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## DESIGN AND FABRICATION OF MULTI NUT REMOVING TOOL

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### ABSTRACT

The vehicle is an important thing in human life. Nowadays, every family has at least one car to make it easier and faster transport. The car, a T-nut wrench tool set-up for each vehicle and car jacked is difficult to use women or teen to open the nut of their car. The proposed system is suitable for removing and driving the concept of human capital with the help of the nut. Implementation of the project and the heart itself. Components used in the right player at the and gear system are encouraged. The main purpose of the model at the same time removing a wheel nuts one. In the model, the primary feathers of the gear shaft is connected to the rotational speed of the rod is due to operate in Hand. Is the primary driver gear and driven gear are secondary gears. The model is placed in the center of the primary gear. Secondary gears mesh with the primary gear. Secondary perfect meshing gears to the base plate and means are placed at a distance measured absolute distance. The primary drive gear is attached to the backbone. Extending from each end of the housing and cover from the outside of the secondary axles will be the first in the second end. The purpose of the project is to develop four self-designed and a nut remover (4: 1), the device will help to remove the 4 nuts at a time. [3]

**Keywords:** Gears, Box Spanner Sockets, Spanner, Bearings

### I. OVERVIEW OF THE PROJECT

The problem is to remove the nuts of a vehicle tire. if the user is required to remove the nut and fix the problem. it is difficult to remove the nut, especially for female users. Obstacles to waste time and energy are needed. A car's tire is too big for a long time to open the nut and female users is difficult to remove the tire and fix it, is waste of time. Opposition to waste time and decrease the power. Then high power required to remove nuts. But our design is safe and it is easy to use. 100mm pitch circle diameter tire nut removal (PCD) has been designed with the last project. This tool has been low for a long time and the use of force can open the four nuts. The tire nut removal force is working to reduce the use of the gear system must take a long time to remove the four nuts and a nut straight. This project is likely to be solved and the problem of the use of four nut removal power. [3]

### II. INTRODUCTION

Torque wrench, or spanners are widely used tool to remove the nuts from the bolts. Torque wrench helps in setting the required torque. Nut remover is the most widely used in the field of vehicle. Removing a wheel and the need to replace it with a wrench or other. Remove the nuts from the wheel wrench to tighten the bolts can be used. On this page you can find a nut, but only one at a time. Emergency puncture the tires of the ambulance, it will be a time-consuming removal of nuts. In those cases, it will be more useful in multi-player remover. Must apply to remove a nut, which can be used to remove all the nuts by torque, the gear system. The wheel will be replaced by low consumption of time. Proves to be a symbol of success for any invention or industry. There are now no more need for the car and it is a symbol of luxury. But replacing punctured tires is always a difficult task. Every car manufacturer such as Jack L wrench and provides tools. [2]

### III. COMPONENTS

Table of components

SR.NO.	COMPONENTS NAME	QUANTITY
1	Pinion Gears	1
2	Shafts	4
3	Spur Gears(Ø70mm)	4
4	Box Spanner Socket	4
5	Side Plates	2
6	Hand Lever	1
7	Bearing	10

*Gears*



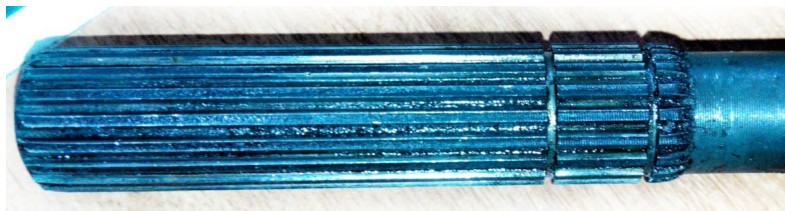
*Fig.:- Gear*

Cutting machine with a rotating wheel of a gear or cog teeth, or cogs, to be broadcast on the size of the other gear being a gear to mesh with another toothed part of torque, the teeth of the same size in most cases, and is often also. Two or sequence (train) work in many cases, a more or gear train is called Gears, a transmission; Such a mechanical advantage through a gear ratio of the gear system of income and thus may be considered a simple machine. some devices can change the speed, torque, direction and a power source. The most common scenario is a gear and a gear mesh; However, one can also mesh with the gear portion of a linear toothed, rack, instead of allowing the production version is called rotation.[4]

*There are 2 types of gears used*

- Primary gears ( driver gear)
- Secondary gears ( driven gear)

*Shaft*



*Fig.:-Shaft*

Drive shaft, a shaft for transferring torque is used to transfer the torque from the manually to the primary gears which is in mesh with the secondary gears which remove the nuts using the removing tools. A hollow shaft is used to transfer the motion from the secondary gears to the removing tool.

