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Advance IOT Based Solar and Motor Operated Electromotive Maglev Train Model

Naveen Kumar Singh [1], Mohan Kumar Gupta [2], Sandeep Nishad [3], Mohd Arman Khan[4], Mr. Puneet Kumar Bhatia[5]

Student, Department of Mechanical Engineering, Buddha Institute of Technology, Gorakhpur, India[1,2,3,4]

Assistant Professor, Department of Mechanical Engineering, Buddha Institute of Technology, Gorakhpur, India[5]

Abstract: The Advance IOT based solar and motor operated electromotive maglev train model is based on the magnetic suspension technique by which an object is suspended with no support other than magnetic fields. Magnetic force is rummaged to counteracted the effects of the gravitational force and friction force, benefit is free of friction, comfort and noiseless. Maglev train also called magnetic levitation train, maglev is floating vehicle for land transportation that is supported by either electromagnetic attraction or repulsion .As IOT stand for internet of things technology is commonly applied to control the speed of the maglev train .the major role to play in ensuring passenger comfort and train safety. Nevertheless, there is still online track on maglev transport vehicle and further changes can be made to the IOT-based suspension function. It is therefore very useful and important for maglev trains, using new data and communication expertise, to perform electronic tracking and data analysis using an advanced IOT monitoring and control network in recent failures on some maglev trains, however, simultaneous acceleration of vehicles and railway sand the instability of the control mechanism were noted. An IOT based online surveillance system is currently urgently needed. The algorithm can also be enhanced by means of data analysis to reduce and enhance oscillation and system stability. The absence of knowledge on IOT based maglev monitoring systems is discussed on a maglev protection and data acquisition platform located in the IOT.

Keywords: Magnetic-Strip, Wood,(node-mcu), Male-Female Wire, Solar panel, Fan-exhauster.

I. INTRODUCTION

Maglev mean (Magnet + Levitation) maglev train is based on the principle of the magnetic suspension technique and IOT. The target of Advance IOT based solar and motor operated electromotive maglev train model is to reduce the friction loss between track and wheel of electric locomotive train. That electrical energy is used in other place such school hospital .we are used a solar panel in the top of the maglev train .Magnetic force is rummage to counteract the effects of the gravitational and friction force, benefit free of friction, comfort and noiseless .the some component used in Maglev train such and Fig 1 -male female, Fig 2-wood, Fig 3 Node MCU, Fig 4 Exhaust fan., Fig 5 Solar panel, Fig 6 Magnetic strip .the maglev train reduce friction loss within the network. They are less expensive to operate and maintain, because the absence of rolling friction means that parts do not wear out quickly The stability effect becomes worse as time passes and as the environment changes and the magnetic suspension system becomes difficult to effectively control . Rural area will be provided more electricity , that electricity we are using from electric locomotive train .the maglev train is very advance technique train model .they have many facility such as car charging ,mobile charging ,etc The magnet will repeal each other . it cause the magnetic train will floating in the air and a exhauster fan is fitted on the Maglev train and the fan Exhauster is apply trust force on the train .it cause the train will move and the movement of train will control by IOT (internet of things).such an increase or decrease the speed of fan. The power is supply by a solar panel and some energy is store in a battery to run the IOT system.

II. LITERATURE REVIEW

Sr. No.	Author Name	Research paper Title	Research Outcome
1	Farheen Jahan, Shweta Bisht	Feasibility study of Maglev Trains on existing Railways infrastructure. 5September 2016.**[1]**	The Maglev trains have been compared with other high speed means of transportation such as Air Transport.

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2	Sonia Arora and Ayushi Verma	The Railway Maglev reached rapid stage of development. 12December 2020.**[2]**	The railway Maglev has reached a rapid stage of development. The related tracking equipment needs to be examined urgently to avoid possible security hazards for the service of maglev trains.
3	Sujay Jaiaraman and Madhu.S	Maglev technology: Electromagnetic Suspension.20 May 2019**[3]**	This paper involves the design, hardware, Maglev technology, application and future uses of "Magnetic levitation trains."
4.	Abejubbh et , Qadir	The energy consumption of transportation sector, 10 June 2019**[4]**	The transportation sector in Shanghai between 2000 and 2010 and the implications of this on transportation energy consumption and energy efficiency

III. COMPONENTS

Male female wire- it is used to connect the node-mcu to power supply and it is also used to transfer the data from node-mcu to other device such as fan exhauster, light.

