and a controller interface coupled to the motor

for altering motion of said motor driven element during the present run in response to a determination made by the controller (figure 3).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the teachings of Bamford with the teachings of Okuyama et al., because the teaching allow the use of more accurate and precise measurements to be used in updating the window movements to thereby more accurately detect obstructions.

As recited in claim 24-27, Okuyama et al. do not disclose the apparatus, wherein the obstacle detector comprises an infrared light source and detector.

However, Official Notice is taken with respect to infrared light sources being well known in the art to detect movement of an object.

It would be obvious to use any type of sensor, because the teachings merely provide alternate means for providing the same, wherein one could substitute one sensor or detector for another.

With respect to claims 36 and 37, Okuyama et al. disclose the claimed invention except for the range in which the measurements are taken (40 milliseconds). It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide measurements at forty millisecond interval, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Response to Arguments

Applicant's arguments with respect to claims 1-8, 10-32, 36, and 37 have been considered but are moot in view of the new ground(s) of rejection.

The reference on the IDS provides a teaching of using the present measurement. This was the missing element that previously placed the application in condition for allowance. Therefore, the claims are rejected based on the newly cited art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marlon T. Fletcher whose telephone number is 571-272-2063. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lincoln Donovan can be reached on 571-272-1988. 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.

MTF
07/19/2008

/Marlon T Fletcher/
Primary Examiner, Art Unit 2837

PTO/SB/08b (01-08)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 2 of 2

Complete if Known	
Application Number	10/765,487
Filing Date	01/27/2004
First Named Inventor	Mario Boisvert
Art Unit	2837
Examiner Name	Marlon T. Fletcher
Attorney Docket Number	14-733C2D1

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
		Provisional Application No. 60/152,605 filed on September 8, 1999, to which Patent No. 6,377,009, issued on April 23, 2002 claims priority	
		9 pages total - cover sheet (2 pages), specification (4 pages), drawings (3 pages)	

Examiner Signature	/Marlon Fletcher/	Date Considered	07/20/2008

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.98. 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 2 hours 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, 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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Privacy Act Statement

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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.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10765487	BOISVERT ET AL.
	Examiner	Art Unit
	Fletcher, Marlon T	2837

✓	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	07/19/2008								
	1	✓								
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	36	✓								

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CLAIM		DATE								
Final	Original	07/19/2008								
	37	✓								

PTO/SB/08a (01-08)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 2

Complete if Known	
Application Number	10/765,487
Filing Date	01/27/2004
First Named Inventor	Mario Boisvert
Art Unit	2837
Examiner Name	Marlon T. Fletcher
Attorney Docket Number	14-733C2D1

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US- 6,377,009	04-23-2002	Philipp	
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FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]

Examiner Signature	/Marlon Fletcher/	Date Considered	07/20/2008

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This collection of information is required by 37 CFR 1.97 and 1.98. 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 2 hours 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, 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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(Use as many sheets as necessary)

Sheet 1 of 1

Complete if Known	
Application Number	10/765,487
Filing Date	01/27/2004
First Named Inventor	Mario Boisvert
Art Unit	2837
Examiner Name	Marlon T. Fletcher
Attorney Docket Number	14-733C2D1

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US-			
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FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]
		GB2189906A	11-04-1987	Byrne and Davidson Doors		
		2502679	03-23-1982	Societe Gebr. Bode		
		WO 92/20891	11-26-1992	Volex Group		
		EP0581509A1	02-02-1994	The General Electric Co.		

Examiner Signature	/Marlon Fletcher/	Date Considered	07/20/2008

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1]Applicant's unique citation designation number (optional). [2]See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5]Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6]Applicant is to place a check mark here if English language Translation is attached.

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Mario Boisvert *et al.*

Serial No.: 10/765,487

Filing Date: January 27, 2004

Title: *COLLISION MONITORING SYSTEM*

Examiner: Marlon T. Fletcher

Art Unit: 2837

Docket No.: 14-733C2D1

Tarolli, Sundheim, Covell & Tummino, LLP
Suite 1700
1300 East Ninth Street
Cleveland, OH 44114

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

RESPONSE

In response to the office action having a mailing date of July 23, 2008, please consider the following:

Claim Status

1. (previously presented) Apparatus for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said apparatus comprising:

a) a sensor for measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element;

b) a memory for storing a number of measurement values from the sensor based on immediate past measurements of said parameter over at least a portion of a present traversal of said motor driven element through said range of motion;

c) a controller coupled to the memory for determining to de-activate the motor based on a most recent sensor measurement of the parameter and the immediate past measurement values stored in the memory obtained during a present run through the motor driven element range of motion; and

d) a controller interface coupled to the motor for altering motion of said motor driven element during the present run in response to a determination made by the controller.

2. (previously presented) A method for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said method comprising:

a) measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element by taking a multiplicity of measurements as the motor moves the motor driven element over its range of motion;

b) storing a number of measurement values based on measurements of said parameter over an immediate past portion of a present run through said range of motion;

c) determining that the parameter is outside a parameter range based on stored measurement values obtained during the immediate past portion as the motor driven element moves over its range of motion; and

d) altering motion of said motor driven element during the present run in response to a determination that the parameter is outside the parameter range.

3. (Original) The method of claim 2 wherein the motor driven element is a window or panel and additionally comprising reverse actuating the window or panel prior to moving said window or panel in a direction to close the window or panel.

4. (Original) The method of claim 3 additionally comprising maintaining a position of the window or panel based on the sensed parameter and the reverse actuation is initiated if a leading edge of the window or panel is near a closed position.

5. (Original) The method of claim 4 movement is first initiated toward a closed position when a leading edge of the window or panel is near the closed position and wherein the reverse actuation is performed upon a sensing of an obstacle that is based on determining the parameter is outside the parameter range.

6. (Previously Presented) Apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving said window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel, said apparatus comprising:

a) a sensor for sensing movement of the window or panel and providing a sensor output signal related to a speed of movement of the window or panel;

b) a switch for controllably actuating the motor by providing an energization signal; and

c) a controller having an interface coupled to the sensor and the switch for controllably energizing the motor; said controller sensing a collision with an obstruction

when power is applied to the controller by:

i) monitoring movement of the window or panel by monitoring a signal from the sensor related to the movement of the window or panel;

ii) adjusting an obstacle detection threshold in real time based on immediate past measurements of the signal sensed by the sensor to adapt to varying conditions encountered during operation of the window or panel;

iii) identifying a collision of the window or panel with an obstacle due to a change in the signal from the sensor that is related to a change in movement of the window or panel by comparing a value based on a most recent signal from the sensor with the obstacle detection threshold; and

iv) outputting a control signal to said switch to deactivate said motor in response to a sensing of a collision between an obstacle and said window or panel.

7. (Original) The apparatus of claim 6 wherein the controller comprises a programmable controller including a processing unit for executing a control program and including a memory for storing multiple window or panel speed values corresponding to a signal received from the sensor.

8. (Original) The apparatus of claim 6 additionally comprising one or more limit switches for use by the controller to determine window or panel position for use in identifying a collision.

9. (Cancelled)

10. (Original) The apparatus of claim 6 wherein the controller maintains a position of a leading edge of the window or panel and further wherein the controller reverse energizes the motor to move the window or panel away from a closure position prior to activating the motor to close the window or panel.

11. (Original) The apparatus of claim 10 wherein the controller reverse energizes the motor in response to a sensing of an obstacle and the reverse energizing and attempt to move the window or panel to a closed position is performed to confirm sensing of the obstacle.

12. (Previously Presented) Apparatus for controlling activation of a motor for moving an object along a travel path and de-activating the motor if an obstacle is encountered by the object comprising:

a) a movement sensor for monitoring movement of the object as the motor moves said object along a travel path;

b) a switch for controlling energization of the motor with an energization signal; and

c) a controller including an interface coupled to the switch for controllably energizing the motor and said interface additionally coupling the controller to the movement sensor for monitoring signals from said movement sensor; said controller comprising a stored program that:

i) determines motor speed of movement from an output signal from the movement sensor ;

ii) calculates an obstacle detect threshold based on motor speed of movement detected during a present run of said motor driven element;

iii) compares a value based on currently sensed motor speed of movement with the obstacle detect threshold; and

iv) outputs a signal from the interface to said switch for stopping the motor if the comparison based on currently sensed motor movement indicates the object has contacted an obstacle.

13. (Original) The apparatus of claim 12 wherein the controller includes a buffer memory for storing successive values of motor movement for use in determining the obstacle detect threshold.

14. (Original) The apparatus of claim 12 wherein the controller includes a clock and an input from the movement sensor is in a form of a sequence of pulses and further wherein the controller counts clock signals occurrences between receipt of pulses to provide an indication of motor speed.

15. (Original) The apparatus of claim 12 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a motor energization sequence a specified minimum time period in response to a short period user actuation of said control inputs to maintain position accuracy in monitoring window or panel movement.

16. (Original) The apparatus of claim 12 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the object and wherein in response to a specified input the controller conducts a calibration motor energization sequence to determine parameters of object.

17. (Original) The apparatus of claim 12 wherein the motor is coupled to a motor vehicle window or panel and wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a position indication which is updated in response movement of the window or panel and further wherein the controller reverse actuations the motor near an end point in an object path of travel to avoid false obstacle detection in the region of closure of the window or panel.

18. (Original) The apparatus of claim 12 wherein the sensor is a current sensor and wherein the controller includes means for adjusting the obstacle threshold based on dynamic motor current as sensed from the current sensor to take into account varying loads experienced by the motor.

19. (previously presented) Apparatus for controlling activation of a motor for moving a window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel comprising:

a) a sensor for sensing movement of a window or panel along a travel path;

b) a switch for controlling energization of the motor with an energization signal; and

c) a controller coupled to the switch for controllably energizing the motor and having an interface coupling the controller to the sensor and to the switch; said controller comprising decision making logic for:

i) monitoring a signal from the sensor;

ii) calculating a real time obstacle detect threshold based on the signal that is detected during at least one prior period of motor operation during movement along a present or current run through a path of travel of said window or panel ;

iii) comparing a value based on a currently sensed motor parameter with the obstacle detect threshold; and

iv) stopping movement of the window or panel by controlling an output to said switch that controls motor energization if the comparison based on a currently sensed motor parameter indicates the window or panel has contacted an obstacle.

20. (Previously Presented) Apparatus for controlling activation of a motor for moving a window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel comprising:

a) a sensor for generating speed signals representative of the window or panel speed as the motor moves the window or panel along a travel path;

b) an obstacle detection controller for monitoring at least a part of the travel path of the window or panel for sensing and generating an obstacle detect signal indicating the presence in said travel path of an obstacle to movement of the window or panel;

c) a switch coupled to said controller for controlling energization of the motor with an energization signal; and

d) said controller for processing speed signals and obstacle detection signals and controlling operation of the motor in response to said speed or obstacle detection signals; said controller including:

i) a storage for storing a number of speed signals that vary with motor speed;

ii) a processor for calculating an obstacle detect threshold based on one or more speed signals stored in said storage obtained in real time based on immediate past measures of the speed signal sensed by the sensor to adapt to varying conditions encountered during movement along a present path of travel of said window or panel;

iii) a logic unit for making a comparison between a value representing window or panel speed based on a currently sensed motor speed signal with the calculated obstacle detect threshold, and generating a control output if an obstacle is detected based on said comparison; and

iv) an interface coupled to said switch for changing the state of the switch to stop the motor.

21. (Original) The apparatus of claim 20 wherein the sensor for generating a speed signal comprises a Hall-effect sensor.

22. (Original) The apparatus of claim 20 wherein the sensor for generating a speed signal comprises a magnetic pick-up.

23. (Original) The apparatus of claim 20 additionally comprising an obstacle detector having an output coupled to the controller that senses a disruption in a region through which the window or panel moves.

24. (Original) The apparatus of claim 23 wherein the obstacle detector comprises a microwave generator and a reflected wave transducer.

25. (Original) The apparatus of claim 23 wherein the obstacle detector comprises an infrared light source and detector.

26. (Previously Presented) The apparatus of claim 23 wherein the obstacle detector comprises a field effect device.

27. (Previously Presented) The apparatus of claim 26 wherein the field effect device comprises a magnetic field inductive sensor.

28. (previously presented) Apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving said window or panel along a travel path and de-activating the motor when the window or panel is within an acceptable range of a predetermined position , said apparatus comprising:

a) a sensor for sensing movement of the window or panel and providing a sensor output signal related to a position of the window or panel;

b) a switch for controllably actuating the motor by providing an energization signal; and

c) a controller having an interface coupled to the sensor and the switch for controllably energizing the motor; said controller determining the position of the window or panel when power is applied to the controller by:

i) monitoring the sensor output signal from the sensor related to the position of the window or panel;

ii) identifying the position of the window or panel based on the sensor output signal from the sensor; and

iii) outputting a control signal to said switch to deactivate said motor in response to a sensing of said window or panel within the acceptable range.

29. (Previously Presented) The apparatus of claim 28 wherein the controller comprises a programmable controller including a processing unit for executing a control program and including a memory for storing multiple window or panel position values corresponding to a signal received from the sensor.

30. (previously presented) The apparatus of claim 28 additionally comprising for use by the controller to determine whether the window or multiple position limits that define the acceptable range programmed panel is closed or open.

31. (Previously Presented) The apparatus of claim 28 wherein the controller maintains a position of a leading edge of the window or panel and further wherein the controller reverse energizes the motor to move the window or panel away from a closure position prior to activating the motor to close the window or panel.

32. (Previously Presented) The apparatus of claim 28 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the motor vehicle window or panel and wherein the controller maintain a position indication which is updated in response to movement of the window or panel and further wherein the controller reverse actuates the motor near an end point in the travel path of the window or panel to avoid false obstacle detection in a region of closure of the window or panel.

33 -35. (Cancelled)

36. (Previously Presented) The apparatus of claim 1 wherein the immediate past measurements of said parameter were taken within a forty millisecond interval prior to the most recent sensor measurement.

37. (Previously Presented) The apparatus of claim 6 wherein the immediate past measurements of said signal are sensed within a forty millisecond interval prior to the most recent signal from the sensor.

REMARKS

No claims are amended and claims 1 – 8, 10 – 32, 36 and 37 are pending and reconsideration of those claims is requested.

In an earlier office action dated April 10, 2007 during this prosecution, the Examiner rejected then pending claim 1 as being unpatentable over Jones et al (US 4,831,509) in view of Wrenbeck et al (US 5,436,5390) having a filing date of August 30, 1993. In the amendment filed June 20, 2007, applicants argued that the language in then pending claim 1 (as well as claims 2, 6, 12, 19, 20 28 and 33) was supported by the specification in US patent 5,334,876 having an April 22, 1992 filing date and from which the present application claims priority. In the office action of October 31, 2007, the Examiner acknowledged the claims were supported in the specification of the '876 patent to Washeleski et al and the rejection based on Wrenbeck et al was withdrawn. That office action states "the applicant argued that Wrenbeck et al were not prior art. The Examiner agrees."

Claims 1, 2, 19, 28 and 30 were amended subsequent to the October 31, 2007 office action, more specifically, the amendment filed January 10, 2008 made changes to these claims. Independent claims 6, 12, and 19 have not been amended since the October 31, 2007 office action and therefore the Examiner's conclusion regarding support for these claims in the '876 patent specification still applies. Those claims that were amended are still supported as the following claim chart shows. The additions to claims1, 2, 19, 28, and 30 that were made after the October 31, 2007 office action are underlined.

