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Review on electric roller skates

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Abstract**—***Now a days As No. of vehicles are increasing, due to which fuel consumption rate increases and also the traffic. Due to which hazardous gases are liberated which leads to air pollution and global warming. In traffic people keep their vehicle ON even if they are not moving which leads to waste of fuel and also liberates harmful gases with no work output. Whereas we can't carry our vehicles wherever we travel such as on platforms, skywalk, workshops, footpath etc.The key of this problem is Electric Roller Skates which has wireless controlling. These skates are simple, reliable and safe. The electric skates is an eco-friendly product, which does not causes any harm to environment. We can control the speed using joystick which is very easy. DC motor and the controller are the main elements of skates. Mechanical brakes are provided for the braking of the skates.*

Keywords—Electric, Portable, Simple, Skates, Wireless

I. INTRODUCTION

1.1 Objectives

The project work presented in this paper is based on manufacturing of electric roller skates which will help people to get rid of problems caused due to traffic such as pollution, huge time waste etc. So the system used in this project is ecofriendly which will not harm the environment in any condition. It will also help people those who have problem in leg and not able to walk but they are able to stand can also make use of it for travelling between short to medium distance.

1.2 Productivity

One can ride electric skates on roads, footpaths, platform, malls, big workshop etc. easily. The max speed it can run is 20 km/hr. Battery used is light weight made up of lithium ion cells which has durability of 1hr if used at max speed. It is easy to control with help of joystick which has forward and backward (speed controller) switch. The controller used to adjust speed of skates is wireless. So no stress of handling wires.

It can carry a normal person 60-70 kg of weight. The rectangle hollow frame is designed in which battery, motor driver and Arduino UNO are placed in proper position. The footboard is also provided to keep our legs comfortably. The joystick transmits signal to the electronic wireless circuit to start or stop the DC motor, so the skates would run by the electric power.

Using various types of parts in project such as the battery, the motor driver, Aduino UNO, NRF module, stabilizing wheels, joystick, etc. As there various types of motors in the market but the motor we are using is a DC motor. The reason of using a DC motor is that it gives the sufficient amount of torque which is needed to carry a person .

Also there are various types of batteries in the market such that the lithium ion battery, lead acid battery, lithium phosphate ,lithium silicate but the battery used is a lithium ion battery. The reason of using lithium ion battery is that it is very light in weight and small in size i.e compact. The varying of speed will be operated by the joystick. The module we have used is Arduino

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UNO as the function of Arduino is to control the speed variation using NRF module which makes the system wireless. Stabilizing wheel is nothing but the wheels of the normal roller skates as we see in our day to day life.

II. LITERATURE REVIEW

Zhongyuan CHEN, XinjianJ,Bin TU ,Inam IBRAHEEM,2019 [1] has developed roller skating device and electric balance device which include footboard, ground contacting elements, sensors, driving elements and controller.**AbhishekDoiphode, ChetanLakde , Ajit Prasad, RushikeshBoche et.al, 2019 [2]**has described thatE-cycle typically incorporates a battery, which can be charged at an ordinary domestic power socket, linked to an electric motor in the bicycle transmission system.**Dr. Antonio Carlos Bento**,**2018[3]**had studied about Arduino using its own programming language with Arduino software (ide). He has explained that the nodemcu is from the esp8266 family, being one of the easiest to use, and it is not necessary to use another device of the Arduino type because it already has direct connection to wifi, without the need to install new devices, unlike the Arduinouno, which does not have this capability and needs another connections.**P.Viswabharathy, P.Boobalan, M.ArunWingston,2017 [4]** had Fabricated the electric vehicles (EVs) which offer a zero emission, new automobile industry establishment, and economic development, efficient and smart transportation system. This project having a foot controlled steering system to control the vehicle easily.**Nick Lauren et.al, 2007 [5]** have designed Battery-powered, remote-controlled, motor-driven, steer able roller skates. Each skate includes a boot, a transmitter, a base, a driving mechanism, a steering mechanism, a controller, and a receiver.

III. MATERIAL AND METHOD

Various parts have been used which includes motor, battery, motor controller, joystick, NRF module, stabilizing wheels, bevel gears, bearings. The motor used is a DC motor which is of 12 volts and has a rotation of 1000 rpm. The battery used is a lithium-ion battery which is made up of lithium ion cells and the capacity of the battery is 12 volt 10 ampere hour. This battery is connected to the motor controller. Since, motor controller will also be of 12 volts.

