

Design & Fabrication of Auto Safe Alert System for School Vans

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Abstract— Millions of children need to commute between home to school every day. Safer transportation of school children has been a critical issue as it is often observed that, many accidents occurs due to lack of high standard facilities in school vans. In order to reduce the accidents to the maximum extent as possible and concerning about the safety of the children is the sole purpose of this project. Auto safe alert system for school vans also improves the standard of the school vans as it ensures maximum safety.

Key words: School Vans, Safe Alert System

I. INTRODUCTION

School vans transports over millions of children from their home to school and from school to home daily. The safety of the school children has become an issue in recent years. Due to the lack of well-equipped facilities in the school van, the safety of the children has become a doubt and alot of parents concerns about the safety of the children. The accidents due to the lack of safety in the school vans has been increasing day by day and the number of death due to this kind of accidents has been increasing drastically every year. Our government tries to reduce this of kind of accidents and introduces various schemes and proposals every year to monitor the school vans and to assure safety in the school vans to avoid the accidents that happens due to the poor quality of the safety systems in the school vans. This project proposes the maximum safety to the school children and avoid the accidents that occurs due to the poor quality of safety systems in the school vans. This project also improves the quality of the school buses to the level than the usual. The main concept of this project is to make sure that the child has no chance to fall out of the van at any cost. In this project, the door of the van must be closed in order to make the vehicle in motion. If the door of the van is not closed then the driver cannot operate the accelerator pedal as it will be jammed until the door is closed. This operation itself will assure maximum safety to the child as it has no chance to fall out of the van. If the child comes to the step while the van is in motion, then there will be an indication to the driver with a caution alarm that create awareness to the child and the driver so that the child could be rescued from the step immediately. Right after the indication of the caution alarm the fuel flow to the engine is restricted and the van comes to its idle position. Once the child moves out of the step to the seat the fuel begins to flow to the engine. This system functions only when the van is in motion. Fuel flow to the engine is resricted with the help of solenoid values. This system also intimates to the rear vehicles about its process of bringing the vehicle to rest position with a horn and the illumination of tail light.

II. LITERATURE REVIEW

E.Coelingh et al; studied more and more vehicles are being equipped with Automatic Emergency Braking (AEB) systems. These systems intend to help the driver avoid or mitigate accidents by automatically applying the brakes prior

to an accident. Initially only rear-end collision were addressed but over time more accident types are incorporated and brakes are applied earlier and stronger, in order to increase the velocity reduction before the accident occurs. This paper describes one of the latest AEB systems called Collision Warning with Full Auto Brake and Pedestrian Detection (CWAB-PD). It helps the driver with avoiding both rear-end and pedestrian accidents by providing a warning and, if necessary, automatic braking using full braking power. A limited set of accident scenarios is selected to illustrate the theoretical and practical performance of this system. It is shown that the CWAB-PD system can avoid accidents up to 35 km/h and can mitigate accidents achieving an impact speed reduction of 35 km/h. To the best of the authors knowledge CWAB-PD is the only system on the market that automatically can avoid accidents with pedestrians.

T. Gandhi et al; studied paper describes the recent research on the enhancement of pedestrian safety to help develop a better understanding of the nature, issues, approaches, and challenges surrounding the problem. It presents a comprehensive review of research efforts underway dealing with pedestrian safety and collision avoidance. The importance of pedestrian protection is emphasized in a global context, discussing the research programs and efforts in various countries. Pedestrian safety measures, including infrastructure enhancements and passive safety features in vehicles, are described, followed by a systematic description of active safety systems based on pedestrian detection using sensors in vehicle and infrastructure. The pedestrian detection approaches are classified according to various criteria such as the type and configuration of sensors, as well as the video cues and classifiers used in detection algorithms. It is noted that collision avoidance not only requires detection of pedestrians but also requires collision prediction using pedestrian dynamics and behavior analysis. Hence, this paper includes research dealing with probabilistic modeling of pedestrian behavior for predicting collisions between pedestrians and vehicles.

B. Tang et al; prepared the Intelligent Transportation Systems Conference is the annual flagship conference of the IEEE Intelligent Transportation Systems Society. This conference welcomes articles in the field of Intelligent Transportation Systems, dealing with new developments in theory, analytical and numerical simulation and modeling, experimentation, demonstration, advanced deployment and case studies, results of laboratory or field operational tests. ITSC 2017 especially invites and encourages prospective authors to share their work, findings, perspectives and developments, to mark 20 years of IEEE Intelligent Transportation Systems Conference.

Y. Chen et al; prepared the Institute for Superconducting and Electronic Materials (ISEM) has built an interdisciplinary research capability in advanced materials and technology for energy applications including batteries,