CLAIM NO.	CLAIM LANGUAGE	SUPPORT IN 5,334,876 PATENT
1	Apparatus for controlling motion of a motor driven element (1A) in a vehicle over a range of motion and for altering said motion (1B) when undesirable resistance to said motion is encountered (1C), said apparatus comprising:	1A. Window or Panel Col. 2, Line 40; 1B. Range of Motion Col. 5, Lines 60 – Col. 6, Line 9; 1C. Motor de-energized Col. 6, Lines 65-66.

1(a)	a) a sensor (1D) for measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element;	1D. Op-amp 110, Col. 5, Line 19
1(b)	a memory (1E) for storing a number of measurements values from the sensor based on immediate past measurements of said parameter over at least a portion of a present traversal (1F) of said motor driven element through said range of motion	1E. Control Circuit with memory that compares sensed motor current with calibrated current Col. 1, Lines 65-66 -- see also Col. 6, Lines 20-24 1F. col 6, line 46-63
1(c)	a controller (1G) coupled to the memory for determining to de-activate the motor based on a most recent sensor measurement of the parameter and the immediate past measurement values stored in the memory <u>obtained during a present run through the motor driven element</u> range of motion	1G. Control circuit determines 'compare value' at col 6, line 62 and the motor is de-energized if presently sensed current is greater than the 'compare value', col 6, line 64-66. The sensed value is compared against a template. For soft obstacle detection, if the sensed value is within a window of the template threshold, the template is updated using the sensed value. Col. 6, lines 12-40. For hard obstacle detection, the sensed current is evaluated against a compared value that is a function of a reading of the motor current every two milliseconds and stored as a first in, first out. Col. 6, lines 41-66. This constitutes a value obtained during a present run through the motor drive element range of motion.

1(d)	d) a controller interface (1H) coupled to the motor for altering motion of said motor driven element during the present run in response to a determination made by the controller.	1H. Field effect transistor 20 Col. 2, Line 53. If the current values of the sensed current is greater than the compare value, an obstruction flag is set and the motor is de-energized. Col. 6, Lines 64-66.

CLAIM NO.	CLAIM LANGUAGE	SUPPORT IN 5,334,876 PATENT
2	A method for controlling motion of a motor driven element (2A) in a vehicle over a range of motion (2B) and for altering said motion when undesirable resistance to said motion is encountered (2C), said method comprising:	2A. Window or Panel Col. 2, Line 40; 2B. Range of Motion Col. 5, Lines 60 – Col. 6, Line 9; 2C. Motor de-energized Col. 6, Lines 65-66.
2(a)	a) measuring a parameter (2D) of a motor (2E) coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element (2F) by taking a multiplicity of measurements (2G) as the motor moves the motor driven element over its range of motion;	2D. Voltage drop corresponds to current, Col. 5, Lines 15-16; 2E. motor 12, Col. 5, Line 14; 2F. current used to sense obstruction Col. 6, Lines 36-40; 2G. current measured every two milliseconds Col. 6, Line 24;

2(b)	b) storing a number of measurement values (2H) based on measurements of said parameter over an immediate past portion of a present run through said range of motion;	2H. FIFO buffer, Col. 6, Line 50 For hard obstacle detection, the sensed current is evaluated against a compared value that is a function of a reading of the motor current every two milliseconds and stored as a first in, first out. The data stored in the FIFO buffer is twenty values deep, allowing the controller to look back in time 40 milliseconds. Col. 6, lines 41-66. This is a parameter that is measured during an immediate past portion of the present run through the range of motion.
2(c)	c) determining that (2I) the parameter is outside a parameter range based on stored measurement values obtained during the immediate past portion as the motor driven element moves over its range of motion; and	2I. comparing sensed with compare value from equation Col. 6, Line 64. The sensed value is compared against a template. For soft obstacle detection, if the sensed value is within a window of the template threshold, the template is updated using the sensed value. Col. 6, lines 12-40. For hard obstacle detection, the sensed current is evaluated against a compared value that is a function of a reading of the motor current every two milliseconds and stored as a first in, first out. Col. 6, lines 41-66.
2(d)	d) altering motion of said motor driven element during the present run in response to a determination that the parameter is outside the parameter range (2J).	2J. Stop motor, Col. 6, Line 65 If the current values of the sensed current is greater than the compare value, an obstruction flag is set and the motor is de-energized. Col. 6, Lines 64-66.

CLAIM NO.	CLAIM LANGUAGE	SUPPORT IN 5,334,876 PATENT

6	Apparatus for controlling activation of a motor coupled to a motor vehicle window or panel (6A) for moving said window or panel along a travel path (6B) and de-activating the motor if an obstacle is encountered (6C) by the window or panel, said apparatus comprising:	6A. Window or panel, col 2, line 40 6B. Range of motion, col 5, line 60-col 6, line 9 6C. Motor de-energized, col 6, line 66
6(a)	a) a sensor (6D) for sensing movement of the window or panel and providing a sensor output signal related to a speed of movement of the window or panel;	6D. Phase inputs 72, 74 from shaft encoder, col 3, line 44
6(b)	b) a switch (6E) for controllably actuating the motor by providing an energization signal; and	6E. FET 20, or relay 30, 32, Col 2, line 64
6(c)	c) a controller (6F) having an interface coupled to the sensor and the switch for controllably energizing the motor; said controller sensing a collision with an obstruction when power is applied to the controller by:	6F. Controller 22, col 2, line 55
6(c)(i)	i) monitoring movement of the window or panel by monitoring a signal (6G) from the sensor related to the movement of the window or panel;	6G. Position encoder, col 4, line 16 Col 6, line 14, absolute position of the sunroof, and the speed at which the roof is traveling. Col 6, lines 39-40 response time of the algorithm versus the speed of the sunroof.
6(c)(ii)	ii) adjusting (6H) an obstacle detection threshold in real time (6I) based on immediate past measurements of the signal sensed by the sensor to adapt to varying conditions encountered during operation of the window or panel;	6H. after the first 50 ms, col 7 line 28 6I. 50ms – 450 ms, col 7, lines 28-34

6(c)(iii)	iii) identifying a collision (6J) of the window or panel with an obstacle due to a change in the signal from the sensor that is related to a change in movement of the window or panel by comparing a value based on a most recent signal from the sensor with the obstacle detection threshold; and	6J. Controller detects an obstruction using rate of speed of motor, col 7, line 33
6(c)(iv)	iv) outputting a control signal to said switch to deactivate (6K) said motor in response to a sensing of a collision between an obstacle and said window or panel.	6K. Motor re-energized, col 4, line 44

CLAIM NO.	CLAIM LANGUAGE	SUPPORT IN 5,334,876 PATENT
12	Apparatus for controlling activation of a motor for moving an object along a travel path (12B) and (12A) de-activating the motor if an obstacle is encountered by the object comprising:	12A. Window panel, col 1, line 44 12B. Obstacle, col 4, line 44
12(a)	a) a movement sensor for (12C) monitoring movement of the object as the motor moves said object along a travel path;	12C. Movement sensor, position encoder, col 4, line 16
12(b)	b) a switch (12D) for controlling energization of the motor with an energization signal; and	12D. Switch relay 30, 32, col 2, line 64
12(c)	c) a controller (12E) including an interface coupled to the switch for controllably energizing the motor and said interface additionally coupling the controller to the movement sensor for monitoring signals from said movement sensor; said controller comprising a stored program that:	12E. Controller 22, col 2, line 55
12(c)(i)	i) determines motor speed of movement from an (12F) output signal from the movement sensor ;	12F. Motor speed, rate of change of pulses, col 3, line 59

12(c)(ii)	ii) calculates an obstacle detect (12G) threshold based on motor speed of movement detected during a present run of said motor driven element ;	12G. Obstacle detect motor speed, col 7, line 33
12(c)(iii)	iii) compares a value based on (12H) currently sensed motor speed of movement with the obstacle detect threshold; and	12H. Col 7, line 33
12(c)(iv)	iv) outputs a signal from the interface (12I) to said switch for stopping the motor (12J) if the comparison based on currently sensed motor movement indicates the object has contacted an obstacle.	12I. Interface, col 4, line 1 12J. Stopping motor, braking effect, col 4, line 13

CLAIM NO.	CLAIM LANGUAGE	SUPPORT IN 5,334,876 PATENT
19	Apparatus for controlling activation of a motor for moving a window or panel (19A) along a travel path (19B) and de-activating the motor if an obstacle is encountered (19C) by the window or panel comprising:	19A. Window or panel col 2, line 40 19B. Travel path, col 5, line 60-col 6, line 9 19C. De-activating motor, col 6, line 65-66
19(a)	a) a sensor (19D) for sensing movement of a window or panel along a travel path;	19D. Op amp 110, col 5, line 19
19(b)	b) a switch (19E) for controlling energization of the motor with an energization signal; and	19E. FET 20, col 2 line 53
19(c)	c) a controller (19F) coupled to the switch for controllably energizing the motor and having an interface coupling the controller to the sensor and to the switch; said controller comprising decision making logic for:	19F. Controller 22, col 2 line 55

19(c)(i)	i) monitoring a signal from the sensor;	
19(c)(ii)	ii) calculating a real time obstacle detect threshold (19G) based on the signal that is detected during at least one prior period of motor operation during movement along a present or current run through a path of travel of said window or panel;	19G. Equation at col 6, line 62 The compare value algorithm reads the motor current every two milliseconds and is stored in a FIFO buffer. Col. 6, Lines 46-50. This is a signal that is detected along a present or current run through a path of travel of the window or panel.
19(c)(iii)	iii) comparing (19H) a value based on a currently sensed motor parameter with the obstacle detect threshold; and	19H. Comparing, col 6, line 65
19(c)(iv)	iv) stopping movement (19I) of the window or panel by controlling an output to said switch that controls motor energization if the comparison based on a currently sensed motor parameter indicates the window or panel has contacted an obstacle.	19I. Stopping movement, col 6, line 65-66.

CLAIM NO.	CLAIM LANGUAGE	SUPPORT IN 5,334,876 PATENT
20	Apparatus for controlling activation of a motor for moving a window or panel (20A) along a travel path (20B) and de-activating the motor if an obstacle is encountered by the window or panel comprising:	20A. Window or panel, col 2, line 40 20B. Range of motion, col 5, line 60-col 6, line 9
20(a)	a) a sensor (20C) for generating speed signals representative of the window or panel speed as the motor moves the window or panel along a travel path;	20C. Encoder, col 4, line 16, col 3, line 44

20(b)	b) an obstacle detection controller (20D) for monitoring at least a part of the travel path of the window or panel for sensing and generating an obstacle detect signal indicating the presence in said travel path of an obstacle to movement of the window or panel;	20D. Controller 22, col 2, line 55
20(c)	c) a switch (20E) coupled to said controller for controlling energization of the motor with an energization signal; and	20E. FET 20, or relay 30, 32 col 2, line 64
20(d)	d) said controller for processing speed signals and obstacle detection signals (20F) and controlling operation of the motor in response to said speed or obstacle detection signals; said controller including:	20F. Preferred controller is microprocessor having central processing unit, col 2, line 55
20(d)(i)	i) a storage (20G) for storing a number of speed signals that vary with motor speed;	20G. Microprocessor 22 has storage for storing speed signals shown in Figure 5, col 3, line 59
20(d)(ii)	ii) a processor (20H) for calculating an obstacle detect threshold based on one or more speed signals stored in said storage obtained in real time (20I) based on immediate past measures of the speed signal sensed by the sensor to adapt to varying conditions encountered during movement along a present path of travel of said window or panel;	20H. Processor 22 20I. 50ms – 450 ms, col 7, lines 28 – 34

20(d)(iii)	iii) a logic unit for making a comparison between a value representing window or panel speed (20J) based on a currently sensed motor speed (20K) with the calculated obstacle detect threshold, and generating a control output if an obstacle is detected based on said comparison; and	20J. Controller outputs controls to ramp up motor speed in controlled fashion col 7, line 30 20K. Sensed speed compared with expected based on controlled output, col7, line 33, 34
20(d)(iv)	iv) an interface (20L) coupled to said switch for changing the state of the switch to stop the motor.	20L. Controller interfaces with FET 20 or relay, col 2, line 65

CLAIM NO.	CLAIM LANGUAGE	SUPPORT IN 5,334,876 PATENT
28	Apparatus for controlling activation of a motor coupled to a motor vehicle window or panel (28A) for moving said window or panel along a travel path (28B) and de-activating the motor when the window or panel is within an acceptable range of a predetermined position, said apparatus comprising:	28A. Window or panel, col 2, line 40 28B. Path described, col 5, line 60-col 6, line 9 28C. Deactivates at home position, col 5, line 65, col 6, line 1 The controller knows when the sunroof panel is in the closed position by monitoring an output 130 from hall effect sensor 132. Col. 5, Lines 61-63. Hall effect sensors are known for proximity sensing, therefore provide a range of detection. The controller 22 adjusts its operation for various lengths of travel (col 6, lines 1 and 2) and this feature also constitutes an acceptable range relative the parked position for de-activating the motor at its requested, open destination.

28(a)	a) a sensor (28D) for sensing movement of the window or panel and providing a sensor output signal related to a position (28E) of the window or panel;	28D. Hall sensor 132, col 5, line 63, and phase inputs 72, 74 from position encoder, col 3 line 44 28E. Home position, open position etc col 5, lines 60-68, col 6, line 1
28(b)	b) a switch for controllably actuating the motor by providing an energization signal (28F); and	28F. FET 20, col 2, line 53
28(c)	c) a controller (28G) having an interface coupled to the sensor (28H) and the switch for controllably energizing the motor; said controller determining the position of the window or panel when power is applied to the controller by:	28G. Controller 22, col 2, line 55 28H. Output from position encoder
28(c)(i)	i) monitoring the sensor output (28I) signal from the sensor related to the position of the window or panel;	28I. Controller monitors encoder output, col 3, line 44.
28(c)(ii)	ii) identifying the position of the window or panel based on the sensor output signal from the sensor; and	"The control circuit updates the profile of current vs. position as the window or panel is opened and closed" Col. 2, lines 6-7.
28(c)(iii)	iii) outputting a control signal to said switch to deactivate (28J) said motor in response to a sensing of said window or panel <u>within the acceptable range</u>.	28J. Controller stops the roof at the park, full open and vent positions, col 5, lines 59-col 6, line 9. The controller knows when the sunroof panel is in the closed position by monitoring an output 130 from hall effect sensor 132. Col. 5, Lines 61-63.

CLAIM NO.	CLAIM LANGUAGE	SUPPORT IN 5,334,876 PATENT

30	The apparatus of claim 28 additionally comprising multiple position limits that define the acceptable range programmed for use by the controller to determine whether the window or panel is closed or open.	The controller knows when the sunroof panel is in the closed position by monitoring an output 130 from Hall Effect sensor 132. Col. 5, Lines 61-63. The sunroof panel is then moved to the full open position and the physical position is recorded. Col. 5, Lines 67-68 – Col. 6, Line 1.

