

Implementation Of Gear Locking Antitheft System In Two Wheeler

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ABSTRACT

In today's world the means of transport has increased into a variety of aspects, such as land, water and even air. The increase in population demand has led to increase in the automobile industries production, thus in such a case, simultaneously the rate of vehicle theft has also increased likewise. In the last decade the rate has gone up tremendously. Most of the thefts take place when the vehicle is in parked condition. Hence in order to overcome this aspect, our project concentrates on the method of keeping our vehicle safe and parked properly without slip, therefore implementing it by locking the gear and wheel of the two wheeler. The safety of the vehicle from getting stolen can be increased by giving an authenticated access to the driver only. Thus by doing this the possibilities of a vehicle being stolen is reduced. Anyway the mechanism should automatically come into action that is it should lock itself when the driver shuts the engine and leaves the vehicle. Also the vehicle should be in a stable parked condition .There should be no movement in the vehicles wheels after the vehicle is shut down. The operation and the working should be easily understandable and should not interfere with the other operations of the conventional system. Thus our project concentrates on locking the gear in the two wheeler. There are no possibilities of shifting of gear and also kicker cannot be kicked.

Keywords: Gear locking system, clutch casing, Clutch bell, spur gear slot

ARTICLE INFO

Article History

Received: 4th July 2016

Received in revised form :

4th July 2016

Accepted: 7th July 2016

Published online :

22nd July 2016

I. INTRODUCTION

The increase in population demand has led to increase in the automobile industries production, thus in such a case, simultaneously the rate of vehicle theft has also increased likewise. In the last decade the rate has gone up tremendously. Most of the thefts take place when the vehicle is in parked condition. Hence in order to overcome this aspect, our project concentrates on the method of keeping our vehicle safe and parked properly without slip, therefore implementing it by locking the gear and wheel. We are introducing gear locking and wheel locking mechanism.

According to the report published by National Crime Records Bureau (NCRB), in the year 2011 alone 122,367 two wheeler vehicles were stolen in India. Out of which only 32,826 vehicles were recovered. Typically, two-wheelers are stolen right off streets or

apartment parking lots. By the time the police are alerted (which could be a few hours since the theft), the vehicles are made underground leaving almost no traces. Later the vehicles are either dismantled or sold in neighboring states/districts at throw-away prices, leaving the owner and police helpless in bringing the thief to book. The story remains same for rest of the world. The only possible way out of this problem is implementation of security system in the vehicle. The security system should be capable of performing reasonably well even in unfavorable conditions to meet the desired level of security.

The price of the security System should be reasonably low or else the automobile manufacturers cannot implement such a system, as it will increase the overall cost of the vehicle by a big margin. If the design

of the security system is such that it is compatible with most of the brands and classes of vehicles then it helps reducing the NRE cost. The overall power consumption should be less as the source of supply for the security system is the 12V battery of the vehicle. Keeping these requirements and constraints in mind we propose this new design of Two Wheeler Vehicle Security System (TWVSS).

The remainder of this paper is organized as follows. Section 2 gives the insight of the work carried out in this field. Section 3 gives the description of the proposed TWVSS. Section 4 describes the design of hardware module. Section 5 describes the design of software module. Section 6 shows the result of the tests conducted. Section 7 lists some of the future enhancements that could be carried out. Lastly, Section 8 concludes the paper.

In 2015, a vehicle is stolen every 13 minutes in Delhi. In 2014, the average interval was 23.6 minutes. Thieves have never been this efficient before, and your bike never more unsafe. In 2014, 22,223 vehicles were stolen in Delhi. At the end of the year, only 2,322 were found. In 2013 the number of stolen vehicles was 26,330.

II. METHODOLOGY

Lock and housing

The gear is locked with the help of lock made up of steel.

The gear box is locked in the outer housing of the gear box.

To avoid moving of vehicle the spur gear is placed in the clutch bell.

When the kicker is kicked housing is locked with spur teeth.

To avoid an oil leakage rubber bush is used in the housing.

III. DESIGN & CALCULATIONS

The various components have different factors of which it should consider before designing the particular equipment.

