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ZEAL POLYTECHNIC

NARHE, PUNE

NAV NIRMITI

STUDENT PROJECT BOOKLET

**VOLUME
NO. 2**

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**MECAHNICAL ENGINEERING
DEPARTMENT**



ABOUT INSTITUTE ZEAL POLYTECHNIC, NARHE, PUNE

Zeal Education Society was established in 1996 with the vision to offer education with a difference, the expert guidance of Hon. Shri. S.M. Katkar, a distinguished industrialist. ZES hosts eight institutes that provide quality education to students from pre- primary to Ph.D. courses. Zeal Polytechnic started in 2008 and offers Diploma Courses in Mechanical Engineering, Civil Engineering, Computer Engineering, Electronics and Telecommunication Engineering & Electrical Engineering.

The institute aims at providing the students with excellent Infrastructure, state of the art facilities, well-equipped laboratories and a strong force of faculty members. This has resulted in incredible performance of the students continually throughout the years. Recently, our Founder director has been conferred with the 'Icon of Education 'award by Lokmat media group in the presence of Hon. Smt. Smriti Irani, Former HRD Minister, Government of India from Hon. Shri. Vinod Tawde, former Technical Education Minister, Maharashtra State.

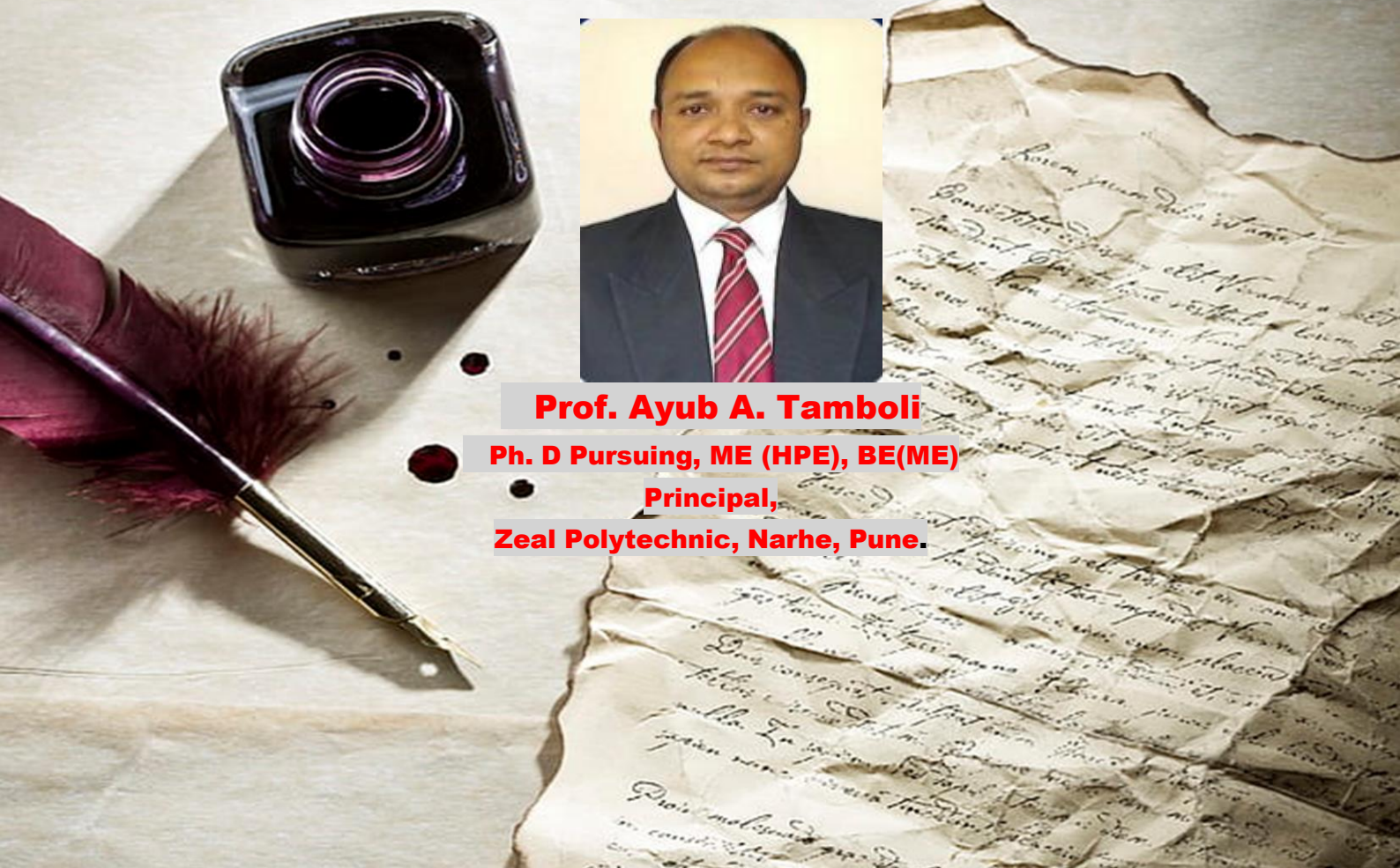
Principal's Message

Prof. Ayub A. Tamboli

I am very happy to note that the department of Mechanical Engineering of Zeal Polytechnic is releasing its NAVNIRMITI, a student project booklet enumerating the various emerging projects of the students. I take immense pride in acknowledging the outstanding academic achievements of our diploma mechanical engineering students. Your commitment to excellence and the pursuit of knowledge has been commendable. Your academic journey is a testament to the dedication and hard work you have invested in your education. Polytechnic education provides the knowledge and skills required to help revolutionize the world in which we live. The students and faculty of department are proactive in taking initiatives in technical, cultural and social events. I hope this NAVNIRMITI a student project booklet will serve the purpose of reflecting all research activities of this department and it will inspire others to do their best. I express my gratitude to each one of you for your contributions to the success of our diploma mechanical engineering program. Together, let us continue to strive for excellence and innovation I congratulate all the students who have put their efforts in bringing this great issue of NAVNIRMITI, a student project booklet and also appreciate HOD and all faculty members for motivating the students towards this fulfillment. I wish each one of them in the department success in all their endeavors.



Prof. Ayub A. Tamboli
Ph. D Pursuing, ME (HPE), BE(ME)
Principal,
Zeal Polytechnic, Narhe, Pune.



HOD Message

Prof. Rameshwar Khorane

The Department was established as Dnyanganga Polytechnic in 2008. It offers a diploma in mechanical engineering and can accommodate 150 students we function with the vision that the Department should get recognized as an innovative and leading Mechanical department in Pune region and afar. The department aims at offering students with the high-quality education clubbed with practical exposure that empowers them with the ability to aid the society by their services in the future. The Department aims at making superior diploma engineering professionals through academic brilliance and excellent education. The syllabus in Mechanical Engineering is steered with an extraordinary approach that helps students to meet the modern requirements of industries. To cater to the current advancement in technology, new subjects such as CAD / CAM and Automation, alternative Energy Resources, Material Handling System are also conducted using modernized laboratories and the required infrastructure. A team of well qualified and experienced faculty members forms the backbone of the Department. This team is determined to empower students with sound academic knowledge and practical experience which in turn makes the students ready to face the industry challenges.



Prof. Shashikant Aghor

HOD,

M.E. (Design)

NAVNIRMITI COMMITTEE

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Dear Readers,

In the vibrant tapestry of our academic journey during the 2022-23, the NAVNIRMITY project booklet has been a transformative odyssey. As students passionately engaged in ground breaking research, we found ourselves at the crossroads of curiosity and innovation. This project booklet serves as a testament to our collective pursuit of knowledge and the unyielding dedication that fuelled our academic endeavours. Each student's contribution represents a unique thread in the intricate fabric of NAVNIRMITY, weaving together diverse perspectives and disciplines. Through late-night brainstorming sessions, countless hours in the lab, and the shared excitement of discovery, we forged bonds that extended beyond the realm of academia. The challenges we faced became stepping stones, and the solutions we unearthed stand as markers of our resilience and creativity. This booklet encapsulates not just our academic achievements, but the spirit of collaboration, curiosity, and determination that defines our collective journey through the NAVNIRMITY project. May these pages inspire future students to embrace the joy of exploration and the limitless possibilities that lie within the realm of research.

Warm Regards,

The Editorial Team

Mechanical Engineering Students



CAPSTONE PROJECT EXECUTION & REPORT WRITING

LIST OF PROJECTS FOR A.Y. : 2021-22

S. N.	Group No.	Name of Students	Project Title	Guide Name
1	1	1) Randive Karan Ashok	Fertilizer Spreading Machine by using braking system.	Prof. D. A. Khope
2		2) Rasal Aditya Santosh		
3		3) Bobade Yash Shivaji		
4		4) Shinde Ravi Mahadev		
5	2	1) Aavate Prathamesh Hari	Automatic Solar Tracking System.	Prof. N. A. Mulani
6		2) Jadhav Vishwanath Laxman		
7		3) Rananaware Aniruddha Kailas		
8		4) Kad Sarthak Satish		
9	3	1) Alvi Sohail Allauddin	Design & Manufacturing of Grant Robot with Linear Motor Technology.	Prof. D. M. Pathak
10		2) Choudhari Omkar Babasaheb		
11		3) Mahajan Ganesh Kishor		
12		4) Kadagi Venukumar Ravindra		
13	4	1) Hilim Varun Shivram	Grain Collecting Machine.	Prof. D. M. Pathak
14		2) Jagdale Harsh Kailas		
15		3) Marenavar Prajwal Ashok		
16		4) Pasalkar Rutvik Sanjay		
17	5	1) Shinde Lalit Vishnu	Two Cavity Horizontal Mold.	Prof. S.G. Aghor
18		2) Naske Rushikesh		
19		3) Kulkarni Prathamesh P.		
20		4) Jadhav Rohan Vinayak		
21	6	1) Bhor Kajal Ashok	Working Model of Solar Sprayer.	Prof. E.N. Aitawade
22		2) Bhanage Jay Jagdish		
23		3) Kadepurkar Lokesh Bharat		
24		4) Jagtap Vinayak Anil		
25	7	1) Jadhav Veena Laxman	CMM Controller Cabinet.	Prof. N.A. Mulani
26		2) Acharya Rohit Sadanand		
27		3) Adhav Viraj Vikas		
28		4) Waghmare Soham Subhash		
29	8	1) Shirsath Abhishek Ganesh	Power Generation by Using Gym Lat Machine.	Prof. S.G. Aghor
30		2) Bansode Harshal Appasaheb		
31		3) Kale Vaibhav Datta		
32		4) Akim Mahesh Sayappa		
33	9	1) Borkar Vaishnavi Satish	Load Assisting Hook for Circular Object.	Prof. D. A. Khope
34		2) Shaikh Mahek Palikunji		
35		3) Pratap Suryansh Dadasaheb		
36		4) Salunke Swarup		
37	10	1) Mangalvedhekar Mahesh Jalinda	Power Hacksaw Machine.	Prof. D. M. Pathak
38		2) Walunekar Gaurav Suresh		
39		3) Bhandare Om Maloji		
40		4) Ghugare Sandeep Anil		

41	11	1) Rakh Omkar Sandipan	Speed Breaker Power Generation.	Prof.G.G.Naik
42		2) Vetal Lalit Shankar		
43		3) Gurav Ravi Ashok		
44		4) Waghmare Siddharth		
45	12	1) Renuse Kisan Prakash	Vertical Axis Wind Turbine.	Prof. S.D. Limaye
46		2) Bandal Sandesh Balasaheb		
47		3) Desai Shivprasad Hanmant		
48		4) Parmar Kushal Manoj		
49	13	1) More Vaibhavi Vijay	Working Model of Automatic Street Light.	Prof. S.S. Waghmode
50		2) Malvadkar Rohan Balasaheb		
51		3) Khedekar Akash Rajendra		
52		4) Karad Nilesh Dilip		
53	14	1) Swami Ajay Vyankatesh	Modify Existing 360 Degree Drilling Machine.	Prof. B.P. Shinde
54		2) Koli Akash Arjun		
55		3) Ghisare Aditya Laxman		
56		4) Kadam Om Tukaram		
57	15	1) Kalshetti Shreedhar Rajendra	Floor and Road Cleaner.	Prof. S.D. Limaye
58		2) Mishra Vivek Kumar		
59		3) Shendkar Omkar Chimaji		
60	16	1) Karale Sainath Pandurang	Stand Mount Auto Sanitizer Dispenser.	Prof. G. G. Naik
61		2) Dhule Nilesh Pralhad		
62		3) Datir Gorakh Baburao		
63		4) Darade Ajay Balu		
64	17	1) Sawant Omkar Shripad	Pneumatic Spray Painting Robot.	Prof. N. N. Kokare
65		2) Gaikwad Raturaj Mahadev		
66		3) Pawar Pratik Samir		
67		4) Chavan Ritesh Bhagwan		
68	18	1) Rikame Nitesh Baban	Scissor Lifting System.	Prof. S.D. Limaye
69		2) Kamble Shreyash Dattatray		
70		3) Dhanne Abhishek Kapil		
71		4) Kadam Anurag Somnath		
72	19	1) Vidhate Omkar Ananad	Wifi Controlled Car.	Prof. N. N. Kokare
73		2) Bhosale Omkar Dattatray		
74		3) Shinde Aniket Mahendra		
75		4) Bonde Pratik Kamalakar		
76	20	1) Chitnis Gaurang	Pneumatic Garbage Separator.	Prof. S.D. Limaye
77		2) Bhagwat Samarth Shrikrishna		
78		3) Pawar Rajat		
79		4) Inamdar Taufik Hidayttulla		
80	21	1) Mahagaonkar Asawari Madhukar	Reciprocating Air Compressor for Emergency in Heavy Duty Vehicles.	Prof. R. H. Tike
81		2) Yadav Omkar Nilesh		
82		3) MD Taslim		
83		4) Kachare Vishal Balu		
84	22	1) Shitole Aditya Deepak	Hydro Electricity Generator Pipe.	Prof. G. G. Naik
85		2) More Ankit Anil		
86		3) Darwatkar Shubham Kailas		
87		4) Jawalkar Vipul Shivaji		
88	23	1) Prasad Durga Hari	To Find Out The Pressure Drop V/S Mass Flow Of Pneumatic Flow Control Valve	Prof. S.D. Limaye
89		2) Wagh Ganesh Vijay		
90		3) Barge Ganesh Shankar		
91		4) Parulekar Atish Jeevan		

92	24	1) Dhagare Abhishek Kaluram	Sand Filter Machine.	Prof. G. G. Naik
93		2) Ingale Snehal Pradip		
94		3) Narale Mahadev Jalindhar		
95		4) Pawar Vishal Vijay		
96	25	1) Tangavade Rahul Parmeshwar	Electrically & Manually Operated Portable Washing Machine.	Prof. S. S. Suryawanshi
97		2) Gaikwad Kartik Vilas		
98		3) Awate Vivek Vishnu		
99		4) Khutwad Aditya Bhanudas		
100	26	1) Kachi Samarth Rahul	Customized CNC Drawing BOT.	Prof. S. J. Shrivas
101		2) Bhalerao Chinmay Sachin		
102		3) Tapkir Om Ganesh		
103		4) Sakhre Soham Sudhir		
104	27	1) Kale Amit Milind	Alcohol Detection of Drunk Drivers with Automatic Car Engine Locking System.	Prof. D. A. Khope
105		2) Rane Ajay Bhalchandra		
106		3) Jadhav Saurabh Rajendra		
107		4) Thote Rohit Dnyaneshwar		
108	28	1) Walunj Sahil Revannath	Automatic Headlight Alignment System	Prof. R. G. Yenkar
109		2) Sayyed Shahebaj Mohammed		
110		3) Waghmare Anand Masaji		
111		4) Jadhav Sankalp Mahesh		
112	29	1) Nakawal Nikhil Raju	Manually Operated Spray Pump.	Prof. S. S. Waghmode
113		2) Kamble Mayur Ramesh		
114		3) Chavan Deepak Ganesh		
115		4) Salaskar Sushant Prakash		
116	30	1) Margale Dhanaji Shivaji	Solar Powered Smart Grass Cutting Robot.	Prof. R. G. Yenkar
117		2) Tribhuvan Sainath Prakash		
118		3) Hole Suraj Baburao		
119		4) Shelar Shubham Chandrakant		
120	31	1) Rokade Swapnil Kondiba	Automatic Bird Repellent System.	Prof. D. M. Pathak
121		2) Lamkane Sachin Satish		
122		3) Londhe Aniket Vishwas		
123		4) Kulkarni Vinayak Shriram		
124	32	1) Darwatkar Kumar Balu	Pneumatic Robotic Arm.	Prof. S. S. Suryawanshi
125		2) Nagawade Rahul Baban		
126		3) Mane Anuj Ganpat		
127		4) Landge Shivam Suresh		
128	33	1) Chaudhari Omkar Babasaheb	The Flywheel Bicycle (KERS).	Prof. S. S. Waghmode
129		2) Kale Omkar Anil		
130		3) Bhosale Harshad Vijay		
131		4) Hinge Vijay Pratap		
132	34	1) Bhandkar Shubham Santosh	Automatic Inspection System.	Prof. D. A. Khope
133		2) Shelke Amit Sunil		
134		3) More Hemant Umesh		
135		4) Shaikh Sahil Abdulrazak		
136	35	1) Shendge Kumar Mahadeo	Generation Of Electricity Through Railway Track.	Prof. N. N. Kokare
137		2) Hagawane Shubham Vikas		
138		3) Paygude Shriram Babasaheb		
139		4) Hemgude Omkar Dnyaneshwar		
140	36	1) Ghule Darshan Dipak	Material Handling System With Geneva Mechanism.	Prof. E.N. Aitawade
141		2) Kadu Siddharth Shekhar		
142		3) Vitkar Sahil Vyankat		
143		4) Sayyad Imran Shabbir		

144	37	1) Dhumal Purva Ganesh	Study & Modelling of Turbo Jet Engine.	Prof. S. J. Shrivastava
145		2) Zende Prathamesh Anil		
146		3) Chavan Piyush Sanju		
147	38	1) Vaidya Saurabh Kumar	Six Wheels Rockers Bogie Mechanism.	Prof. S.G. Aghor
148		2) Kale Omkar Vikas		
149		3) Panchal Vaishnav Rajendra		
150	39	1) Alim Aniket Anant	Regenerative Braking System.	Prof. B.P. Shinde
151		2) Surve Pavan Krushna		
152		3) Junnarkar Abhishek Vasudev		



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PROJECT TITLE: - FERTILIZER SPREADING MACHINE BY USING BRAKING SYSTEM.