CLAIM NO.	CLAIM LANGUAGE	SUPPORT IN 5,334,876 PATENT
33	Apparatus for controlling activation of a motor for moving a motor driven element in a vehicle (33A) over a range of motion (33B) and de-activating (33C) the motor when undesirable resistance to motion of the element is encountered, the apparatus comprising:	33A. Window or panel, col 2, line 40 33B. Range of motion, col 5, line 60-col 6, line 9 33C. De-activating motor, col 6, lines 65-66
33(a)	a) a sensor (33D) for sensing a speed of the motor and generating an output signal representative of a speed of the motor, a speed of the motor changing when undesirable resistance to motion of the element is encountered;	33D. Shaft encoder, col 3, line 44
33(b)	b) a switch (33E) for controlling activation of the motor; and	33E. FET 20, col 2, line 53
33(c)	c) a controller (33F) coupled to the sensor and the switch, the controller receiving the sensor output signal from the sensor and outputting a control signal to the switch to de-activate the motor if the sensor output signal indicates that the element has encountered undesirable resistance to motion.	33F. Controller 22, col 2, line 55

The July 23, 2008 patent office action rejects all independent claims based on the combination of Okuyama et al (US 4,608,637) and Bamford (EP 0581 509). The effective date of Bamford is its publication date, that is February 2, 1994. This date is well after the effective filing date (April 22, 1992) of U.S. Patent No. 5,334,876 (hereinafter "the '876 Patent) from which the present application claims priority. The specification of the '876 Patent fully supports the independent claims and dependent claim 30, including the amendments (underlined) from the response to the October 31, 2007 Office action, as indicated in the above claim chart. Therefore Bamford is not prior art and the rejection based on the combination of Okuyama et al and Bamford is traversed. For this reason independent claims 1, 2, 6, 12, 19, 20, and 28 and claims depending from those claims are allowable.

As noted in the amendment of January 10, 2008, Okuyama et al alone neither anticipates nor renders obvious the pending claims relating to real time obstruction detection. The Examiner agrees. At page 7 of the July 23, 2008 office action it is noted "Okuyama et al do not disclose storing immediate past measurements over a present traversal of the motor." Furthermore, the office action of May 30th, 2008 all independent claims now pending were allowed as being patentable over the Okuyama et al reference.

Other commentary regarding the July 23, 2008 office action

Applicant's stress that the claims are patentable in view of the removal of the Bamford published application as prior art. However, the July 23, 2008 office action interprets the prior art in ways that need clarification.

There are two situations disclosed in the '637 patent to Okuyama et al for stopping the motor. During normal operation, when the motor has driven the window to a so called goal position it is stopped. *See* col. 18, lines 35 – 40. A second condition for stopping the motor occurs when an overcurrent condition is sensed. The sensed motor current is compared with a table of stored values. *See* table 8 of Okuyama et al.

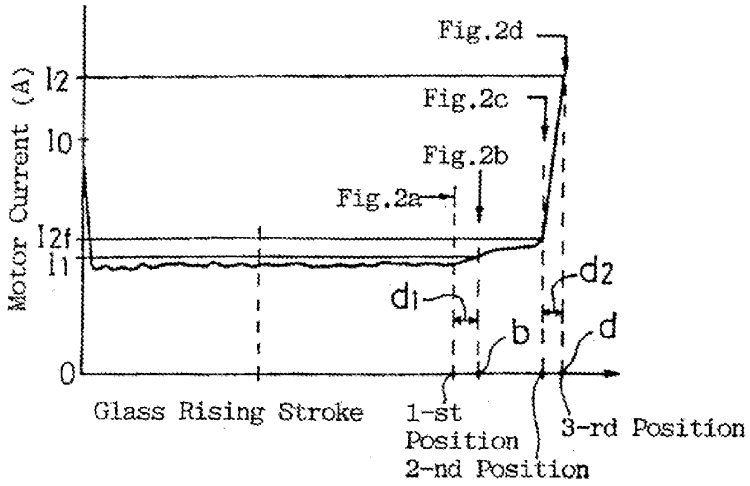
The Examiner's rejection of claim 1 articulated at page 2, second paragraph of

the July 23, 2008 office action states that the sensors 6a, 6ab *etc*. can be interpreted to be the sensors for measuring "a parameter of a motor" and then states that the Okuyama *et al*. patent at column 7, lines 49 –62 shows measuring this parameter as the parameter varies in response to a resistance to motion. As noted previously in this prosecution, the sensors 6a *etc*. of the '637 Okuyama et al patent generate pulses rather than providing a means for measuring a parameter.

The parameter Okuyama discusses at column 7, lines 49 – 62 is an overload current derived from an A/D converter. This motor current parameter is most definitely **not** monitored by the sensors 6a, 6ab etc to which the Examiner refers.

A memory is also referred to by the Examiner at page 2, paragraph 2 of the office action. The function of this memory is described at column 8, lines 51 – 64 and its contents are stored in table 6. This memory is for storing three positions per window (note since four windows are referenced, there are a total of 12 positions stored) in terms of counts from a zero position. Depending on the direction of motion, each pulse from the sensor (6a for example) increments or decrements a value corresponding to the then current position. The contents of table 6, i.e. 1st position, 2nd position and 3rd position, (*See* column 8, lines 51 – 64) are count totals (obtained from the sensor 6a for example) described in reference to Figure 3a which is reproduced below.

Fig.3a



The Examiner's reference to the parameter stored in this memory as being motor current is incorrect. These comments regard the interpretation of Okuyama et al also apply to independent claims 2 and 6 and dependent claims 3-5 and 7–11.

Claim 12 features apparatus for controlling activation of a motor to move an object along a travel path. The motor is de-activated if an obstacle is encountered by the object. A movement sensor monitors movement of the object as the motor moves the object along a travel path. A switch controls energization of the motor with an energization signal.

A controller has an interface coupled to the switch for controllably energizing the motor. The interface also couples the controller to the movement sensor to monitor signals from the movement sensor. The controller has a stored program that:

i) determines motor speed of movement from an output signal from the movement sensor ;

ii) calculates an obstacle detect threshold based on motor speed of movement detected during a present run of said motor driven element;

iii) compares a value based on currently sensed motor speed of movement with

the obstacle detect threshold; and

iv) outputs a signal from the interface to said switch for stopping the motor if the comparison based on currently sensed motor movement indicates the object has contacted an obstacle.

The Examiner asserts the italicized portion of claim 12 relating to a determination of motor speed is taught at col 7, lines 6 – 36 of Okuyama et al. Reading of this portion of the ''637 patent fails to disclose this feature, nor does is suggest this feature. This is a completely independent basis, in additional to the above explanation that Bamford is not prior art to the pending claims, for the patentability of claim 12. Claims 13 – 18 depend from allowable claim 12 and are also allowable.

Claim 19 features apparatus for controlling activation of a motor for moving a window or panel along a travel path. The motor is de-activated if an obstacle is encountered by the window or panel. A sensor senses movement of a window or panel along a travel path. A switch controls energization of the motor with an energization signal. A controller coupled to the switch for controllably energizing the motor and having an interface coupling the controller to the sensor and to the switch. The controller comprises decision making logic for:

i) monitoring a signal from the sensor;

ii) *calculating a real time obstacle detect threshold based on the signal that is detected during at least one prior period of motor operation during movement along a present or current run along a path of travel of said window or panel ;*

iii) comparing a value based on a currently sensed motor parameter with the obstacle detect threshold; and

iv) stopping movement of the window or panel by controlling an output to said switch that controls motor energization if the comparison based on a currently sensed motor parameter indicates the window or panel has contacted an obstacle.

Since the Okuyama et al prior art patent neither shows nor suggested the italicized portion of the claim relating to a real time obstacle detection threshold, this claim is allowable.

Claim 20 features apparatus for controlling activation of a motor for moving a window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel. A sensor generates speed signals representative of the window or panel speed as the motor moves the window or panel along a travel path. An obstacle detection controller monitors at least a part of the travel path of the window or panel to sense and generate an obstacle detect signal indicating the presence in said travel path of an obstacle to movement of the window or panel. A switch coupled to said controller for controls energization of the motor with an energization signal.

The controller featured in claim 20 processes speed signals and obstacle detection signals and controls operation of the motor in response to said speed or obstacle detection signals. The controller has

i) a storage for storing a number of speed signals that vary with motor speed;

ii) a processor for calculating an obstacle detect threshold based on one or more speed signals stored in said storage obtained in real time based on immediate past measures of the speed signal sensed by the sensor to adapt to varying conditions encountered during movement along a present path of travel of said window or panel;

iii) a logic unit for making a comparison between a value representing window or panel speed based on a currently sensed motor speed signal with the calculated obstacle detect threshold, and generating a control output if an obstacle is detected based on said comparison; and

iv) an interface coupled to said switch for changing the state of the switch to stop the motor.

The '637 patent to Okuyama et al does not show or suggest the italicized features of claim 20. The only potential speed signals that are received are the pulses transmitted by the sensors 6a etc to the controller. These signals are not stored in memory, however, but are instead used to increment or decrement a position indicator that relates to the number of counts from a zero position for the window. For this additional reason, claim 20 is allowable.

Claims 21 – 27 depend from allowable claim 20 and are also allowable.

Analysis regarding obviousness rejection of claims 24 – 27, 36, and 37.

The Office Action stated that claims 24-27, 36 and 37 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Okuyama *et al*.

Okuyama *et al*. fails to satisfy the requisite *prima facie* criteria for rejecting a claim under 103 and as such, the rejection is respectfully traversed.

In particular, the Office Action states that Official Notice is taken with respect to claims 24-27, stating "that Okuyama *et al*. does not disclose the apparatus, wherein the obstacle detector comprises an infrared light source and detector" and that "Official Notice is taken with respect to infrared light sources being well known in the art to detect movement of an object." *See* Office Action at page 7. It is respectfully pointed out that *only* claim 25 discusses an infrared light source and detector. Therefore, the rejection with respect to claims 24 and 26-27, respectfully remain unaddressed and are assumed to be in allowable condition.

The Examiner's reliance on Official Notice with respect to claim 25 is respectfully misplaced as it is not considered to be common knowledge to use an infrared light source and detector as an obstacle detector in an apparatus for controlling the movement of a window, Accordingly, the rejection with respect to claim 25 is respectfully traversed. "If the examiner is relying on personal knowledge to support the finding of what is known in the art, the examiner must provide an affidavit or declaration setting forth specific factual statements and explanation to support the finding." *See* M.P.E.P. 2144.03(C) citing 37 C.F.R. 1.104(d)(2). Further, claims 24-27, 36, and 37 depend either directly or indirectly from nonobvious independent claim 20, 1, and 6, respectively, and are allowable as a result of their dependency and because of their own distinctive features. Accordingly, claims 24-27, 36 and 37 are in condition for allowance and a notice to that effect is respectfully requested.

Claim 28 features apparatus for controlling activation of a motor coupled to a motor vehicle window or panel as the window or panel moves along a travel path. The

motor is de-activated when the window or panel is within an acceptable range of a predetermined position. A sensor senses movement of the window or panel and provides a sensor output signal related to a position of the window or panel. A switch controllably actuates the motor by providing an energization signal.

A controller has an interface coupled to the sensor and the switch for controllably energizing the motor. The controller determines the position of the window or panel when power is applied to the controller by monitoring the sensor output signal from the sensor related to the position of the window or panel and identifying the position of the window or panel based on the sensor output signal from the sensor. The controller outputs a control signal to the switch to deactivate the motor in response to a sensing of said window or panel within the acceptable range.

Other than a broad statement that claim 28 is obvious due to the combination of Okuyama et al in view of Bamford, no explanation is contained in the July 23, 2008 office action with regard to claim 28. Since Bamford is not prior art to claim 28 this rejection is traversed. Claims 29 – 32 depend from allowable claim 28 and are allowable.

Commentqry regarding the Bamford published application

In the July 23, 2008 office action (page 7) the Examiner asserts Bamford (EP 0 581 509) has a controller 6 for determining to deactivate the motor "based on a most recent sensor measurement of the parameter and the immediate past measurement values stored in the memory obtained during a present run through the motor driven element range or motion." This assertion is not correct.

Bamford references an update-map function where a "NEW" value of current is set equal to a PRESENT plus a linear combination of an OLD value. (See column 5, line 17). Reference to the flow chart of Figure 4, however, makes clear that this New value is not used during a current run. As taught by Bamford, "The current sensor senses the current at a number of successive positions of the window during its upward or downward movment." (COL 3, LINE 56). The system maintains a current vs time

map and uses time since actuation is used to determine position. As made clear in the figure 4 flowchart, a decision step is made whether the current exceeds a limit and the sensed current is either OK or NOT OK based on what is stored in the map. If the current is OK, then the 'UPDATE MAP' function is performed and the NEW current value calculated and stored in the MAP for that position, let us say position A, therefore stores a current map value A. The next test (loop through the flowchart) tests another current at another position, let us say position B. At position B, the sensed current value B is compared to a corresponding map value B and not to the most recent sensor measurement (i.e. map value A.) Therefore, the most recently updated current value is most definely not used to determine a fault. This is clearly evidenced by Bamford's continued use of the term "corresponding current in the map" See for example, Col 5, line 1; col 5, line 6. The Examiner should call the undersigned attorney if this explanation is not clear. The bottom line is that the previous value of current is not used to sense a fault during the current run.

All claims are believed to be in condition for allowance and prompt issuance of a Notice of Allowance is respectfully requested. If any fees are determined to be due, the commissioner is authorized to charge those fees to deposit account no 20-0090.

Respectfully submitted,

Date: August 19, 2008

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Electronic Acknowledgement Receipt	
EFS ID:	3801278
Application Number:	10765487
International Application Number:	
Confirmation Number:	9537
Title of Invention:	Collision monitoring system
First Named Inventor/Applicant Name:	Mario Boisvert
Customer Number:	28060
Filer:	Stephen J. Schultz
Filer Authorized By:	
Attorney Docket Number:	14-733C2D1
Receipt Date:	19-AUG-2008
Filing Date:	27-JAN-2004
Time Stamp:	10:14:44
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	Amendment - After Non-Final Rejection	14733C2D1.pdf	215849 ed58a064d968f2c27846aa19d2323a432074d693	no	31
Warnings:					
Information:					

Total Files Size (in bytes):	215849

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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 (07-06)
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PATENT APPLICATION FEE DETERMINATION RECORD
Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
10/765,487	01/27/2004	

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			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	35 minus 20 =	* 15	X $9 =	135	OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	8 minus 3 =	* 5	X $43 =	215		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 $250 ($125 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	350		TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 08/19/2008	(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 ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 33	Minus	** 36	= 0	X $25 =	0	OR	X $ =	
Independent (37 CFR 1.16(h))	* 7	Minus	***8	= 0	X $105 =	0	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	0	OR	TOTAL ADD'L FEE	

AMENDMENT	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
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 number found in the appropriate box in column 1.

Legal Instrument Examiner:
/GERALDINE STANLEY/

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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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,487	01/27/2004	Mario Boisvert	14-733C2D1	9537

28060 7590 10/24/2008

TAROLLI, SUNDHELM, COVELL & TUMMINO, LLP
1300 EAST NINTH STREET
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CLEVELAND, OH 44114

EXAMINER	
FLETCHER, MARLON T	
ART UNIT	PAPER NUMBER
2837	

MAIL DATE	DELIVERY MODE
10/24/2008	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.

Interview Summary	**Application No.** 10/765,487	**Applicant(s)** BOISVERT ET AL.	
	Examiner Marlon T. Fletcher	**Art Unit** 2837	

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

(1) *Marlon T. Fletcher*. (3)_____.

(2) *Steve Schultz*. (4)_____.

Date of Interview: *25 September 2008*.

Type: a)☒ Telephonic b)☐ Video Conference
c)☐ Personal [copy given to: 1)☐ applicant 2)☐ applicant's representative]

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

Claim(s) discussed: *1-37*.

