

Modelling and Fabricating Automatic Head Light Alignment System with Dim and Bright Control

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Abstract: As for Indian road transport scenario is concerned, accidents are becoming a day to day cause an attempt has been made in this project to reduce such mishaps. In our project of “Automatic Head Light Alignment System with Dim and Bright Control” having the following operation occurs automatically in the vehicle. They are Automatic head light up/down alignment depends upon the vehicle moves in upward/downward direction, The head light in steady position for the vehicle in normal condition and The automatic dim and bright control system during driving. 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 for the safety of others. This is an era of automation where it is broadly defined as replacement of manual effort by mechanical power in all degrees of automation. The operation remains an essential part of the system although with changing demands on physical input as the degree of mechanization is increased.

Index Terms – Trailer, Locking Arrangement, Pneumatic cylinder, Compressed Air.

I. INTRODUCTION

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 for the safety of others. This is an era of automation where it is broadly defined as replacement of manual effort by mechanical power in all degrees of automation. The operation remains an essential part of the system although with changing demands on physical input as the degree of mechanization is increased. When driving vehicle, headlights are required to be turned on before sunset and turn off after sunrise, according to light intensity and any other time of poor light conditions, such as fog, snow or rain, which keeps driver from clearly seeing people or vehicles less than 150 meters away.

At night even with less traffic on the road, more than half of accidents occur, because headlight glare is a major issue that has grown in terms of public awareness over the past decade. High beam of headlight of an on-coming vehicle as blinding effect and decreases visibility during night driving is dangerously. The drivers of most vehicles use bright beam while driving at night. This causes a discomfort to the person traveling from the opposite direction. It causes sudden glare for a short period of time. This is caused due to the high intense headlight beam from the other vehicle coming towards him from the opposite direction. Glare causes a temporary blindness to a person resulting in road accidents during the night. By considering this fact to dim the headlight to avoid glares, the prototype of headlight system is developed. In another case, during high fog or moisture present in atmosphere, driver can't see the road and vehicle; due to this more an accident are occur, at that time bright light of our vehicle is turning on with high intensity. This point is also considered in the project work.

II.LITERATURE REVIEW

Drivers are facing a huge problem due to this high beam light which falls directly onto their eyes from coming vehicle during driving. There are many medical facts which support their problems of night driving. When the bright light from the headlight of a vehicle coming from the opposite direction falls on a person, it glares him for a certain amount of time. This causes disorientation to that driver. This will create discomfort to driver which results in closing of driver eyes for certain interval of time. This fraction of distraction is the prime cause of many road accidents. In the medical world, Due to the bright light falls onto the eyes of driver, it creates temporary blindness for the driver is known as Troxler effect. It is also known as the ‘fading effect’. A study shows that if our eyes are exposed to a very bright light source of around 10,000 lumens, we experience a glare. This glare is produced due to over exposure and cones inside our eye. Even after the source of glare is removed, an after-image remains in our eye that creates a blind spot. This phenomenon is called Troxler effect. There are many accidents caused due to Troxler effect. This is more than enough to cause a disaster on the road. This Troxler effect is across all ages. Any one exposed to sudden bright light experiences this Troxler effect.

Murlikrishnan, worked on Headlights of vehicles pose a great danger during night driving. The drivers of most vehicles use high, bright beam while driving at night. This causes a discomfort to the person travelling from the opposite direction. He experiences a sudden glare for a short period of time. This is caused due to the high intense headlight beam from the other vehicle coming towards him from the opposite direction. He was expected to dim the headlight to avoid this glare. This glare causes a temporary blindness to a person resulting in road accidents during the night. To avoid such incidents, we have fabricated a prototype of automatic headlight dimmer.

III. MATERIALS/COMPONENTS USED

3.1. SHAFT

A shaft is a rotating machine element which is used to transmit power from one place to another. The power is delivered to the shaft by some tangential force and the resultant torque (or twisting moment) set up within the shaft permits the power to be transferred to various machines linked up to the shaft. In order to transfer the power from one shaft to another, the various members such as pulleys, gears etc., are mounted on it. These members along with the forces exerted upon them causes the shaft to bending. In other words, we may say that a shaft is used for the transmission of torque and bending moment. The various members are mounted on the shaft by means of keys or spines.