Abstract:-

Sugarcane is the most widely grown crop in India due to rapid development in the sugar industry in India. Sugarcane is grown on around 2.8% of the gross cropped area of India. To achieve a good yield of sugarcane crop use of fertilizers is obvious. Fertilizers provide plants with the essential chemical elements needed for growth, particularly nitrogen, phosphorus and potassium. Solid chemical fertilizers are one of important sources for plant nutrition; they provide the plant with important nutrients needed for growth during the periods of its growing life, and also it works to improve the properties of soil (soil structure and the degree of acidity).

The objective of this invention is to provide a simple and inexpensive fertilizer spreader. in the form of a 'walk-behind' device which may be easily and quickly pushed by the farmers for spreading solid fertilizers like urea. This is a type of spreader which can be operated manually for spreading granular materials in farms especially for solid fertilizers like urea. When the vehicle is pushed, motion is transferred from rear axle wheels which in turn transmits rotational motion through sprocket (mounted on rear axle) and chain mechanism which in turn rotates the second sprocket connected to a shaft having screw conveyor at both the ends. This rotation of the screw conveyor will discharge the fertilizer which is supplied through a hopper acting as a storage tank.

Name of Students :-

- 1) Randive Karan Ashok
- 2) Rasal Aditya Santosh
- 3) Bobade Yash Shivaji
- 4) Shinde Ravi Mahadev

Guide Name :- Prof. D. A. Khope



Project Photo :-



PROJECT TITLE: - AUTOMATIC SOLAR TRACKING SYSTEM.

Abstract :-

Solar energy is the only energy that gained its popularity and importance quickly. Through the solar tracking system, we can produce an abundant amount of energy which makes the solar panel's workability much more efficient. Perpendicular proportionality of the solar panel with the sun rays is the reason behind its efficiency. Pecuniary, its installation charge is high provided cheaper options are also available. This project is discussed all about the design and construction mechanism of the prototype for the solar tracking system having a single axis of freedom. The main control circuit is based upon an Arduino microcontroller. Programming of this device is done in the manner that the LDR sensor, in accordance with the detection of the sun rays, will provide direction to the DC Motor that in which way the solar panel is going to revolve.

Through this, the solar panel is positioned in such a manner that the maximum amount of sun rays could be received. In comparison with the other motors, the DC motor is the simplest and the suave one, the torque of which is high and speed of which is slow enough. We can program it for



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changing direction notwithstanding the fact that it rotates only in one direction subject to exception as far as programming is concerned. 1985, first time ever it was witnessed for production of the silicon solar cells with an efficiency of 20%.

Though a hike in the efficiency of the solar panel had a handsome increase still perfection was a far-fetched goal for it. Below 40%, most of the panels still hover to operate. Consequently, people are compelled to purchase a number of panels in order to meet their energy demands or purchase single systems with large outputs. Availability of the solar cells types with higher efficiencies is on provided they are too costly to purchase. Ways to be accessed for increasing solar panel efficiencies are a plethora in number still one of the ways to be availed for accomplishing the said purpose while reducing costs, is tracking. Tracking helps in the wider projection of the panel to the Sun with increased power output. It could be a dual or single axis tracker. Duality ragged up with better compatibility as far as tracking of the sunlight from both the axis is concerned. Commercially single tracker is cheaper to use though the boom of power is considerable and therefore a minuscule increase in the price is worthy and acceptable, provided maintenance cost should float around on an average level.

Name of Students :-

- 1) Aavate Prathamesh Hari
- 2) Jadhav Vishwanath Laxman
- 3) Rananaware Aniruddha Kailas
- 4) Kad Sarthak Satish

Guide Name :- Prof. N. A. Mulani

Project Photo :-



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PROJECT TITLE: - DESIGN & MANUFACTURING OF GRANT ROBOT WITH LINEAR MOTOR TECHNOLOGY.

Abstract:-

As per technical evolution and latest requirement and related trends taken into consideration here elèctively created an advanced optimistic system which can be used as a lift with multiple movements and also work as a storage and retrieval system. This system works on rack and pinion technology with Vertical movement, horizontal movement and to and fro movement. This complete system is power optimized and works on 12 v DC only with desired current rating according to the motor used. This system uses rack and pinion mechanism for horizontal movement and to and fro movement. This complete system uses high torque and medium torque motors. This system having advantages i.e. Multilevel movement is possible using advanced arrangement, Optimistic design with secured movement, Shock Resistant, Easy to set up anywhere according to design System able to lift any material, machines and devices with the use of high torque motor and proper arrangement of



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system. This system can work as a universal lifting system for any industry, factories, schools and colleges, hospitals and malls.

A Rack and Pinion Lift is composed of two gears and a Rack and Pinion arrangement. The flat helical gear is the rack and the round helical gear is the pinion. The rack has teeth cut into it and they mesh the teeth of the pinion gear. Also a spur gear is connected to the shaft of the pinion. And this gear is connected to another gear by using a chain drive. One of the spur gear is connected to the shaft of the torque and transfers power by using a chain. The motor is running by using a 12 v battery. A rack and pinion is used to convert between rotary and linear motion. This rack and pinion lift is commonly used in many industrial applications. A rack and pinion lift consists of a rack and a pinion engaging also transfer motion to or from a special kind of spur gear called a rack consisting of a series of teeth in a straight line on a flat surface.

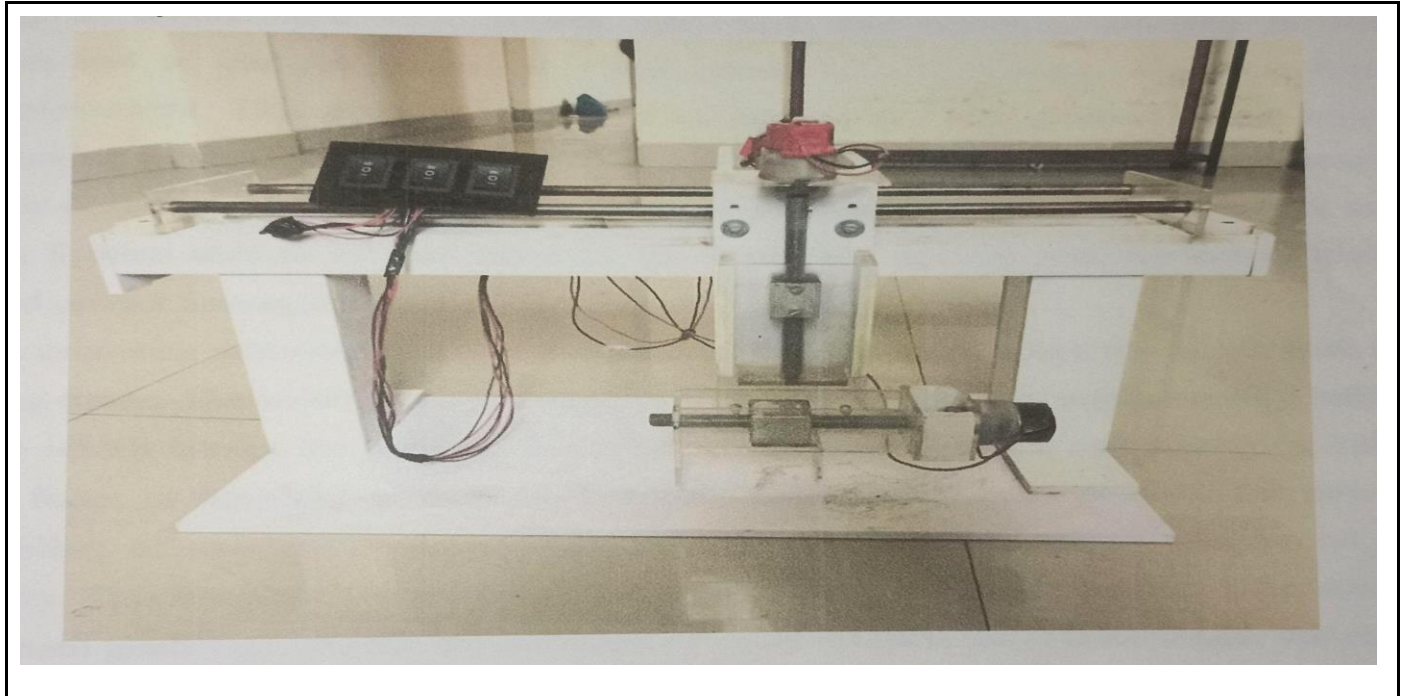
The invention relates to rack and pinion lifts, which include a lift car which is driven via toothed wheels by means of an electromotor along a rack carried by a lift mast, said car containing a control and maneuver unit for the electric motor with a control and maneuver button set including floor call buttons, landing based call button units being connected to said control and maneuver unit via a ground level unit from which also a power cable leads to the lift car in the field of technology, Everyday a new technique is launched. It has its own characteristics due to which we have to not. Today is the world of new technology which we have to take in practice. Material handling equipment is one of the areas of development. This Material Handling Equipment is widely used in the mechanical field. No matter what you're moving online, the material handling machine can help to make the job earlier, more efficient and reduce the margin for error, saving your business thousands of rupees each year. In the industrial assembly processes, the USING RACK AND PINION MATERIAL HANDLING DEVICE" has the unique capabilities to carry away the load which is loaded on it at one workstation to the another workstation on the same floor, at a definite distance. It does not require any kind of power supply as it works on its own weight of the load.



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Project Photo :-



Name of Students :-

- 1) Alvi Sohail Allauddin
- 2) Choudhari Omkar Babasaheb
- 3) Mahajan Ganesh Kishor
- 4) Kadagi Venukumar Ravindra

Guide Name :- Prof. D. M. Pathak

PROJECT TITLE: - GRAIN COLLECTING MACHINE.

Abstract:-

A simple manually operated grain collector and bagging made of locally available materials using local manufacturing technology was designed, fabricated, and tested for collecting and bagging of grains(paddy) dried on concrete pavement. The invention belongs to the technical field of



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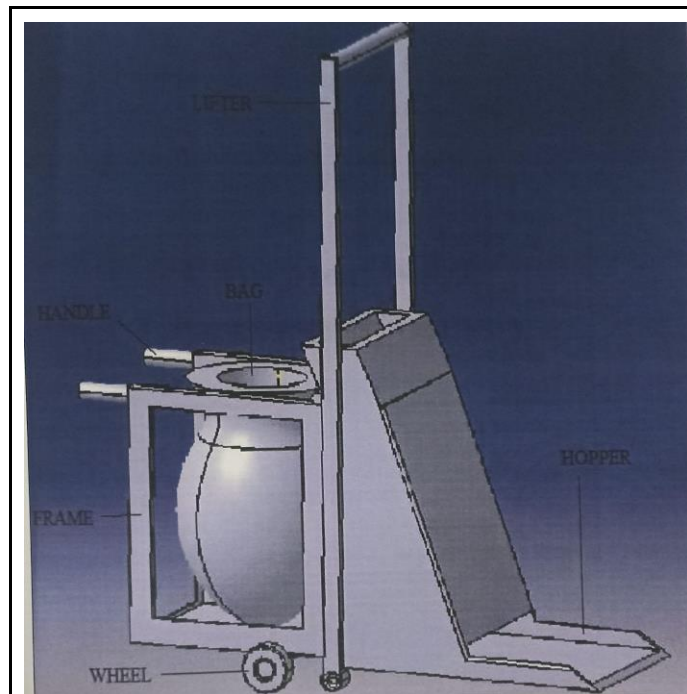


agricultural machines, and relates to a tool applied when grains are collected after being aired, in particular to a manual grain bagging machine.

Grains are automatically loaded into a dustpan by pushing the manual grain bagging machine with hands, a hand wheel of a drive assembly is rotated so that a gear can push a rack to move upwards at first and then move horizontally, and a stop bar on the dustpan is blocked by a left arc baffle and a right arc baffle so that the a dustpan can tilt to pour the grains into an opening bag.

A simple manually operated grain collector and bagging had the following major components: frame, wheel, long pipe, vertical stand frame (bars), horizontal bars, collector, and bag. Radial flat bladed type base plate, slot bar, sweeping box, bagging area, frame and the conveyance system. Results showed significant differences on the collecting capacity, and noise level. Other parameters such as collecting efficiency, air velocity, augmented cracked grain percentage. The design was made based on certain assumptions and calculations and the collector was built, tested and evaluated.

Project Photo :-





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Name of Students :-

- 1) Hilim Varun Shivram
- 2) Jagadale Harsh Kailas
- 3) Marenavar Prajwal Ashok
- 4) Pasalkar Rutvik Sanjay

Guide Name :- Prof. D. M. Pathak

PROJECT TITLE: - TWO CAVITY HORIZONTAL MOLD.

Abstract:-

For producing intricate and complex shape plastic parts with higher dimensional accuracy, injection. The molding method is widely used. Presently, plastic industries are under great pressure due to the globalization of the market, the short life cycle of the product, increasing diversity, the high demand of product quality, meeting requirements by adapting various advanced technologies like CAD/CAM/CAE, concurrent engineering and so on for the development of the injection molded part. The design of a mold is of high priority for product quality and economic processing and also it acts as an integral part of plastic injection molding since the quality of final plastic part is greatly reliant on injection mold. A two cavity injection molding tool design and its mold flow analysis for a given component was taken up according to the industrial specification. Polypropylene (PP) is thermoplastic material used for Fan Blade Back Cover due to its light-weight, durability, recyclable, rugged and resistant to chemical solvents.

The design of the tool includes the design of core insert, cavity inserts, number of cavities in the mold, type of mold, feeding system, side cores and production quantity. After thorough study and necessary calculations of the component for achieving shape, size critical parameters, to help in proper selection of parting surface, ejection system, feeding system, selection of suitable injection molding machine based on clamping force calculation and the manufacture of mold to produce better-



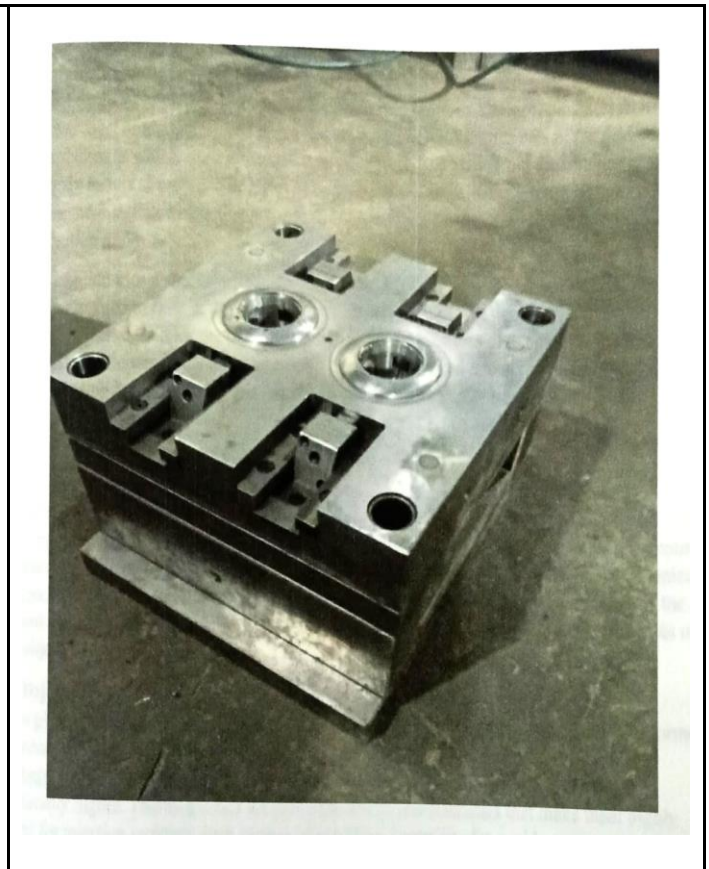
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quality components was done. 3D virtual models are created using the Solid works software. The 2D drawings were drafted using Auto-CAD software.

