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Design And Fabrication Of Lawn Mower

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Abstract – *A normal grass cutter moving with IC engine will run based on the energy from petrol. The major drawbacks of this technology are high running cost; create noise pollution and air pollution. Also, an IC engine requires periodic maintenance such as changing the engine oil, mechanical maintenance. It is an innovative technology of cutting grass without any pollution, electric grass cutter are environmentally friendly. Nowadays, the labor charge is increased day by day. This project is mainly proposal for reduce the manpower and time consumption. So we decided Electric lawn mower with 0 emission and endless working.*

1. INTRODUCTION

In our day to day life conservation of energy is very important and so pollution should be stopped. So for that reason we decided "Electric lawn mower". As it is eco-friendly and less time consuming. It is corded instead of battery assembled. Because battery can't generate enough torque and problem is to charge battery again and again, so it is very much time consuming. So Electric lawn mower is the best option as it works on AC supply with single phase. As Diesel lawn mower makes unpleasant noise and effect human life. So electric lawn mower is the best option today.

1.1 History of lawn mower

The first actual lawn mower was invented in 1830 by Edwin Beard Budding. Budding was an engineer from England who first discovered the idea of a mower from a cylindrical machine used for cutting in mills. Two of the earliest Budding machines sold went to Regent's Park Zoological Gardens in London and the Oxford Colleges.

1.2 Electric Lawn Mower

It converts electrical energy into mechanical energy by rotation of motor. It works on 220V single phase and have 18KW/Hr and torque generated by motor is 1.19Nm torque and motor blade rotates at 1440 (RPM) and designed in a way that it works at any lawn and feasible in size with 4 wheels assembled in it.

1.1 Avoid Diesel Lawn Mower

Diesel lawn mower not only affect environment but also affect human comfort and human health. With increase in population, pollution increases day by day and with using diesel lawn mower it will increase more pollution (Diesel smoke). After seeing all this we decided to make an Electric lawn mower which is Eco friendly with 0 emission and 0 thermal emissions too.

2. SILENT/SPECIAL FEATURE IN OUR PROJECT

After decided of this project we though to make this project more effective and less time consuming to collect small fine cutted grass. So after lots of calculation and discussion we make an automatic suction created by the lawnmower itself.

Fig: Actual working suction

As electricity supplied to motor, blade starting rotates in clockwise direction and of 0 clearance with the ground level and it was challenging for us but we successfully solved it. As it moves with1440 (RPM) so suction is created because of single opening towards grass collector only. So by that air lifts the fine grass and blows into the grass collector.

Emission by Diesel Lawn mower in Past is given below,

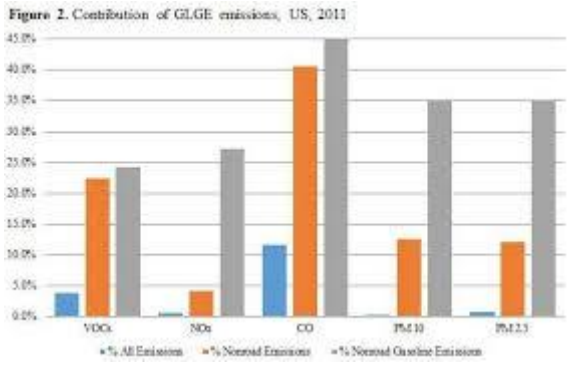

Chart -1: **Emission chart by Diesel lawn mower**

By that reason we should stop using diesel (Engine) lawn mower as it harmful for environment as well as human health. Our main motto is that to have a suction created by blade speed. With applying paint it will looks good and corrosion resistance.

Fig -1: Electric lawn mower

This is the actual image of our project. As it have Motor, Wheels at bottom, Wiring, Grass collector at front and full chassis as shown in above figure.

2.1 Objectives of our project

1. To design and fabricate the lawn mower which is feasible in size.
2. To design and fabricate of lawn mower which gives less effort to operator.
3. To design and fabricate the lawn mower which have less energy consumption.
4. To design and fabricate the lawn mower which have less affect to Environment and Human health.
5. To design and fabricate the lawn mower which is easy to control.
6. To design and fabricate the lawn mower which is less in economy for middle class peoples.

All these objectives are achieved by our projects successfully. The design is complicated but simple in making. We hope that our project will be very beneficial in today's generation and for future too.

2.2 Design of Lawn Mower

Fig -2 Base part of lawn mower

Our project is made up of iron and steel for toughness and by applying paint it will become corrosion resistance.
Length is 43 inch.
Breath is 40 inch.
Diameter of circle is 8 inch.

2.3 Selection of motor

Fig -3 Selection of Motor

For perfect grass cutting we used VICCO (1440RPM) Motor. 1440RPM motor is quite good for smooth grass cutting and the speed of blade is enough to carry cutted grass to grass collector.

Specification	VICCO 1/4HP MOTOR
Rated Voltage(V)	220
Speed(RPM)	1440
Kilowatt/hour	18
Phase	1
Frequency(Hz)	50
Ampere(amps)	2
Generated Torque(Nm)	1.19
Weight(Kg)	9

Table -1 Specification of motor

2.3 Design of blade

Fig -4 Blade Design

We designed this blade for smooth cutting with 0 clearance with ground level.
Length of Blade is 8 Inch.
Width is 0.5 Inch

2.4 Selection of wheel

Fig -5 Selection of wheel

It gives free movement to anywhere with minimum resistance and less friction.
Diameter of wheel is: 6cm.

2.5 Design of bucket

Fig -6 Design of Bucket

It can collect 2 to 4 kg of grass in single use with perfect design. It can rotate at angle 90 degree for empty the grass collector.

3.1 Advantages of Electric Lawn mower

1. It is Eco Friendly that it 0 pollution. Now we are in safety with no pollutant emitted.
2. Less time consuming.
3. No skill labour is required.
4. Less effort is required.
5. No fluctuation of speed thus it works on constant speed.
6. Less electricity consume as diesel lawn mower requires more fuel.
7. Automatic Suction is created.

3.2 Applications of Electric Lawn Mower

The smaller types are pushed by human user and are suitable for small residential lawns and gardens. Electric lawn mower are widely used in grounds like (Home lawn, Small Gardens) with less energy and time consuming with 0 emission .

4. CONCLUSION

In a nutshell, the prototype lawn mower has been designed, fabricated and tested. Moreover, the usage of this machine makes the grass cutting process faster by reducing the cutting time. Besides that, it is a bit heavy but wheels minims heaviness, Environmental friendly with 0 emission and helpful for non-commercial use (home users) in maintaining and trimming the grass in gardens, home, or yards. Wheels are good for supports. Further we also concluded that waste collecting is difficult while operating the lawn mower. So we tried to make an automatic vacuum created by speed of blade rotating in clockwise direction and 0 clearance by ground for auto collecting waste. So it reduces the operating time and effort for collection of grass.

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