3.2. RACK AND PINION GEARS

A 'rack and pinion' gears system looks quite unusual. However, it is still composed of two gears. The 'pinion' is the normal round gear and the 'rack' is straight or flat. The 'rack' has teeth cut in it and they mesh with the teeth of the pinion gear. Rack-and-pinion steering is quickly becoming the most common type of steering on cars. It is actually a pretty simple mechanism. A rack-and-pinion gear set is enclosed in a metal tube, with each end of the rack protruding from the tube. A rod, called a tie rod, connects to each end of the rack. The pinion gear is attached to the steering shaft. When you turn the steering wheel, the gear spins, moving the rack. The tie rod at each end of the rack connects to the steering arm on the spindle. The rack-and-pinion gear set does two things: It converts the rotational motion of the steering wheel into the linear motion needed to turn the wheels. It provides a gear reduction, making it easier to turn the wheels. On most cars, it takes three to four complete revolutions of the steering wheel to make the wheels turn from lock to lock.

3.3. FRAME

This is made of mild steel material. The whole parts are mounted on this frame structure with the suitable arrangement. Boring of bearing sizes and open bores done in one setting so as to align the bearings properly while assembling. Provisions are made to cover the bearings with grease.

3.4. BEARING WITH BEARING CAP

The bearings are pressed smoothly to fit into the shafts because if hammered the bearing may develop cracks. Bearing is made up of steel material and bearing cap is mild steel.

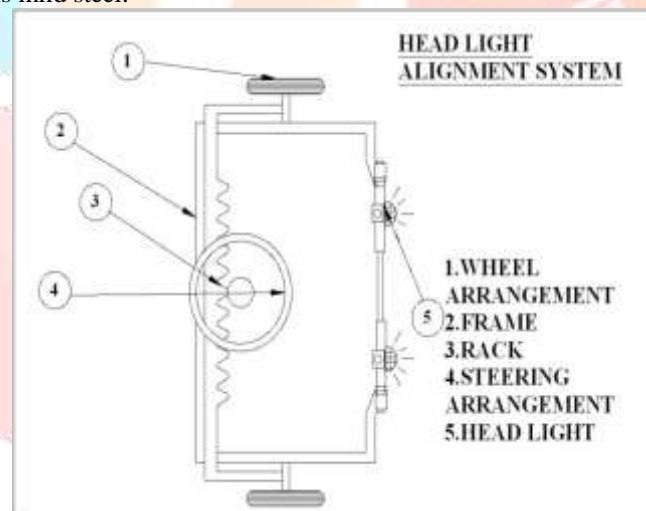


Fig.1.2D Model of an Automatic Headlight Adjustment

IV. WORKING PRINCIPLE

Automatic dipper provides better safety at night time and drivers can drive comfortably and reach their destination safely. There are two modes provided viz. automatic and manual mode. While driving in the cities there are light everywhere which can affect the working of the device at that time the mode can shift to manual mode to avoid flickering of the headlight. When both the vehicles were fitted with the "Automatic Dipper" then both the vehicles dip the headlight beam of each other efficiently.

4.1. AT NORMAL CONDITION

The rack and pinion steering is in straight line, so that the head light frame is in straight line. The head light frame is made up of mild steel pipe materials.

4.2. AT LEFT SIDE TURNING TIME

The rack and pinion steering turn the left direction, so that the head light frame moves in the same left side by using hinges mechanism. Head light is drawn supplies from the already charged 12 voltage lead-acid battery.

4.3. AT RIGHT SIDE TURNING TIME

The rack and pinion steering turn the right direction, so that the head light frame moves in the same right side by using hinges mechanism.



Fig.2. Fabricated Automatic Headlight Adjustment Model

V. CONCLUSION

The Automatic Head Lamp Alignment System for Automobiles system is working promptly and also it is working with all conditions satisfied. Nighttime vehicle detection is still an open area for research since, a cost friendly solution to this problem can only incorporate such system into low budget automotive. However, this attempt of accurate detection addresses issue of temporary blindness well and provides a reliable algorithm for headlight control. Further studies can be focused to improvising detection range, false positives per image. Making system more portable so that it can be mounted on two wheelers is also in interest of practical headlight beam control systems. Analysis of unique features of headlights and tail light so as to improve detection rate is scheduled for further study. The idea of detecting vehicles at night time is useful for various applications such as, traffic surveillance, smart headlight beam control, lane departure warning etc. We can able to understand the difficulties in maintaining the tolerances and also the quality. The application of sensor produces smooth operation. By using more techniques, they can be modified and developed according to the applications.

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