super capacitors for energy conversion and storage, thermoelectric, magneto caloric, thermionic materials and fuel cells for waste energy recovery and energy generation, superconductors for energy transmission, storage and electrical devices. Widespread adoption of electric vehicles (EVs) has immense potential for social, economic and environmental benefits. However, the major challenges that are impeding the widespread uptake of EV's, including short driving range, difficulties to recharge, safety and high cost, must be addressed. Significant advances already made by our group include high capacity anodes using carbon coated nano scale Si and nano wire SnO₂, composite oxide/carbon nano tubes, and high capacity and high power cathodes using nano composites. The work on alloyed LiFePO₄/C nano composite showed a fast charging rate within several minutes with long cycling stability over 1000 cycles. These advances represent important milestones in the development of high power and high energy density batteries and super capacitors for electric vehicles. In superconductivity area, we have made a breakthrough in the fabrication of wires from the superconductor magnesium diboride by using nano-scale doping. They have achieved a world record high critical current carrying capacity in superconducting MgB₂ wires and a record high upper critical field for the nano-scale SiC doped MgB₂. This is one of the most important advances since the discovery of superconductivity in this material and has an important impact on the development of technological superconductors. This emerging superconductor would have practical applications, such as wind turbine generators, magnetic resonance imaging (MRI), fault current limiters, power cables, motors, energy storages, generators, magnetic xxv 2013 IEEE 8th Conference on Industrial Electronics and Applications (ICIEA) separators and transformers, and will lead to enormous energy and cost savings.

M. Heesen et al; studied and prepare the main goal of the large-scale research facility FASCar[®] are scientific studies and analyses in the field of driver assistance and vehicle automation. This includes also studies of human behavior, acceptance studies, test of new assistance systems and automation, as well as user friendliness. FASCar[®] makes it possible to test and analyze innovative systems and developed functions in a simulated or even real traffic environment.

III. BACKGROUND OF THE PROJECT

A. Motivation of the Project

The motivation for doing this project was primarily an interest in undertaking a challenging project in an interesting area of automobiles. New innovations and creative technologies in automobiles are being implemented every day and it is still in its developing stage. Increase in death rate of the school children is being increased every year. Avoiding the unnecessary death of school children at any cost is our prime motivation for the project. A highly standardized safety system must be implemented in every school van. In order to achieve this safety we developed a system called AUTO SAFE ALERT SYSTEM FOR SCHOOL VANS. This project carried out by us will make an impressive mark in the field of automobile.

B. Problem Statement

In every school van prime safety for every children is the door of the school bus and the speed governing of the school bus. Engine the piston is the major part. The speed governor of the school vans can have a certain role in the safety reduction of the engine and is a highly desirable goal if it can be achieved without increased in cost and decrease in quality and reliability. It is possible to achieve this kind of safety and produce high standard school vans with cost efficiency.

IV. DESIGN

A. Principles of Operation

In this project we are using ultrasonic sensor for detecting the objects or vehicles in front of our vehicle. It also measures the distance of the vehicle in front of ours. It consists of ultrasonic transmitter and receiver. The transmitter always transmitting the waves, the receiver receives the reflected waves and converts it in to digital pulse. The ultrasonic sensor sends the output to the controller. The pulse time will vary depends on the closeness between the sensor and the object. Using this pulse timing the controller measures the distance. When the distance becomes low, the controller will switch on the relay for applying braking. Here the pneumatic cylinder braking mechanism is used for applying brake in the wheel. Pneumatic cylinders (sometimes known as air cylinders) are mechanical devices which produce force, often in combination with movement, and are powered by compressed gas (typically air). To perform their function, pneumatic cylinders impart a force by converting the potential energy of compressed gas into kinetic energy. This is achieved by the compressed gas being able to expand, without external energy input, which itself occurs due to the pressure gradient established by the compressed gas being at a greater pressure than the atmospheric pressure. This air expansion forces a piston to move in the desired direction. The proximity sensor for vehicle to high speed sense controller will switch on the relay for applying braking and reverse gear detection. There are three limit switches placed under the steps if any one stands on the steps the limit switch will be pressed hence corresponding signals will be passed to the control unit and it switches on the alarm also the pneumatic cylinder is actuated for apply the brake.

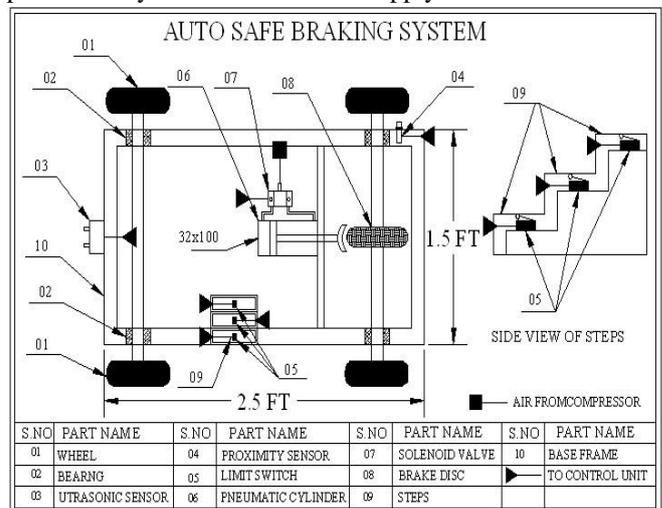


Fig. 1: Auto Safe Braking System

V. CONCLUSION & FUTURE SCOPE

This project is made with pre planning, that it provides flexibility in operation. This innovation has been made more desirable and economical. This project “Auto Safe Alert System for School Vans” is designed with the hope that it will be a revolutionary in safe guarding the lives of school children. It also enhances the standards of safety driving. Hope it minimizes the accidents to the greater extents as possible. This project helped us in knowing the periodic steps in completing a project work. This work deals with the replacement of conventional safety systems with a high standard well equipped auto safe alert system.

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