Identification of prior art discussed: *Okuyama and Bamford*.

Agreement with respect to the claims f)☐ was reached. g)☒ was not reached. h)☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: *See Continuation Sheet*.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

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. See Summary of Record of Interview requirements on reverse side or on attached sheet.

/Marlon T Fletcher/ Primary Examiner, Art Unit 2837	

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.

Continuation of Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: The applicant dicussed what he believed to be different from the present invention and the prior art. The operation of using a sensor for sensing motor operation during a present run of movement of a window or panel, appears to provide a difference in the operation over the operation of the prior art. However, this limitation is not present in claim 6 and 28. An amendment to claim 6 was agreed upon. However, since claim 28 wolud remain rejected, no examiner's amendment was made. Furthermore, claim 28 refers to a different inventive entity. An office action will soon follow this interview summary.

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Mario Boisvert *et al.*

Serial No.: 10/765,487

Filing Date: January 27, 2004

Title: *COLLISION MONITORING SYSTEM*

Examiner: Marlon T. Fletcher

Art Unit: 2837

Docket No.: 14-733C2D1

Tarolli, Sundheim, Covell & Tummino, LLP
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1300 East Ninth Street
Cleveland, OH 44114

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

RESPONSE TO INTERVIEW SUMMARY

In response to the interview summary having a mailing date of October 24, 2008, applicants point out that during the interview there was no discussion that "Furthermore, claim 28 refers to a different inventive entity". This conclusion may have been arrived at later by the Examiner, but most definitely was not discussed in the September 28, 2008 telephone interview.

Respectfully submitted,

Date: November 24, 2008

/Stephen J. Schultz/

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Electronic Acknowledgement Receipt	
EFS ID:	4340084
Application Number:	10765487
International Application Number:	
Confirmation Number:	9537
Title of Invention:	Collision monitoring system
First Named Inventor/Applicant Name:	Mario Boisvert
Customer Number:	28060
Filer:	Stephen J. Schultz
Filer Authorized By:	
Attorney Docket Number:	14-733C2D1
Receipt Date:	24-NOV-2008
Filing Date:	27-JAN-2004
Time Stamp:	11:06:53
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	Applicant summary of interview with examiner	14733C2D1.pdf	19022 8ed040092e3d7f7b4fa7347e23478140805d50af	no	2
Warnings:					
Information:					

Total Files Size (in bytes):	19022

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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.
10/765,487	01/27/2004	Mario Boisvert	14-733C2D1	9537

28060 7590 01/05/2009

TAROLLI, SUNDHELM, COVELL & TUMMINO, LLP
1300 EAST NINTH STREET
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CLEVELAND, OH 44114

EXAMINER	
FLETCHER, MARLON T	
ART UNIT	PAPER NUMBER
2837	
MAIL DATE	DELIVERY MODE
01/05/2009	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.	Applicant(s)	
	10/765,487	BOISVERT ET AL.	
	Examiner	Art Unit	
	Marlon T. Fletcher	2837	

-- 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* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, 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 *19 August 2008*.

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

3)☐ 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

4)☒ Claim(s) *1-8,10-32,36,37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-5,7 and 12-27* is/are allowed.

6)☒ Claim(s) *6-8,10,11,28-32,36 and 37* is/are rejected.

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

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

Application Papers

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

10)☐ The drawing(s) filed on _____ 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).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

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).

a)☐ All b)☐ Some * c)☐ None of:

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) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

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

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 6-8, 10-11, 28-32, 36, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okuyama et al. (4,608,637) in view of Bamford (EP 0 581 509).

Okuyama et al. disclose an apparatus for controlling motion of a motor driven element over a range of motion and for altering said motion when undesirable resistance to the motion is encountered, said apparatus comprising: a sensor (6a, 6ab, 6d, 6da) for measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element (column 7, lines 49-62); a memory for storing a number of measurement values from the sensor based on measurements of said parameter over at least a portion of the range of motion (column 8, line 51-64); a controller (microcomputer 9) coupled to the memory for determining to de-activate the motor based on the measurement values stored in the memory as the motor driven element moves over its range of motion; and a controller interface coupled to the motor (Ma, Md, Mab, Mda) for altering motion of said motor driven element in response to a determination made by the controller (column 5, lines 9-60), wherein altering is also in response to a determination that the parameter is outside the parameter range.

As recited in claim 6, Okuyama et al. disclose an apparatus for controlling activation of a motor coupled to a motor vehicle window or panel for moving said window or panel along a travel path and deactivating the motor if an obstacle is encountered by the window or panel, said apparatus comprising: a sensor for sensing movement of the window or panel and providing a sensor output signal related to a speed of movement of the window or panel (discussed above; column 7, lines 30-37), and a controller having an interface coupled to the sensor and the switch for controllably energizing the motor (figure 4a); said controller sensing a collision with an obstruction when power is applied to the controller by: monitoring movement of the window or panel by monitoring a signal from the sensor related to the movement of the window or panel (column 7, lines 6-23; and column 8, lines 35-50), identifying a collision of the window or panel with an obstacle due to a change in the signal from the sensor that is related to a change in movement of the window or panel (Abstract; and column 8, lines 51-64); and outputting a control signal to said switch to deactivate said motor in response to a sensing of a collision between an obstacle and said window or panel (column 8, line 65 – column 9, line 7).

As recited in claims 7 and 29, Okuyama et al. disclose the apparatus, wherein the controller comprises a programmable controller including a processing unit for executing a control program and including a memory for storing multiple window or panel speed values corresponding to a signal received from the sensor (column 6, lines 52-60).

As recited in claims 8 and 30, Okuyama et al. disclose the apparatus, additionally

comprising one or more limit switches (11) for use by the controller to determine window or panel position for use in identifying a collision.

Okuyama et al. disclose the apparatus, wherein the control program adjusts an obstacle detection threshold in real time based on immediate past measures of the signal sensed by the sensor to adapt to varying conditions encountered during operation of the window or panel (column 8, lines 65 – column 9, line 7).

As recited in claim 10, and 11, Okuyama et al. disclose the method, movement is first initiated toward a closed position when a leading edge of the window or panel is near the closed position and wherein the reverse actuation is performed upon a sensing of an obstacle that is based on determining the parameter is outside the parameter range (column 7, lines 49-62).

As recited in claim 28, Okuyama et al. disclose apparatus for controlling activation of a motor for moving an object along a travel path and de-activating the motor if an obstacle is encountered by the object comprising: a) a movement sensor for monitoring movement of the object as the motor moves said object along a travel path (discussed above; a switch for controlling energization of the motor with an energization signal (column 6, lines 52-60); and a controller (microcomputer 9) including an interface coupled to the switch means for controllably energizing the motor and said interface additionally coupling the controller to the movement sensor for monitoring signals from said movement sensor (discussed above; said controller comprising a stored program that: determines motor speed from an output signal from the movement sensor; calculates an obstacle detect threshold based on motor speed of movement detected

during at least one prior period of motor operation (column 7, lines 6-36); compares a value based on currently sensed motor movement with the obstacle detect threshold; and outputs a signal from the interface to said switch for stopping the motor if the comparison based on currently sensed motor movement indicates the object has contacted an obstacle.

As recited in claim 31, Okuyama et al. disclose the method, wherein the motor driven element is a window or panel and additionally comprising reverse actuating the window or panel prior to moving said window or panel in a direction to close the window or panel (column 6, lines 24-33).

As recited in claim 32, Okuyama et al. disclose the apparatus, wherein the motor is coupled to a motor vehicle window or panel and wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a position indication which is updated in response movement of the window or panel and further wherein the controller reverse actuations the motor near an end point in an object path of travel to avoid false obstacle detection in the region of closure of the window or panel.

Okuyama et al. do not disclose storing immediate past measurements over a present traversal of the motor.

However, Bamford discloses an apparatus for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said apparatus comprising: a sensor (5) for measuring a parameter of a motor coupled to the motor driven element

that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element; a memory (9) for storing a number of measurement values from the sensor based on immediate past measurements of said parameter over at least a portion of a present traversal of said motor driven element through said range of motion; a controller (6) coupled to the memory for determining to de-activate the motor based on a most recent sensor measurement of the parameter and the immediate past measurement values stored in the memory obtained during a present run through the motor driven element range of motion; and a controller interface coupled to the motor for altering motion of said motor driven element during the present run in response to a determination made by the controller (figure 3).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the teachings of Bamford with the teachings of Okuyama et al., because the teaching allow the use of more accurate and precise measurements to be used in updating the window movements to thereby more accurately detect obstructions.

However, Official Notice is taken with respect to infrared light sources being well known in the art to detect movement of an object.

It would be obvious to use any type of sensor, because the teachings merely provide alternate means for providing the same, wherein one could substitute one sensor or detector for another.

With respect to claims 36 and 37, Okuyama et al. disclose the claimed invention except for the range in which the measurements are taken (40 milliseconds). It would

have been obvious to one having ordinary skill in the art at the time the invention was made to provide measurements at forty millisecond interval, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Allowable Subject Matter

3. Claims 1-5 and 12-27 are allowed.

Response to Arguments

Applicant's arguments filed 8/19/2008 have been fully considered but they are not persuasive. While some of the arguments were persuasive, others were not. More specifically, the claims rejected above do not take in account a present run of the motor in comparison with immediate past measurements or threshold values. These elements in conjunction with the operation of the apparatus were found to be convincingly different from the prior art. It is well known in the art to provide obstacle detection devices that detect obstruction based on previously run operations of the element motor. However the above allowed claims appear to differ from the prior art.

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 Marlon T. Fletcher whose telephone number is 571-272-2063. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Benson can be reached on 571-272-2227. The fax phone number for the organization where this application or proceeding is assigned is 571-2173-8300.

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.

MTF
12/31/2008

/Marlon T Fletcher/
Primary Examiner, Art Unit 2837

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10765487	BOISVERT ET AL.
	Examiner	Art Unit
	Fletcher, Marlon T	2837

✓	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	12/31/2008								
	1	=								
	2	=								
	3	=								
	4	=								
	5	=								
	6	✓								
	7	✓								
	8	✓								
	9	-								
	10	✓								
	11	✓								
	12	=								
	13	=								
	14	=								
	15	=								
	16	=								
	17	=								
	18	=								
	19	=								
	20	=								
	21	=								
	22	=								
	23	=								
	24	=								
	25	=								
	26	=								
	27	=								
	28	✓								
	29	✓								
	30	✓								
	31	✓								
	32	✓								
	33	-								
	34	-								
	35	-								
	36	✓								

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10765487	BOISVERT ET AL.
	Examiner	Art Unit
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✓	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	12/31/2008								
	37	✓								

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Mario Boisvert *et al.*

Serial No.: 10/765,487

Filing Date: January 27, 2004

Title: *COLLISION MONITORING SYSTEM*

Examiner: Marlon T. Fletcher

Art Unit: 2837

Docket No.: 14-733C2D1

Tarolli, Sundheim, Covell & Tummino, LLP
Suite 1700
1300 East Ninth Street
Cleveland, OH 44114

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

RULE 116 AMENDMENT

In response to the office action having a mailing date of January 5, 2009, please amend the application as follows:

Claim Status

1. (previously presented) Apparatus for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said apparatus comprising:

a) a sensor for measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element;

b) a memory for storing a number of measurement values from the sensor based on immediate past measurements of said parameter over at least a portion of a present traversal of said motor driven element through said range of motion;

c) a controller coupled to the memory for determining to de-activate the motor based on a most recent sensor measurement of the parameter and the immediate past measurement values stored in the memory obtained during a present run through the motor driven element range of motion; and

d) a controller interface coupled to the motor for altering motion of said motor driven element during the present run in response to a determination made by the controller.

2. (previously presented) A method for controlling motion of a motor driven element in a vehicle over a range of motion and for altering said motion when undesirable resistance to said motion is encountered, said method comprising:

a) measuring a parameter of a motor coupled to the motor driven element that varies in response to a resistance to motion during all or part of a range of motion of the motor driven element by taking a multiplicity of measurements as the motor moves the motor driven element over its range of motion;

b) storing a number of measurement values based on measurements of said parameter over an immediate past portion of a present run through said range of motion;

c) determining that the parameter is outside a parameter range based on stored

measurement values obtained during the immediate past portion as the motor driven element moves over its range of motion; and

d) altering motion of said motor driven element during the present run in response to a determination that the parameter is outside the parameter range.

3. (Original) The method of claim 2 wherein the motor driven element is a window or panel and additionally comprising reverse actuating the window or panel prior to moving said window or panel in a direction to close the window or panel.

4. (Original) The method of claim 3 additionally comprising maintaining a position of the window or panel based on the sensed parameter and the reverse actuation is initiated if a leading edge of the window or panel is near a closed position.

5. (Original) The method of claim 4 movement is first initiated toward a closed position when a leading edge of the window or panel is near the closed position and wherein the reverse actuation is performed upon a sensing of an obstacle that is based on determining the parameter is outside the parameter range.

Please cancel claims 6 – 8 without prejudice or disclaimer.
6 – 8 (Cancelled)

9. (Cancelled)

Please cancel claims 10 and 11 without prejudice or disclaimer.

10 & 11. (Cancelled)

12. (Previously Presented) Apparatus for controlling activation of a motor for moving an object along a travel path and de-activating the motor if an obstacle is encountered by the object comprising:

a) a movement sensor for monitoring movement of the object as the motor moves said object along a travel path;

b) a switch for controlling energization of the motor with an energization signal; and

c) a controller including an interface coupled to the switch for controllably energizing the motor and said interface additionally coupling the controller to the movement sensor for monitoring signals from said movement sensor; said controller comprising a stored program that:

i) determines motor speed of movement from an output signal from the movement sensor ;

ii) calculates an obstacle detect threshold based on motor speed of movement detected during a present run of said motor driven element;

iii) compares a value based on currently sensed motor speed of movement with the obstacle detect threshold; and

iv) outputs a signal from the interface to said switch for stopping the motor if the comparison based on currently sensed motor movement indicates the object has contacted an obstacle.

13. (Original) The apparatus of claim 12 wherein the controller includes a buffer memory for storing successive values of motor movement for use in determining the obstacle detect threshold.

14. (Original) The apparatus of claim 12 wherein the controller includes a clock and an input from the movement sensor is in a form of a sequence of pulses and further wherein the controller counts clock signals occurrences between receipt of pulses to provide an indication of motor speed.

15. (Original) The apparatus of claim 12 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or

panel and wherein the controller maintains a motor energization sequence a specified minimum time period in response to a short period user actuation of said control inputs to maintain position accuracy in monitoring window or panel movement.

16. (Original) The apparatus of claim 12 wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the object and wherein in response to a specified input the controller conducts a calibration motor energization sequence to determine parameters of object.

17. (Original) The apparatus of claim 12 wherein the motor is coupled to a motor vehicle window or panel and wherein the controller includes an interface for monitoring user actuation of control inputs for controlling movement of the window or panel and wherein the controller maintains a position indication which is updated in response movement of the window or panel and further wherein the controller reverse actuations the motor near an end point in an object path of travel to avoid false obstacle detection in the region of closure of the window or panel.

18. (Original) The apparatus of claim 12 wherein the sensor is a current sensor and wherein the controller includes means for adjusting the obstacle threshold based on dynamic motor current as sensed from the current sensor to take into account varying loads experienced by the motor.

