SMART LAWN MOWER

[1]B.SURESH RAM, [2]P.MAHESH BABU,[3]KARTHIK REDDY,[4]C.SUNIL KUMAR,[5]M.MANI KRAN

[1,]Associate Professor, Dept. of ECE, CMR COLLEGE OF ENGINEERING & TECHNOLOGY

[2]Assistant professor,Dept. of MECH, CMR COLLEGE OF ENGINEERING & TECHNOLOGY

[3]Assistant professor,Dept. of ECE, CMR COLLEGE OF ENGINEERING & TECHNOLOGY

[4-5]B-TECH, Dept.of CSE, CMR COLLEGE OF ENGINEERING & TECHNOLOGY

Abstract

In the past, cutting of grasses in the schools, sports track, or field, industries hotels, pubic center, etc was done by cutlass this method of manual cutting is time consuming a s it is human effort that is needed for cutting, there was also inaccuracy in cutting level using the manual cutting system.Apart from all these old methods of cutting there is also risk of accident. The problems of the manual were meant to be overcome with the aid of this project (the construction of a "SMART LAWN MOWER" which is used for cutting of grasses to equal height or level for speedy cutting.This project lawn mower, is also the accident free as well, it reduced labor and also reduced number personnel that is needed in a particular operation, it also reduced man control to one as it a Bluetooth controlled device that does the actual cutting while the operator provides the controls, great portion of land can easily be cut with lawn mower. Again, to encourage beauty in our environment this project was embarked on to help in keeping our environment clean because most laborer are finding it difficult as a handy tool for gasses cutting. It is also used for cutting sports field, (like football pitch as well as crowns in hotel and business premises so this project reduces human effort and should be encouraged in school, hotel, business area, etc. although mowers can be of electric type too, but we decided to fabricate a mechanical type to overcome the problem of electricity and as such this our lawn mower can be used everywhere even where there is no electricity. The objective of the project is to design the hybrid powered grass cutter which operates on battery energy and avoids the drawback of old grass cutters. The purpose is to avoid fuel consumption and reduce the human effort, operating cost and maintenance cost. Also, electricity-based grass cutters are environmentally friendly compared to diesel or petrol using mowers and are used for various applications. The whole machine operates on the electric energy which is stored in a battery and is controlled by an android device via a Bluetooth application.

1. INTRODUCTION

A lawn mower (also known as a mower, grass cutter or lawnmower) is a machine utilizing one or more revolving blades to cut a grass surface to an even height. The height of the cut grass may be fixed by the design of the mower, but generally is adjustable by the operator, typically by a single master lever, or by a lever or nut and bolt on each of the machine's wheels. The blades may be powered by manual force, with wheels mechanically connected to the cutting blades so that when the mower is pushed forward, the blades spin or the machine may have a battery - powered or plug in electric motor. The most common self-contained power source for lawn mowers is a small (typically o) internal cane cylinder combustion engine. Smaller mowers often lack any form of propulsion, requiring human power to move over a surface; "walk-behind" mowers are self-propelled, requiring a human only to walk behind and guide them. Larger lawn mowers are usually either self-propelled "walk-behind" types or more often, are "ride-on" mowers, equipped so the operator can ride on the mower and control it. A robotic lawn mower ("lawn-mowing bot", "mow bot", etc.) is designed to operate either entirely on its own or less commonly by an operator by remote control. Two main styles of blades are used in lawn mowers. Lawn mowers employing a single blade that rotates about a single vertical axis are known as rotary mowers, while those employing a cutting bar and multiple blade assembly that rotates about a single horizontal axis are known as cylinder or reel mowers (although in some versions, the cutting bar is the only blade, and the rotating assembly consists of flat metal pieces which force the blades of grass against the sharp cutting bar).

