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JOINTLESS STEERING MECHANISM WITH ADAPTIVE HEADLIGHTS

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ABSTRACT

Special safety features have been built into cars for years, some for the safety of car's occupants only, and some for the safety of others. One of the choices available is Design and fabrication of Joint less steering controlled wheel and head light system. Car safety is the avoidance of automobile accidents or the minimization of harmful effects of accidents, in particular as pertaining to human life and health. Still, more specially, this device relates to a headlight arrangement operable connected to the steering and front wheel assembly of and automobile operable to maintain headlight members and the front wheels pointed in the same direction at all times. The purpose of this design is to enhance the safety and improved performance of the fabricated system. Also to achieve the maximum possible efficiency of design.

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I. INTRODUCTION

It has been a long way from the first vehicles being equipped with a steering wheel to today's state of the art steering systems. While for a long period of time hydraulic power steering (HPS) systems were considered the optimum solution for all vehicles, the progress in steering system development throughout the last decades has led to a paradigm shift towards electric power steering (EPS) systems. By today, EPS systems have a wide market penetration starting from A-segment up to the heavy passenger vehicles with high wheel loads such as SUVs. Higher allowable electric power demand facilitated by the upcoming 48 V voltage level will increase the deployment rate of EPS systems even further. EPS systems facilitate an individual design of the steering torque feedback within large boundaries but current demands go beyond this degree of freedom. In order to holistically design steering feedback, it is also desirable to realize a variable steering angle transmission ratio. In fact, the first systems that were able to independently vary torque and angle transmission ratios were superimposed steering systems incorporating an additional gear set to enable the variable angle transmission ratio. It took another decade and some changes in legislation until the first real steer-by-wire system was introduced in a series-production vehicle Car safety is the avoidance of automobile accidents or the minimization of harmful effects of accidents, in particular as pertaining to human life and health. Special safety features have been built into cars for years, some for the safety of car's occupants only, and some of the safety of others. One of the choices available is Design and fabrication of steering controlled head light system. This device relates to a headlight arrangement for vehicles, and, more particularly, to a head light arrangement operably connected to the steering mechanism of the vehicle for illuminating the proposed path of travel including support brackets operable to support head light members thereon connectable to a frame portion of the vehicle, linkage means interconnecting the brackets for conjoint movement thereof, and means interconnecting one of the brackets to the connector rod of the vehicle whereupon the brackets and headlight members are moved in relation to the direction of vehicle travel. Still, more specifically, this device relates to a headlight arrangement operably connected to the steering and front wheel assembly of an automobile operable to maintain headlight members and front wheels pointed in the same direction at all times.

II. PROBLEM STATEMENT

Sometimes the main cause of accident is the failure of Steering mechanism and headlight system. The conventional

steering profile has the assembly of different shafts, knuckle joint and gearing or Tie rod arrangement. But using the conventional methods we were unable to get accurate angle while turning the wheels are dependent on each other also, In the Indian context in particular, accidents are in a particular rise at places like steep turnings and curves especially in four wheelers and heavy vehicles like lorry's and busses during the night time. In a way to have a financially viable solution to reduce these accidents, an attempt has been made to design and fabricate a mechanism to increase the visibility of the path for vehicle driver during night driving.

III. OBJECTIVES

- To provide smooth and safety ride in curved roads especially in mountains.
- To provide mind free ride for the motorist.
- To provide the nation with an accident free roads.
- To manufacture a Low Cost Automation Project.
- Avoid accidents by using rotation of headlight and wheel at night.

IV. SCOPE OF PROJECT

Adaptive Steering and headlights are an active safety feature designed to make driving at night or in low-light conditions safer by increasing visibility around curves and over hills. Also these system introduce the new concept of linkages free assembly And the isolated wheel can be further link with mechatronics to control without any human interfere. Also the connection of headlight with wheels can give more benefits. They are - driving around a bend in the road, standard headlights continue to shine straight ahead, illuminating the side of the road and leaving the road ahead of you in the dark. Adaptive headlights, on the other hand, turn their beams according to your steering input so that the vehicle's actual path is lit up. Similarly, when a vehicle with standard headlights crests a hill, the headlight beams temporarily point upwards towards the sky. . This makes it difficult for driver to see the road ahead and for oncoming motorists to see the driver approaching. In contrast, adaptive headlights use a self-levelling system that points the light beam up or down, according to the position of the vehicle.

V. LITERATURE REVIEW

Harshal Mohite, Bhushan Mahangade, Maruti Gholase, Sharada Kattgihalimath and Sandip Kumbhar
In this paper, we found the idea about intelligent and adaptive headlight with EPS system. The aim is to improve the visibility for the drivers thereby achieving avoid the accident in the night vision more efficiently. This paper is really useful to carry researcher work point of view.

