DEVELOPMENT OF HEATING SYSTEM FOR INDUCTION FURNACE

Abhishek Ash
Dina Nath Mishra
Md Shohrab Alam
Gobinda Singha Roy
Ankit Kumar Das
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Ramiz Taseen

Department of Mechanical Engineering

Regent Education and Research Foundation Group of Institutions

Affiliated to ***Maulana Abul Kalam Azad University of Technology***

DEVELOPMENT OF HEATING SYSTEM FOR INDUCTION MELTING FURNACE

Report submitted to

Regent Education and Research Foundation Group of Institutions
for the partial fulfillment of the degree

of

Bachelor of Technology

in Mechanical Engineering

by

Abhishek Ash (26300718067)
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Under the supervision of ***Dr.Pabitra Maji (Assistant professor)***

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MAY 2023

REPORT APPROVAL

This project report entitled "DEVELOPMENT OF HEATING SYSTEM FOR INDUCTION MELTING FURNACE" by Abhishek Ash, Dina Nath Mishra, Md Shohrab Alam, Gobinda Singha Roy, Ankit Kumar Das, Sayan Ghosh, Ramiz Taaseen is approved for the degree of Bachelor of Technology in Mechanical Engineering

Examiners

Arpan Mandal 24/05/23

Mr. ARPAN MANDAL
(Assistant Professor)

Aninda Das 24/05/23

Mr. ANINDA DAS (ASSISTANT PROFESSOR)

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Mr. DEBTANU PATRA
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24/05/23

DR. PABITRA MAJI
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Chairman

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Mr.SABYASACHI MUKHARJEE
(HOD,ME RERFGOI)

Date: 24TH MAY 2023
Place: Barrackpore

DECLARATION

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We confirm that the work has not been submitted to any other Institute for any degree or diploma. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Abhishek Ash
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Gobinda Singha Roy
Ankit Kumar Das
Sayan Ghosh
Ramiz Taaseen

Date: 24th MAY 2023

Signature of the Students

CERTIFICATE

This is to certify that the Report entitled, "DEVELOPMENT OF HEATING SYSTEM FOR INDUCTION MELTING FURNACE" submitted by "Abhishek Ash, Dina Nath Mishra, Md Shohrab Alam, Gobinda Singha Roy, Ankit Kumar Das, Sayan Ghosh, Ramiz Taaseen" to Regent Education and Research Foundation Group of Institutions (*Affiliated* to MAKAUT), Barrackpore, West Bengal, India, is a record of bonafides project work carried out by them under my supervision and guidance and is worthy of consideration for the award of the degree of Bachelor of Technology in Mechanical Engineering of the Institute.

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Signature of Supervisor
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May 2023

Acknowledgement

We would like to express our sincere gratitude to our advisor, Dr.Pabitra Maji (Assistant Professor), for his invaluable guidance and support throughout our B.tech program. His expertise and encouragement helped us to complete this research and write this thesis.

We would also like to thank Dr.Rahul Kanti Nath (Assistant Professor) for serving on our thesis committee and providing helpful feedback and suggestions. We are grateful to Assistant Professor Mr.Sabyasachi Mukherjee (HOD of our Mechanical Department) for providing our with the opportunity to conduct our research at Regent Education & Research Foundation group of Institution , and for all of the resources and support they provided.

We would also like to thank my friends and family for their love and support during this process. Without them, this journey would not have been possible.

Finally, We would like to thank all of the participants in our study for their time and willingness to share their experiences. This work would not have been possible without their contribution.

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ABSTRACT

A new generation of industrial induction melting furnaces has been developed during the last 25 years. Present practices followed in Induction Furnaces are discussed in this paper. Through a literature review account of various practices presently being followed in industries using Induction Furnaces has been carried out with a view to gather principal of working. Apart from this a pilot study has also been carried out in few industries in India.

We provide some recommendations for the productivity improvement. Due to non-availability of the proper instrumentations the effect of the ill practices cannot be precisely judged. If this is properly measured, the percentage of productivity improvement in melting Induction Furnace can be calculated. The review is carried out from the literature in the various journals and manuals.

DESIGN OF BELT CONVEYER WITH MOST EFFICIENT SAFETY FEATURES

Report submitted to

Regent Education and Research Foundation Group of Institutions

for the partial fulfillment of the degree

of

Bachelor of Technology

in Mechanical Engineering

by

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Under the supervision

Of

DEBTANU PATRA

Department of Mechanical Engineering

REGENT EDUCATION AND RESERCH FOUNDATION GROUP OF INSTITUTIONS

Affiliated to **MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY,**

MAY 2023

Report Approval

This report entitled "**BELT CONVEYER WITH MOST EFFICIENT SAFETY FEATURES"** by "**Subham Ghosh, Dipendu Dey Halder, Ashesh Kumar Mahato, AnutoshJana,Utpal Shee, BangmoyRoychowdhury"**and supervised by **"Debtanu Patra"** and approved by the degree of bachelor of technology in mechanical engineering.