2. RELATED WORK

Most people do not associate air pollution with mowing the lawn. Yet emissions from lawn mowers, snow blowers, chain saws, leaf vacuums, and similar outdoor power equipment are a significant source of pollution. Today’s small engines emit high levels of carbon monoxide, a colorless, odorless, poisonous gas. They also emit hydrocarbons and nitrogen oxides, pollutants that contribute to the formation of ozone. While ozone occurs naturally in the upper atmosphere and shields the earth from harmful radiation, ozone at ground level is a noxious pollutant. Ground-level ozone impairs lung function, inhibits plant growth, and is a key ingredient of smog. Each weekend, about 54 million Americans mow their lawns, using 800 million gallons of gas per year and producing tons of air pollutants. Garden equipment engines, which have had unregulated emissions until very recently,

emit high levels of carbon monoxide, volatile organic compounds and nitrogen oxides, producing up to 5% of the nation's air pollution and a good deal more in metropolitan areas. According to the U.S. Environmental Protection Agency (EPA), a traditional gas-powered lawn mower produces as much air pollution as 43 new cars each are being driven 12,000 miles. Among various types of outdoor equipment, lawn mowers are an important contributor to community noise, with the blades contributing up to 50% of noise. Lawn mowers can be just as loud as leaf blowers. According to some societies, lawn mowers can emit 80-96 dB(A) when measured at a distance of three feet.

Two-stroke lawn mowers tend to be more polluting than four-stroke models. For example, one study found that lawn mowers with two-stroke engines emit hydrocarbons at an average rate in excess of seven times the rate of emission from lawn mowers with four-stroke engines. Evaporative fuel emissions from lawn mowers are estimated to be 5.8 grams/day. Lawn mowers can be more polluting than driving a car. One half-hour of lawn mowing with a typical walk-behind mower produces as much hydrocarbon emissions as driving an automobile for about 100 miles or 160 kilometers. A study found that the emissions produced from a lawn mower engine during one hour of operation were around 4000 Î¼g/h; this is comparable to driving more than 150 km in a car with a three-way catalytic converter.

Automatic lawn mowers (e.g., lawn mowers) contribute to noise and air pollution that can adversely affect human health and the environment, minimize noise, exhaust and evaporative emissions from lawn/garden equipment and protect public health.

3. IMPLEMENTATION

Firstly, we need to switch ON the power button and connect the power cable to the provided USB slot. Open the Bluetooth RC car controller app in your android device and make sure the device Bluetooth is switched ON. Connect and pair with the HC-05 Bluetooth module and check for the green light on the screen. If it shows green it means that the device is connected. Using the controls of the Bluetooth RC car app we can move our device wherever we like. The Bluetooth is connected to the Arduino and when we give a command the Bluetooth module and Arduino communicate via TX and RX. The Arduino is connected to the motor driver and that to the motors of the device. Using the Cutter blade switch ON/OFF button we can start using it for cutting the grass. Once our work is done, we need to charge up the battery using an adapter. A lawn mowing device is a machine that helps to

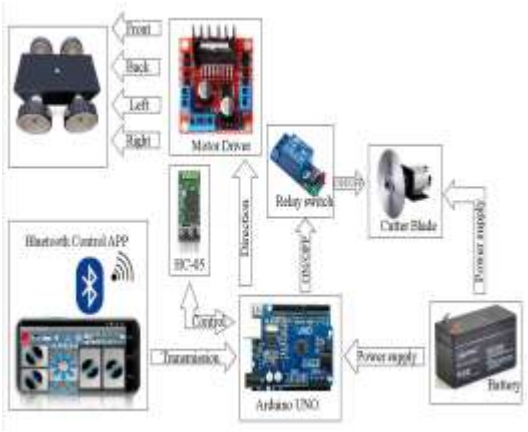
cut a lawn to a consistent height. There are two different types of cutting systems for lawn mowers which are known as rotary mowers and cylinder mowers. A cylinder mower has the grass box located at the front, and it employs a multiple blade at the front of the mower to slice the grass blades about a single horizontal axis. The rotary mowers have rotating blades underneath that rotate at a very high speed. The basic rotary mower has a handlebar attached and the grass box is located at the rear so that it can provide a better vision as compared with the cylinder mowers. First lawn mower was all made of cast iron and featured a large rear roller with a cutting cylinder (reel) in the front. Cast iron gear wheels transmitted power from the rear roller to the cutting cylinder. These machines were remarkably similar to modern mowers. One of life's greatest pleasures is seeing a lawn that is well maintained. Most people can find satisfaction in seeing a well-maintained lawn because it can offer comfort, peace and relaxation. For others, smelling freshly cut grass or stepping onto the smooth grass early in the morning can bring about a simple joy. These are some of the reasons why most people want to keep their lawns green and beautiful. To achieve having a well-manicured lawn, you need the right lawn mower to help keep your lawn healthy and looking good. As of today, there are numerous types of lawn mowers out there making it hard for you to know what's best for you. Choosing the best lawn mower is not that hard and time consuming if you know what to assess before deciding what type of lawn mower you should get.