The core and cavities are extracted through modeling software and Mold Flow Analysis was carried out. Complete mold design is designed after conducting the mold flow analysis and optimizing the gating and the runner design by CAE software for flow and solidification of the liquid material into the cavities. It determines the optimal combination of part geometry, material choice and processing parameters to produce quality finished parts. This work also reveals results of fill analysis, pack analysis, warp analysis and cooling analysis. Finally, based on the analysis results, the manufactured mold was tested for the production of the final product, with precise specification of the Industry requirement. The present work can also be further extended for a detailed stress and fatigue.

Project Photo :-





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Name of Students :-

- 1) Shinde Lalit Vishnu
- 2) Naske Rushikesh
- 3) Kulkarni Prathamesh P.
- 4) Jadhav Rohan Vinayak

Guide Name :- Prof. S.G. Aghor

PROJECT TITLE: - WORKING MODEL OF SOLAR SPRAYER.

Abstract:-

The population of India is increasing rapidly in order to fulfill their diet & needs, the production of foods must be increased. But this must come at an affordable price to everyone. In India farming is done in traditional ways. Besides that there has been larger development of industry and service sector as compared to that of agriculture sector.

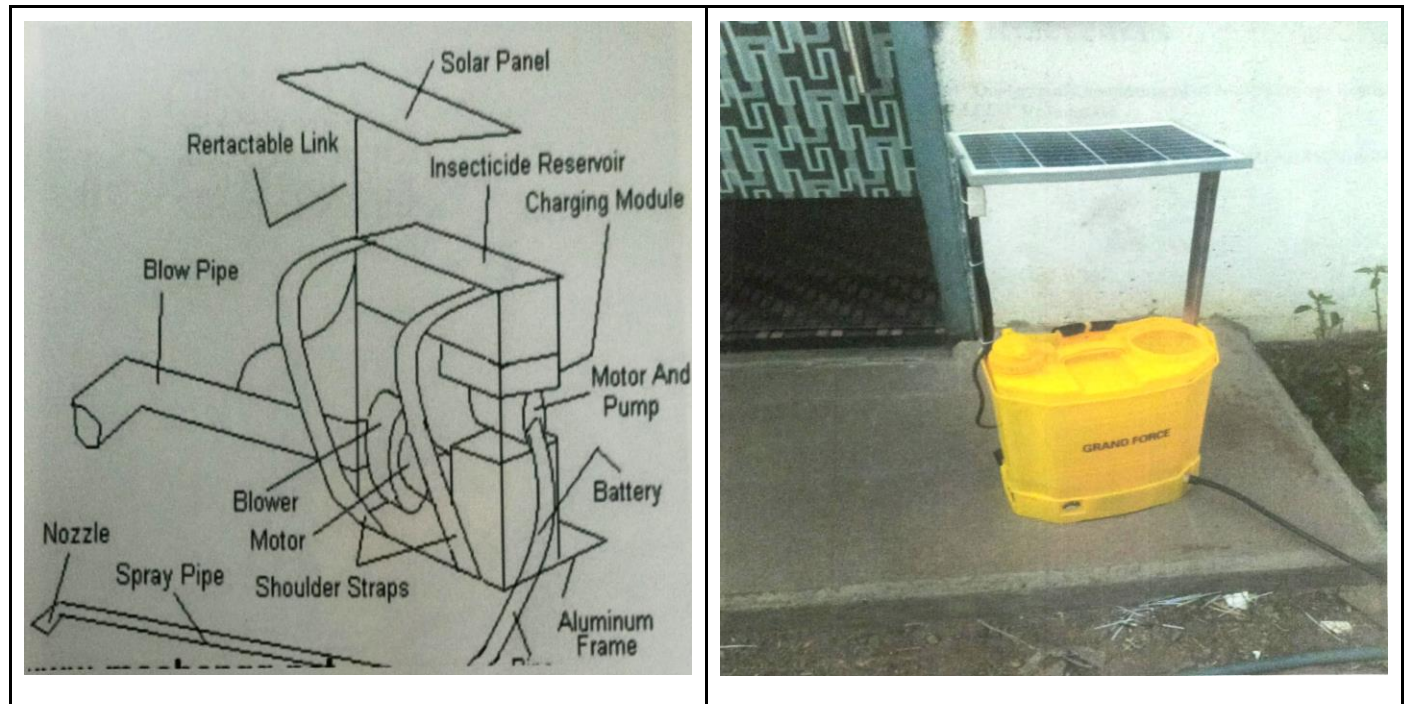
To mechanize agriculture in India some equipment has been developed. The pesticide sprayer is one among them and it is done by traditional farm workers by carrying backpack type sprayer, which requires human effort or by using an electric pump. To improve the agriculture system and to reduce the human effort and problems associated with the backpack sprayer new equipment is fabricated which will be beneficial to farmers.

The equipment utilizes renewable energy source (Solar energy) which is eco-friendly to function. The solar panel gives out electric supply to the system, the radio controlled transmitter and receiver minimize drudgery of farmers. Also minimize the wastage of pesticide and time.

Our contribution on our project is by using eco-friendly reliably available solar energy as a main source of energy making this multifunctional sprayer device by advancing the spraying methods which make it friendly to use and operate which can be usable in different spraying stages of farming

as per process requirement. It can be operated in small farming land with the standard spacing decreasing the labor cost and human effort.

Project Photo :-



Name of Students :-

- 1) Bhor Kajal Ashok
- 2) Bhanage Jay Jagdish
- 3) Kadepurkar Lokesh Bharat
- 4) Jagtap Vinayak Anil

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PROJECT TITLE: - CMM CONTROLLER CABINET.

Abstract :-

The ergonomic and mobile CMM Controller Cabinet offers the flexibility and workspace optimization required on the production floor and metrology lab. We are manufacturing a CMM Controller Cabinet that is not only used in industries and metrology lab that can be used for domestic purposes. That helps us to organize wires of electrical equipment. We also provide an extension board in the cabinet and cooling fan to cool a system like CPU, process automation and predictive maintenance play an essential role.

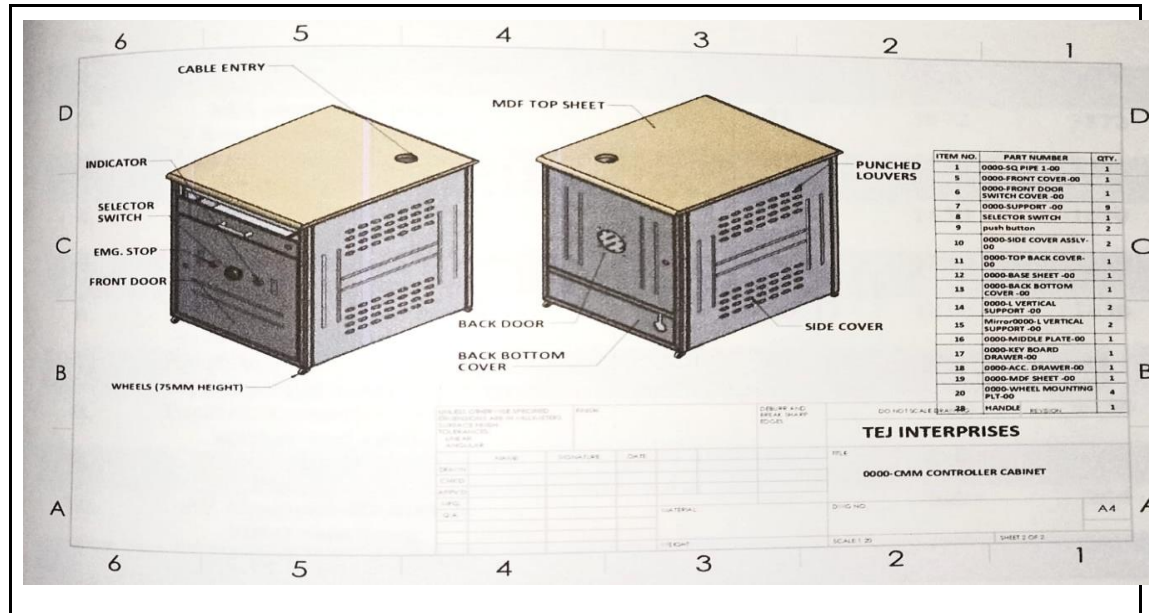
There is a need to provide more effective and faster maintenance through the integration of industrial tools and processes, to support manufacturing operations, in the perspective of integration standards and architectures. In a typical maintenance system, registration and maintenance requests are made through maintenance orders, which consist of a standard form and usually are created and filled manually. However, predictive maintenance requires a higher level of automatization, from data acquisition to maintenance order generation in a Computerized Maintenance Management System (CMMS) / Enterprise Asset Management (EAM).

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- 3) Adhav Viraj Vikas
- 4) Waghmare Soham Subhash

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Project Photo :-



PROJECT TITLE :- POWER GENERATION BY USING GYM LAT MACHINE.

Abstract:-

In a world with growing demand for energy, it has become a necessity for alternate sources of energy. As a result various inventions have been made to overcome the issue. Increasing efficiency of electrical and mechanical products has been one of the ways to reduce energy consumption. These techniques are useful for reducing energy consumption. One such way is to develop alternate sources of energy which will help us to save energy. Geothermal energy, biogas, solar energy, wind energy are various forms of energy which are used alternatively today. One such source of energy is Human Power. Human power is an endless source of energy which has been wasted. Humans eat food and spend it on his work without proper conversion of energy.

Human kinetic energy can be extracted and transferred to small scale power applications in several different ways such as pedaling bicycles and hand-crank tools. In this research an energy



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harvesting system using human kinetic energy was presented. For this purpose, the Lat pull downs were investigated for potential waste mechanical energy capture.

Project Photo :-

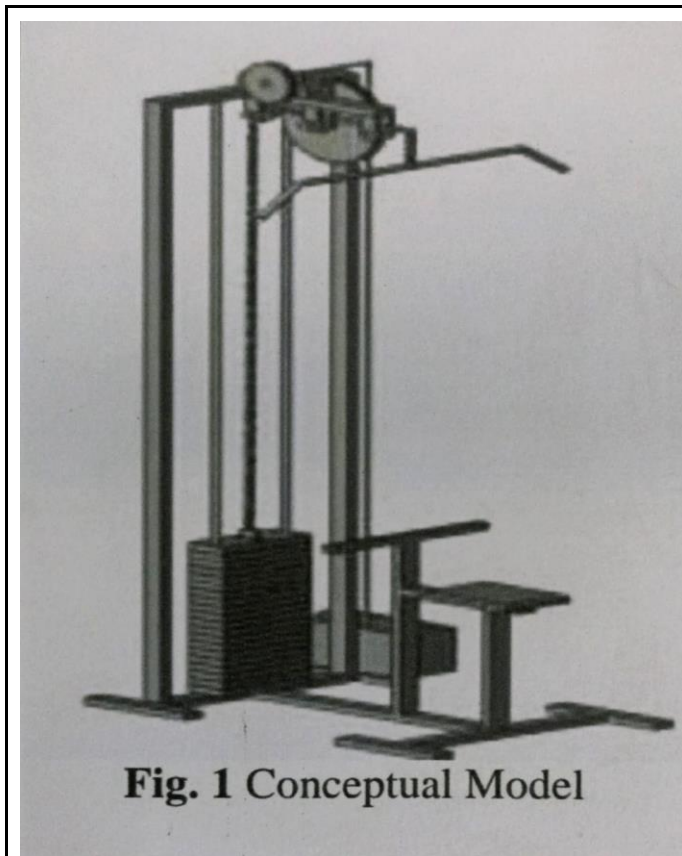


Fig. 1 Conceptual Model



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PROJECT TITLE: - LOAD ASSISTING HOOK FOR CIRCULAR OBJECT.

Abstract :-

Machines to lift circular objects are lesser in the market. Circular objects can be lifted and transported from one place to another through hooks which are provided in this mechanism. The hooks will expand to certain limits according to the circular dimension. External system will support the performance of the hooks for lifting the objects. It can lift maximum load up to certain size limitations. The raw materials used are specifically classified with their good lifting capacity. The mechanism is assembled and designed in such a way that it can be operated and handled easily.

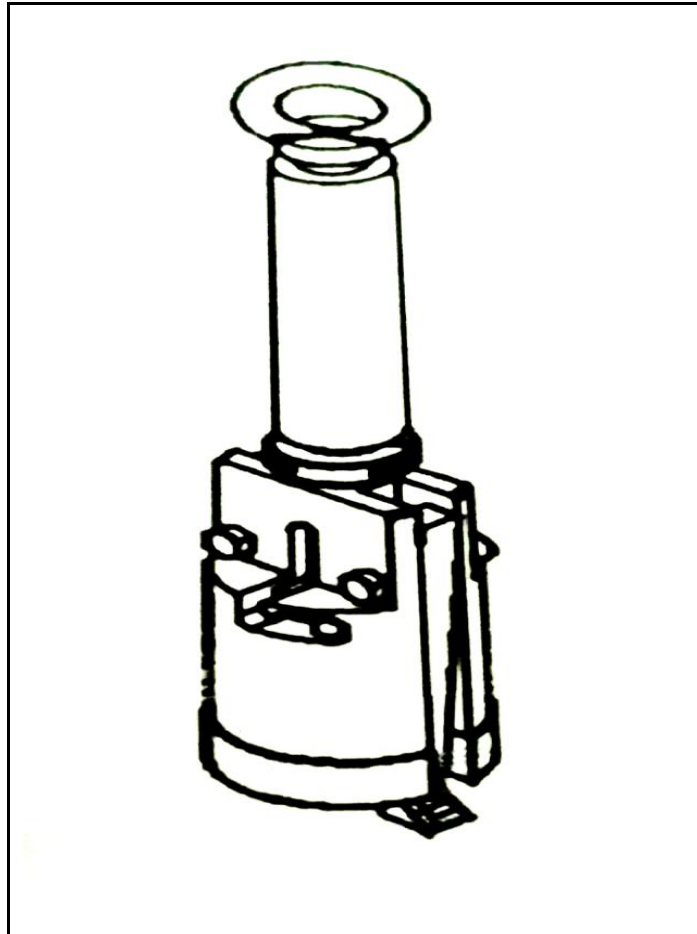
Lifting mechanism for carrying loads includes a hook as the base structure. Traditional techniques used for designing hooks result in over designed structure. Base design and analysis of hooks done using FEA and experimental stress analysis techniques. Concept hook design achieved using CAD software. Optimization will be achieved through FEA packages like Ansys/ Optistruct/ Hyper mesh. Strain gauging installed at high strain location for measuring strain to quantify then within Elastic/yield limit. Machining/EDM used for achieving optimized hook model dimensions. Comparative analysis done between FEA and experimental stress analysis results.

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Guide Name :- Prof. D. A. Khope

Project Photo :-



Project Title :- Power Hacksaw Machine.

Abstract :-

This project is on the design and construction of a motor operated hacksaw machine for cutting metal to different size and length with the help of a hacksaw. The objective of this project is to save manpower and time in cutting metals in order to achieve high productivity. It is a cutting machine with teeth on its blade used especially for cutting metals.

The power to the hacksaw is provided by the motor. The motor drives which in turn are connected to the connecting rod. Finally the connecting rod is connected to the vertical arm connected

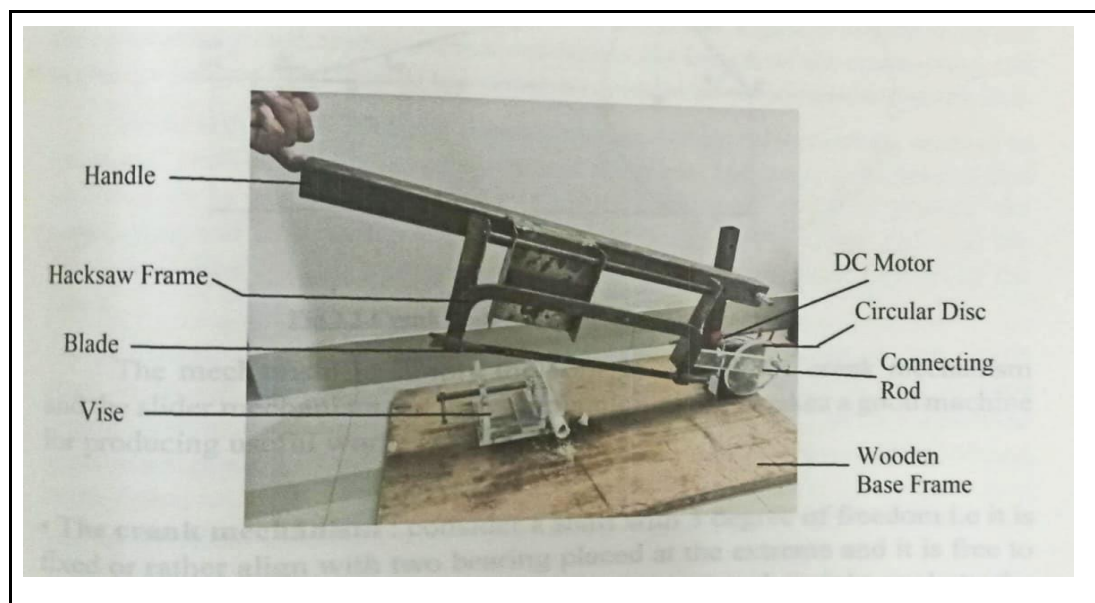


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to the horizontal arm. Rotary motion of the shaft is converted into reciprocating motion of the hacksaw with the help of crank and connecting rod. A piece of desired length can be cut by feeding it to a hacksaw by holding it into a bench vice.

