DESIGN & FABRICATION OF COMBINED PEDAL FOR BRAKE & ACCELERATOR SYSTEM

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ABSTRACT: Every human having two legs to operate three pedals when driving a four vehicles which are accelerator, clutch and brake where confusion may occurs at some uncomfortable situation. This project is to conclude that this new mechanism results in avoiding interference of braking during acceleration and vice versa. Moreover, it is advantageous over conventional pedals. This combined pedal mechanism thus provides a driving control which permits the quick and smooth transition from acceleration to braking, without needing to transfer the foot from one pedal to another. The rapid increase in number of vehicles on roads day by day, demands an exploration of such mechanism to get rid of driver’s effort and reduce road accidents.

Keywords: accelerator, brake, mechanism, conventional pedals, exploration

I. INTRODUCTION

Cars have been equipped with the same foot-pedal arrangement since the days of the afore. The clutch is to the left, the accelerator to the right and the brake in the middle. The right foot should be used for pressing the accelerator and the brake. This arrangement guarantees, that the throttle is released as the driver brakes. However, it also means that the foot almost always is placed at a distance from the brake, that is, on the accelerator, thus movement time adds to brake reaction time. The foot may be inaccurately placed on the brake resulting in bad braking performance and it may even miss the brake and hit the accelerator. If the accelerator is pressed instead of the brake in a car with automatic transmission it can cause an instance of so called unintended acceleration (Schmidt 1989). The driver persists in pressing what he believes is the brake though it is the accelerator.

However, different levels cost extra movement time. To overcome the drawbacks with the with the traditional pedals various combined accelerator-brake pedals have been constructed. All of these construction have been more or less impractical.

In order to eliminate such kind of problems, a combined pedal mechanism is designed to function as both brake and accelerator, which can be adopted by driver quickly and effortlessly. this new mechanism enables the driver to control acceleration and braking using one feet, which will lead to reduction in stopping distance, miss judgment and ultimately decrease in number of road accidents that may happen each day.

II. THE COMBINED ACCELERATOR-BRAKE PEDAL

The basic idea with the combined accelerator-brake pedal is to eliminate movement of the foot between the accelerator and the brake. Several benefits will follow: First, brake-reaction time is reduced. Studies on Winkelmann’s pedal showed a reduction of up to 0,2 seconds (Higginbotham & Frost 1972, Konz et. al. 1971, Poock et.al. 1973). Second, the foot is constantly on the brake in an optimal position, no risk for misapplication. Third, acceleration and braking involves different groups of muscles. Conventional pedals are manoeuvred with the same movement albeit with rather different forces. Fourth, the braking movement, to reach out with the leg parallels probably an inherited reflex.
The pedal is mounted in the same position as the conventional accelerator. The right foot is placed on the pedal an should stay there during the drive. A heel support prevents the foot from slipping off the pedal. When accelerating, the driver pushes with the forefoot in the usual manner and when braking the driver pushes with the whole foot. The throttle does not have to be released, that is, it is not necessary to lift the forefoot before braking, a sensor cuts off the throttle of the brake is affected. To avoid unintended braking a solenoid gives extra resistance at the start of the break movement. In case the driver mixes up pedal system s and moves the foot unnecessarily an entry brake pedal is mounted to the side of the combined pedal in the normal position of a conventional brake pedal.

In order to brake, the foot lever and support both moves in linear direction such that, there would be no acceleration of the vehicle. This is achieved by fixing the source (acceleration cable) at the bottom end of the pedal near the heel rest. Therefore, the whole assembly (foot lever, support) rotates about the pivot point 1 and spring comes in stretched position. On releasing the pedal, the spring tends to come in original position due to spring action. Hence, driver can decelerate or stop the vehicle without actuation of throttle.

A. ACCELERATION

In order to accelerate, the foot lever rotates about pivot point 2(upper pivot point). Figure 4 shows the upper half of foot lever moves in downward direction and lower half of pedal moves in upward direction i.e rotation of foot lever would be in anticlockwise direction. However, the support is kept in stationary position, this resistance is achieved by using helical tension spring. The main purpose of spring is to provide Resisting force to the support during throttling. Hence, by using upper half of the foot, driver can accelerate the vehicle without actuation of brakes.

B. WORKING METHODOLOGY

C. COMPONENTS USED

Brakes
Accelerator
Frame
Electric Motor
Wheel

D. SCOPE AND OBJECTIVE

The main aim is avoiding interference of braking during acceleration and vice versa by combination of pedal for brake and accelerator. This combined pedal mechanism thus provides a driving control which permits the quick and smooth transition from acceleration to braking, without needing to transfer the foot from one pedal to another.

