Motorized Gear Shifting in Two Wheelers

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Abstract— The fundamental target of this idea is to apply the rigging by utilizing mechanization framework in vehicles. This is the new innovative model mainly used for vehicles to control the vehicle. In this project we design the MOTORIZED GEAR SHIFTING IN TWO WHEELERS by using the electronics devices. This is very useful for gear changing mechanism in automobiles vehicles. By using this we can easily control the vehicle and enhance the execution of the vehicle likewise we can dodge the wear and tear of the rigging. When gear shifting-up of an automatic transmission to be to be affected, the heap connected by the heap gadget is expanded, or the heap is associated to an output rotation of the shaft of the engine to a required level. In this work, two electromagnetic coil are coupled to the gear rod of the two ends. The two buttons are used to activate the electromagnetic coil so that the gear will be shifted.

Key words: Spur gear, Power window motor, Microcontroller, Limit switch button, Push button switch

I. INTRODUCTION

Although bikes are the most common automobile on the roads today there is a large population that has a difficulty driving it. The people who have a good balance and good control on the two wheeler that is a gearless vehicles but has a trouble once they shift to a geared vehicle. The main problem they face is the inefficiency in having their concentration on the clutch, the brakes and gears. The brake and the gear are on the either sides of the vehicle and are to be controlled by both the legs at a time. For many it isn't an easy job, some even quit learning because of the complications in it. This project helps such people and even the new riders to ride a gear bike have been many ideas that have been developed in years that have increased the possibilities of the better control on the geared two wheelers than it was before. Ideas like the use of hydraulics and pneumatic and the use of electromagnetic pistons have been the most common ones. Although having many similar and various distinct errors and problems they all where a new possibility into the world of geared two wheelers. The main disadvantages in all the existing alternatives are its occupancy and its complicity. The ideas are in themselves siple but become complicated because of the area they occuoy and because of the difficulty that the rider faces these ideas have never been able to be become a possibility rather than just an idea. We use an idea in our project that is used less but have wider possibilities.

A. AIM

The aim of his project is to overcome difficulties which are faced by the people in driving a two wheeler with gear. It is hard to shift gear by using both hand and leg at same time. In heavy traffic roads it leads more body pain because of continuous leg movement. Few vehicles have already reduce leg effort to shift gears but it required lot of force by hand to change gears. So we are going to reduce effort of leg also it required very small hand effort for gear shifting. Its also very useful for physically challenged peoples.

II. EXISTING SYSTEM

In existing system in this study, a gear shifting mechanism was designed and applied on a clutch featured bike to make the gear transmission process faster and less destructible for the driver utilizing push catch System plan. Be that as it may, the apparatus transmission component planned makes driving easier and to achieve efficient driving. This new device must be reliable, has small measurements, sparing and low support cost. This venture intends to enhance the rigging moving process with a suitable control mechanism to implement in clutch featured bikes. According to the proposed equip moving technique, the chooses the transmission outfit according to the speed of the vehicle without any human interference. A pneumatic shifter is a mechanical device that utilizes packed air to change a gear from the grasp close to the driver to the motor of a vehicle. Pneumatic shifters should be viewed as a safety device. There is no lag time in a gear shift occurring at the clutch and taking hold in the rest of the vehicle.
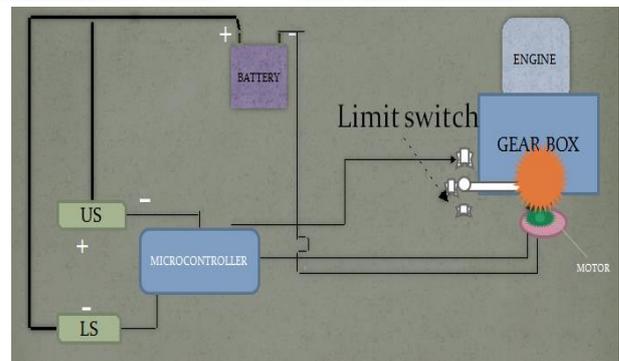
III. PROPOSED SYSTEM

A. Block Diagram

Fig. 1: Block Diagram

B. Hardware

1) Spur Gear

A goad apparatus is a rigging with teeth that venture outwards from a barrel shaped surface. Two goad apparatus are utilized to transmit control between parallel shafts. Spur gear is a gear having straight teeth cut on the rim parallel to the axis of rotation. The sole variance in their identity remains the rack, which is covered more in-depth in engineering 360's rack and pinion.