Project Photo :-



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- 4) Ghugare Sandeep Anil

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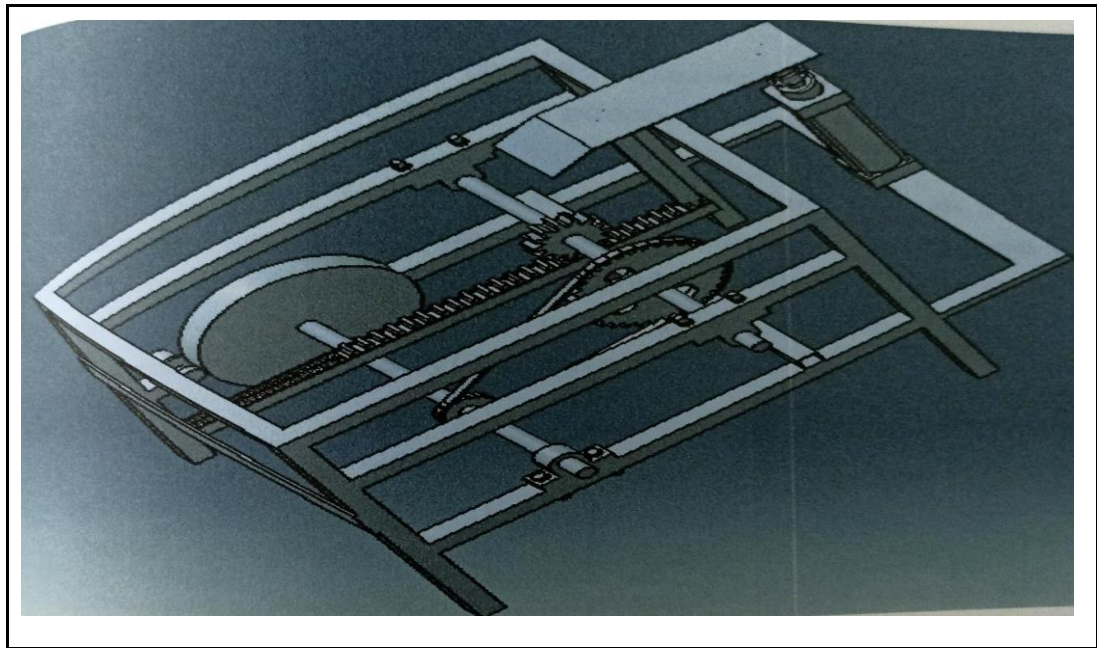
PROJECT TITLE :- SPEED BREAKER POWER GENERATION.

Abstract :-

In this project. We generated power by energy harvesting arrangement, simply vehicle suspension for power applications. Today there is a need for a Non-conventional energy system in our Nation.

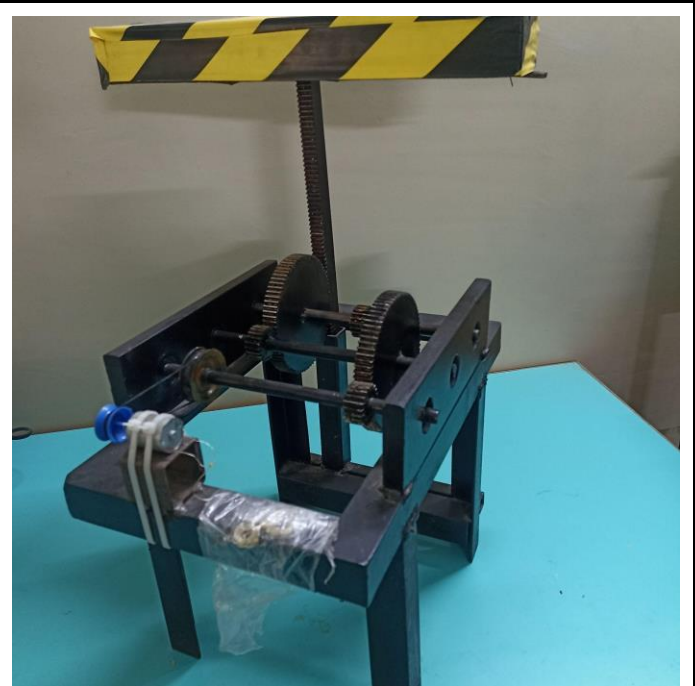
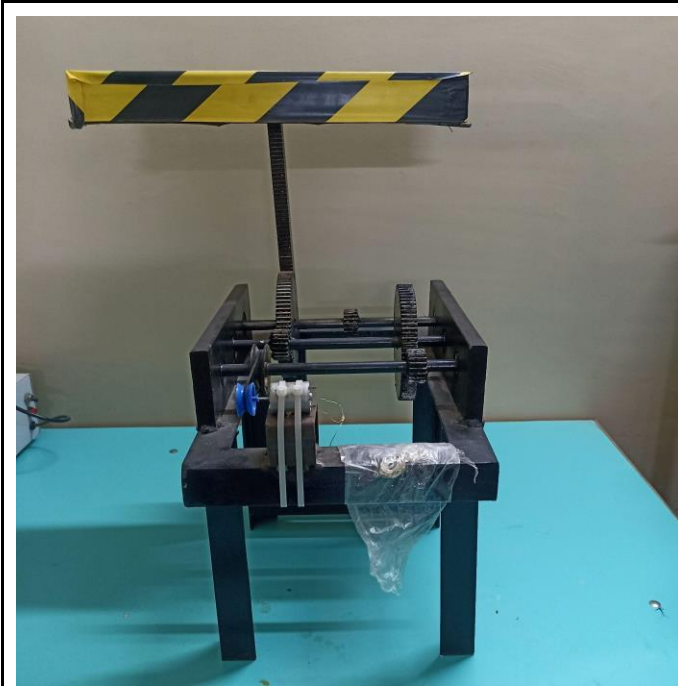
The energy obtained from suspension is one source of generating non-conventional energy because there is no need of fuel as an input to generate the output in the form of electrical power and This is done by using a simple gear drive mechanism. This mechanism carries a rack and pinion. freewheel. cam and follower, chain and sprocket, alternator. The main focus of this arrangement is the harvesting large amounts of power from suspension.

Project Photo :-





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- 3) Gurav Ravi
- 4) Waghmare Siddharth

Guide Name :- Prof.G.G.Naik

PROJECT TITLE: - VERTICAL AXIS WIND TURBINE.

Abstract :-

The project focuses on Design, Fabrication and Testing of a VAWT (Vertical Axis Wind Turbine) with Wind deflectors. The project is an ongoing research project and the phase we carried out was concerned in shifting the design from Darrieus type to Savonius type, which created the necessity



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of freshly designing all the parts, increasing the torque and rpm of the VAWT by implementing a deflector/guide vane System, make the whole structure portable meanwhile maintaining the project within a very low cost range. The said objectives can be achieved by manipulating the knowledge of Design of Machine element, fluid dynamics, Energy Technology and CFD Analysis.

A major concern was fashioning the design to enable the VAWT to operate with maximum efficiency. Several parameters were analyzed with respect to wind speed to determine the best value for each parameter which would give the highest efficiency, thus ensuring the maximum ultimate performance of the VAWT. The parameters that were considered for analyzing are the number of blades the rotor should have, positioning of the blade (i.e. the distance from the shaft to blade and the angle the blade creates with the shaft), the shape of the deflector, and the angle of the deflector so as to generate the highest efficiency. Above parameters were analyzed using ANSYS/Fluent software package and the ultimate design was produced in accordance with the obtained results.

The final design came out with four rotor blades, one rudder and two wind deflectors. Four rotor blades proved to be the optimum design for typical wind speeds available island wide. The rudder would adjust the whole wind vane unit so that the deflectors would face the wind. The two deflectors would capture more wind, converge and direct the wind into the rotor. Results of every analysis are appended in this report.

The final design was virtually created in 1:1 scale in SolidWorks environment and tested for its strength and durability. The fabrication of the VAWT was carried out under few stages, namely the fabrication of rotor blades, fabrication of main shaft with bearings and rotor blade support frames, fabrication of support structure, fabrication of wind vane unit, painting and assembling the structure. As the final step, the VAWT was tested for its performance practically with and without the Wind vane unit, and the results were recorded and then analyzed. The comparison between the two displayed a significant increase in the energy extraction ability of the VAWT from the wind.

Several possible improvements for the design that could be implemented to further increase the efficiency were identified during the practical testing of VAWT and are elaborated further in the report. The targets laid ahead of us at the beginning of the project were successfully achieved through

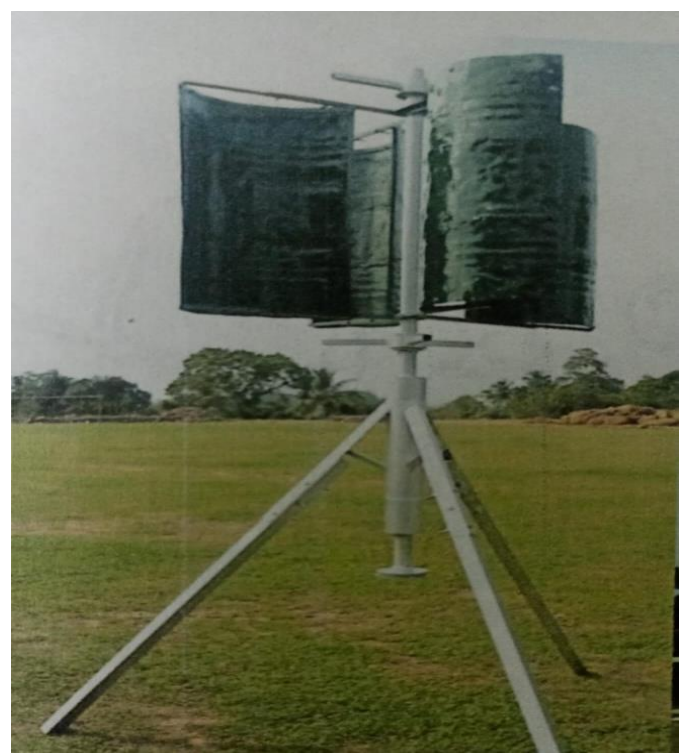


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careful and wise manipulation of theoretical and practical knowledge as well as hands on experience. Objectives were accomplished, not with ease but certainly.

Project Photo :-



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 - 4) Parmar Kushal Manoj

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PROJECT TITLE :- WORKING MODEL OF AUTOMATIC STREET LIGHT.



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Abstract:-

This project aims at designing and executing the advanced development in embedded systems for energy saving of street lights. Nowadays, humans have become too busy, and unable to find time even to switch the lights wherever not necessary. The present system is like, the street lights will be switched on in the evening before the sun sets and They are Switched off the next morning after there is sufficient light on the roads.

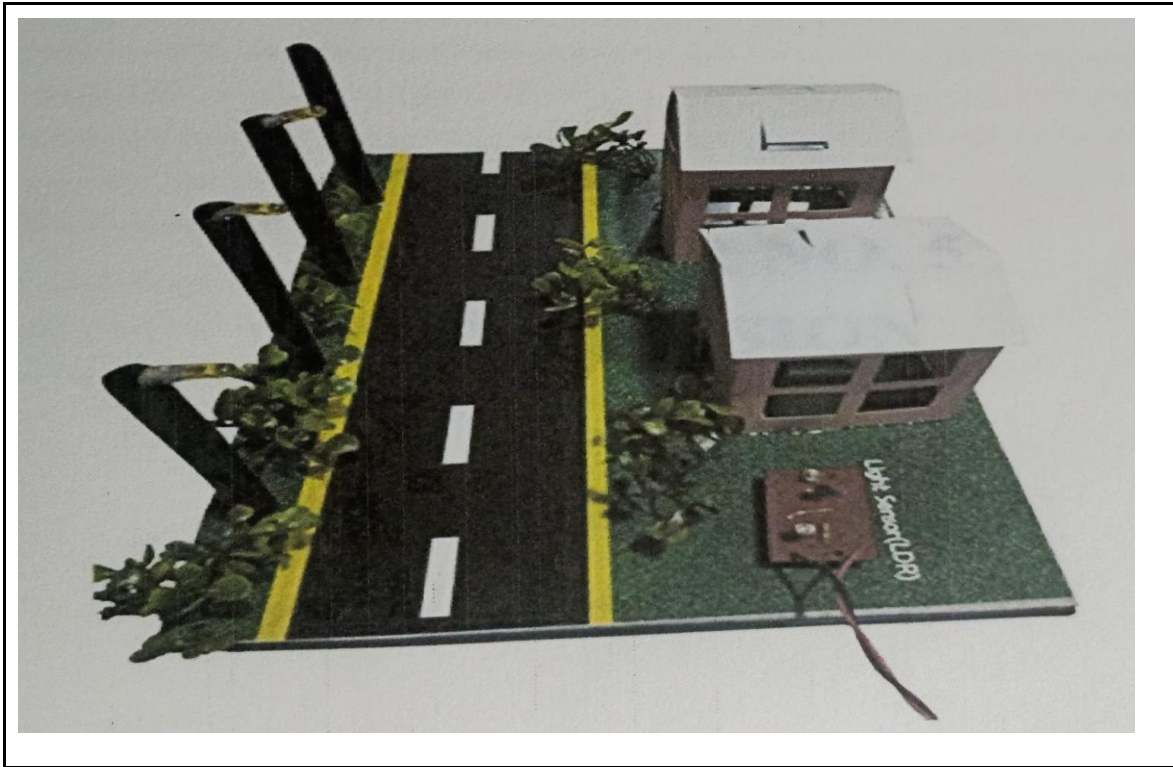
This paper gives the best solution for electrical power wastage. Also the manual operation of the lighting system is completely eliminated. In this paper the two sensors are used which are Light Dependent Resistor LDR sensors to indicate a day/night time. Finally, the system has been successfully designed and implemented as a prototype system.

Project Photo :-





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PROJECT TITLE :- MODIFY EXISTING 360 DEGREE DRILLING MACHINE.

Abstract :-

Nowadays, machines are widely controlled by embedded systems. To meet the need of an exploding population, economic and effective control of machines is necessary. Our project even is rotated to easily drill in any direction. So that job setting operation is not complicated as well as reduces the setting time for the operation. It also takes into consideration the most effective method of controlling the drilling machine by manually. Materials like wood, plastic and light metals can be drilled with this. The work piece is fixed on the work table, which is provided with a moving arrangement. The drilling machine is one of the most important machine tools in a workshop. In a drilling machine holes may be drilled quickly and at a low cost. The hole is generated by the rotating edge of a cutting tool known as the drill, which exerts larger force on the work clamped on the table.