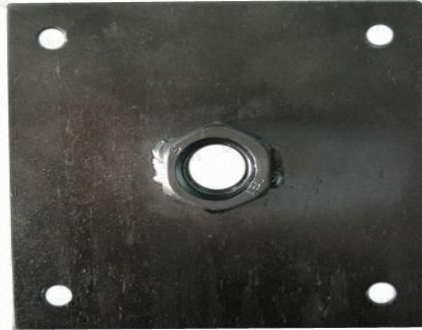
*Box Spanner Socket*



*Fig.-Box Spanner Socket*

The second type socket wrench is a box design is very similar. The head of the socket wrench that is completely the same as the nut / bolt head cover and the sense of the handle is not fixed. the socket is a hexagonal shape or size estimate which itself is either a square. This estimate, which fits into the appropriate size of the cavity or on the handle, can be used to apply force. If you see a picture or description of a lot better about this type of content, and everything will be clear.[4]

***Base Plates***



***Fig.:-Base Plate***

In order to keep the forces and means of the gear base plate is used to withstand the gears and the shaft extension. To remove the weight and increases the stability of the device. This is a plate made of cast iron.[4]

***Ball Bearing***

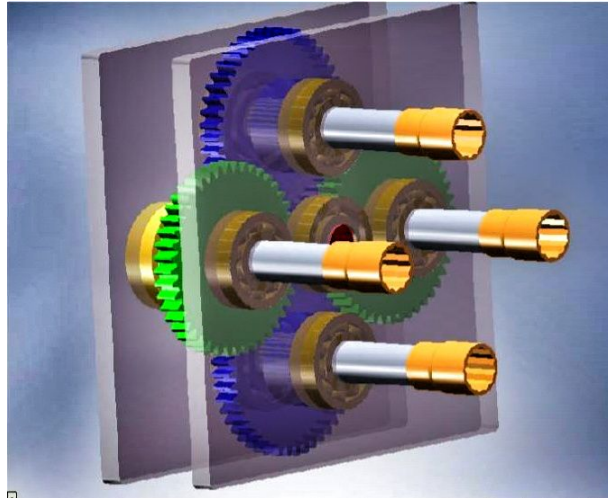


***Fig. :-Bearing***

A ball bearing rolling-element bearing a type races. The purpose of balls to maintain the separation between the rotational friction and support radial loads and to reduce the axial. In most applications, a race is stationary and the other rotating assembly (eg.hub or shaft) is attached. Causes the ball to rotate the bearing races as well as a change. Because the balls are rolling, it is much less than the coefficient of sliding friction against each other if the two flat surface.

**IV. WORKING PRINCIPLE**

This device is so simple. Hand operated or manual means as input power to the gear pinion. This will transfer the wings through a spur gear belt. Wing walking round a spur belt, it may be attached to a car wheel nut wrench are open around .This screw spindle revolution. As required, the car BCD (bolt circle diameter.) We also have to change the BCD are the same device. This wing is straight gear to work. BCD need to change a tire belt movement spur wheel gear to help achieve the wings. So we can continue to work with the opening of all four car wheel nut. By doing so, we can achieve higher productivity.[1]



*Fig. :-4 in 1 Nut Removal (Catia V5)Design*

It works on the principle of a worker, performed by the wheel is very often the work. About losing every four nuts at the same time / application individually on tight. We can rotate anticlockwise gears are encouraged at the direction and the wings rotate the shaft clockwise (in the direction of the opposite gear pinion). Either to help develop a mechanism to loosen or tighten the nuts in one and only one hand to operate all four strokes or operate on its own. This is done by adjusting the five machines to operate on both sides of letters between the input shaft with a lever or wings.

It consist of 4 spur gears , 4 shafts for spur gears , 4 box spanner, 1 lever on which the pinion gear are fixed i.e. input pinion , 2 side plates.

#### **V. ADVANTAGES**

1. Simple in construction.
2. Less weight.
3. Less cost.
4. It saves time as compares to other devices.
5. It can operate easily.

#### **VI. APPLICATIONS**

It is applicable in automobile workshops.

#### **VII .FUTURE SCOPE**

1. Itself is clean and free of hazardous operation to tell the system development with the help of the gear system.
2. Design and operate the full assembly of the wings to be fitted with all the gear wheels of the vehicle to get ready for the pitch circle diameter of the small or adjusted in accordance with the large wheel.
3. It can be operated manually by the hand of the need to reduce the power of the gear system so that the transfer itself. Model weight can be reduced by using a light weight material base plate.
4. It is also suggested that the need to reduce the power of the gear system.

#### **VIII. CONCLUSION**

Search time was reduced to remove lug nuts consumed . Some of the traditional methods of torque must be applied in a single lug nut off. In this search, the stiffness torque / remove all lug nuts is enough to form a lug / hard nut to remove the wheel. Use the same multi-nut remover is used to remove more than one nuts. This device can be operated manually and is external power. These are commonly used to remove the wheel nuts and remove the wheel mechanical effort required is very low so. Multi-vehicle unit and the nut remover can be used to produce units.

Weight can be reduced by using a light weight material model base plate. Wheel nuts can easily be removed using multi-nut remover.[2]

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