Spur gears are regularly used for speed reduction or increases, torque multiplication, resolution ans accuracy enhancement for positioning systems. The teeth run parallel

to the gear sets. Spur gears mate just a single tooth at any given moment, bringing about high weight on the mating teeth and loud operation.

Spur gear materials are cast iron, alloy steel, cast steel, carbon steels, aluminium, brass, copper, plastics.

Spur gear dimension specification is the gear mate via teeth with very specific geometry. pitch is a measure of tooth spacing and is expressed in several ways. They are diametral pitch and circular pitch.

Spur gear mounting specifications is consider the gear centre, bore diameter and shaft diameter. The gear centre can be a bored hole or an integral shaft. Shaft mounting includes keyway, set screw, hub clamping screw, split, simple bore.

Fig. 2:

IV. POWER WINDOW MOTOR

The power window motor consists of a motor, connector to the gear.Two Hall effects switches are set in the connector.The hall effect switch utilizes magnets set on a rotating axis to sense the power window motor rotation, and outputs asynchronized pulse to the power window main switch.Hall effects switch no.1 outputs one pulse cycle for each rotation of the power window engine hub. Appropriately, the power window principle switch recognizes the rotational speed of the power window engine. The power window main switch detects the rotational direction of the power window engine by the distinction amongst high and low heartbeat focuses from lobby impact switch no1 and 2.

For left side of car door
- Voltage rating:12VDC
- No load speed 85 15RPM
- Rated current(load):<15A
- Rated speed:60 15 RPM
- Current (No load):<5A
- Stall current (Locked):<28A at 12V
- Stall Torque(Locked):100 15kg.cm(~10.N.M)
- For Right side of car door
- Voltage rating:12VDC
- No load speed 85 15RPM
- Rated current(load):<15A
- Rated speed:60 15 RPM
- Current (No load):<5A
- Stall current (Locked):<28A at 12V
- Stall Torque(Locked):100 15kg.cm(~10.N.M)

Fig. 3:

V. LIMIT SWITCH

The motivation behind this guide is to fortify the essential parts of ABB's mechanical farthest point switch advertising. This incorporates the accompanying:
- Understand basic farthest point switch wording
- Recognize promoting openings
- Develop arrangements with related segments
- Make instructed deals suggestions
- Compete in the market and enhance ABB's market position in farthest point switches
- Learn where to discover the breaking point switch devices and assets accessible from ABB.

This guide has been intended to give a careful diagram of farthest point switches, both as a general mechanical item, and furthermore as a quality ABB offering.Readers who are new as far as possible switch controls industry ought to start with Section 2, which clarifies a few extensive terms and products.For the individuals who know about breaking point switches, however are new to the ABB item runs, you may go straight to Section 3 which gets into the ABB item portfolio.

Constrain switches are a sort of sensor that distinguish nearness and nonattendance. In particular, mechanical cutoff switches will be switches that are mechanically initiated, implying that they have some kind of arm, lever, handle, plunger, and so on., which is physically—or mechanically—enacted by reaching another question. As the question reaches the actuator of the switch, it in the end moves the actuator "as far as possible" where the contacts change state. Different assortments of sensors/switches exist, including closeness sensors, light sensors, electric switches, among others.In its least difficult frame, a breaking point switch is a "switch" that can be mounted into remote areas with the goal that it is incited by a question other than a human administrator. Some essential elements of farthest point switches are:
- Detecting nearness/nonattendance
- Counting
- Detecting scope of development
- Detecting situating and travel constrain
- Breaking a live circuit when hazardous conditions emerge
- Detecting speed
- And several different applications Restrict switches are a critical thinking item. There is regularly "no

correct answer" as to which switch can be utilized as a part of any given circumstance. Normally item decision is left to the client to decide how he can best use the switch. Due to this trademark, confine switches can be enjoyable to offer a "fun" item—they are the answer for a brainteaser amusement!

Mechanical farthest point switches can be found in any modern or business application where discovery or wellbeing is required.

When all is said in done, gadgets are intended for two markets: the IEC (worldwide) advertise, and the NEMA (North American) showcase. ABB's product offering meets both IEC and NEMA necessities.