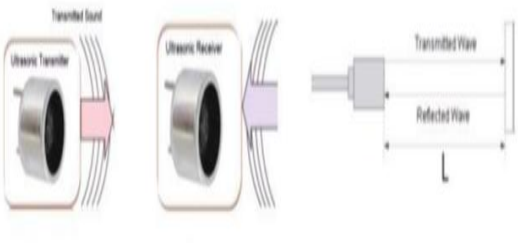
Shreyas S1, Kirthanaa Raghuraman1, Padmavathy AP1, S Arun Prasad2, G.Devaradjane3
In this paper we studied that, in future, the adaptive headlight system can be made more efficient by controlling the spread of the light beam from the head lamps using an 'automatic range extender' depending on the vehicle speed. The beam can be made to diverge when the vehicle is travelling at high speeds and can be made to converge when the speed is low. Also automatic low beamhigh beam adjuster can be incorporated to reduce accidents due to dazzling of lights.

VI. COMPONENTS DETAILS

Ultrasonic Sensor
Ultrasonic ranging and detecting devices use high frequency sound waves called ultrasonic waves to detect presence of an object and its range. Normal frequency range of human ear is roughly 20Hz to 20,000Hz. Ultrasonic sound waves are sound waves that are above the range of human ear, and thus have frequency above 20,000Hz. An ultrasonic sensor necessarily consists of a transducer for conversion of one form of energy to another, a housing enclosing the ultrasonic transducer and an electrical connection.
These sensors are of two types

• Ultrasonic Transmitter – Before transmitting the ultrasonic wave, transducer is used to generate the ultrasonic waves. The transducer is given a signal to intermittently produce ultrasonic waves. After that the ultrasonic transmitter sends the waves at a predetermined distance frontward. The maximum range for which obstacle can be detected depends on the range of ultrasonic sensors used shown in figure.

• Ultrasonic Receiver – If the ultrasonic wave detects the obstacle, it will produce a reflected wave. An ultrasonic receiver is used for receiving the ultrasonic waves reflected from the obstacle. The received ultrasonic wave is converted into a reception signal with the help of a transducer. The signal is amplified by an amplifier (operational amplifier). The amplified signal is compared with the reference signal, to detect components in amplified signal due to obstacles on the road shown in figure.



(a)Transmitter (b) Receiver (c) Ultrasonic sensor
Fig.1. Ultra sonic sensor

STEPPER MOTOR
A stepper motor is an electromechanical device which converts electrical pulses into discrete mechanical movements. The shaft or spindle of a stepper motor rotates in discrete step increments when electrical command pulses are applied to it in the proper sequence. The motors rotation has several direct relationships to these applied input pulses. The sequence of the applied pulses is directly related to the direction of motor shafts rotation. The speed of the motor shafts rotation is directly related to the frequency of the input pulses and the length of rotation is directly related to the number of input pulses applied.

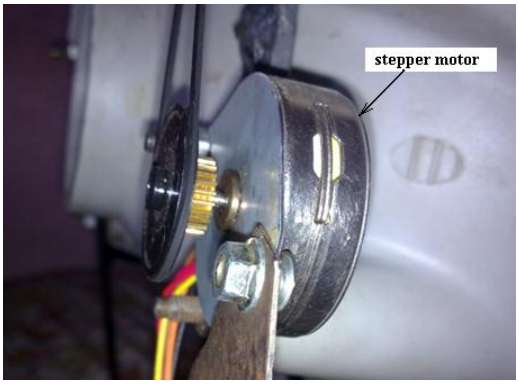
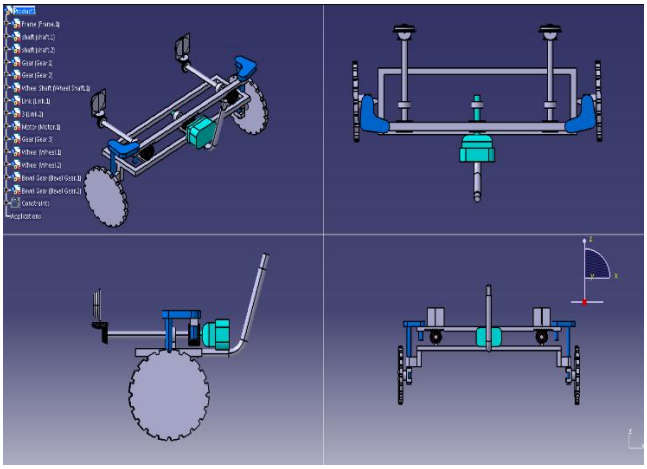


Fig.2.stepper motor

Electromagnet is given power, which makes the gear's teeth magnetically attracted to the electromagnet's teeth. When the gear's teeth are thus aligned to the first electromagnet, they are slightly offset from the next electromagnet. So when the next electromagnet is turned on and the first is turned off, the gear rotates slightly to align with the next one, and from there the process is repeated. Each of those slight rotations is called a "step", with an integer number of steps making a full rotation. In that way, the motor can be turned by a precise angle.

VII.DESIGN



VIII. CONCLUSION

From the intelligent headlight project we can avoid the probable accidents that might happen in our country or in world. We will turn light when vehicle about to turn this is helpful in many situations. As the material we are using to develop this project is very low cost so this is also cost effective project. This can be easily implemented in all vehicles in the India.

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