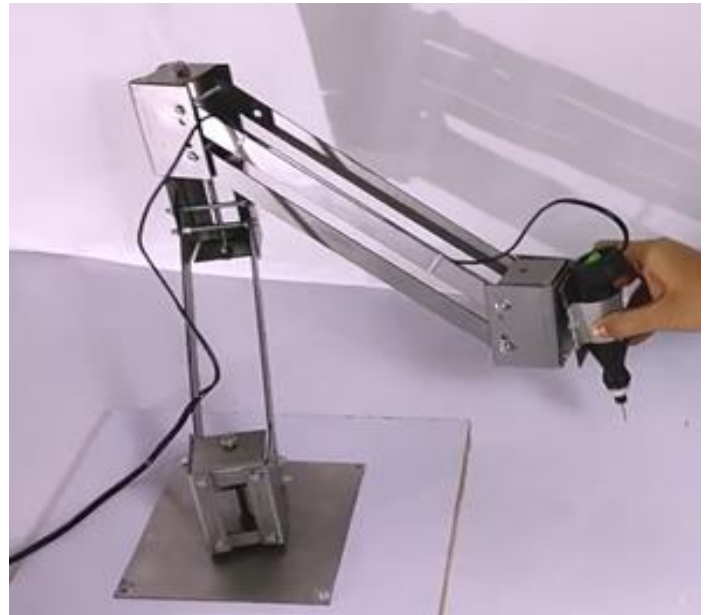
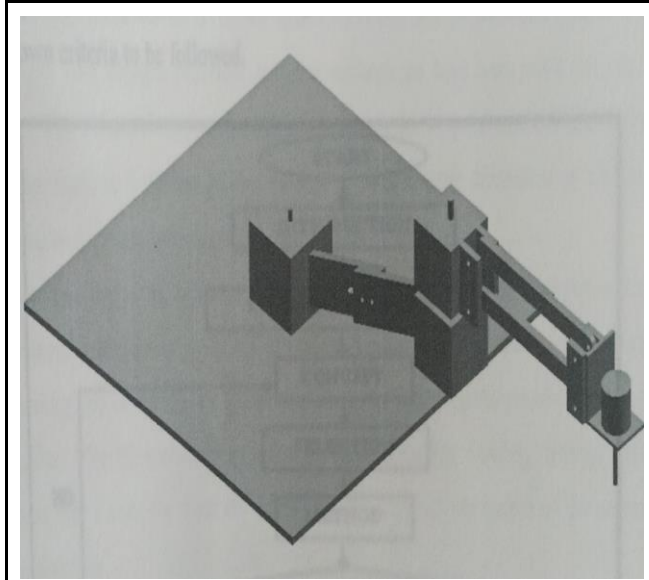
As the machine tool exerts vertical pressure to original a hole it is loosely called a drill press. Drilling is the operation of producing circular hole in the work-piece by using a rotating cutter called drill, the most common type of drill is the twist drill. The machine tool used for drilling is called a drilling machine. The drilling operation can also be accomplished in a lathe, in which the drill is held in the tailstock and the work is held and rotated by a chuck. This angular drilling is performed for Different Angle Drilling in the working job. Indexing Plate and Up/down mechanism is available in this Angular Drilling Machine.

In previous drilling machines many of the problems arise during drilling. Some parts cannot drill due to the small work space between drill bit and work piece. So we use hand drills in these cases but it causes alignment problems. So here I propose a 360 degree flexible drill that can be mounted on a table or wall and can be used to drill holes horizontally, vertically or even upside down. So this makes it possible for easy drilling in even complicated parts and surfaces.

Project Photo :-



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- 4) Kadam Om

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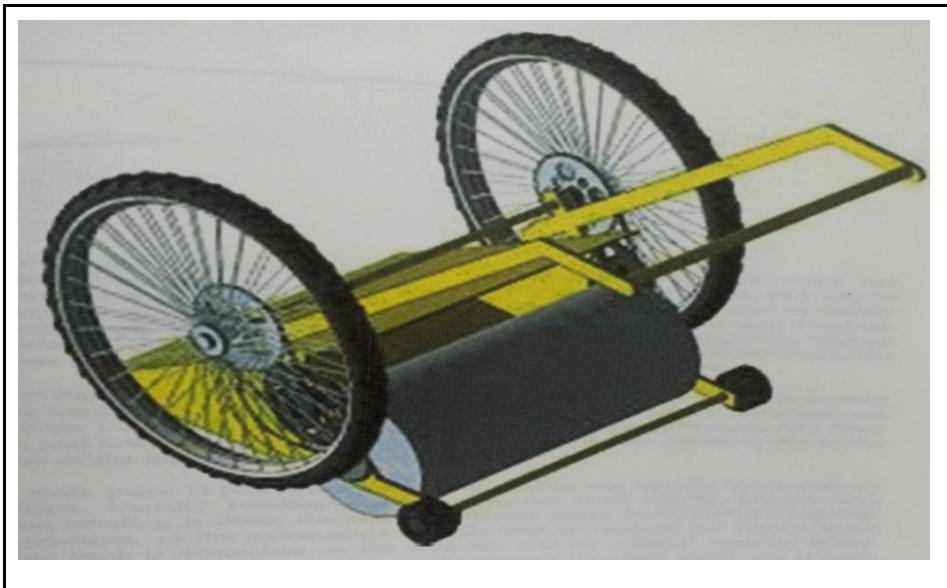
PROJECT TITLE :- FLOOR AND ROAD CLEANER.

Abstract :-

Cleaning has become a basic need for all human beings and it is an unavoidable daily routine process. A road cleaning machine has a wide range of applications. To overcome the rising issues of cleanliness in India the road cleaner can play a vital role. The conventional road cleaning machine is most widely used in railway stations, airports, hospitals, Bus stands, etc. It is not user friendly as well as Eco-friendly. In summer time there is power crisis and most of the roads cleaning machines are not used effectively due to this problem particularly.

In our project we are using easily available materials with low cost. The machine is an assembly of various rigid components. In this report, our motive is to present a detailed qualitative study of the cleaning system used in our machine, the main focus being cleanliness with minimum utilization of resources available with us.

Project Photo :-





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PROJECT TITLE: - STAND MOUNT AUTO SANITIZER DISPENSER.

Abstract :-

Most of the countries in the world are suffering from the CoronaVirus. WHO has already declared it as a Pandemic disease and many cities are in lockdown situations and changing our lifestyle.

In this present scenario of the global outbreak, it is instructed by WHO (World health organization) to maintain Healthy Hand Wash and Sanitation Habits, but the key problem is the way we do It, this is by physical touch. Touching hand sanitizers with infected hands can spread the virus to the next person.

In this project, we will build an automatic hand sanitizer dispenser that uses IR sensors to detect the presence of a hand and activates a pump to pour the liquid on the hand. You can find various Arduino automated liquid dispensers circulating the web. But our motive is to keep it simple and cheap so that anyone can replicate it. Possibly the easiest solution for this purpose is to use a simple transistor with an IR proximity sensor, which would also drastically reduce the costs. Obviously, the absence of a microcontroller removes control over spilling, but using a smaller nozzle would physically maintain the flow of liquid.

Viruses such as COVID-19 are transferable through touch and contact. There are WHO guidelines to clean or sanitize hands regularly to reduce the risk of infection. Dispensing Sanitizer from bottle and storage would require manual intervention. In this paper we propose a novel design of touchless sanitizer machines to reduce the risk due to contact.

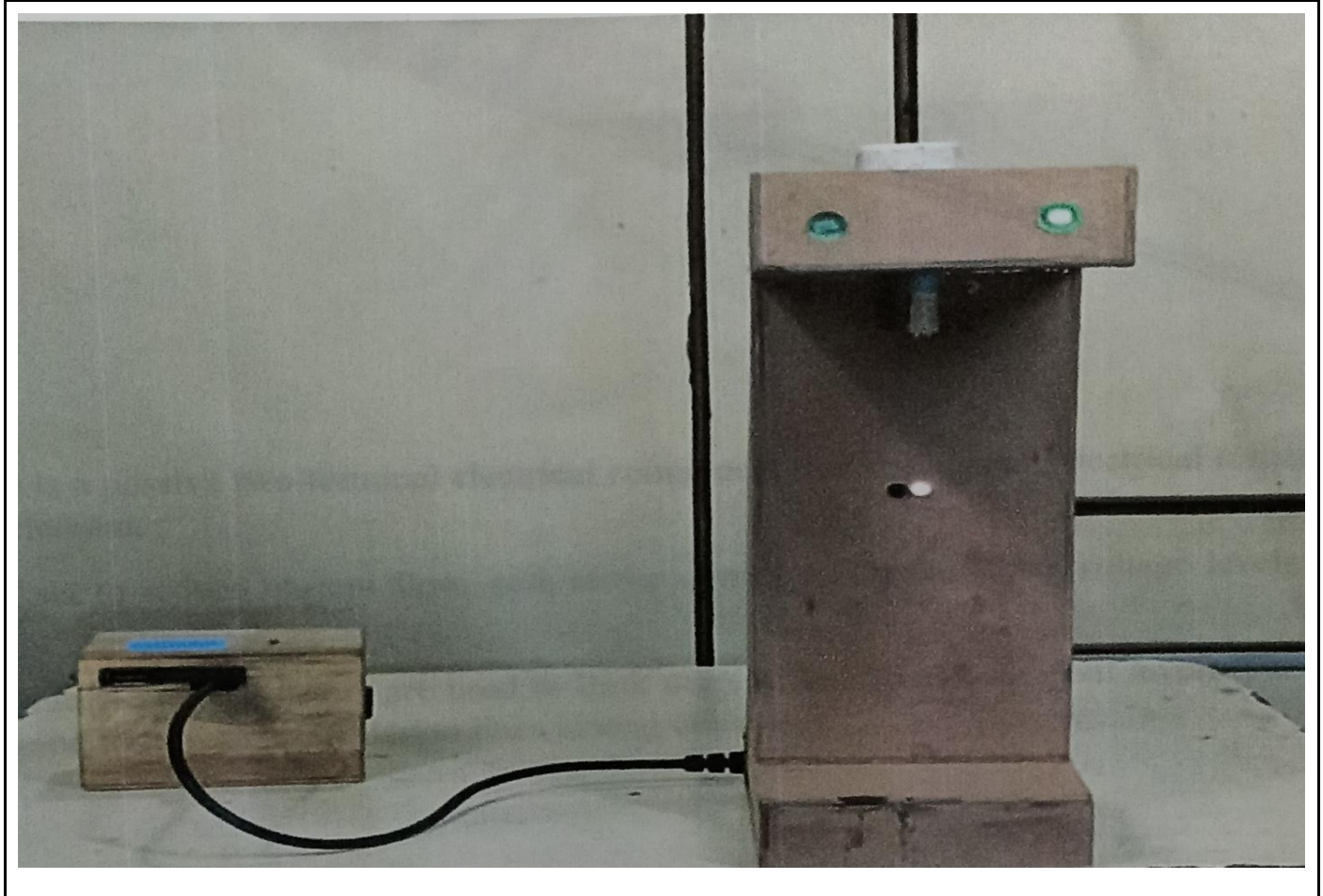
The system can sense the proximity with the help of an ultrasonic sensor and sends a signal to the microcontroller. The controller processes the sensor data & actuates the pump and solenoid valve. The sanitizer liquid dispenses through a mist nozzle.



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Project Photo :-



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- 3) Datir Gorakh Baburao
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PROJECT TITLE: - PNEUMATIC SPRAY PAINTING ROBOT.

Abstract :-

Pipes are used in many applications to move fluids from one place to another. The most common examples being use of pipes in water supply systems, or oil refineries and many more. As pipes carry the fluid which often may be corrosive, so also to protect against corrosion due to atmospheric conditions the most common method used is painting the surfaces of pipe with anti-corrosion paint.

Paint application on the external surfaces is easy and can be done without much difficulty, despite the large diameter or long length of pipe. But painting the inner-walls of the pipe becomes increasingly difficult with the increasing length of the pipe. The length of the pipe does-not permit the application of paint as these inner walls become in-accessible. Hence there is a need for a special device that will coat the entire inner-wall of the pipe irrespective of the diameter of pipe or length of pipe.

The Pneumatic spray painting robot is a simple device that carries the entire paint application set up from one end to the other end of pipe and simultaneously applies a uniform spray coat of paint on the inner wall of the pipe. This machine easily solves the above problem which otherwise is really difficult without such aid. The machine needs a compressed air supply and link mechanism for movement of the robot.

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- 3) Pawar Pratik Samir
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PROJECT TITLE: - SCISSOR LIFTING SYSTEM.

Abstract :-

Automotive parts are mostly made of metal, which is a major reason for its large weight and as such requires devices of lifting and displacement of same. In an automobile production and assembly facility, components have to be raised to certain heights which could be more convenient to the personnel working on it. When such a device is not available workers are often forced to bend from the waist to access the Components which can lead to strains and major discomforts or even serious injuries that could affect productivity.

Consequently, an assembly table that will be adjustable will be required for use in the automotive industry to improve the efficiency of personnel working in a production or assembly facility. In order to do this, a mechanism is recommended to be incorporated into a table platform where the height is adjustable.

In recent years, various platforms or devices with various means of application have been produced for use in the automotive industry. The automotive industry has also experienced the influx of various lifting platforms, some of which are Electrically operated lifting devices which are operated by the turning effect of electric motors to drive the gear which will eventually turn a screw shaft to raise or lower load.

Hydraulic operated lifting platform which utilizes the pressure power developed from hydraulic oil to raise or lower a load. Pneumatic lifting device which makes use of air to create pressure or vacuum to raise or lower load. Recent research also shows the use of air bags for raising or lowering load. (Michael Adel, PE (2008): Understanding Scissors Lift Deflection). All these lifting devices have contributed greatly to the advancement recently being experienced in the automotive industry, but most of them are still faced with various challenges. This report presents a scissors mechanism with a table platform that will be horizontal at every level. The proposed mechanism is a double scissors for stability.



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 - 4) Kadam Anurag Somnath

Guide Name :- Prof. S. D. Limaye

PROJECT TITLE: - WIFI CONTROLLED CAR.

Abstract :-

An existing remote-controlled machine will be designed according to the following project plan. The control will be carried out via Wi-Fi, and the order will be made from a web page hosted by the ATmega64 microcontroller. The control of the engines of the car will be done using a DC-DC converter with the H-bridge. The power supply of the assembly will be realized with the help of 41.5 V AA batteries connected in series. The Wi-Fi connection will be provided by an ESP-12F module that will allow the microcontroller access to the Internet network.

The circuit will be designed on a printed wiring board, designed with the Eagle software and the software development of the project will be carried out in the Atmel Studio environment. To control the direction of the car two DC motors will be used, the one in front for the left-right direction and the rear one for the front-rear steering. The front-engine is equipped with a mechanically driven mechanism, which will move after the engine is actuated and will move planetary for the left-right direction.

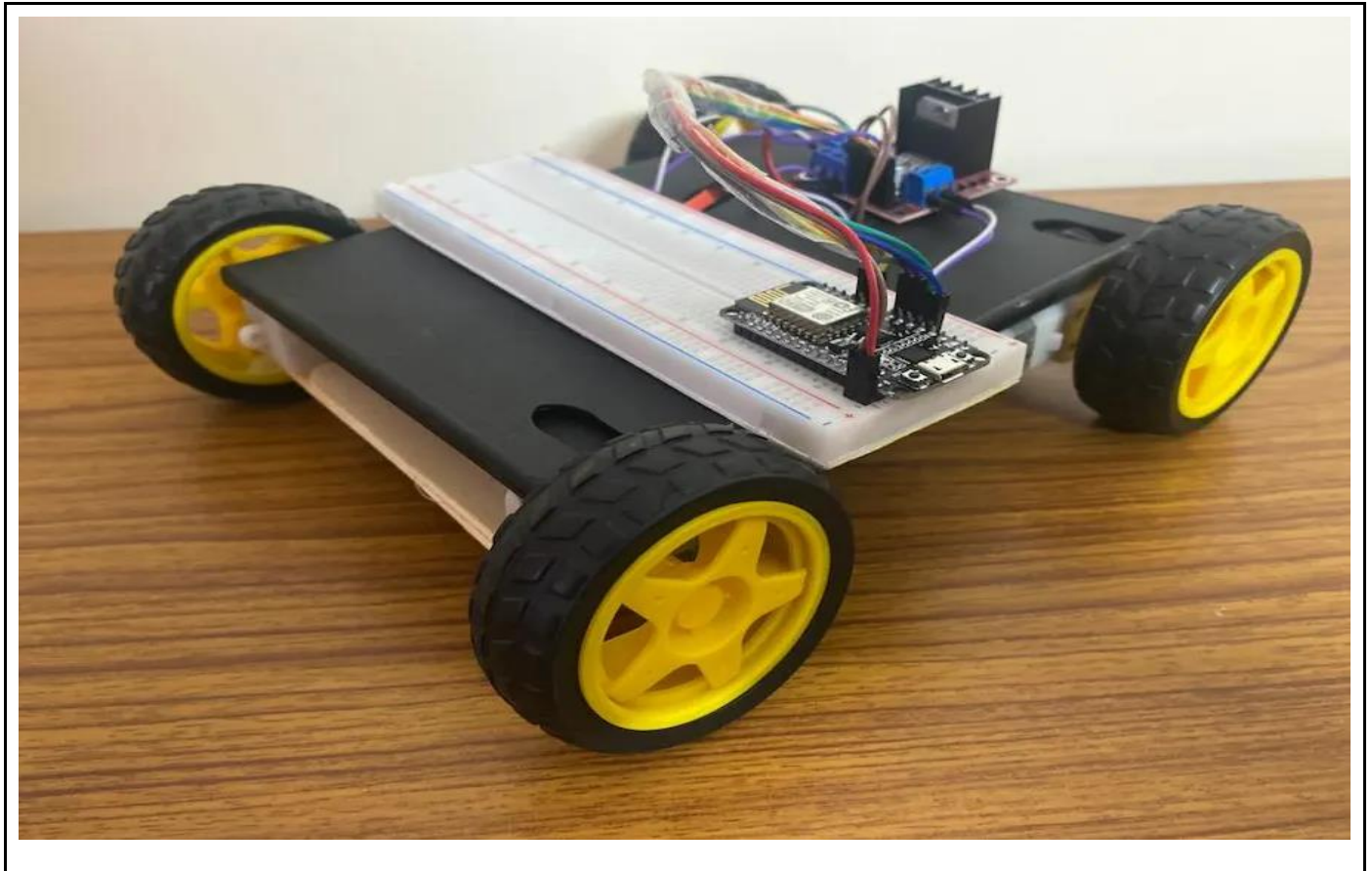
The functions of the car compared to the existing ones that only could be controlled by the remote control, are the movement in the four cardinal points according to the orders received from the web page, as well as the illumination of the road by lighting the headlights in front. Also on the web page, you can see in real-time the battery voltage level.