Fig1. Male female

Wood- The wood is a type of material which has good insulation property and good strength .it is used to create a frame of maglev train

Fig2-wood

Exhaust Fan – it is used to create a thrust force on the maglev train which will help to move the maglev train in foreword direction and also we will increased and decreased the speed of maglev train by exhaust fan speed

Fig(3) Exhaust fan

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Node –MCU- it is used to store the program and control all the activity based on the install program.This node mcu control by online by server.

Fig 4. Node –MCU

Solar panel- it is used to convert solar energy into electrical energy. That energy is used for running the maglev train equipment

Fig 5. Solar panel

Magnetic strip- it is used to reduce the friction between track and wheel. due to repulsion of magnetic strip the maglev train float in air

Fig 6. Magnetic strip

IV. CALCULATION

Assumption:
1. The model is in the presence of sunlight.
2. Neglect the friction between exhaust fan shaft and bearing.
3. Neglect the heat loss from model to surrounding.
4. Steady state operation.

Calculation:

Solar panel will provided voltage = 12 V

Solar panel will developed current = 1.6667 A

Power produce by solar panel (P) = V*I=12*16777=20 W --(1)

Exhaust fan maximum rotation speed= 2500 rpm

Diameter of exhaust fan = 10 cm = 0.1m

Radius of exhaust fan = 5cm

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Area $A = \pi d^2/4 = 0.00785\ m^3$

Air flow rate of exhaust fan Q = 1000 CFM (Cubic Feet Per Minute)

Air flow rate in (m3/s) $Q = 1000*4.719*10^{-4} = 0.472$ m3/s

Density of air $\rho = 1.2\ kg/m^3$ ------ at NTP

Thrust force $F = \rho av2 = \rho\ Q2/A$

$= 1.2*(0.472)^2/0.00785$

$= 34.03$ N

The fan exert the force on the Air particle. By Newton third law to every action there is equal and opposite reaction so due to air drag force the maglev train move forward direction

Fig.7 Working model image of Advance IOT based solar and motor operated electromotive maglev train.

V. CONCLUSION

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These trains are weather proof, which means rain, snow, or severe cold don't really hamper their performance.
Maglev train uses less energy unto 30% than normal train.
They are less expensive to operate and maintain, because the absence of rolling friction means that parts do not wear out quickly.
Rural area will be provide electric more time, that electricity we are using from electric train..

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BIOGRAPHY

Mr. Puneet Kumar Bhatia obtained his M.Tech degree from the National Institute of Technology Bhopal in 2020. He is a Assistant Professor in the department of mechanical engineering at Buddha Institute of Technology, Gorakhpur. Affiliated to the APJ Abdul Kalam Technical University,Lucknow, Uttar Pradesh.

Naveen Kumar Singh, currently pursuing B.Tech in Mechanical Engineering at Buddha Institute of Technology, Gorakhpur. Affiliated to the Dr. APJ Abdul Kalam Technical University,Lucknow, Uttar Pradesh.

Mohan Kumar Gupta, currently pursuing B.Tech in Mechanical Engineering at Buddha Institute of Technology, Gorakhpur. Affiliated to the Dr. APJ Abdul Kalam Technical University,Lucknow, Uttar Pradesh.

Mohd Arman Khan, currently pursuing B.Tech in Mechanical Engineering at Buddha Institute of Technology, Gorakhpur. Affiliated to the Dr. APJ Abdul Kalam Technical University,Lucknow, Uttar Pradesh.

Sandeep Nishad, currently pursuing B.Tech in Mechanical Engineering at Buddha Institute of Technology, Gorakhpur. Affiliated to the Dr. APJ Abdul Kalam Technical University,Lucknow, Uttar Pradesh.