19. (previously presented) Apparatus for controlling activation of a motor for moving a window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel comprising:

a) a sensor for sensing movement of a window or panel along a travel path;

b) a switch for controlling energization of the motor with an energization signal; and

c) a controller coupled to the switch for controllably energizing the motor and

having an interface coupling the controller to the sensor and to the switch; said controller comprising decision making logic for:

i) monitoring a signal from the sensor;

ii) calculating a real time obstacle detect threshold based on the signal that is detected during at least one prior period of motor operation during movement along a present or current run through a path of travel of said window or panel ;

iii) comparing a value based on a currently sensed motor parameter with the obstacle detect threshold; and

iv) stopping movement of the window or panel by controlling an output to said switch that controls motor energization if the comparison based on a currently sensed motor parameter indicates the window or panel has contacted an obstacle.

20. (Previously Presented) Apparatus for controlling activation of a motor for moving a window or panel along a travel path and de-activating the motor if an obstacle is encountered by the window or panel comprising:

a) a sensor for generating speed signals representative of the window or panel speed as the motor moves the window or panel along a travel path;

b) an obstacle detection controller for monitoring at least a part of the travel path of the window or panel for sensing and generating an obstacle detect signal indicating the presence in said travel path of an obstacle to movement of the window or panel;

c) a switch coupled to said controller for controlling energization of the motor with an energization signal; and

d) said controller for processing speed signals and obstacle detection signals and controlling operation of the motor in response to said speed or obstacle detection signals; said controller including:

i) a storage for storing a number of speed signals that vary with motor speed;

ii) a processor for calculating an obstacle detect threshold based on one or more speed signals stored in said storage obtained in real time based on immediate past

measures of the speed signal sensed by the sensor to adapt to varying conditions encountered during movement along a present path of travel of said window or panel;

iii) a logic unit for making a comparison between a value representing window or panel speed based on a currently sensed motor speed signal with the calculated obstacle detect threshold, and generating a control output if an obstacle is detected based on said comparison; and

iv) an interface coupled to said switch for changing the state of the switch to stop the motor.

21. (Original) The apparatus of claim 20 wherein the sensor for generating a speed signal comprises a Hall-effect sensor.

22. (Original) The apparatus of claim 20 wherein the sensor for generating a speed signal comprises a magnetic pick-up.

23. (Original) The apparatus of claim 20 additionally comprising an obstacle detector having an output coupled to the controller that senses a disruption in a region through which the window or panel moves.

24. (Original) The apparatus of claim 23 wherein the obstacle detector comprises a microwave generator and a reflected wave transducer.

25. (Original) The apparatus of claim 23 wherein the obstacle detector comprises an infrared light source and detector.

26. (Previously Presented) The apparatus of claim 23 wherein the obstacle detector comprises a field effect device.

27. (Previously Presented) The apparatus of claim 26 wherein the field effect device

comprises a magnetic field inductive sensor.

Please cancel claims 28 – 32 without prejudice or disclaimer.

28 - 32. (cancelled)

33 -35. (Cancelled)

36. (Previously Presented) The apparatus of claim 1 wherein the immediate past measurements of said parameter were taken within a forty millisecond interval prior to the most recent sensor measurement.

37. (Cancelled)

REMARKS

No claims are amended and claims 1 – 5, 12 – 27 and 36 are pending and reconsideration of those claims is requested.

Claims 1 – 5 and 12 – 27 were indicated in the last office action as being allowable.

Claim 36 depends from allowable claim 1 and is allowable as well. If the Examiner disagrees he is encouraged to call the undersigned to discuss the suitability of claim 36.

All claims are believed to be in condition for allowance and prompt issuance of a Notice of Allowance is respectfully requested. If any fees are determined to be due, the commissioner is authorized to charge those fees to deposit account no 20-0090.

Respectfully submitted,

Date: January 20, 2009

/Stephen J. Schultz/
Stephen J. Schultz
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Electronic Acknowledgement Receipt	
EFS ID:	4638305
Application Number:	10765487
International Application Number:	
Confirmation Number:	9537
Title of Invention:	Collision monitoring system
First Named Inventor/Applicant Name:	Mario Boisvert
Customer Number:	28060
Filer:	Stephen J. Schultz
Filer Authorized By:	
Attorney Docket Number:	14-733C2D1
Receipt Date:	20-JAN-2009
Filing Date:	27-JAN-2004
Time Stamp:	11:15:03
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	Amendment After Final	14-733c2d1AFamendJan09.pdf	140033 77c24fe1c91cfd020a965685b14eeb465cd39370	no	9
Warnings:					
Information:					

Total Files Size (in bytes):	140033

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.

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NOTICE OF ALLOWANCE AND FEE(S) DUE

28060 7590 02/24/2009

TAROLLI, SUNDHELM, COVELL & TUMMINO, LLP
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EXAMINER	
FLETCHER, MARLON T	
ART UNIT	PAPER NUMBER
2837	

DATE MAILED: 02/24/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,487	01/27/2004	Mario Boisvert	14-733C2D1	9537

TITLE OF INVENTION: COLLISION MONITORING SYSTEM

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$755	$300	$0	$1055	05/26/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

28060 7590 02/24/2009

TAROLLI, SUNDHELM, COVELL & TUMMINO, LLP
1300 EAST NINTH STREET
SUITE 1700
CLEVELAND, OH 44114

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)

(Signature)

(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,487	01/27/2004	Mario Boisvert	14-733C2D1	9537

TITLE OF INVENTION: COLLISION MONITORING SYSTEM

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$755	$300	$0	$1055	05/26/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
FLETCHER, MARLON T	2837	318-466000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

❑ A check is enclosed.

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

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. 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, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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.

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 NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,487	01/27/2004	Mario Boisvert	14-733C2D1	9537

28060 7590 02/24/2009

TAROLLI, SUNDHELM, COVELL & TUMMINO, LLP
1300 EAST NINTH STREET
SUITE 1700
CLEVELAND, OH 44114

EXAMINER	
FLETCHER, MARLON T	
ART UNIT	PAPER NUMBER
2837	

DATE MAILED: 02/24/2009

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 434 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 434 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PTOL-85 (Rev. 08/07) Approved for use through 08/31/2010.

Notice of Allowability	Application No.	Applicant(s)	
	10/765,487	BOISVERT ET AL.	
	Examiner	Art Unit	
	Marlon T. Fletcher	2837	

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

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the after final amendment filed on 1/20/2009*.

2. ☒ The allowed claim(s) is/are *1-5,12-27 and 36*.

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

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/Marlon T Fletcher/
Primary Examiner, Art Unit 2837

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10765487	BOISVERT ET AL.
	Examiner	Art Unit
	Fletcher, Marlon T	2837

✓	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	2/15/2009								
1	1	=								
2	2	=								
3	3	=								
4	4	=								
5	5	=								
	6	▤								
	7	▤								
	8	▤								
	9	-								
	10	▤								
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	30	▤								
	31	▤								
	32	▤								
	33	-								
	34	-								
	35	-								
6	36	▽								

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10765487	BOISVERT ET AL.
	Examiner	**Art Unit**
	Fletcher, Marlon T	2837

✓	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	2/15/2009								
	37	✓								

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	9573	obstruct$4 and (detect$4 or sens $4) and window and (stor$4 or memor $4) and ($5process $4 or mpu or cpu or $5computer) and (revers$4 or travers $4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/02/16 21:34
L2	8	(obstruct$4 and (detect$4 or sens $4) and window and (stor$4 or memor $4) and ($5process $4 or mpu or cpu or $5computer) and (revers$4 or travers $4)).CLM.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/02/16 21:34
L3	60	(obstruct$4 and (detect$4 or sens $4) and window and (stor$4 or memor $4) and ($5process $4 or mpu or cpu or $5computer)).CLM.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2009/02/16 21:36
S1	2	("4831509").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/03/29 16:27
S2	0	S1 and (vehicle or car or automobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/03/29 16:39
S3	1	S1 and (motor near3 speed)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/03/29 17:06

S4	10	(("5218282") or ("5039925") or ("4855653") or ("4831509") or ("4383206")).PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/03/29 17:12
S5	12358	obstruct$4 and (detect$4 or sens $4) and window and (stor$4 or memor $4) and ($5process $4 or mpu or cpu or $5computer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/10/25 20:17
S6	12358	obstruct$4 and (detect$4 or sens $4) and window and (stor$4 or memor $4) and ($5process $4 or mpu or cpu or $5computer)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/03/29 19:20
S7	5636	S6 and motor	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/03/29 19:20
S8	4075	S7 and speed	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/03/29 19:20
S9	1700	S8 and (motor same speed)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/03/29 19:38
S10	1248	S9 and (revers$4 or travers$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/03/29 19:40
S11	212	S10 and ("318"/$7. ccls. or "701"/$7. ccls.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/03/29 19:41

S12	2	("4608637").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2007/10/25 20:17
S13	0	S12 and (light or infrared)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2007/10/25 20:18
S14	2	("4608637").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2008/05/27 12:26

2/16/2009 9:41:03 PM
C:\Documents and Settings\mfletcher\My Documents\EAST\Workspaces\10-765487.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10765487	BOISVERT ET AL.
	Examiner	Art Unit
	Fletcher, Marlon T	2837

SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST TEXT SEARCH: SEE SEARCH HISTORY PRINTOUT	2/15/2009	MTF

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
SEE	SEARCH HISTORY PRINTOUT	2/15/2009	MTF

	/Marlon T Fletcher/ Primary Examiner.Art Unit 2837

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	10765487	BOISVERT ET AL.
	Examiner	**Art Unit**
	Marlon T Fletcher	2837

ORIGINAL		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
318	466	G	0	5	D	3 / 00 (2006.01.01)						

CROSS REFERENCE(S)					
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
318	467	468	469	476	

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

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	12	17		33										
2	2	13	18		34										
3	3	14	19		35										
4	4	15	20	6	36										
5	5	16	21												
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	10	21	26												
	11	22	27												
7	12		28												
8	13		29												
9	14		30												
10	15		31												
11	16		32												

NONE	---	**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	22	
/Marlon T Fletcher/ Primary Examiner.Art Unit 2837	2/15/2009	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

OK TO ENTER: /M.F./

02/18/2009

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Mario Boisvert *et al.*

Serial No.: 10/765,487

Filing Date: January 27, 2004

Title: *COLLISION MONITORING SYSTEM*

Examiner: Marlon T. Fletcher

Art Unit: 2837

Docket No.: 14-733C2D1

Tarolli, Sundheim, Covell & Tummino, LLP
Suite 1700
1300 East Ninth Street
Cleveland, OH 44114

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

RULE 116 AMENDMENT

In response to the office action having a mailing date of January 5, 2009, please amend the application as follows:

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.: 10/765,487 Confirmation No. 9537

Filed: January 27, 2004 Art Unit: 2837

Title: COLLISION MONITORING SYSTEM Examiner: Marlon T. Fletcher

Docket No.: 14-733C2D1

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

APPLICATION FOR PATENT TERM ADJUSTMENT INCLUDING REQUEST FOR RECONSIDERATION UNDER 37 CFR § 1.705 (b)

Dear Sir:

1. This is a request for reconsideration of the patent term adjustment of 434 days indicated on the Notice of Allowance and Fees Due having a mailing date of February 24, 2009. It is respectfully requested that Applicant be granted a patent term adjustment of 898 days.

2. This petition is being filed before the payment of the issue fee.

3. Applicant submits herewith a "Statement Under 37 CFR § 1.702(b)(2)".

4. In accordance with 37 CFR § 1.705(b)(1), the fee set forth in 37 CFR § 1.18(e) ($200) is submitted herewith. Please charge any necessary additional fees or credit any overpayments to our Deposit Account No. 20-0090.

Respectfully submitted,

Date: March 4, 2009

/Stephen J. Schultz/
Stephen J. Schultz, Esq.
Reg. No. 29,108
Tarolli, Sundheim, Covell & Tummino LLP
1300 East Ninth Street
Suite 1700
Cleveland, OH 44114
(216) 621-2234
(216) 621-4072 (Fax)
Attorney for Applicant

Patent

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Mario Boisvert *et al.*

Serial No.: 10/765,487

Filing Date: January 27, 2004

Title: COLLISION MONITORING SYSTEM

Examiner: Marlon T. Fletcher

Art Unit: 2837

Docket No.: 14-733C2D1

Tarolli, Sundheim, Covell & Tummino, LLP
Suite 1700
1300 East Ninth Street
Cleveland, OH 44114

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

Statement Under 37 CFR 1.705(b)(2)

Dear Sir:

1. This statement is submitted in support of the "Application for Patent Term Adjustment Including Request for Reconsideration under 37 CFR 1.705(b)" for the above referenced patent application. In view of the following facts, it is requested that the patent term adjustment of 434 days on the notice of allowance be lengthened to 898 days.

2. The United States Patent and Trademark Office (Herein "PTO") initial determination of a patent term adjustment was in error due to the fact the PTO failed to take certain action

within the time frame specified in 37 CFR 1.702(a) **and** failed to issue a patent within three years of the actual filing date of the above identified patent application in accordance with 37 CFR 1.702(b). (See *Wyeth v Dudas*, 88 USPQ 2d 1538 (Dist Ct DC, 2008)

A. Examination delay pursuant to 37 CFR 1.703(a)

Pursuant to 37 CFR 1.703(a), Applicants are entitled to a period of patent term adjustment due to the failure by the Office to mail an action under 35 USC 132 not later than 14 months after the actual filing date (i.e. by March 27, 2005)(herein "14 month delay") As the PTO failed to mail an action under 35 USC 132 until April 6, 2006, Applicants are entitled to a period of patent term adjustment beginning on the day after the date that is 14 months after the date on which the application was filed under 35 USC 111(a) i.e March 28, 2005, and ending on the date of mailing of an action under 35 USC 132, i.e., April 6, 2006. Accordingly, the 14 Month Delay by the PTO is 375 days, which is in agreement with the period calculated by the PTO on the Patent term Adjustment History submitted herewith as Exhibit A.

Also pursuant to 37 CFR 1.703(a), Applicants are entitled to a period of patent term adjustment due to failure by the PTO to mail an Office Action not later than four months after Appliicants submitted a response to a previous action (herein "4 Month Delay").

i) Applicants submitted a Response to an Office action on June 5, 2006. Since the PTO failed to mail a subsequent Office Action until October 16, 2006, Applicants are entitled to a period of patent term adjustment beginning on the day after the date that is four months after the date on which the response was filed i.e., Octorber 6, 2006 and ending on the date the PTO mailed the subsequent Office Action , i.e., October 16, 2006. Therefore, the first period of patent term adjustment due to the 4 Month Delay is 11 days, which is in agreement with the period calculated by the PTO (See Exhibit A)

ii) Applicants submitted a Response to an Office action on June 20, 2007. Since the PTO failed to mail a subsequent Office Action until October 31, 2007, Applicants are entitled to a period of patent term adjustment beginning on the day after the date that is four months after the date on which the response was filed i.e., October 21, 2007 and ending on the date the PTO mailed the subsequent Office Action , i.e., October 31, 2007. Therefore, the second period of

patent term adjustment due to the 4 Month Delay is 11 days, which is in agreement with the period calculated by the PTO (See Exhibit A)

iii) Applicants submitted a Response to an Office action on January 10, 2008. Since the PTO failed to mail a subsequent Office Action until May 30, 2008, Applicants are entitled to a period of patent term adjustment beginning on the day after the date that is four months after the date on which the response was filed i.e., May 11, 2008 and ending on the date the PTO mailed the subsequent Office Action , i.e., May 30, 2008. Therefore, the third period of patent term adjustment due to the 4 Month Delay is 20 days, which is in agreement with the period calculated by the PTO (See Exhibit A)

iv) Applicants submitted a Response to a Office action on August 19, 2008. Since the PTO failed to mail a subsequent Office Action until January 5, 2009, Applicants are entitled to a period of patent term adjustment beginning on the day after the date that is four months after the date on which the response was filed i.e., December 20, 2008 and ending on the date the PTO mailed the subsequent Office Action , i.e., January 5, 2009. Therefore, the fourth period of patent term adjustment due to the 4 Month Delay is 17 days, which is in agreement with the period calculated by the PTO (See Exhibit A). The total of the four different 4 Month Delay periods is 59 days.