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Project Photo :-



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- 2) Bhosale Omkar Dattatray
- 3) Shinde Aniket
- 4) Bonde Pratik Kamalakar

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PROJECT TITLE: - PNEUMATIC GARBAGE SEPARATOR.

Abstract :-

Plastic pollution of our oceans is becoming a bigger problem every day. The production of new plastics is extremely cheap and convenient, resulting in a lack of incentive to retrieve plastic litter. Annually 8 billion kg of plastics enter the ocean, polluting the ocean environment, of which the largest part via rivers and other waterways. Eventually, plastic enters the food chain through fish and other sea life. Organizations are arising worldwide to reduce the plastic stream to the ocean. The pneumatic garbage separator is based on the idea of filtering plastic rivers by making use of bubble curtains. The principle behind this idea is as follows: a long tube is placed diagonally across a river and air is pumped through it, creating a wall of bubbles. The rising bubbles enhance upward entrainment of the surrounding water. When approaching the surface, the vertical flow is transferred into horizontal flow away from the bubble curtain on both sides. Together with the cross-flow, this horizontal flow induced by the bubbles drives the plastic to the side. This horizontal flow is strongest at the surface and decays linearly down to 25% of the water depth.

Therefore, only the plastic litter floating in the upper layer is affected. The vertical and horizontal flow induced by the bubble curtain in still water has been extensively researched in the last century. In this thesis, the influence of the cross-flow on the behavior of the bubble curtain is explored. Predictions of the horizontal surface flow are based on a theoretical model and validated with experiments performed at the Eastern Scheldt Flume at Deltares. The model is based on the assumption that the maximum bubble-induced horizontal velocity is not influenced by the strength of the cross-flow. At every depth in the surface layer, the two velocities can be summed up. Depending on their magnitude and the angle of the curtain, the direction of the resulting flow at that depth can be calculated. If the resulting flow is directed to the upstream side of the bubble barrier, the plastics are assumed to stay on the upstream side too and will, therefore, be led to the side of the river. If the resultant is directed to the downstream side of the bubble curtain, the plastics are assumed to get



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through the vertical velocity of water in the plume, as well as the horizontal bubble induced velocity is calculated using two equations.

One is derived from the momentum balance and the second is empirically found by Bulson. The results of both equations are compared with the experiments. For the vertical velocity, the momentum balance derived equation gives better results, whereas Bulson's equation gives a higher accuracy for the horizontal velocity. The cross-flow is described by a logarithmic profile. For all angles and cross-flow velocities, the airflow required to keep the resultant upstream can be calculated at every depth in the surface layer. The airflow that is theoretically required to keep the resultant at a 10 cm depth upstream, is shown to be sufficient to block 90% of the tested objects in all experimental setups. The smaller the angle relative to the direction of the crossflow, the smaller the total required airflow over the whole tube despite the longer required tube length. This work has gained a better understanding of the working principle of a bubble curtain as a plastic barrier. Further research on its performance in deeper waters is advised.

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- 3) Pawar Rajat
- 4) Inamdar Taufik

Guide Name :- Prof. S. D. Limaye



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PROJECT TITLE: - RECIPROCATING AIR COMPRESSOR FOR EMERGENCY IN HEAVY DUTY VEHICLES.

Abstract :-

An air compressor is a pneumatic device that converts power (using an electric motor, diesel or gasoline engine, etc.) into potential energy stored in pressurized air (i.e., compressed air). By one of several methods, an air compressor forces more and more air into a storage tank, increasing the pressure. The purpose of the compressor is to circulate the system under pressure, this concentrates the heat it contains. At the compressor, the low-pressure gas changed to high pressure gas Air compressors function based on a very simple principle. When the air is compressed, its volume decreases whereas the pressure increases. The most common way to achieve this is with the help of a reciprocating actuator. We are adding an extra small reserve wire tank to heavy automobiles (vehicles) for emergency refilling of tires.

Name of Students :-

- 1) Mahagaonkar Asawari Madhukar
- 2) Yadav Omkar Nilesh
- 3) MD Taslim
- 4) Kachare Vishal Balu

Guide Name :- Prof. R. H. Tike



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PROJECT TITLE: - HYDRO ELECTRICITY GENERATOR PIPE.

Abstract :-

Instead use the forceful water flowing through a pipe. Tap Water is a suggestion for the growing Power demand. If every house could use a cheap mini Generator for every flowing pipe, can't that light up the bathrooms When the pipe is in flowing condition?

The idea could be extended to the Overhead tanks too. The energy is trapped from the flowing Water, where the work of the turbine could be done by a Mini fan, which is connected to a mini-sized generator to Generate Electricity. The USP or the thing that makes this Idea unique is that No conditions apply! Every house will Have a water flowing pipe and every household wants to reduce the Electricity bill. It could be possible with a moderate investment. If batch Processing could be achieved, the manufacturing cost would Come down too.

However, the challenges that come on the Way are many. They include varying force of water, Intermittency in the usage, the very less power that one Could trap from every water pipe. Then why not all the pipes, But the problem of integrating a number of generators to Supply and store energy in a single battery or integrating Them to the grid Voltage and frequency becomes a major Issue that has to be handled.

Thus we need to develop a Circuit for CHARGING A SINGLE BATTERY FROM MULTIPLE ENERGY SOURCES and develop a successful Design to trap energy from the pipes and integrate them. This idea will not only be useful for the pipe but in most Cases of renewable energy tapping as in a cycle dynamo in a Gym or electricity from Tain, where the main problem is the Integration of micro energy sources. This paper throws light On one of the most important practical aspect of micro-Generation of green energy and its integration to the grid Whose idea can be extended to other green energy sources also.



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Name of Students :-

- 1) Shitole Aditya
- 2) More Ankit
- 3) Darwatkar Shubham
- 4) Jawalkar Vipul

Guide Name :- Prof. G. G. Naik

Project Title :- To Find Out The Pressure Drop V/S Mass Flow Of Pneumatic Flow Control Valve.

Abstract:-

During the last few decades various automation and rationalization techniques have been introduced in the field of manufacturing in order to enhance overall industrial productivity. Pneumatic system is a cheap but very effective method of automation technique and hence found extensive use all over the world in robotics and pick and place devices. Certain characteristics of compressed air have made this medium quite suitable for use in modern manufacturing and production plants.

Pressure losses are very important factors that affect the flow in piping systems which conclude different lengths of pipes, diameters, fittings, elbows and valves. In this study water was used as a working fluid at room temperature and physical properties water was used. Different actual and theoretical pressure losses were studied and compared. Pressure drop measurement and prediction in curved pipes and elbow bends is reviewed for both laminar and turbulent single-phase fluid.

A pneumatic system consists of a compressor plant; pipelines control valves, drive members and related auxiliary appliances. The air is compressed in the compressor plant; the flow medium is transmitted to the pneumatic cylinder through a well-laid pipeline system. To maintain optimum efficiency of the pneumatic system it is of vital importance that the pressure drop between generation and consumption is kept very low.

Name of Students :- 1) Prasad Durga Hari



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- 2) Wagh Ganesh Vijay
- 3) Barge Ganesh Shankar
- 4) Parulekar Atish Jeevan

Guide Name :- Prof. S. D. Limaye

PROJECT TITLE: - SAND FILTER MACHINE.

Abstract :-

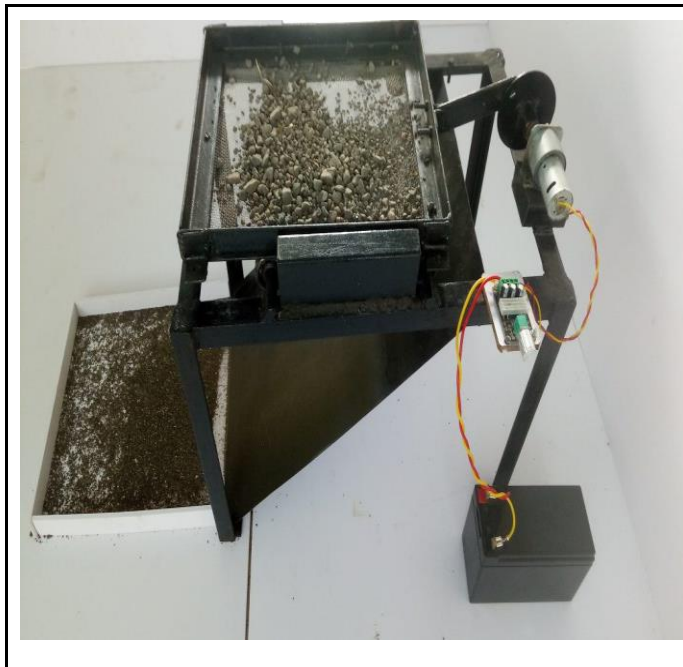
Here we demonstrate the design & fabrication system. Sand is used in construction, manufacturing and many industries. Sand needs to be filtered and separated from unneeded particles, stones and other large particles before it is put to use. Our system puts forward a fully automated sand filtering and separator system that automatically filters sand poured on it. Here we use a motorized shaft that is mounted horizontally using mounts. The shaft is connected to a filter frame with mesh below and enclosing frame on the sides. We now have a rod connected from the shaft to the filter frame in a way such as to achieve the best horizontal motion. Also we have a frame to hold the filter frame in place while ensuring proper horizontal motion at the same time. On switching on the motor using our motor controller circuit, the system allows the motor to operate. This allows us to operate the sand filter motion for appropriate sand filtering needs.

Components : 1) Shaft 2) Motor 3) Mounts 4) Mesh 5) Connecting Rod 6) Supporting Frames

Project Photo :-



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Name of Students :- 1) Dhagare Abhishek Kaluram



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- 2) Ingale Snehal Pradip
- 3) Narale Mahadev Jalindhar
- 4) Pawar Vishal Vijay

Guide Name :- Prof. G. G. Naik

PROJECT TITLE :- ELECTRICALLY & MANUALLY OPERATED PORTABLE WASHING MACHINE.

Abstract:-

Electrically and Manually operated washing machines are a very great innovation on their own.

Electrically and Manually operated washing machine is specially made for the purpose of its utilization to wash the cloth by means of Drill machine. This project includes the construction and utilization of the drill machine.

The main aim of this project is to reduce human effort to provide light washing machines in the rural areas which are very cost efficient. In our country where approximately 70% of the population is living with poor economic status Cloth washing is one of the essential parts of life but it is considered undesirable because of the involvement of effort, time, energy and cost. Nowadays a wide variety of washing machines are available in the market. All of the washing machines available in the market are electric power driven and the basic principle of their operation depends upon the creation of the turbulent flow of detergent around the dirty clothes. In our country where approximately 70% of the population is living with very poor economic status, those people cannot have a washing machine because of cost constraints and unavailability of electricity due to any reason.

The present work is an attempt to develop a concept to make a cloth washing mechanism which can meet the requirements of the above mentioned 70% population of the nation. Working principle of this concept is no more different from available similar types of machine with a different driving



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mechanism of the machine. The objective of bringing down the initial cost and operating cost of washing machines is almost achieved in present work within the limitation of work as mentioned.

Project Photo :-



Name of Students :-

- 1) Tangavade Rahul
- 2) Gaikwad Kartik
- 3) Awate Vivek
- 4) Khutwad Aditya

Guide Name :- Prof. S. S. Suryawanshi



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PROJECT TITLE: - CUSTOMIZED CNC DRAWING BOT.

Abstract:-

Natural convection heat transfer in air from a pin-finned surface is investigated experimentally by considering the effect of radiation heat transfer. The plate was oriented as the pin arrays facing either downwards or upwards from the vertical axis with different angles and the experiments were performed for different values of heater power input. From the results Or the experiments it is observed that the pin fins increase the heat transfer considerably when compared to the unpinned surface. The up facing pins are more enhancing heat transfer than the down facing pins and the enhancement is decreasing with increasing orientation angle from the vertical axis. The plate was oriented as the pin arrays facing either downwards or upwards from the vertical axis with different angles and the experiments were performed for different values of heater power input. From the results of the experiments it is observed that the pin fins increase the heat transfer considerably when compared to the unpinned surface. The up facing pins are more enhancing heat transfer than the down facing pins and the enhancement is decreasing with increasing orientation angle from the vertical axis.

Name of Students :-

- 1) Kachi Samarth Rahul
- 2) Bhalerao Chinmay Sachin
- 3) Tapkir Om Ganesh
- 4) Sakhre Soham Sudhir

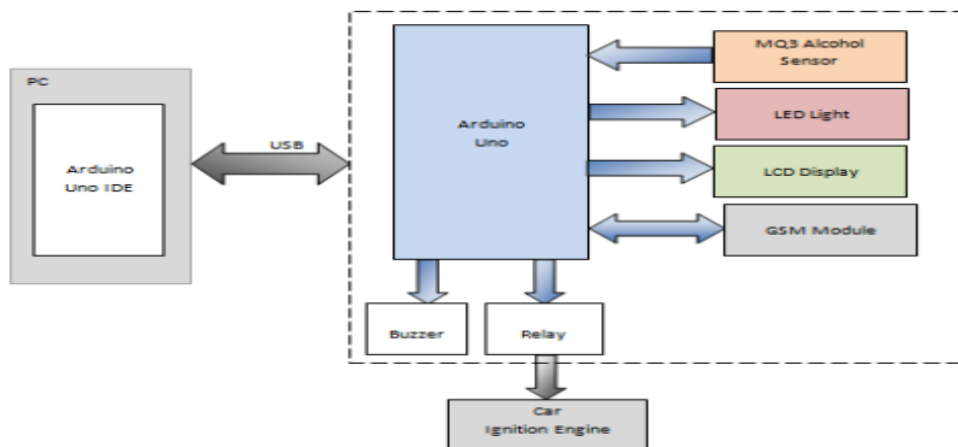
Guide Name :- Prof. S. J. Shrivastava



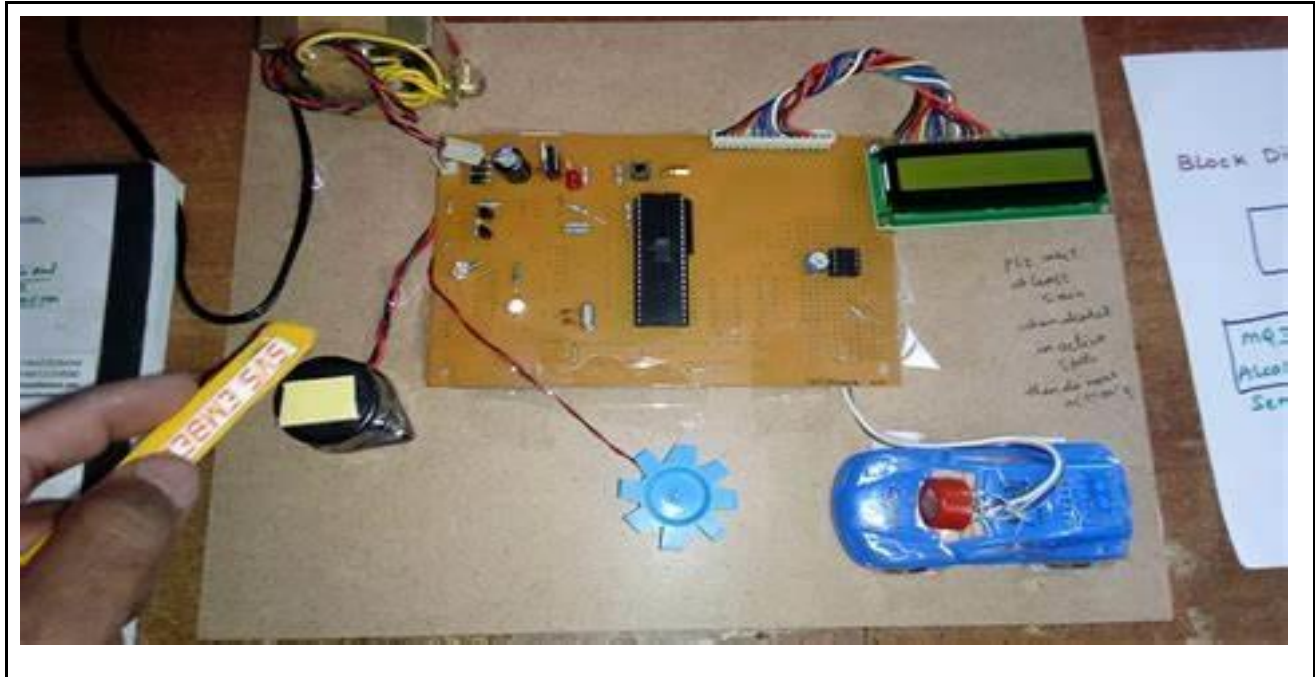
PROJECT TITLE: - ALCOHOL DETECTION OF DRUNK DRIVERS WITH AUTOMATIC CAR ENGINE LOCKING SYSTEM.