A. European (International) Standards

EN models are distributed for low voltage modern items, utilizing the IEC as a premise. For point of confinement switches, the relevant EN measures for breaking point switches are:

   – EN 50047, for 30mm gadgets
   – EN 50041, for 40mm gadgets

These models apply to the dimensional institutionalization of the switches.

   – EN 60947-1-5, Low-voltage controlgear: electromechanical control circuit gadgets

Prerequisites for switches, including necessities for positive-opening operation

B. CE checking

CE checking must not be mistaken for a quality mark. A CE stamp put on an item is verification of similarity with the European Directives worried that item sort. It is a piece of an authoritative system and ensures free development of the item inside the European Community.
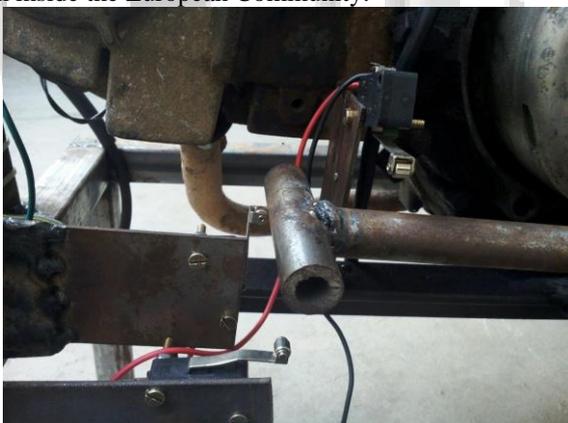

Fig. 4:

VI. MICROCONTROLLER

A microcontroller (now and again condensed μC, uC or MCU) is a little PC on a solitary coordinated circuit containing a processor center, memory, and programmable information/yield peripherals. Program memory as NOR blaze or OTP ROM is frequently included on chip, and in addition a regularly little measure of RAM. Microcontrollers are intended for installed applications, rather than the microchips utilized as a part of PCs or other broadly useful applications. In this archive the kind of microcontroller joined is AT89C52. AT89C52 is an 8-bit microcontroller and has a place with Atmel's 8051 family.

AT89C52 has 8KB of Flash programmable and erasable read just memory (PEROM) and 256 bytes of RAM. AT89C52 has a continuance of 1000 Write/Erase cycles which implies that it can be deleted and customized to a most extreme of 1000 circumstances.
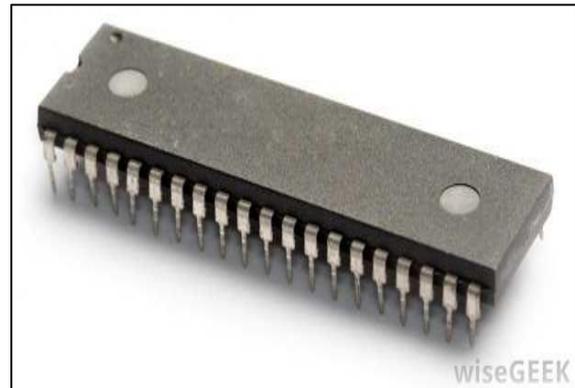

Fig. 5:

VII. PUSH BUTTON SWITCH

A push button is a simple switch mechanism for controlling some aspects of the machine or a process. Buttons are typically made out of hard material, usually plastic or metal. The surface is usually flat to accommodate the human finger, so as to be easily depressed. Buttons are most often biased switches, although many unbiased buttons still required a spring to return to their unpushed state. Different people use different terms for the pushing of the button, such as press, depress, mash, hit and punch.

The push buttons has been utilized in calculator, push button telephones, kitchen appliances, and various other mechanical and electronic devices. To avoid operator from pushing the wrong button in error, push button s are often color coded to associate them with their function.
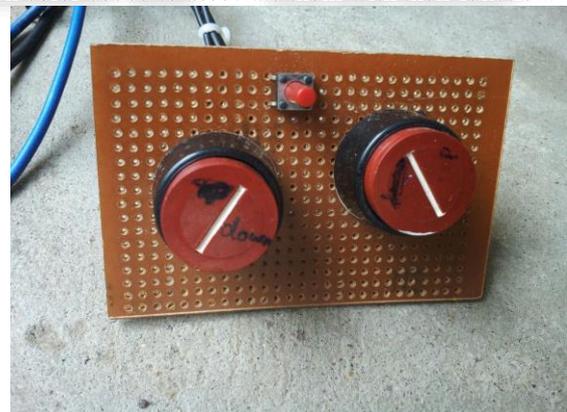

