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Ventilation Vehicle Windows on Automatically Independently Mitigate using Overheated Interior Microcontroller & Automatic Ventilation

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Abstract: The module is implemented utilizing a microcontroller as a central logical unit and a series of sensors which provide sufficient data to ascertain functional, but additionally efficient, reliable and safe ventilation. The ventilation process is performed by opening conveyance windows scarcely, which enables air to circulate. Microcontroller controls the position of the windows autonomously and independently of the driver's presence, following predefined algorithm that utilizes sensors data obtained from the vehicle's circumventions. Besides temperature, the most paramount factors to ascertain quality implementation of ventilation are detected forms of kineticism around the conveyance, the presence of precipitation and other. In order to mitigate overheated interior of a conveyance parked in the sultry summer sun and thereby to make the entering into the conveyance more comfortable, micro-controller managed module for automatic ventilation of conveyance interior is made.

Keywords: Ventilation, Vehicle Windows, Automatically, Independently, Mitigate, Overheated Interior, Micro-controller, Automatic Ventilation.

I. INTRODUCTION

This paper shows the components, their purport and capabilities, advantages and disadvantages, as well as potential implementations and upgrades. The test results give insight into utilization options of this module and its usefulness. This project uses regulated 5V, 500mA power supply. 7805 three terminal voltage regulator is utilized for voltage regulation. Bridge type full wave rectifier is utilized to rectify the ac output of secondary of 230/12V step down transformer. The fundamental conception of this project is to avert or at least mitigate overheating of the conveyance interior in order to facilitate entering into the conveyance. The quandary can be solved by leaving the conveyance windows partially opened so air can circulate, which reduces the heating of the conveyance interior. However, as the ventilation process takes place in a parked conveyance, without human presence, and the conveyance is exposed to external influences, such as precipitation or potential burglary, it is unreliable and unsafe. Consequently, it is indispensable to automate the ventilation process. If it exceeds predefined level of "comfortable temperature", microcontroller automatically lowers the There are withal other sensors whose implementation gives supplemental quality, but these are the most consequential of them. Together with temperature sensor, they meet the minimum requisites to perform automatic function of ventilation, without imperilling the conveyance. power windows to enable air circulation which alleviates aforementioned "greenhouse effect". Results of testing the module in authentic conditions are presented and analyzed.

II. RELATED WORK

In order to meet all the criteria of quality ventilation, the module has to amass enough data from the conveyance's immediate environment and, predicated on that data, it has to decide whether it is indispensable to lower the windows and thus start the ventilation process. Accordingly, the module can be divided to three logical units: peripheral unit - amasses data, control unit manages module operations, and switching unit – adjusts signals. Fig1 shows logic diagram of module. Since the peripheral unit is withal the input unit, it is presented first, for better insight into module operations and modes. By having to amass many variants of data, the peripheral unit is intricate enough as it is. The indispensability of placing different sensors in separate locations, in order to achieve data amassment, makes it even more intricate.

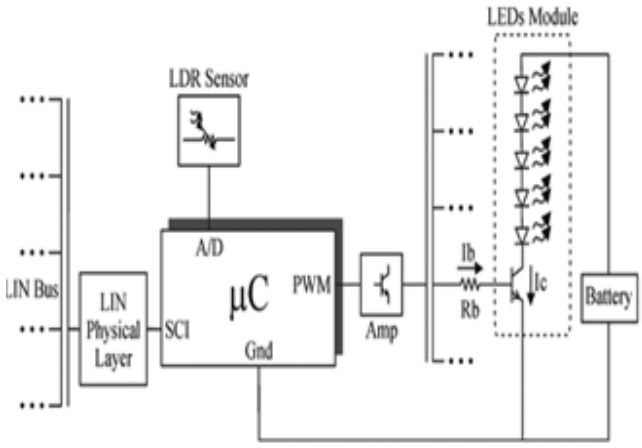

Fig1. Block Diagram.

Precipitation sensor [9] is very consequential because it makes the automatic ventilation reliable. If precipitation occurs during the ventilation process, sensor detects the incipient circumstances and sends a signal to the control unit which orders to close the windows immediately. The sensor is situated on the windshield inside the conveyance, above the rear-view mirror in order to detect the falling drops of dihydrogen monoxide on the glass.LED (Light Emitting Diode) or IR (Infra-Red) diode is utilized as a transmitter that emits light at a certain angle onto the windshield. The light of the expected intensity reflects to the photodiode which is utilized as a receiver. If droplets appear onto the windshield, the light reflects differently which causes a transmutation in the receiving electronic circuit connected to the microcontroller.