The motor controller an NRF module is connected which is a type of a radio frequency module. NRF module is a device that can be used to receive signals from the joystick. The Nrf24L01 communicates using the serial peripheral interface or SPI bus. Here one NRF module (Transmitter) is connected with arduinouno and joystick to send the signals. These signals will be received by the NRF module (receiver) which is installed on the skates. Motor controller will be further connected to the motor and battery.

By doing all of the above connections when the button on the joystick is moved ahead it will send a signal which will go from the NRF module connected to the joystick to the NRF module connected on skates, which will be further converted into the volts and then will be given to the motor controller. Also by doing further circuit connections the roller skates are able to move in the reverse direction. Bevel gears are used to transmit the motion from motor to the stabilizing wheels equally. Bearings are used to mount the wheels and gears to the frame. All these components excluding joystick will be mounted in a frame which is made up of wood material. The connection from the skates to the joystick will be wirelessly so the joystick will always be in a hand while riding the roller skates.

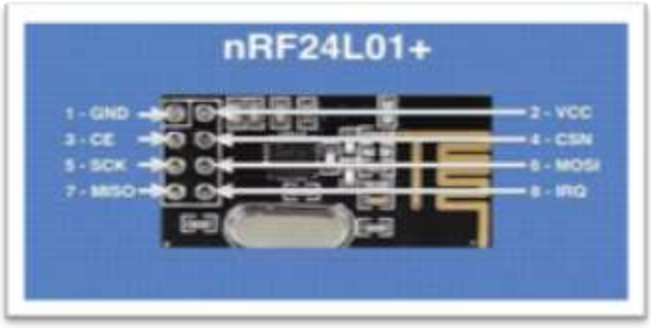

FIGURE 1: nRF24L01 Module

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FIGURE 2:DC Motor

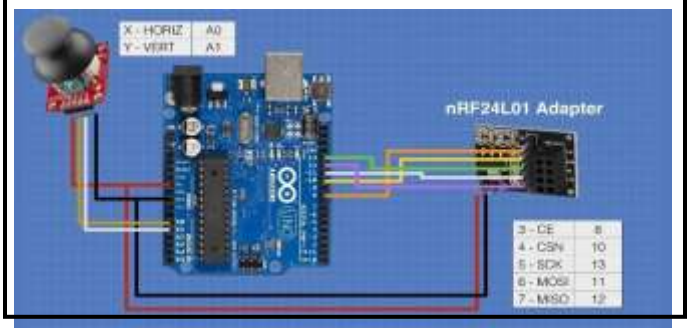

FIGURE 3:Joy Stick connection

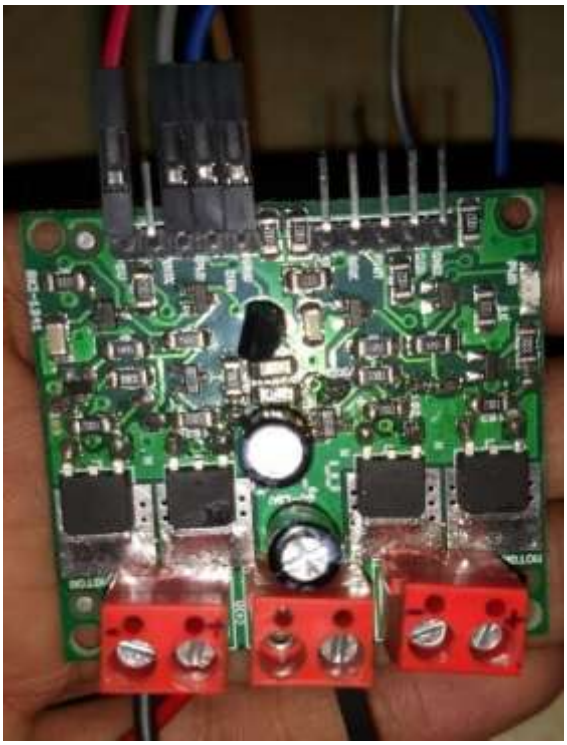

FIGURE 4:Motor Driver

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IV. CONCLUSION

The literature represented in this study describes the importance of having easy transportation techniques from one place to other; it also describes that using a DC motor wheel is more probably very convenient.

Portable roller skates are found to be rare thing especially in between common people in India while electric roller skates may offer an excellent solution for traffic. Also when two legs are separated and not fixed on a vehicle, balancing and braking is easy thus roller skates are better than skateboard. Whereas moving forward in straight poster is comfortable compare to that of moving side way poster.

If roller skates are being used by majority of youngsters travelling would be easy, cheaper and time saving.

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