Fig. 6:

A. Design Calculation

1) Gear Calculation

SPUR GEAR

Gear 1

Dia of gear = Ø70mm
No of teeth =32 no
Thickness of the gear =10mm

MODULE m:

This is the standard term used in S.I.units. It can be defined as the length on the pitch circle diameter per tooth. It is the reverse of the diameter pitch.

$$m = D/T$$

m = 70/32

m = 2.18 mm

2) ADDENDUM (A)

The radial distance between the pitch circle and the tip circle is known as Addendum.

a = 1 m

a = 1 x 2.18

a = 2.18 mm

3) Dedendum

The radial distance between the pitch circle and the root circle is known as Dedendum (d).

d=2.18

d = 2.18x 2.18

d = 4.75 mm

4) Circular Pitch (Pc)

The distance between the corresponding sides of two adjacent of a gear measured on the pitch circle is known as circular pitch.

Pc =pD/T

Pc = p (70)/ 32

Pc = 6.86 mm

5) Diametral Pitch (Pd)

It is the ratio of the number of teeth per unit pitch diameter. This Is a mostly used in F.P.S. system.

Pd=T/D

Pd = 32/70

Pd = 0.457 mm

6) Gear 2

Dia of gear = Ø20mm

No of teeth =7 no

Thickness of the gear =8mm

7) Module

m = D/T

m = 20/8

m = 2.5 mm

8) Addendum

a = 1 m

a = 1 x 2.5

a = 2.5 mm

9) Dedendum

d=1.25m

d = 2.18 x 2.5

d = 5.45 mm

10) Circular Pitch (Pc)

Pc =pD/T

Pc = p (20)/ 7

Pc = 8.97 mm

11) Diametral Pitch (Pd)

Pd=T/D

Pd = 7/20

Pd = 0.35 mm

VIII. SOFTWARE DESIGN

A. Embedded C

Embedded C is a set of language extensions for the C Programming language which is used in the Keil platform to create the interfacing between the hardware components and the Keil by the C Standards committee to address commonality issues that exist between C extensions for different embedded systems. It is a computer system with a dedicated function within a bigger mechanical or electrical framework, regularly with ongoing figuring limitations. It is inserted as part of a complete device often including hardware and mechanical parts along with the touch of software which is used to control the mechanical parts. Ninety-eight percent of all microprocessors are manufactured as components of embedded systems.

The C Standards Committee extended the C dialect to address these issues by giving a typical standard to all usage to adhere to. It includes a number of features not available in normal C, such as, fixed-point arithmetic, named address spaces, and basic I/O hardware addressing.

IX. WORKING

The project consists of an engine, dc motor, gear arrangement, electronic circuits. the dc motor is connected to the gear shaft with a gear. There are three limit switches provided to set the freedom of motor which is controlled by a micro controller. When the rider engages the clutch and presses the up button provided to gear up the vehicle, the motor rotates and pushes the gear lever up to gear up the vehicle. This process can be repeated to increase the gear further. In order to gear down the vehicle, the the down button is pressed. The above process runs in opposite direction. Thus the gear changing is achieved using a button system.
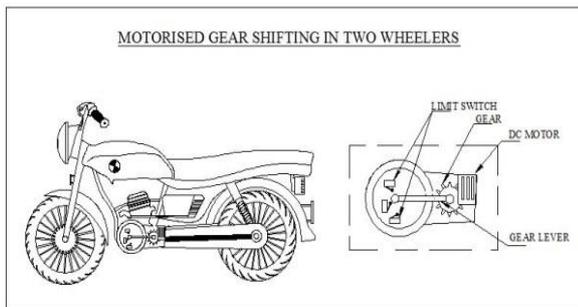

Fig. 7:

Fig. 8:

Fig. 9:

X. CONCLUSION

The venture did by us made an inspiring assignment in the field of vehicle office. It is extremely helpful for driver while drive the vehicle at any spots with no strain.

This venture has additionally decreased the cost required in the worry. Extend has been intended to play out the whole prerequisite assignment which has additionally been given.

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