The fundamental function of automatic ventilation inside the conveyance is achieved utilizing temperature sensor. Ventilation inside the conveyance is achieved by method of scarcely lowering windows for a few centimeters, which makes it functional, discreet enough, but relatively reliable and safe. By integrating the precipitation and kineticism sensors, the ventilation process becomes reliable and safe, but it opens up the possibility of even better ventilation. That is, now when there is a control system and aegis from external impact, the windows can be further lowered to increment air circulation, and more air circulation betokens more quality ventilation. Method of operation can facilely be described by the flowchart. At the commencement, initialization of microcontroller and auxiliary variables is performed. After completion of the initialization, program commences checking parameters and thus sets the state of the output. First, it determines whether the conveyance is parked or in utilization. This is resolute by checking whether the key is in the ignition lock, which is not a one hundred percent corroboration, but it is considered copacetic. Depending on the result, manual or automatic mode is switched on. In manual mode, while a person utilizes the conveyance, microcontroller only transmits input state to output and thereby has only a minor role in the bulwark of electric motors from overload.

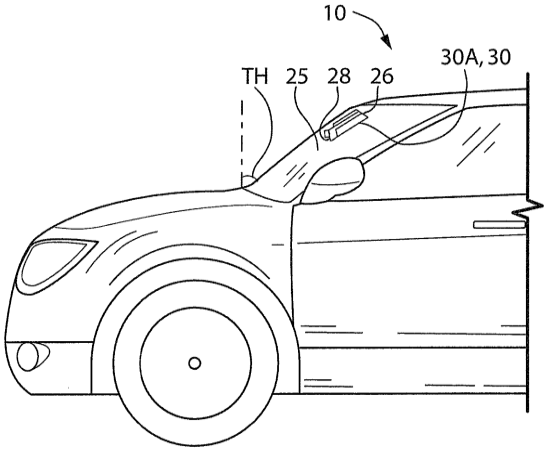

Fig2. Precipitation Sensor.

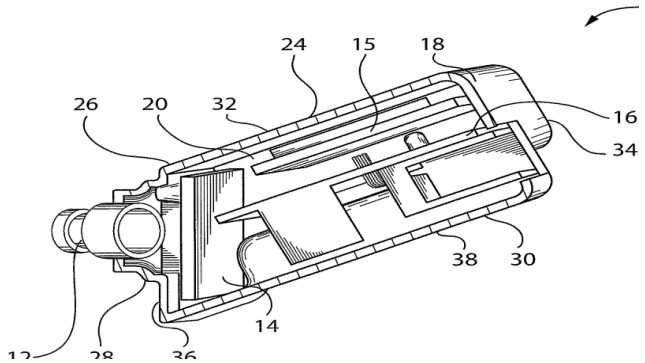

Fig3. Liquid Crystal Display.

III. IMPLEMENTATION

The car has two power windows which can be managed. That is why this module prototype manages only two sets of input and output signals for connecting two independent windows. Figure 4 shows the electric scheme of a module prototype. Control unit, switching unit, other units and some of the peripheral units (temperature and light sensors) can be perceived. Since the rest of the sensors cannot be integrated into the module's main electronic circuit, connectors for their signals are located inside the module. However, what is not mentioned so far are an abundance of buttons, switches and LEDs that can be optically discerned alongside input and output connectors. With buttons, switches and LEDs, this prototype module becomes the simulator as well – inside the module are simulators of all input and output signals that make this prototype even more convenient for the further development and testing. Albeit this is just a module prototype, it satiates all requisites for working in authentic conditions and can be implemented in any conveyance.