Abstract:-

Drunken Driving is one of the most fatal causes of premature deaths around the world. According to WHO, about 20% of fatally injured drivers have excess alcohol in their blood in high income countries whereas the figures may be as high as 69% in low and middle income countries. In India alone, there have been 38,000 road mishaps due to drunk driving in the past three years according to the latest report of Ministry of Road Transport and Highways. The objective of this paper is to make human driving safer and overcome such incidences. The present paper describes the process of detection of alcohol in sample breath testing, developed using Arduino and Arduino Integrated Design Environment (IDE). The system will sense the alcohol concentration in breath and control the switching of the ignition engine according to the data it receives. Also, it allows the driver a delay time in case the breath is detected after the vehicle has started to avoid traffic mismanagement. Finally, it will send an SMS alert to his/her relatives/close friends to alert them of a possible drunk driving incident and prevent it.



Project Photo :-



Name of Students :-

- 1) Kale Amit Milind
- 2) Rane Ajay Bhalchandra
- 3) Jadhav Saurabh Rajendra
- 4) Thote Rohit Dnyaneshwar

Guide Name :- Prof. D. A. Khope



PROJECT TITLE: - AUTOMATIC HEADLIGHT ALIGNMENT SYSTEM.

Abstract:-

The topic of this project is steering controlled (or directional) headlights, that are usually a separate set of headlights fitted to road vehicles beside the usual low beam/high beam headlights and their feature is that they turn with the steering. so that the driver of the vehicle can see the bend, what he is actually turning into. The headlights can be connected to the steering linkage by means of rods or cables, operated hydraulically by the power steering or nowadays electronically adjusted, even controlled by satellite navigation system.

Our project deals with the fabrication of the automatic headlight. As for the Indian road transport scenario, accidents are becoming a day to day cause an attempt has been made in this project to reduce such mishaps. In our project the following operation occurs automatically in the vehicle. Automatic head light left and right alignment depends upon the vehicle moving in left and right direction. The headlight is in a steady position for the vehicle in normal condition.

Project Photo :-





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- Name of Students :-**
- 1) Walunj Sahil Revannath
 - 2) Sayyed Shahebaj Mohammed
 - 3) Waghmare Anand Masaji
 - 4) Jadhav Sankalp Mahesh

Guide Name :- Prof. R. G. Yenkar

PROJECT TITLE: - MANUALLY OPERATED SPRAY PUMP.

Abstract:-

As of today the whole world is facing a problem of energy crisis. If we want to continue for prolonged use of energy then we must try to save it as much as we can whether it is on large scale or Small scale. Today we use various Spraying technologies involving use of electrical energy, chemical energy of fuels. This fact makes us know how large amounts of energy is being used at such places where mechanical energy can be used instead of direct energy sources.

This is a reason why we have implemented mechanical sprayer getting powered by human effort. Although these are serving the purpose, their range of working is not enough. They take considerably longer time for spraying. Thus what we have aimed is to design such a technology which will run on mechanical power but requiring less time for spraying than those which are hand operated. Thus considering today's demand, we have come up with a mechanically operated spray pump which is purely mechanical.

This device has the advantage of taking less time for spraying once it starts. If we want to decrease the time further we just need to increase the size of our piston and no. of nozzles with relative change in effort. In addition to all this we are implementing soil clutter along with a spray pump so we can have a double advantage.

Mechanical energy can be used instead of direct energy sources. This is a reason why we have implemented some mechanical sprayers getting powered by human effort. Although These are serving the purpose, their range of working is not enough. They take considerably longer time for spraying. Thus what we have aimed is to design such a technology which will run on mechanical



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power but requiring less time for spraying than those which are hand operated. Thus considering today's demand, we have come up with a mechanically operated multipurpose spray pump. As it has huge advantages so this concept should be used in agriculture

Project Photo:-



- Name of Students :-**
- 1) Nakawal Nikhil Raju
 - 2) Kamble Mayur Ramesh
 - 3) Chavan Deepak Ganesh
 - 4) Salaskar Sushant Prakash

Guide Name :- Prof. S. S. Waghmode



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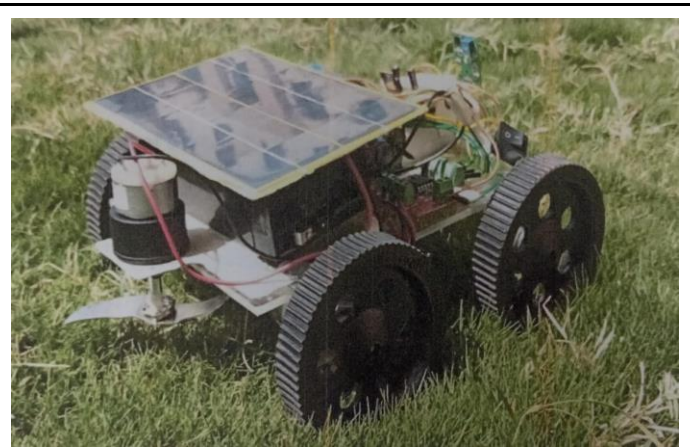
PROJECT TITLE: - SOLAR POWERED SMART GRASS CUTTING ROBOT.

Abstract :-

A Solar grass cutter is a machine that uses sliding blades to cut a lawn at an even length. Even more sophisticated devices are there in every field. Power consumption becomes essential for the future. Solar grass cutter is a very useful device which is very simple in construction. It is used to maintain and upkeep lawns in gardens, schools, college's etc. We have made some changes in the existing machine to make its application easier at reduced cost. Our main aim in pollution control is attained through this. Unskilled operation can operate easily and maintain the lawn very fine and uniform surface look. In our project, -Solar grass cutter is used to cut the different grasses for different applications.

Moving the grass cutter with a standard motor powered grass cutter is an inconvenience and no one takes pleasure in it. Cutting grass cannot be easily accomplished by elderly, younger, grass cutters mowing with engines creating noise pollution due to loud engine, and local air pollution due to combustion in the engine. Also if the electric grass cutter is corded, mowing could prove to be problematic and dangerous. The prototype will also be charged by the sun with the help of a solar panel.

Project Photo :-





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Name of Students :-

- 1) Margale Dhanaji Shivaji
- 2) Tribhuvan Sainath Prakash
- 3) Hole Suraj Baburao
- 4) Shelar Shubham Chandrakant

Guide Name :- Prof. R. G. Yenkar

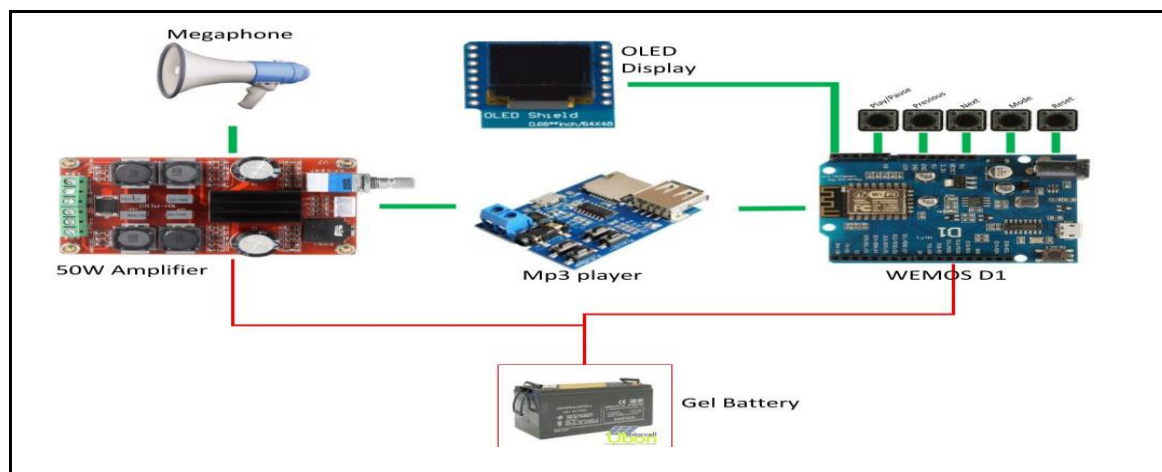
PROJECT TITLE: - AUTOMATIC BIRD REPELLENT SYSTEM.

Abstract :-

In the old days we were using 'EFIGY' in farm houses to repel the bird, but this method is not suitable and effective. Therefore to overcome this problem we made an automatic system. In which one PIR (passive infrared) sensor is used. This sensor is the main part of the system. The function of a sensor to transmit continuous waves.

When foreign bird is enter in sensing areas at that time sensor sense the motion of bird and send the signal to the microcontroller (89S52) in which one type of delay is made and the value of delay is 10 to 15 sec. the controller sends logic to the alarm. Therefore, the alarm will start to produce sound.

Project Photo :-



Name of Students :- 1) Rokade Swapnil Kondiba



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- 2) Lamkane Sachin Satish
- 3) Londhe Aniket Vishwas
- 4) Kulkarni Vinayak Shriram

Guide Name :- Prof. D. M. Pathak

PROJECT TITLE: - PNEUMATIC ROBOTIC ARM.

Abstract:-

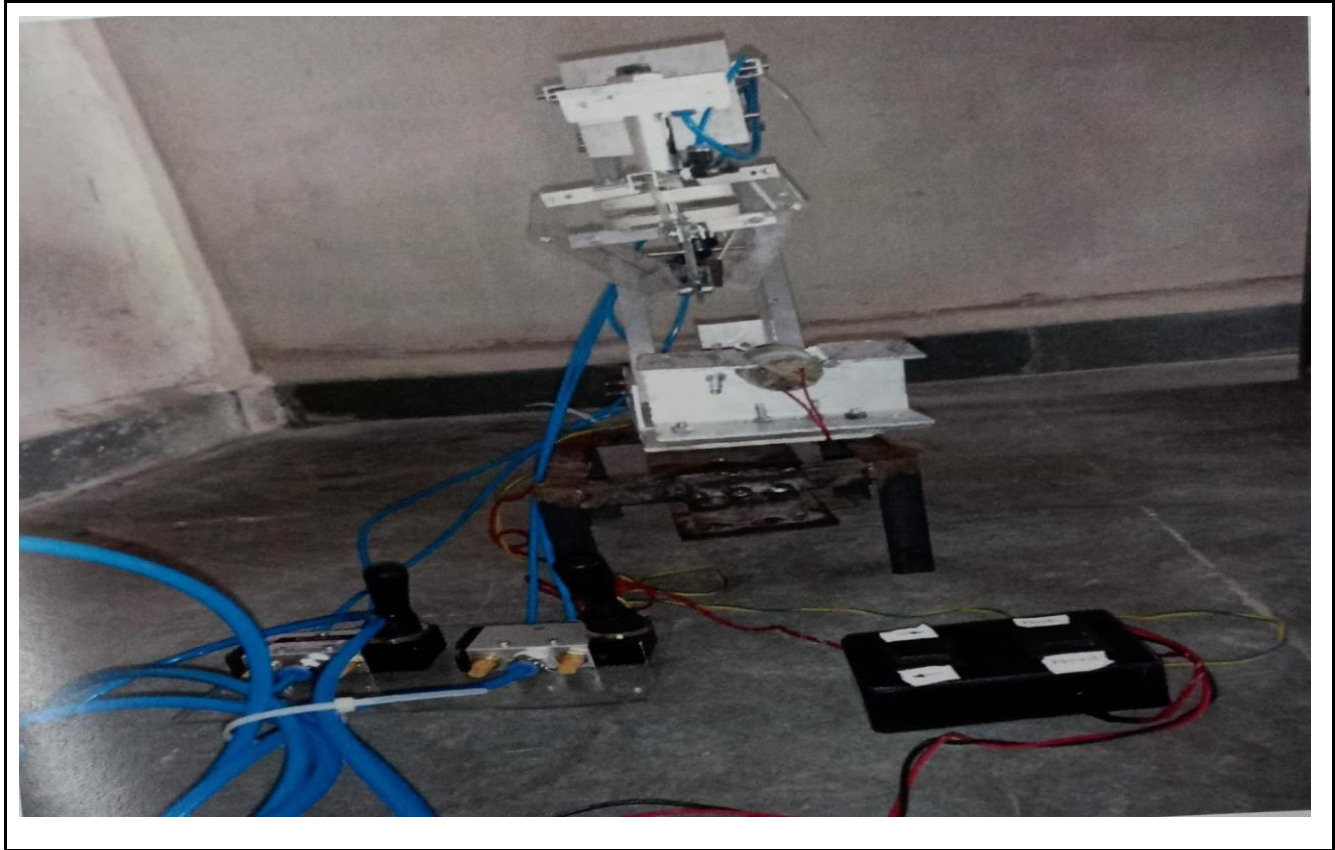
The handling of abstract materials and mechanisms to pick and place are widely found in factory automation and industrial manufacturing. There are different mechanical grippers which are based on different motor technologies that have been designed and employed in numerous applications. The designed robotic gripper in this paper is a two jaw actuated gripper which is different from the conventional cam and follower gripper in the way that controlled movement of the jaws is done with the help of pneumatic cylinders using air pressure. The force developed in the cylinder is very gentle and is directly delivered to the jaws in a compact way. The design analysis and fabrication of the gripper model are explained in detail along with the detailed list of all existing pneumatic grippers in the market. The force and torque for the gripper have been calculated for different sets of conditions. The working of the model is checked for and observation for pay load is recorded at various pressures.

The highly dynamic and highly accelerated gripper model can be easily set at intermediate positions by regulating the pressure. Pneumatic grippers are very easy to handle and are generally cost-effective because air hoses, valves and other pneumatic devices are easy to maintain.

Project Photo :-



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Name of Students :-

- 1) Darwatkar Kumar Balu
- 2) Nagawade Rahul Baban
- 3) Mane Anuj Ganpat
- 4) Landge Shivam Suresh

Guide Name :- Prof. S. S. Suryawanshi

PROJECT TITLE: - THE FLYWHEEL BICYCLE (KERS).



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Abstract:-

A kinetic energy recovery system is also known simply as KERS. KERS is an automotive system for recovering a moving vehicle's kinetic energy under braking. The recovered energy is stored in a reservoir (for example a flywheel or high voltage batteries) for later use under acceleration. In Kinetic Energy Recovery System (KERS) the moving vehicle's kinetic energy under braking is recovered and also it converts the usual loss in kinetic energy into gain in kinetic energy. There are two basic types of KERS systems i.e. Electrical and Mechanical. The main difference between them is in the way they convert the energy and how that energy is stored within the vehicle. Battery-based electric KERS systems require a number of energy conversions each with efficiency losses. On reapplication of the energy to the driveline, the global energy conversion efficiency is 34%. The mechanical KERS system storing energy mechanically in a rotating flywheel eliminates the various energy conversions and provides a global energy conversion efficiency exceeding 70%, more than twice the efficiency of an electric system.

This design of KERS bicycle was motivated by a desire to build a flywheel energy storage unit as a proof of concept. On a flat road, the cyclist can maintain a fixed cruising speed to get from point to point. When riding a bicycle, a great amount of kinetic energy is lost while braking, making start up fairly strenuous. Here we used a mechanical kinetic energy recovery system by means of a flywheel which will be mounted between the frames of the bicycle to store the energy which is normally lost during braking. The flywheel can store the braking energy by rotating and this energy can be given back to the system which will reduce the pedaling power required to drive the bicycle. The rider can charge the flywheel when slowing or descending a hill and boost the bike when accelerating or climbing a hill.

Project Photo :-



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Name of Students :-

- 1) Chaudhari Omkar Babasaheb
- 2) Kale Omkar Anil
- 3) Bhosale Harshad Vijay
- 4) Hinge Vijay Pratap

Guide Name :- Prof. S. S. Waghmode

PROJECT TITLE: - AUTOMATIC INSPECTION SYSTEM.



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Abstract:-

Automatic inspection system is a process in which various parameters such as diameter, material, height, weight, surface finish are checked automatically with the help of advanced technology. Our project is AUTOMATIC INSPECTION SYSTEM is based on the TAYLOR'S PRINCIPLE which gives an overall background of whether a produced useful product will be accepted or rejected on the basis of material condition It consists of conveyor belt system, gripping mechanism, lifting & lowering mechanism, GO & NO GO gauge. Due to this usage of the automatic system the effort, time required manually for the inspection is reduced to a certain limit. A manufactured product is inspected with the help of an inspecting tool and with the help of certain parameters it is accepted or rejected.