B. "Three Years Delay" Pursuant to 37 CFR 1.703

In addition to the patent term adjustment due to the 14 Month Delay and the 4 Month Examination Delays, Applicants are entitled to a period of patent term adjustment pursuant to 37 CFR 1.703(b) . The period of delay under 37 CFR 1.703(b) is equal to the number of days in the period beginning on the day after the date that is three years after the date on which the above application was filed under 35 USC 111(a), i.e., January 28, 2007 and ending on the date Applicants filed a Request For Continuing Examination, i.e. June 5, 2008. (See 37 CFR 1.703(b)(1)) Applicant has calculated the period of "Three Years Delay" of 495 days.

As set forth in 37 CFR 1.703(f), Applicants are entitled to a period of patent term adjustment equal to the period of delays based on grounds set forth in 37 CFR 1.702 (herein "Office Delay") reduced by the period of time during which Patentees failed to engage in

reasonable efforts to conclude prosecution pursuant to 37 CFR 1.704 (hereinafter "Applicant Delay"). In this petition, the sum of the period of the 14 Month Delay and the combined 4 Month Delays under 37 1.703 is referred to as "Examination Delay" and is 434 days. In the present application, the total period of PTO Delay is the sum of the period of the Three Years Delay (495 days) under 37 CFR 1.703(b) and the period of Examination Delay (434 days) under 37 CFR 1.703(a) *to the extent these periods of delay are not overlapping*.

Applicants note, that the second and third "4 Month Delays" enumerated above overlap with the three year delay period (January 28, 2007 to June 5, 2008). Accordingly, Applicants submit the total period of PTO delay is 898 which is the sum of the Three Year Delay plus the period of Examination delay, minus the period of overlap.

To calculate the period of patent term adjustment, the total period of Office Delay is reduced by the period of Applicant Delay, which the PTO calculates as a period of 0 days. See "Applicant Delay" in Exhibit A. Applicant does not dispute the Applicant Delay calculated by the PTO. Accordingly, Applicants calculate that the correct patent term adjustment for the present application is 898 days which is the total period of PTO delay.

This calculation is arrived at by the following calculation:

14 month delay period	375 days
Plus 4 month delay period	59 days
Plus Three year delay period	495 days
EqualsTotal PTO Delay	929 days
Minus Overlap, 4 month period and three year period	31 days
Equals	898 days
Minus Applicant delay	0 days
Equals Patent Term Adjustment	**898 days**

3. Applicants submit the present patent application is not subject to a terminal disclaimer.

4. There are no circumstances during the prosecution of the application that constitute a failure to engage in reasonable efforts to conclude processing or examination of the application as set for 37 CFR 1.704.

In view of the foregoing, it is respectfully requested that this application for Patent Term Adjustment be favorably considered and that a corrected Determination of Patent Term adjustment be issued to reflect a patent term adjustment of 898 days. Should the PTO delay issuance of the patent more than four months from payment of the issue fee, other Patent Term Adjustments may be warranted.

Respectfully Submitted,

Date: March 4, 2009

/Stephen J. Schultz/

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Exhibit A

Patent Term Adjustment

Filing or 371(c) Date:	01-27-2004	USPTO Delay (PTO) Delay (days):	434
Issue Date of Patent:	-	Three Years:	-
Pre-Issue Petitions (days):	+0	Applicant Delay (APPL) Delay (days):	0
Post-Issue Petitions (days):	+0	Total Patent Term Adjustment (days):	434
USPTO Adjustment (days):	+0	Explanation Of Calculations	

Patent Term Adjustment History

Date	Contents Description	PTO(Days)	APPL(Days)
02-24-2009	Mail Notice of Allowance		
02-19-2009	Notice of Allowance Data Verification Completed		
02-19-2009	Case Docketed to Examiner in GAU		
02-19-2009	Document Verification		
01-26-2009	Date Forwarded to Examiner		
01-20-2009	Amendment after Final Rejection		
01-05-2009	Mail Final Rejection (PTOL - 326)	17	
01-05-2009	Final Rejection		
10-24-2008	Mail Examiner Interview Summary (PTOL - 413)		
09-25-2008	Examiner Interview Summary Record (PTOL - 413)		
10-06-2008	Date Forwarded to Examiner		
08-19-2008	Response after Non-Final Action		
07-23-2008	Mail Non-Final Rejection		
07-21-2008	Non-Final Rejection		
06-05-2008	Information Disclosure Statement considered		
06-05-2008	Information Disclosure Statement considered		
06-18-2008	Information Disclosure Statement considered		
06-18-2008	Information Disclosure Statement (IDS) Filed		
06-05-2008	Reference capture on IDS		
06-05-2008	Information Disclosure Statement (IDS) Filed		
06-30-2008	Date Forwarded to Examiner		
06-30-2008	Date Forwarded to Examiner		
06-05-2008	Request for Continued Examination (RCE)		
06-30-2008	DISPOSAL FOR A RCE/CPA/129 (express abandonment if CPA)		
06-18-2008	Information Disclosure Statement (IDS) Filed		
06-05-2008	Information Disclosure Statement (IDS) Filed		
06-05-2008	Information Disclosure Statement (IDS) Filed		
06-05-2008	Workflow - Request for RCE - Begin		
05-30-2008	Mail Final Rejection (PTOL - 326)	20	
05-28-2008	Final Rejection		

Exhibit A

02-02-2008	Date Forwarded to Examiner		
01-10-2008	Response after Non-Final Action		
10-31-2007	Mail Non-Final Rejection	11	
10-26-2007	Non-Final Rejection		
07-02-2007	Oath or Declaration Filed (Including Supplemental)		
07-02-2007	Rule 47 / 48 Correction of Inventorship Papers Filed		
06-23-2007	Date Forwarded to Examiner		
06-20-2007	Response after Non-Final Action		
05-30-2007	Examiner Interview Summary Record (PTOL - 413)		
04-10-2007	Mail Non-Final Rejection		
04-02-2007	Non-Final Rejection		
12-26-2006	Date Forwarded to Examiner		
12-13-2006	Response after Non-Final Action		
10-16-2006	Mail Non-Final Rejection	11	
10-13-2006	Non-Final Rejection		
08-02-2006	Correspondence Address Change		
06-09-2006	Date Forwarded to Examiner		
06-05-2006	Response after Non-Final Action		
04-06-2006	Mail Non-Final Rejection	375	
04-03-2006	Non-Final Rejection		
11-26-2004	Information Disclosure Statement considered		
12-30-2005	Correspondence Address Change		
12-09-2005	Mail-Record Petition Decision of Granted to Make Special		
04-25-2005	Petition Entered		
12-08-2005	Correspondence Address Change		
11-26-2004	Reference capture on IDS		
11-26-2004	Information Disclosure Statement (IDS) Filed		
11-26-2004	Information Disclosure Statement (IDS) Filed		
07-15-2004	IFW TSS Processing by Tech Center Complete		
07-15-2004	Case Docketed to Examiner in GAU		
01-27-2004	Preliminary Amendment		
06-16-2004	Application Return from OIPE		
06-16-2004	Application Return TO OIPE		
06-16-2004	Application Return from OIPE		
06-17-2004	Application Is Now Complete		
06-16-2004	Application Return TO OIPE		
06-15-2004	Application Return from OIPE		
06-16-2004	Application Is Now Complete		

Exhibit A

06-15-2004	Application Return TO OIPE	
06-15-2004	Application Dispatched from OIPE	
06-16-2004	Application Is Now Complete	
03-10-2004	Cleared by OIPE CSR	
02-04-2004	IFW Scan & PACR Auto Security Review	
01-27-2004	Initial Exam Team nn	

Electronic Patent Application Fee Transmittal	
Application Number:	10765487
Filing Date:	27-Jan-2004
Title of Invention:	COLLISION MONITORING SYSTEM
First Named Inventor/Applicant Name:	Mario Boisvert
Filer:	Stephen J. Schultz
Attorney Docket Number:	14-733C2D1
Filed as Small Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Application for patent term adjustment	1455	1	200	200
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**200**

Electronic Acknowledgement Receipt	
EFS ID:	4899182
Application Number:	10765487
International Application Number:	
Confirmation Number:	9537
Title of Invention:	COLLISION MONITORING SYSTEM
First Named Inventor/Applicant Name:	Mario Boisvert
Customer Number:	28060
Filer:	Stephen J. Schultz
Filer Authorized By:	
Attorney Docket Number:	14-733C2D1
Receipt Date:	04-MAR-2009
Filing Date:	27-JAN-2004
Time Stamp:	10:35:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$200
RAM confirmation Number	5760
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Post Allowance Communication - Incoming	14733C2D1PTA.pdf	17087 c4d7ed22e2a2b2da10d9442982dea4122b0a3b92	no	1
Warnings:					
Information:					
2	Post Allowance Communication - Incoming	14733C2D1statement.pdf	42477 7f9769f9ad57bb6176f26dedba85d1b2d00957e9	no	5
Warnings:					
Information:					
3	Post Allowance Communication - Incoming	14733C2D1Exhibit.pdf	70544 ba577265a0f968cd59a78bbead4cb03dea2d081e	no	3
Warnings:					
Information:					
4	Fee Worksheet (PTO-06)	fee-info.pdf	30143 1fdef8f205b68db9a85f3b069c7ef461efb87dc4	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	160251		

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.

<u>New Applications Under 35 U.S.C. 111</u>
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.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
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.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
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.

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax **(571) 273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Tarolli, Sundheim, Covell & Tummino LLP
1300 East Ninth Street
Suite 1700
Cleveland, OH 44114

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

Carrie A. Lewis	(Depositor's name)
	(Signature)
March 5, 2009	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,487	01/27/2004	Mario Boisvert	14-733C2D1	9537

TITLE OF INVENTION: Collision Monitoring System

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$755	$300	$1055	05/26/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
Fletcher, Marlon T.	2837	318-466000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 Tarolli, Sundheim, Covell &
2 Tummino LLP
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)
PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE	(B) RESIDENCE: (CITY and STATE OR COUNTRY)
Nartron Corporation	Reed City, MI

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are enclosed:
☑ Issue Fee
☑ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s):
☐ A check in the amount of the fee(s) is enclosed.
☑ Payment by credit card. Form PTO-2038 is attached.
☑ The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number 20-0090.

5. Change in Entity Status (from status indicated above)
☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.
NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature Stephen Schultz Date March 5, 2009

Typed or printed name Stephen J. Schultz Registration No. 29,108

This collection of information is required by 37 CFR 1.311. 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, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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TAROLLI, SUNDHELM, COVELL & TUMMINO, LLP
1300 EAST NINTH STREET
SUITE 1700
CLEVELAND OH 44114

COPY MAILED

JUL 24 2009

OFFICE OF PETITIONS

In re Application of	:	
Boisvert et al.	:	
Application No. 10/765,487	:	ON APPLICATION FOR
Filed: January 27, 2004	:	PATENT TERM ADJUSTMENT
Atty Docket No. 14-733C2D1	:	

This is in response to the APPLICATION FOR PATENT TERM ADJUSTMENT INCLUDING REQUEST FOR RECONSIDERATION UNDER 37 CFR §1.705(b) filed on March 4, 2009. Applicant submits that the correct patent term adjustment to be indicated on the patent is eight hundred ninety-eight (898) days, not four hundred thirty-four (434) days as calculated by the Office as of the mailing of the initial determination of patent term adjustment. Applicant requests this correction solely on the basis that the Office will take in excess of three years to issue this patent.

The application for patent term adjustment is **GRANTED to the extent indicated**.

The Office has updated the PALM and PAIR screens to reflect that the correct Patent Term Adjustment (PTA) determination at the time of the mailing of the Notice of Allowance is FOUR HUNDRED TWENTY-ONE (421) days. A copy of the updated PAIR screen, showing the correct determination, is enclosed.

To the extent the instant application for patent term adjustment requests reconsideration of the patent term adjustment as it relates to the Office's failure to issue the patent within 3 years of the filing date, the application for patent term adjustment under 37 CFR 1.705(b) is **DISMISSED as PREMATURE**.

Knowledge of the actual date the patent issues is required to calculate the amount, if any, of additional patent term patentee is entitled to for Office failure to issue the patent within 3 years. See § 1.702(b). (This is true even where a request for continued examination (RCE) was filed). The computer will not undertake the § 1.702(b) calculation until the actual date of issuance of the patent has been determined. Likewise, the computer will not calculate any further Office delay under § 1.702(a)(4) or applicant delay under § 1.704(c)(10) until the actual date of issuance of the patent has been determined. As such, the Office can not make a determination on the correctness of the patent term adjustment until the patent has issued.

Requesting reconsideration of the patent term adjustment to be indicated on the patent under 37 CFR 1.705(b) based on the initial determination of patent term adjustment and a projected issuance date of the patent (or even the filing date of the request for continued examination) is premature. Accordingly, it is appropriate to dismiss as premature such a request.

Rather than file an application for patent term adjustment under 37 CFR 1.705(b) contesting the 37 CFR 1.702(b) calculation at the time of the mailing of the notice of allowance, applicant is advised that they may wait until the time of the issuance of the patent and file a request for reconsideration of the patent term adjustment pursuant to 37 CFR 1.705(d). As the USPTO does not calculate the amount of time earned pursuant to 37 CFR 1.702(b) until the time of the issuance of the patent, the Office will consider any request for reconsideration of the patent term adjustment due to an error in the calculation of 37 CFR 1.702(b) to be timely if the request for reconsideration is filed within two months of the issuance of the patent. However, as to all other bases for contesting the initial determination of patent term adjustment received with the notice of allowance, applicant must timely file an application for patent term adjustment prior to the payment of the issue fee[1].

[1] For example, if applicant disputes both the calculation of patent term adjustment under 37 CFR 1.702(a)(1) for Office failure to mail a first Office action or notice of allowance not later than fourteen months after the date on which the application was filed and under 37 CFR 1.702(b) for Office failure to issue a patent within three years of the actual filing date of the application, then applicant must still timely file an application for patent term adjustment prior to the payment of the issue fee to contest the calculation of Office delay in issuing a first Office action or notice of allowance. See 37 CFR 1.705(b) and 35 U.S.C. 154(b)(3)(B). A dispute as to the calculation of the §1.702(a)(1) period raised on request for

The Office acknowledges submission of the $200.00 fee set forth in 37 CFR 1.18(e) for consideration of the application for patent term adjustment under 37 CFR 1.705(b).

Any request for reconsideration of the patent term adjustment indicated on the patent must be timely filed within 2 months after issuance pursuant to 37 CFR 1.705(d) and must include payment of the required fee under 37 CFR 1.18(e).