SPUR GEAR DESIGN:

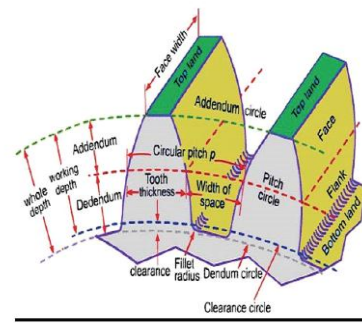


Fig1.0

Force and Power:

Gears transmit force from tooth of the driving gear on to the Meshing driven tooth as shown in Fig The tooth of the Driving gear 1 pushes the meshing tooth on gear 2 along the Line of action. The force is normal to the teeth profiles and has been designated as F_n . At the pitch point, normal force F_N may be resolved into two components, the tangential component F_t and the radial component F_r .

$$F_t = F_N \cos \alpha \text{ and } F_r = F_N \sin \alpha$$

- where α is the pressure angle
- The power P transmitted is

$$P = \frac{F_t v}{1000} = F_t \left(\frac{\pi d_1 n_1}{60 \times 10^6} \right) kW$$

Where,
 v = pitch line velocity, m/s
 d_1 = pitch diameter of pinion, mm
 n_1 = speed of pinion, rpm

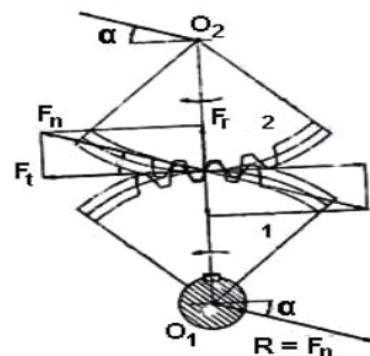


FIG 2

IV. MANUFACTURING AND CONSTRUCTION

The manufacturing process was carried out for the different components which were used for the whole setup of the project. Existing parts from suitable conventional vehicles were taken and at other hand the products of new setup were designed and fabricated according to the requirement of the project. Thus the total equipment's which were fabricated and fixed are given below.

Construction of gear locking

The clutch casing is removed..

First fit the spur gear to the clutch bell (clutch load gear).

Then cut the clutch casing while require space.

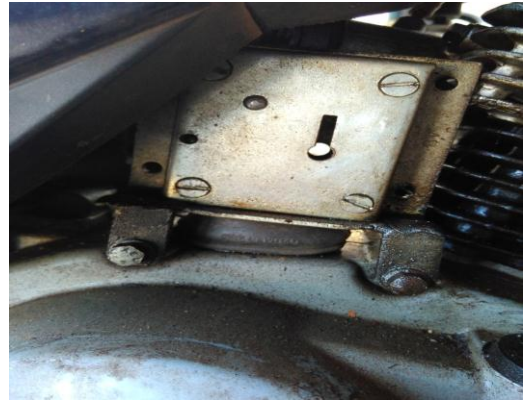
Pile the cutting surface.

The locker and spur gear is welded.

In this setup is placed on the clutch bell.

Then close the clutch casing.

To avoid oil leakage we used rubber bush.



Working:

Gear locking:

- At first a hole is made at top of the casing for fitting the locking system.
- Then the three grids of spur gear is cutter and piece of spur gear is get welded with the locker.
- Finally the spur gear with lock is engaged with the flywheel inside the engine.
- Now while locking it will get engaged and while unlocking it get disengaged.
- Before locking the gear will not get engaged and the vehicle will be under normal running
- After locking the gear gets engaged and we cannot kick start the vehicle since the gear is engaged with spur gear.

MANUFACTURING OF GEAR LOCKING SYSTEM:

- A spur gear which has three teeth is lathed experimentally to fit the correct space in the clutch bell.
- When the kicker is kicked the clutch bell rotates and the vehicle moves, but here due to the installment of three teeth does not allow the clutch bell to move.
- It is designed to withstand high pressure which happens when the kicker is kicked.
- Spur gear has high material strength which does not break due to friction.

Lock:

- The gear locking system needs the system to be locked when the vehicle is in parked condition.
- This gear locking system uses a high strength material to make a lock which locks the outer casing of the locking system.
- A key is used to lock and unlock the outer casing of the gear locking system.
- This lock is made to withstand high pressure and heat which is produced from the engine of the vehicle.

ADVANTAGE

Only the key gives access to driving the vehicle.

Simple operation.

Stable parking conditions

It avoids the two wheeler theft.

It is applicable for all two wheelers.

When key set is broken & applying duplicate key is not possible for theft.

There is no need of electrical and electronic systems

It is less expansive

No further weight is increased.

DISADVANTAGE

Only applicable in two wheelers.

Driver Concentrations require when parking on locking is required.

V. CONCLUSION

The following points are the concluded for the fabrication gear locking

- The possibilities of theft in two wheeler when parking condition is analysed. Vehicle is reduced by using this two anti-theft systems gear locking
- It can avoid the theft of two wheelers in parking conditions.
- This method is simple mechanical arrangement.
- From this we conclude that it is a low cost, less weight and very compact.
- There are no possibilities of shifting of gear and even kicker cannot be kicked.

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