III. WORKING PRINCIPLE

- In this project consists of brake and acceleration system in a single pedal.
- Here motor is working like as engine to propel vehicle or wheel which is connected with wheel.
This wheel is rotating with respectively to given acceleration.

- The pedal is separated into two system which is upward and downward. The brake will be applied when push downward or below part of pedal.
- The system is accelerated when push at upward or above part of pedal.
- An ordinary system has an individual pedals are acceleration, brake and clutch. but here using a single pedal to operate both process.Here acceleration as well as brake working by single pedal system.
- In order to brake, the foot lever and support both moves in linear direction such that, there would be no acceleration of the vehicle.
- This is achieved by fixing the source (acceleration cable) at the bottom end of the pedal near the heel rest. Therefore the whole assembly (foot lever, support) rotates about the pivot point 1 & 2

Spring comes in stretched position.

- On releasing the pedal, the spring tends to come in original position due to spring action. Hence, driver can decelerate or stop the vehicle without actuation of throttle.
- In this condition foot of driver simply rests on foot lever, it does not cause either of the function. The positioning of foot, any further movement results in acceleration or braking.
- Brakes are generally applied to rotating axles or wheels, but may also take other forms such as the surface of a moving fluid (flaps deployed into water or air).
- Some vehicles use a combination of braking mechanisms, such as drag racing cars with both wheel brakes and a parachute, or airplanes with both wheel brakes and drag flaps raised into the air during landing.
- Brake Lining: heat-resistant, soft but tough material with a high friction
- An accelerator is a device which is usually operated by foot for controlling the speed of an engine.
- Then a prototype has been prepared which confirms the required mechanism and finally tested for its working.

- These mechanical terms are used when we describe how brakes works Understanding the parts that can compose a brake will help when learning about the different types of brakes used in a modern braking system.
- Proper maintenance can prevent brake failure by stopping causes of sticking, corrosion and piston failure. If you have been injured by
- Another’s negligence concerning brake maintenance, an experienced auto accident attorney can help you determine the most appropriate course for legal action.
- It causes the motor to have better dynamics. In a two-pole motor, if the electromagnet is at the balance point, perfectly horizontal between the two poles of the field magnet when the motor starts; you can imagine the armature getting “stuck” there. That never happens in a three-pole motor.
- .Each time the commutate hits the point where it flips the field in a two-pole motor, the commutate shorts out the battery (directly connects the positive and negative terminals) for a moment. This shorting wastes energy and drains the battery needlessly. A three-pole motor solves this problem as well.
- It is possible to have any number of poles, depending on the size of the motor and the specific application it is being used in.
- An electric motor is a machine which converts electrical energy to mechanical energy. Its action is based on the principle that when a current-carrying conductor is placed in a magnetic field, it experiences a magnetic force whose direction is given by Fleming’s left hand rule.
- When a motor is in operation, it develops torque. This torque can produce mechanical rotation. DC motors are also like generators classified into shunt wound or series wound or compound wound motors.
- A wheel is a circular component that is intended to rotate on an axle bearing. The wheel is one of the main components of the wheel and axle which is one of the six simple machines
- In case the driver mixes up pedal system s and moves the foot unnecessarily an entry brake pedal is mounted to the side of the combined pedal in the normal position of a conventional brake pedal.
- To counterweight the individual driver's leg the solenoid and the return spring of the brake is adjustable. For technical reasons smooth function of the combined pedal presupposes electrical gas which is rather rare in passenger cars.
- It is also the natural way to reduce speed as one is walking or running. Possibly, this pedal allows for more "natural" driving.
- For technical reasons smooth function of the combined pedal presupposes electrical gas which is rather rare in passenger cars.
A. ADVANTAGES
- Easy to operate
- No need extra components
- Little modification only
- Low cost

B. APPLICATIONS
- Suitable for all four wheelers

IV. CONCLUSION
In this project is successfully done which is used to gain and share my knowledge. I learned from this project working and construction of engine as well as transmission system. An ordinary we are using individual transmission for a single engine. The engine is cannot takes more load when travelling in a hills station and mountains. If we want to take more person or load in vehicle which cannot propel and makes so much of struggles. This project is identify those kind of uncomfortable to overcome these kind of demerits in vehicles. Here using two engines to propel vehicle so travelling with any load easily.

REFERENCES
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