Nowadays in the inspection department of industry the Taylor's principle of acceptance and rejection is checked manually by the go and no go gauge, but by our project we can check the acceptance and rejection of the job automatically. The main advantage of this system is that the inspection of jobs manually is 100 out of 1000 which requires more time and also its manual accuracy is very less or out of 900 jobs the other 100 is inaccurate. This drawback is overcome by our system in which we check 1000 out of 1000 jobs in less time comparatively, and also all the jobs are accurate and correct.

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- 1) Bhandalkar Shubham Santosh
- 2) Shelke Amit Sunil
- 3) More Hemant Umesh
- 4) Shaikh Sahil Abdulrazak

Guide Name :- Prof. D. A. Khope

Project Photo:-



PROJECT TITLE: - GENERATION OF ELECTRICITY THROUGH RAILWAY TRACK.

Abstract:-

In ancient times primitive man was using only renewable sources of energy. Subsequently he discovered alternate energy sources for his convenience of life. He added a new dimension to the use of energy for domestic as well as industrial applications. Now-a-days renewable energy sources are hardly available so it is necessary to find more alternate sources of energy. Most of the power generating processes are harmful to the environment so it is also an important aspect for generating electricity.

The process of generating electricity by using railway tracks is done by a crank shaft mechanism. The generation of electricity can also be by other mechanism like roller mechanism or rack and pinion mechanism, but it will increase the cost of whole setup. This mechanism is more efficient than the other two mechanisms as it is simple to construct. And for generating electricity Faraday's electric disc

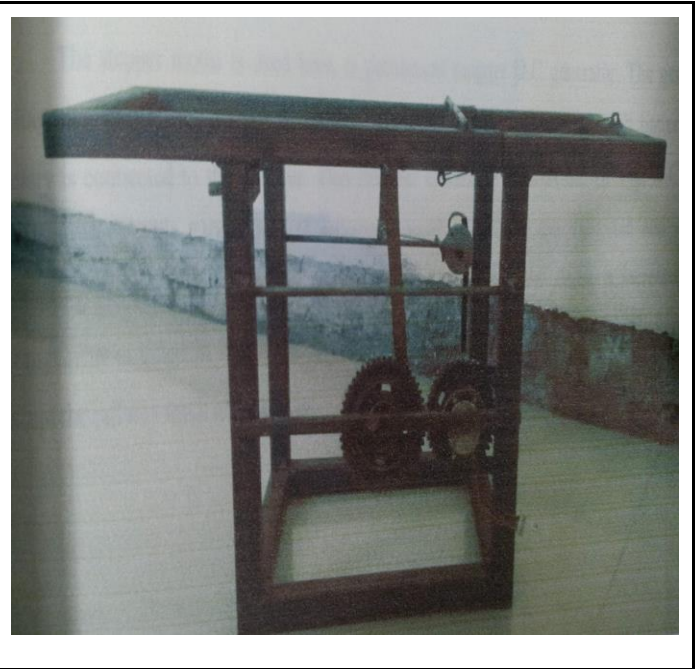


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is used which is the first electricity generator. Most importantly it does not require any power or fuel supply and it is not harmful to the environment as well.

Project Photo :-



- Name of Students :-**
- 1) Shendge Kumar Mahadeo
 - 2) Hagawane Shubham Vikas
 - 3) Paygude Shriram Babasaheb
 - 4) Hengude Omkar Dnyaneshwar

Guide Name :- Prof. N. N. Kokare

PROJECT TITLE: - MATERIAL HANDLING SYSTEM WITH GENEVA MECHANISM.



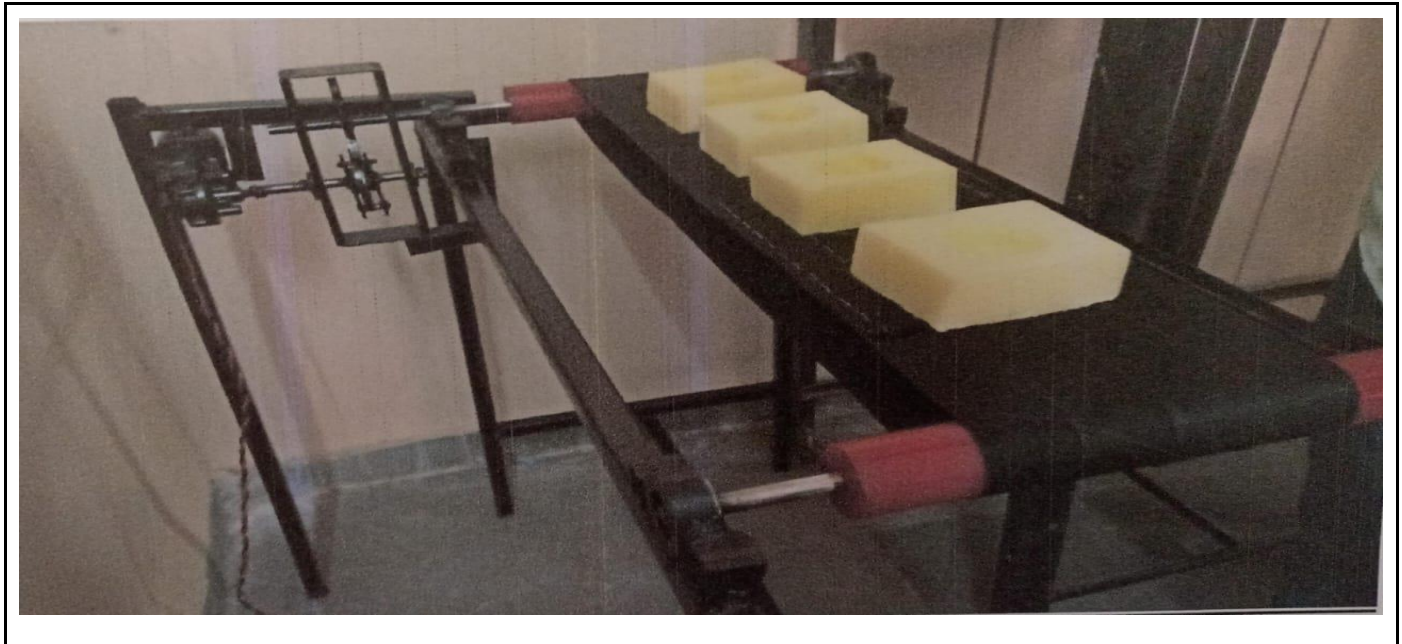
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Abstract:-

In our project we are using the Geneva mechanism for the material handling system. It consists of motor, rollers, belt, Geneva wheel & bearings. The Geneva mechanism is made up of mild steel. Two rollers are mounted on the stand, according to the required distance. The belt of Nylon is mounted on the rollers on which the materials are placed. The roller shaft is coupled with the Geneva drive. The Geneva drive shaft is coupled with the motor shaft, hence when power is supplied to the motor the rollers rotate with a certain time stoppage according to the Geneva drive and the belt moves along the rollers. Thus material handling is carried out.

Project Photo:-





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Name of Students :-

- 1) Ghule Darshan Dipak
- 2) Kadu Siddharth Shekhar
- 3) Vitkar Sahil Vyankat
- 4) Sayyad Imran Shabbir

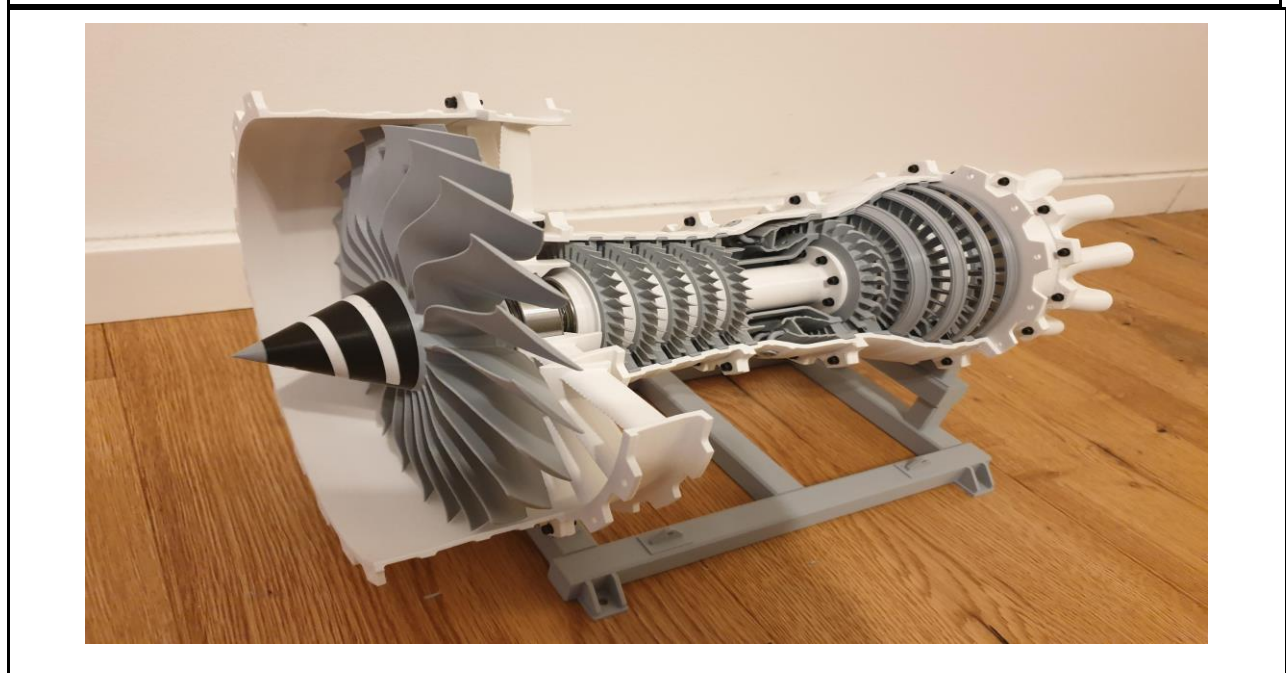
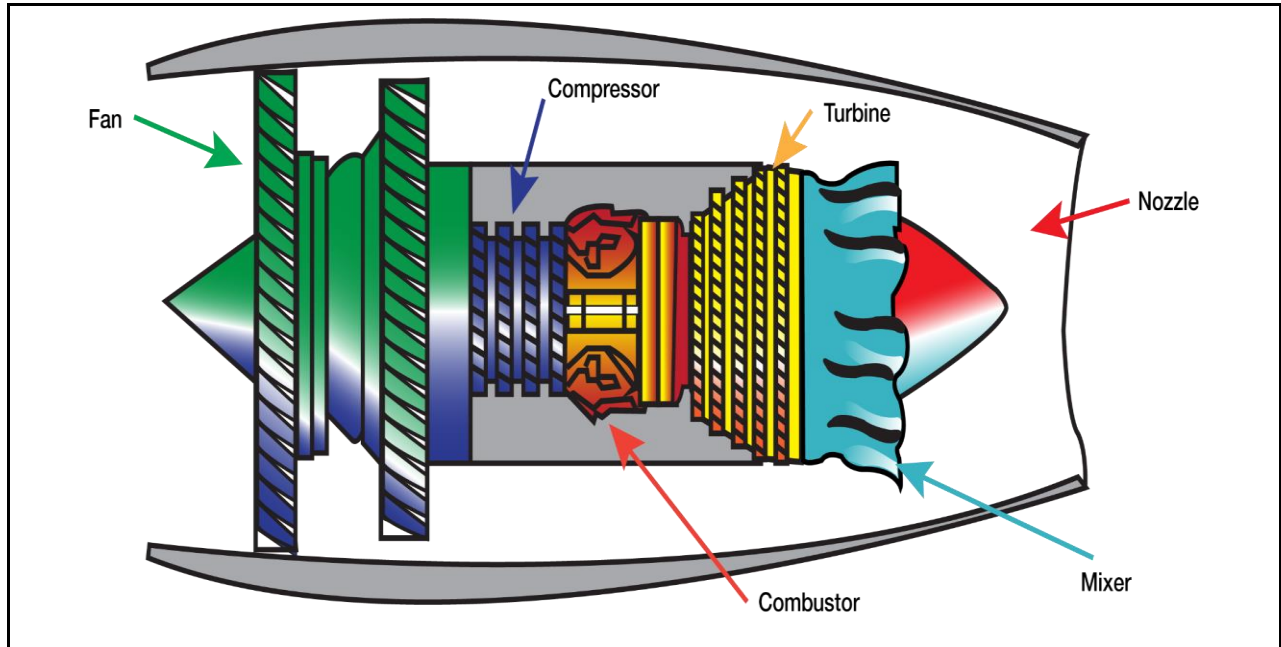
Guide Name :- Prof. E.N. Aitawade

PROJECT TITLE: - STUDY & MODELLING OF TURBO JET ENGINE.

Abstract :-

This report is an experiment on the constructing and running a small scale model of a Turbojet Engine. Initially, basic layouts of other variants of older engines were analyzed and the results of the analysis were used to construct the model of the engine. We came across many new concepts like Self-sustainability of engines, channeling of air etc. in the process of the project. In the provided time, we have succeeded to make a working model. Further scope for development has been kept for afterwards.

Project Photo:-





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Name of Students :-

- 1) Dhumal Purva Ganesh
- 2) Zende Prathamesh Anil
- 3) Chavan Piyush Sanju

Guide Name :- Prof. S. J. Shrivastava

PROJECT TITLE: - SIX WHEELS ROCKERS BOGIE MECHANISM.

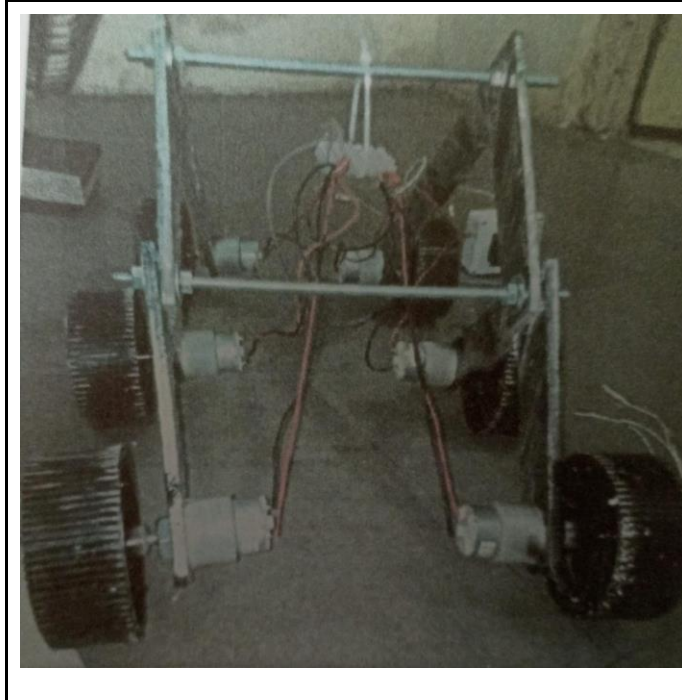
Abstract:-

NASA recently started an ambitious exploration program of Robot .Pathfinder is the first kinematics explorer in this program. Future kinematics will need to travel several kilometers over periods of months and manipulate rock and soil samples. They will also need to be somewhat autonomous. SIX WHEELS ROCKERS BOGIE MECHANISM BY USING KINEMATIC LINKAGE based kinematics are likely candidates for these missions. The physics of these kinematics is quite complex.

This improvement increases the reliability of structure on field operations and also enables the higher speed exploration with the same obstacle height capacity as rocker-bogie. In this thesis study, a new bogie mechanism consisting of double-lambda mechanisms, which has been firstly presented by Pafnuty Lvovich Chebyshev in 1869, is solved analytically to define the positions and singular configurations. A new structural synthesis formula also has been introduced for such suspension mechanisms with lower and higher kinematic pairs. By using structural synthesis methods, a suspension mechanism has been designed with double-lambda Mechanism. Equivalent force and moment functions were also derived with the equation of motion method. The results are confirmed with the computer analysis made by Visual Nastran 4D. For this purpose, a computer model has been constructed and assembled with the same design parameters of NASA Robot Exploration Kinematic (MERI and MER2).



Project Photo:-



- Name of Students :-**
- 1) Kale Amit Milind
 - 2) Rane Ajay Bhalchandra
 - 3) Jadhav Saurabh Rajendra
 - 4) Thote Rohit Dnyaneshwar

Guide Name :- Prof. S.G. Aghor

PROJECT TITLE: - REGENERATIVE BRAKING SYSTEM.

Abstract :-

Presently what the world needs is a method or a technology that saves energy from getting wasted. Energy conservation is the hour of need. In the case of automobiles, energy conservation can be done by using regenerative braking systems (RBS). When driving an automobile, a great amount of kinetic energy is wasted when brakes are applied, which then makes the start-up fairly energy



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consuming. The main aim of this project was to develop a product that stores the energy which is normally lost during braking, and reuses it. The use of regenerative braking system in automobiles provides us the means to balance the kinetic energy of the vehicle to some extent which is lost during the process of braking. of the paper have discussed and presented two methods of using the kinetic energy which generally gets wasted by converting it into either mechanical energy or into electrical energy. Electric Motor is used to convert Kinetic Energy into electrical energy.

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