To the extent that the instant application for patent term adjustment requests reconsideration of the PTA at the time of the mailing of the Notice of Allowance, the request is **granted to the extent indicated**.

On February 24, 2009, the Office mailed a Determination of Patent Term Adjustment under 35 U.S.C. 154(b) in the above-identified application. Applicant was advised that the patent term adjustment to date was four hundred thirty-four (434) days. The period of adjustment was 434 days of PTO delay and 0 days of applicant delay.

On January 30, 2009, the subject application for patent term adjustment was timely filed.[2]

On June 5, 2008, a request for continued examination and an preliminary amendment were filed in response to a final office action mailed on May 30, 2009. On June 18, 2008, an information disclosure statement was filed, 13 days after the filing of the request for continued examination on June 5, 2008.[3]

37 CFR 1.704(c)(8) states that circumstances that constitute a failure of the applicant to engage in reasonable efforts to conclude processing or examination of an application also include the following circumstances, which will result in the following reduction of the period of adjustment set forth in § 1.703 to the extent that the periods are not overlapping: Submission of a supplemental reply or other paper, other than a supplemental reply or other paper expressly requested by the

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reconsideration of patent term adjustment under 37 CFR 1.705(d) will be dismissed as untimely filed.

[2] Office records indicate that the issue fee was paid on March 5, 2009.

[3] A paper styled as an information disclosure statement (IDS) was filed with the request for continued examination on June 5, 2008. That paper was unsigned, however. On June 18, 2008, a properly signed IDS was filed.

examiner, after a reply has been filed, in which case the period of adjustment set forth in § 1.703 shall be reduced by the number of days, if any, beginning on the day after the date the initial reply was filed and ending on the date that the supplemental reply or other such paper was filed.

Accordingly, entry of a period of reduction of thirteen (13) days is warranted.

In view thereof, the correct patent term adjustment at the time of the mailing of the notice of allowance is four hundred twenty-one (421) days (434 days of office delay reduced by thirteen (13) days of applicant delay).

The application is being forwarded to the Office of Data Management for issuance of the patent. The patent term adjustment indicated on the patent (as shown on the Issue Notification mailed about three weeks prior to patent issuance) will include any additional adjustment accrued both for Office delay in issuing the patent more than four months after payment of the issue fee and satisfaction of all outstanding requirements, and for the Office taking in excess of three years to issue the patent (to the extent that the three-year period does not overlap with periods already accorded).

Telephone inquiries specific to this decision should be directed to Senior Petitions Attorney Douglas I. Wood at (571) 272-3231.

Nancy Johnson
Senior Petitions Attorney
Office of Petitions

Encl: Copy of updated PAIR screen

PTA Calculations for Application: 10/765487			
Application Filing Date:	01/27/2004	PTO Delay (PTO):	434
Issue Date of Patent:		Three Years:	0
Pre-Issue Petitions:	0	Applicant Delay (APPL):	0
Post-Issue Petitions:	0	Total PTA (days):	421
PTO Delay Adjustment:	-13		

File Contents History

Number	Date	Contents Description	PTO	APPL	START
86	07/21/2009	ADJUSTMENT OF PTA CALCULATION BY PTO		13	
79	02/24/2009	MAIL NOTICE OF ALLOWANCE			
78	02/19/2009	ISSUE REVISION COMPLETED			
77	02/19/2009	NOTICE OF ALLOWANCE DATA VERIFICATION COMPLETED			
76	02/19/2009	CASE DOCKETED TO EXAMINER IN GAU			
75	02/19/2009	ALLOWED CASE RETURNED TO THE EXAMINER FOR CLERICAL PROCESSING			
74	02/19/2009	DOCUMENT VERIFICATION			
73	02/19/2009	NOTICE OF ALLOWABILITY			
72	01/26/2009	DATE FORWARDED TO EXAMINER			
71	01/20/2009	AMENDMENT AFTER FINAL REJECTION			
70	01/05/2009	MAIL FINAL REJECTION (PTOL - 326)	17		65
69	01/05/2009	FINAL REJECTION			
68	10/24/2008	MAIL EXAMINER INTERVIEW SUMMARY (PTOL - 413)			
67	09/25/2008	EXAMINER INTERVIEW SUMMARY RECORD (PTOL - 413)			
66	10/06/2008	DATE FORWARDED TO EXAMINER			
65	08/19/2008	RESPONSE AFTER NON-FINAL ACTION			
63	07/23/2008	MAIL NON-FINAL REJECTION			
62	07/21/2008	NON-FINAL REJECTION			
61	06/05/2008	INFORMATION DISCLOSURE STATEMENT CONSIDERED			
60	06/05/2008	INFORMATION DISCLOSURE STATEMENT CONSIDERED			
59	06/18/2008	INFORMATION DISCLOSURE STATEMENT CONSIDERED			

58	06/18/2008	INFORMATION DISCLOSURE STATEMENT (IDS) FILED			
57	06/05/2008	REFERENCE CAPTURE ON IDS			
56	06/05/2008	INFORMATION DISCLOSURE STATEMENT (IDS) FILED			
55	06/30/2008	DATE FORWARDED TO EXAMINER			
54	06/05/2008	AMENDMENT SUBMITTED/ENTERED WITH FILING OF CPA/RCE			
53	06/30/2008	DATE FORWARDED TO EXAMINER			
52	06/05/2008	REQUEST FOR CONTINUED EXAMINATION (RCE)			
51	06/30/2008	DISPOSAL FOR A RCE/CPA/129 (EXPRESS ABANDONMENT IF CPA)			
50	06/18/2008	INFORMATION DISCLOSURE STATEMENT (IDS) FILED			
49	06/05/2008	INFORMATION DISCLOSURE STATEMENT (IDS) FILED			
48	06/05/2008	INFORMATION DISCLOSURE STATEMENT (IDS) FILED			
47	06/05/2008	WORKFLOW - REQUEST FOR RCE - BEGIN			
46	05/30/2008	MAIL FINAL REJECTION (PTOL - 326)	20		43
45	05/28/2008	FINAL REJECTION			
44	02/02/2008	DATE FORWARDED TO EXAMINER			
43	01/10/2008	RESPONSE AFTER NON-FINAL ACTION			
42	10/31/2007	MAIL NON-FINAL REJECTION	11		37
41	10/26/2007	NON-FINAL REJECTION			
40	07/02/2007	OATH OR DECLARATION FILED (INCLUDING SUPPLEMENTAL)			
39	07/02/2007	RULE 47 / 48 CORRECTION OF INVENTORSHIP PAPERS FILED			
38	06/23/2007	DATE FORWARDED TO EXAMINER			
37	06/20/2007	RESPONSE AFTER NON-FINAL ACTION			
36	05/30/2007	EXAMINER INTERVIEW SUMMARY RECORD (PTOL - 413)			
35	04/10/2007	MAIL NON-FINAL REJECTION			
34	04/02/2007	NON-FINAL REJECTION			
33	12/26/2006	DATE FORWARDED TO EXAMINER			
32	12/13/2006	RESPONSE AFTER NON-FINAL ACTION			
31	10/16/2006	MAIL NON-FINAL REJECTION	11		27
30	10/13/2006	NON-FINAL REJECTION			

29	08/02/2006	CORRESPONDENCE ADDRESS CHANGE			
28	06/09/2006	DATE FORWARDED TO EXAMINER			
27	06/05/2006	RESPONSE AFTER NON-FINAL ACTION			
26	04/06/2006	MAIL NON-FINAL REJECTION	375		-1
25	04/03/2006	NON-FINAL REJECTION			
24	11/26/2004	INFORMATION DISCLOSURE STATEMENT CONSIDERED			
23	12/30/2005	CORRESPONDENCE ADDRESS CHANGE			
22	12/09/2005	MAIL-RECORD PETITION DECISION OF GRANTED TO MAKE SPECIAL			
21	04/25/2005	PETITION ENTERED			
20	12/08/2005	CORRESPONDENCE ADDRESS CHANGE			
19	11/26/2004	REFERENCE CAPTURE ON IDS			
18.7	11/26/2004	INFORMATION DISCLOSURE STATEMENT (IDS) FILED			
18	11/26/2004	INFORMATION DISCLOSURE STATEMENT (IDS) FILED			
17	07/15/2004	IFW TSS PROCESSING BY TECH CENTER COMPLETE			
16	07/15/2004	CASE DOCKETED TO EXAMINER IN GAU			
15	01/27/2004	PRELIMINARY AMENDMENT			
14	06/16/2004	APPLICATION RETURN FROM OIPE			
13	06/16/2004	APPLICATION RETURN TO OIPE			
12	06/16/2004	APPLICATION RETURN FROM OIPE			
11	06/17/2004	APPLICATION IS NOW COMPLETE			
10	06/16/2004	APPLICATION RETURN TO OIPE			
9	06/15/2004	APPLICATION RETURN FROM OIPE			
8	06/16/2004	APPLICATION IS NOW COMPLETE			
7	06/15/2004	APPLICATION RETURN TO OIPE			
6	06/15/2004	APPLICATION DISPATCHED FROM OIPE			
5	06/16/2004	APPLICATION IS NOW COMPLETE			
4	03/10/2004	CLEARED BY OIPE CSR			
3	03/10/2004	CASE CLASSIFIED BY OIPE			
2	02/04/2004	IFW SCAN & PACR AUTO SECURITY REVIEW			
1	01/27/2004	INITIAL EXAM TEAM NN			

Search Another: Application# Search

EXPLANATION OF PTA CALCULATION

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 NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,487	08/25/2009	7579802	14-733C2D1	9537

28060 7590 08/05/2009

TAROLLI, SUNDHELM, COVELL & TUMMINO, LLP
1300 EAST NINTH STREET
SUITE 1700
CLEVELAND, OH 44114

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 550 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Mario Boisvert, Reed City, MI;
Randall Perrin, Cadillac, MI;
John Washeleski, Cadillac, MI;

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent No.: 7,579,802 B2 based on ser no 10/765,487 Confirmation No. 9537

Filed: January 27, 2004 Art Unit: 2837

Title: COLLISION MONITORING SYSTEM Examiner: Marlon T. Fletcher

Docket No.: 14-733C2D1

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

RENEWED APPLICATION FOR PATENT TERM ADJUSTMENT INCLUDING REQUEST FOR RECONSIDERATION UNDER 37 CFR § 1.705 (b)

Dear Sir:

1. This is a renewed request for reconsideration of the patent term adjustment of 550 days indicated on the front sheet of patent number 7,579,802 B2 having an issue date of August 25, 2009. It is respectfully requested that Applicant be granted a patent term adjustment of 936 days.

2. This petition is being filed within 2 months of the issuance of the '802 patent.

3. Applicant submits herewith a "Statement Under 37 CFR § 1.702(b)(2)".

4. In accordance with 37 CFR § 1.705(b)(1), the fee set forth in 37 CFR § 1.18(e) ($200) is submitted herewith. Please charge any necessary additional fees or credit any overpayments to our Deposit Account No. 20-0090.

Respectfully submitted,

Date: September 23, 2009

/Stephen J. Schultz/
Stephen J. Schultz, Esq.
Reg. No. 29,108
Tarolli, Sundheim, Covell & Tummino LLP
1300 East Ninth Street
Suite 1700
Cleveland, OH 44114
(216) 621-2234
(216) 621-4072 (Fax)
Attorney for Applicant

Patent

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent of: Mario Boisvert *et al.*

Patent No.: 7, 579,802 B2

Filing Date: January 27, 2004

Title: COLLISION MONITORING SYSTEM

Examiner: Marlon T. Fletcher

Art Unit: 2837

Docket No.: 14-733C2D1

Tarolli, Sundheim, Covell & Tummino, LLP
Suite 1700
1300 East Ninth Street
Cleveland, OH 44114

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

Renewed Statement Under 37 CFR 1.705(b)(2)

Dear Sir:

1. This statement is resubmitted in support of the "Application for Patent Term Adjustment Including Request for Reconsideration under 37 CFR 1.705(b)" for the above referenced patent. In view of the following facts, it is requested that the patent term adjustment of 550 days calculated by the United States Patent and Trademark Office (herein USPTO), see attachment A and indicated on the front sheet of US patent number 7,579,802 (herein '802 patent) be lengthened to 936 days.

2. On July 24, 2009 the Office of Petitions of the USPTO issued its decision dismissing as premature applicants' petition under 37 CFR 1.705(b) filed March 4, 2009 with the USPTO since "Knowledge of the actual date the patent issues is required to calculate the amount, if any, of additional patent term patentee is entitled to for Office failure to issue the patent within 3 years." The dismissal also indicated that "Any request for reconsideration of the patent term adjustment indicated on the patent must be timely filed within 2 months after issuance pursuant to 37 CFR 1.705(d)"

3. The USPTO initial and updated determination of a patent term adjustment was in error due to the fact the PTO failed to take certain action within the time frame specified in 37 CFR 1.702(a) **and** failed to issue a patent within three years of the actual filing date of the above identified patent application in accordance with 37 CFR 1.702(b). (See *Wyeth v Dudas*, 88 USPQ 2d 1538 (Dist Ct DC, 2008)

A. Examination delay pursuant to 37 CFR 1.703(a)

Pursuant to 37 CFR 1.703(a)(1), Applicants are entitled to a period of patent term adjustment due to the failure by the Office to mail an action under 35 USC 132 not later than 14 months after the actual filing date (i.e. by March 27, 2005)(herein "14 month delay") As the PTO failed to mail an action under 35 USC 132 until April 6, 2006, Applicants are entitled to a period of patent term adjustment beginning on the day after the date that is 14 months after the date on which the application was filed under 35 USC 111(a) i.e March 28, 2005, and ending on the date of mailing of an action under 35 USC 132, i.e., April 6, 2006. Accordingly, the 14 Month Delay by the PTO is 375 days, which is in agreement with the period calculated by the PTO on the Patent term Adjustment History submitted herewith as Exhibit A.

Also pursuant to 37 CFR 1.703(a)(2), Applicants are entitled to a period of patent term adjustment due to failure by the PTO to mail an Office Action not later than four months after Appliicants submitted a response to a previous action (herein "4 Month Delay").

i) Applicants submitted a Response to an Office action on June 5, 2006. Since the PTO failed to mail a subsequent Office Action until October 16, 2006, Applicants are entitled to a period of patent term adjustment beginning on the day after the date that is four months after the

date on which the response was filed i.e., Octorber 6, 2006 and ending on the date the PTO mailed the subsequent Office Action , i.e., October 16, 2006. Therefore, the first period of patent term adjustment due to the 4 Month Delay is 11 days, which is in agreement with the period calculated by the PTO (See Exhibit A)

ii) Applicants submitted a Response to an Office action on June 20, 2007. Since the PTO failed to mail a subsequent Office Action until October 31, 2007, Applicants are entitled to a period of patent term adjustment beginning on the day after the date that is four months after the date on which the response was filed i.e., October 21, 2007 and ending on the date the PTO mailed the subsequent Office Action , i.e., October 31, 2007. Therefore, the second period of patent term adjustment due to the 4 Month Delay is 11 days, which is in agreement with the period calculated by the PTO (See Exhibit A)

iii) Applicants submitted a Response to an Office action on January 10, 2008. Since the PTO failed to mail a subsequent Office Action until May 30, 2008, Applicants are entitled to a period of patent term adjustment beginning on the day after the date that is four months after the date on which the response was filed i.e., May 11, 2008 and ending on the date the PTO mailed the subsequent Office Action , i.e., May 30, 2008. Therefore, the third period of patent term adjustment due to the 4 Month Delay is 20 days, which is in agreement with the period calculated by the PTO (See Exhibit A)

iv) Applicants submitted a Response to a Office action on August 19, 2008. Since the PTO failed to mail a subsequent Office Action until January 5, 2009, Applicants are entitled to a period of patent term adjustment beginning on the day after the date that is four months after the date on which the response was filed i.e., December 20, 2008 and ending on the date the PTO mailed the subsequent Office Action , i.e., January 5, 2009. Therefore, the fourth period of patent term adjustment due to the 4 Month Delay is 17 days, which is in agreement with the period calculated by the PTO (See Exhibit A).