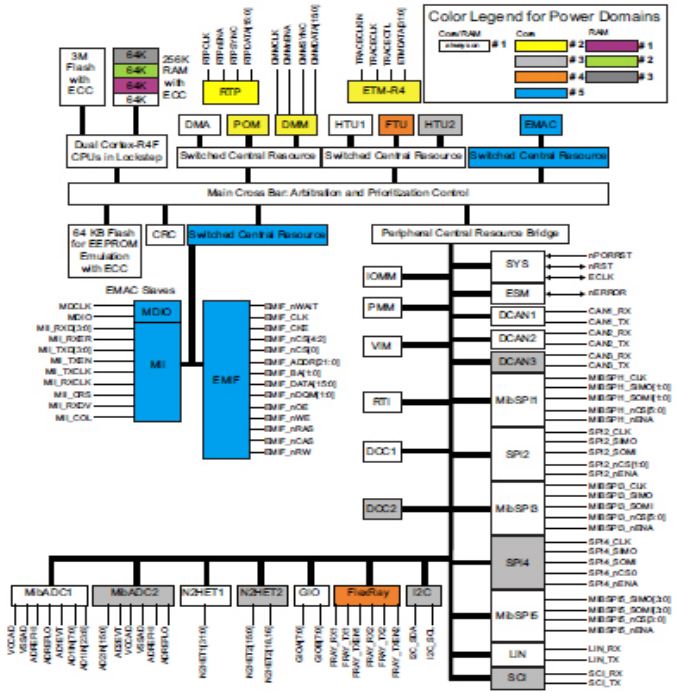

Fig4. Proposed System implementation.

That is why this module prototype manages only two sets of input and output signals for connecting two independent windows. Figure 4 shows the electric scheme of a module prototype. Control unit, switching unit, other units and some of the peripheral units (temperature and light sensors) can be perceived. Since the rest of the sensors cannot be integrated into the module's main electronic circuit, connectors for their signals are located inside the module. However, what is not mentioned so far are an abundance of buttons, switches and LEDs that can be optically discerned alongside input and output connectors. Integration of certain electronic components for fends module against different marginally nuisances that subsist or could appear in authentic circumstances. Electronic circuit was developed parallel with the program code to achieve even better congruence between individual components and operations. Besides all the attention that was given in the hardware development, an abundance of attention was committed to the software segments that amend quality work of module and for fend system against contingent situations. Aesthetic appearance of the Assembly was withal taken into consideration.

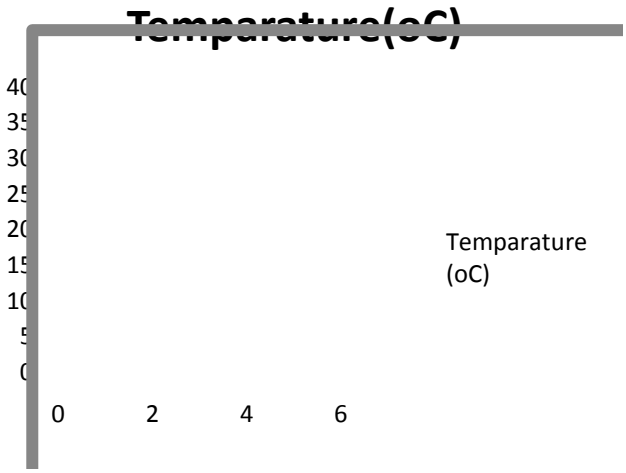

Fig5. Temperature Calculation.

Except module proved to be safe, reliable and efficient, copacetic results of the ventilation function were achieved. Without the module and with closed windows (or scarcely lowered windows), temperature inside of the conveyance parked in the sun on light spring temperatures of 25 °C can reach over 50 °C. In summer, inside temperature elevates even more drastically. While lowering windows for at least 10 to 15 centimeters to enable quality ventilation process, inside temperature becomes much bearable. Considering the fact that this ventilation process is a passive method of cooling overheated interior, it accomplishes very good results.

IV. CONCLUSION

It can be summarized that this module, albeit only a prototype, is plenarily functional contrivance that performs its function safely, reliably and efficiently. Possibility of application is not constrained only to the conveyance ventilation. The module is profoundly expandable in both ways: it is upgradeable for incipient tasks as well as compatible for integration into some subsisting systems. In this paper, both of the prototypes have 1sec replication time. But this replication time can be reconfigured through programming. The high precision high precision availability of components, high convergence speed, and independence of PV characteristics make the schemes worthwhile. To implement either of the prototypes, there is no desideratum of statistical data over a long period. For the single axis tracker, even for variation of minute angle no dead band is found. Moreover, excellent dynamic replication and least steady state error are responsible for this stable organism. The designing simplicity, more facile construction makes the system an imperative one. The increment in energy output is found to be around 21% comparing with the fine-tuned surface at latitude tilt angle.

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