4. EXPERIMENTAL RESULTS

On the residential side, many elderlies and disabled enjoy lawn maintenance, but are no longer able to enjoy the satisfaction of maintaining their own lawn due to the physical demands of traditional lawn mowing equipment. These researches (automatic lawn mowers) are very elderly and disabled friendly with the simple. There are many lawn mowers in the market powered by solar energy, conventional electric and internal combustion engines. In the past and even now, cutting of grasses in the schools, sports tracks, fields, industries, hotels, public center etc. Was done with a cutlass. This method of manual cutting is time consuming because human effort is needed for the cutting. Also, inaccuracy in cutting level was observed using the manual cutting method. This work deals with the cutting of verdant (shrubs, stubborn, grass, flowers, leaves of trees) and also with the design of the machine, its efficiency, rigidity, mode of operation and the selection of materials. We designed a prototype in which it works efficiently and

in a simple way. We can cut grass without any manual power. By using Bluetooth sensors, we can operate the entire process through mobile phones. In this way we can decrease human effort. This also consumes less power compared to other designs in the market.Firstly, the problem is the size of the yard. With the target specific size of the yard then we need to design the required size of the lawn mower. After that, we can choose the suitable blades to use in the lawn mower. Next, we will consider the type of the lawn mower. Whether running with a high performance or running will have high energy efficiency. Since we are required to design an automatic lawn mower, then we need to design the regular cut way for it. When the lawn mower meets an immovable object, what precautions and how does the lawn mower turn over the obstacles. Moreover, the flexibility and length of grass that we need to consider also by changing the sharpness of the blades. Lastly, the cutting height of the lawn mower will be an important problem for the designed lawn mower. The aim of this project is to study and design an automatic lawn mowing device for domestic use that reduces the load for the user and produces a good cut in the lawn with a faster time. We design an automatic lawn mower that can be user friendly and most importantly, safe to use. Our objectives are to decrease the cost of automatic lawn mowing devices and produce an automatic lawn mower that is affordable, reliable and performs better.Basically, it consists of a metal framing body, DC gear motor, Bluetooth module, Arduino uno, tires, battery, motor drivers, rotary cutting blade etc. In operation the battery is pre-charged and the energy stored into the battery will be used for further operation. The smart grass lawn mower uses a dc motor to run the cutter. The operator just needs to control the machine in whichever direction he needs. Then he just needs to switch on the motor as soon as the motor is to switch on the cutting action gets activated and these blades are attached to the shaft of the motor as the blade gets mesh up with the grass the grass gets cut.

Prototype



Block Diagram

5. CONCLUSION

Automatic grass cutters are environmentally friendly (no petrol, oil or emissions). No need for bagging and disposal of clippings is eliminated. It also has a healthy and beautiful looking lawn. In addition to environmental protection, it can also save users time and money. The lawn mower is a mechanical device that literally shaves the surface of the grass by using a rapidly rotating blade or blades. For centuries, grass was cut by workers who walked through pastures or fields wielding small, sharp scythes. In addition to being tiring and slow, manual cutting was ineffective—the scythes worked well only when the grass was wet. Power mowers are presently available in four basic designs: the rotary mower, the power reel mower, the riding mower, and the tractor. Because the rotary mower is by far the most common, it is the focus of this entry. Pushed from behind, rotary mowers feature a single rotating blade enclosed in a case and supported by wheels. Even though all inventions and innovations are done so that it will help us, sometimes there might be few drawbacks or limitations eventhough it showed up to be a very useful device. We always want to reduce the limitations to null and try to do it. Our smart lawn mower promises to be helpful and capable of meeting the customer requirements and available for further advancements and improvements.

6. REFERENCE

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