The total of the four different 4 Month Delay periods is 59 days.

Also pursuant to 37 CFR 1.703(a)(6), Applicants are entitled to a period of patent term adjustment due to failure by the PTO to issue the '802 patent not later than four months after the issue fee was paid (herein "Patent Issuance Delay").

Applicants paid the issue fee March 5, 2009. Accordingly, the day after the date that is four months after the date the issue fee was paid is July 6, 2009. The '802 patent issued August 25 so applicants are entitled to an additional patent term adjustment of 51 days which is consistent with the USPTO calculation on attachment A.

B. "Three Years Delay" Pursuant to 37 CFR 1.703

In addition to the patent term adjustment due to the 14 Month Delay and the 4 Month Examination Delays, Applicants are entitled to a period of patent term adjustment pursuant to 37 CFR 1.703(b) . The period of delay under 37 CFR 1.703(b) is equal to the number of days in the period beginning on the day after the date that is three years after the date on which the above application was filed under 35 USC 111(a), i.e., January 28, 2007 and ending on the date Applicants filed a Request For Continuing Examination, i.e. June 5, 2008. (See 37 CFR 1.703(b)(1)) Applicant has calculated the period of "Three Years Delay" of 495 days.

As set forth in 37 CFR 1.703(f), Applicants are entitled to a period of patent term adjustment equal to the period of delays based on grounds set forth in 37 CFR 1.702 (herein "Office Delay") reduced by the period of time during which Patentees failed to engage in reasonable efforts to conclude prosecution pursuant to 37 CFR 1.704 (hereinafter "Applicant Delay"). In this petition, the sum of the period of the 14 Month Delay and the four enumerated 4 Month Delays under 37 CFR 1.703 is referred to as "Examination Delay" and is 434 days. During pendency of the application, the total period of PTO Delay is the sum of the period of the Three Years Delay (495 days) under 37 CFR 1.703(b), the period of Examination Delay (434 days) under 37 CFR 1.703(a), and the Patent Issuance Delay under 37 CFR 1.703(a)(6) *to the extent these periods of delay are not overlapping*.

Applicants note, that the second and third "4 Month Delays" enumerated above overlap with the three year delay period (January 28, 2007 to June 5, 2008). Accordingly, Applicants

submit the total period of PTO delay is 949 days which is the sum of the Three Year Delay plus the period of Examination delay plus the Patent Issuance Delay, minus the period of overlap.

C. Applicant Delay

To calculate the period of patent term adjustment, the total period of Office Delay is reduced by the period of Applicant Delay, which the PTO calculates as a period of 13 days due to the filing of an Information Disclosure statement 13 days after the filing of a Request for Continuating Examination that was file June 5, 2008. . See "Applicant Delay" in Exhibit A. Applicant does not dispute the 13 day Applicant Delay calculated by the PTO. Accordingly, Applicants calculate that the correct patent term adjustment for the present application is 898 days which is the total period of PTO delay.

This calculation is arrived at by the following calculation:

14 month delay period	375 days
Plus 4 month delay period	59 days
Plus Patent Issuance Delay period	51 days
Plus Three year delay period	495 days
EqualsTotal PTO Delay	980 days
Minus Overlap, 4 month period and three year period	31 days
Equals	949 days
Minus Applicant delay	13 days
Equals Patent Term Adjustment	936 **days**

4. Applicants submit the present patent application is not subject to a terminal disclaimer.

5. The only circumstance during the prosecution of the application that constitute a failure to engage in reasonable efforts to conclude processing or examination of the application as set for

37 CFR 1.704 is the 13 day delay in filing an Information Disclosure Statement subsequent to filing a request for RCE.

In view of the foregoing, it is respectfully requested that this application for Patent Term Adjustment be favorably considered and that a corrected Determination of Patent Term adjustment be issued to reflect a patent term adjustment of 936 days.

Respectfully Submitted,

Date: September 23, 2009

/Stephen J. Schultz/

Stephen J. Schultz
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1300 East Ninth St., Suite 1700
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EXHIBIT A

Patent Term Adjustment

Filing or 371(c) Date:	01-27-2004	USPTO Delay (PTO) Delay (days):	563
Issue Date of Patent:	08-25-2009	Three Years:	-
Pre-Issue Petitions (days):	+0	Applicant Delay (APPL) Delay (days):	0
Post-Issue Petitions (days):	+0	Total Patent Term Adjustment (days):	550
USPTO Adjustment (days):	-13	Explanation Of Calculations	

Patent Term Adjustment History

Date	Contents Description	PTO(Days)	APPL(Days)
08-05-2009	PTA 36 Months	78	
08-25-2009	Patent Issue Date Used in PTA Calculation	51	
07-29-2009	Dispatch to FDC		
07-27-2009	Mail-Petition Decision - Granted in Part		
07-24-2009	Petition Decision - Granted in Part		
07-21-2009	Adjustment of PTA Calculation by PTO		13
07-21-2009	Adjustment of PTA Calculation by PTO		
03-04-2009	Petition Entered		
03-10-2009	Application Is Considered Ready for Issue		
03-05-2009	Issue Fee Payment Verified		
03-05-2009	Issue Fee Payment Received		
02-24-2009	Mail Notice of Allowance		
02-19-2009	Notice of Allowance Data Verification Completed		
02-19-2009	Case Docketed to Examiner in GAU		
02-19-2009	Document Verification		
01-26-2009	Date Forwarded to Examiner		
01-20-2009	Amendment after Final Rejection		
01-05-2009	Mail Final Rejection (PTOL - 326)	17	
01-05-2009	Final Rejection		
10-24-2008	Mail Examiner Interview Summary (PTOL - 413)		
09-25-2008	Examiner Interview Summary Record (PTOL - 413)		
10-06-2008	Date Forwarded to Examiner		
08-19-2008	Response after Non-Final Action		
07-23-2008	Mail Non-Final Rejection		
07-21-2008	Non-Final Rejection		
06-05-2008	Information Disclosure Statement considered		
06-05-2008	Information Disclosure Statement considered		
06-18-2008	Information Disclosure Statement considered		
06-18-2008	Information Disclosure Statement (IDS) Filed		

06-05-2008	Reference capture on IDS		
06-05-2008	Information Disclosure Statement (IDS) Filed		
06-30-2008	Date Forwarded to Examiner		
06-30-2008	Date Forwarded to Examiner		
06-05-2008	Request for Continued Examination (RCE)		
06-30-2008	DISPOSAL FOR A RCE/CPA/129 (express abandonment if CPA)		
06-18-2008	Information Disclosure Statement (IDS) Filed		
06-05-2008	Information Disclosure Statement (IDS) Filed		
06-05-2008	Information Disclosure Statement (IDS) Filed		
06-05-2008	Workflow - Request for RCE - Begin		
05-30-2008	Mail Final Rejection (PTOL - 326)	20	
05-28-2008	Final Rejection		
02-02-2008	Date Forwarded to Examiner		
01-10-2008	Response after Non-Final Action		
10-31-2007	Mail Non-Final Rejection	11	
10-26-2007	Non-Final Rejection		
07-02-2007	Oath or Declaration Filed (Including Supplemental)		
07-02-2007	Rule 47 / 48 Correction of Inventorship Papers Filed		
06-23-2007	Date Forwarded to Examiner		
06-20-2007	Response after Non-Final Action		
05-30-2007	Examiner Interview Summary Record (PTOL - 413)		
04-10-2007	Mail Non-Final Rejection		
04-02-2007	Non-Final Rejection		
12-26-2006	Date Forwarded to Examiner		
12-13-2006	Response after Non-Final Action		
10-16-2006	Mail Non-Final Rejection	11	
10-13-2006	Non-Final Rejection		
08-02-2006	Correspondence Address Change		
06-09-2006	Date Forwarded to Examiner		
06-05-2006	Response after Non-Final Action		
04-06-2006	Mail Non-Final Rejection	375	
04-03-2006	Non-Final Rejection		
11-26-2004	Information Disclosure Statement considered		
12-30-2005	Correspondence Address Change		
12-09-2005	Mail-Record Petition Decision of Granted to Make Special		
04-25-2005	Petition Entered		
12-08-2005	Correspondence Address Change		

11-26-2004	Reference capture on IDS		
11-26-2004	Information Disclosure Statement (IDS) Filed		
11-26-2004	Information Disclosure Statement (IDS) Filed		
07-15-2004	IFW TSS Processing by Tech Center Complete		
07-15-2004	Case Docketed to Examiner in GAU		
01-27-2004	Preliminary Amendment		
06-16-2004	Application Return from OIPE		
06-16-2004	Application Return TO OIPE		
06-16-2004	Application Return from OIPE		
06-17-2004	Application Is Now Complete		
06-16-2004	Application Return TO OIPE		
06-15-2004	Application Return from OIPE		
06-16-2004	Application Is Now Complete		
06-15-2004	Application Return TO OIPE		
06-15-2004	Application Dispatched from OIPE		
06-16-2004	Application Is Now Complete		
03-10-2004	Cleared by OIPE CSR		
02-04-2004	IFW Scan & PACR Auto Security Review		
01-27-2004	Initial Exam Team nn		

Electronic Patent Application Fee Transmittal	
Application Number:	10765487
Filing Date:	27-Jan-2004
Title of Invention:	COLLISION MONITORING SYSTEM
First Named Inventor/Applicant Name:	Mario Boisvert
Filer:	Stephen J. Schultz
Attorney Docket Number:	14-733C2D1
Filed as Large Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Application for patent term adjustment	1455	1	200	200
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**200**

Electronic Acknowledgement Receipt	
EFS ID:	6125667
Application Number:	10765487
International Application Number:	
Confirmation Number:	9537
Title of Invention:	COLLISION MONITORING SYSTEM
First Named Inventor/Applicant Name:	Mario Boisvert
Customer Number:	28060
Filer:	Stephen J. Schultz
Filer Authorized By:	
Attorney Docket Number:	14-733C2D1
Receipt Date:	23-SEP-2009
Filing Date:	27-JAN-2004
Time Stamp:	10:06:05
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$200
RAM confirmation Number	6826
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Patent Term Adjustment Petition	AppforPTA.pdf	17443 de33b0e1e9e3bb169ab06da4360a7e16d00c232f	no	1
Warnings:					
Information:					
2	Patent Term Adjustment Petition	RenewedStatementFinal.pdf	134875 133362c6f77aad938ec15d968add1ad0d6fafc66	no	9
Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	30274 a51fb36da03adf04bf69ca65eaf488a5618b0abc	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	182592		

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.

<u>New Applications Under 35 U.S.C. 111</u>
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.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
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.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
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

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

Paper No.

TAROLLI, SUNDHELM, COVELL & TUMMINO, LLP
1300 EAST NINTH STREET
SUITE 1700
CLEVELAND OH 44114

MAILED

APR 20 2010

OFFICE OF PETITIONS

In re Patent No. 7,579,802	:	DECISION ON REQUEST
Boisvert et al.	:	FOR
Issue Date: August 25, 2009	:	RECONSIDERATION OF
Application No. 10/765,487	:	PATENT TERM ADJUSTMENT
Filed: January 27, 2004	:	and
Atty Docket No.	:	NOTICE OF INTENT TO ISSUE
14-733C2D1	:	CERTIFICATE OF CORRECTION

This is a decision on the petition filed on September 23, 2009, which is being treated as a petition under 37 CFR 1.705(d) requesting that the patent term adjustment indicated on the above-identified patent be corrected to indicate that the term of the above-identified patent is extended or adjusted by nine hundred thirty-six (936) days.

The petition to correct the patent term adjustment indicated on the above-identified patent to indicate that the term of the above-identified patent is extended or adjusted by nine hundred thirty-five (935) days is **GRANTED to the extent indicated herein.**

As the period from the filing date of the request for continued examination (RCE) to the issue date of the patent is not included in the "B" delay period, the over three year period begins on January 28, 2007, and ends on June 4, 2008, the day before the RCE was filed, and is 494 (not 495) days. See 35 U.S.C. 154(b)(1)(B)(i). As such, the patent term adjustment is 935, not 936 days.

The Office will *sua sponte* issue a certificate of correction. Pursuant to 37 CFR 1.322, the Office will not issue a certificate of correction without first providing assignee or patentee an opportunity to be heard. Accordingly, patentees are given **one (1) month or thirty (30) days**, whichever is longer, from the mail date of this decision to respond. No extensions of time will be granted under § 1.136.

The Office acknowledges submission of the $200.00 fee set forth in 37 CFR 1.18(e). No additional fees are required.

The application is being forwarded to the Certificates of Correction Branch for issuance of a certificate of correction. The Office will issue a certificate of correction indicating that the term of the above-identified patent is extended or adjusted by **nine hundred thirty-five (935)** days.

Telephone inquiries specific to this matter should be directed to the undersigned at (571) 272-3231.

D Wood

Douglas I. Wood
Senior Petitions Attorney
Office of Petitions

Enclosure: Copy of DRAFT Certificate of Correction

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT : 7,579,802 B2

DATED : **August 25, 2009** **DRAFT**

INVENTOR(S) : Boisvert et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the cover page,

[*] Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 USC 154(b) by 550 days.

Delete the phrase "by 550 days" and insert – by 935 days--

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 7,579,802 B2
APPLICATION NO. : 10/765487
DATED : August 25, 2009
INVENTOR(S) : Boisvert et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

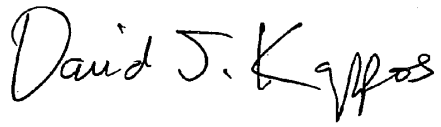
On the Title Page:

The first or sole Notice should read --

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 935 days.

Signed and Sealed this

Thirtieth Day of November, 2010



David J. Kappos
Director of the United States Patent and Trademark Office

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF MICHIGAN

UUSI, LLC a Michigan domestic limited liability company, d/b/a Nartron

Plaintiff(s),

v.

Robert Bosch LLC, a Michigan coporation and Brose North America, Inc., a Michigan corporation

Defendant(s).
_____/

Case No.

Judge

Magistrate Judge

REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court, Eastern District of Michigan, on the following ☑ Patents or ☐ Trademarks

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	6064165	05/16/2000	UUSI, LLC
2	6078117	06/20/2000	UUSI, LLC
3	7548037	06/16/2009	UUSI, LLC
4	7579802	08/25/2009	UUSI, LLC
5	8217612	07/10/2012	UUSI, LLC
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To list additional patent/trademark numbers, please attach another page with the number, date and holder.

Date: February 4, 2013

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UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF MICHIGAN

UUSI, LLC, a Michigan domestic limited liability company, d/b/a Nartron

Plaintiff(s),

Case No.

v.

Judge

Webasto Roof Systems, Inc., a Delaware corporation

Magistrate Judge

Defendant(s).
_____/

REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK

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To list additional patent/trademark numbers, please attach another page with the number, date and holder.

Date: April 15, 2013

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