Examiners Banarsi Pandey

Supervisor(s) Debtanu Patra

Chairman

DECLARATION

We declare that this written submission represents my ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity have not represented or fabricated or falsified any idea/data/fact/source in our submission. We confirm that work has not been submitted to any other institute for any degree or diploma. We understand that any violation of the above will be cause for disciplinary action by the institute and can also evoke panel action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Subhan Ghosh

Dipendra Dey Halder

Ashesh Kumar Mahato.

Anulosh Jana

Utpal Shee

Date: **Signature of the Students**

CERTIFICATE

This is to certify that the work in this thesis report entitled "**BELT CONVAIER WITH MOST EFFICENT SAFETY FEATURES**" submitted by **SUBHAM GHOSH,DIPENDUDEY HALDER,ASHESH KUMAR MAHATO,ANUTOSH JANA,UTPAL SHEE,BANGMOY ROYCHOWDHURY,** students at **Regent Education And Research Foundation,** for the partial fulfillment of the requirements for the degree of Bachelor of Technology in mechanical engineering from "**Maulana Abul Kalam Azad University of Technology** (formerly known as west Bengal university of Technology)west Bengal during the academic year 2020-2023 is a record of project work undertaken by him under my supervision of the undersigned.

Mr. Debtanu Patra

Assistant professor

Department of Mechanical Engineering

Regent Education and Research Foundation group of institutions

Barrackpore, Kolkata

ACKNOWLEDGEMENT

We would like to express our gratitude to **professor Mr. Debtanu Patra(Assistant professor** at **regent education and research foundation group of institutions)** for his guidance, academic enragement and friendly critique. His attitude and care help me to complete this project on time. I would also like to thanks **Mr.Sabyasachi Mukherjee(Professor** at **regent education and research foundation group of institutions)** for his advice and cooperation.

We also like to thank google scholar there help in search of journals, review papers and articles. which helped me to understand previous work and current scenario of the project

Lastly like to thank group members for their contribution to complete this project.

LIST OF SYMBOLS AND ABBREVIATION

Head pully diameter	D
Conveyor belt speed	S
Motor RPM	N
Output RPM	n
Conveyor belt weight	W
Conveyor belt density	β
Conveyor belt volume	V
Conveyor belt capacity	C
Conveyor belt thickness	H
Conveyor belt length	L
Conveyor belt breadth	B
Motor shaft diameter	D

Abstract

Belt conveyors are used in the all types of industry to move material from one place to another. For balk material belt conveyors are used widely. Since a belt conveyor has many moving components, they might form a threat for people working around them if they are not properly shielded.in addition belt conveyors with high installed power or moving high speed store a significant amount of kinetic energy. The high belt tension provides the high protentionalenergy. The kinetic and protentionalenergy stored in a belt conveyor can cause catastrophic damage when suddenly released. For example, when a belt brakes, although the belt is not designed to allow this. some belt conveyors transport people in the mines.These conveyors can be very dangerous if they do not function as designed.

Despite the fact there might be safety risk involved in the operation of a belt conveyor, the design standers for belt conveyors do not address the safety issues. As per report 233 fetal mining accidents takes place in the year of 2001 to 2008 in the U.S. in the year of 2017 a worker died in the industry premises due to entangled in the factory premises and many pre people directly or indirectly effected in the belt conveyers. This paper illustrates how the belt conveyor can be used advantageously in the industry with small change in design and minimize the hazardous with proper safety precaution.

This design not only help for bulk material this one is also help to small and large industries like beverage industries, automobile industries, mining industries, assembly line etc.in short we can say that this one is one of the best ways to reduce accident.

DEVELOPMENT OF COOLING SYSTEM FOR INDUCTION MELTING FURNACE

Report submitted to

Regent Education and Research Foundation Group of Institutions
for the partial fulfillment of the degree
of
Bachelor of Technology
in Mechanical Engineering
by

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MAY 2023

Report Approval

This project report entitled "DEVELOPMENT OF COOLING SYSTEM FOR INDUCTION MELTING FURNACE by "RIPA BAKSHI; ADIL EJAZ; LABONI SEN; SAHIL MONDAL; SUBIR DAS; MILAN PORIA; PRITAM NANDI; SUBHASHIS MAITY" is approved for the degree of Bachelor of Technology in Mechanical Engineering.

Examiners

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Barnard Pandey

Abhijit Biswas

Supervisor(s)

Rahul Kantiwath.

Chairman

HOD, ME

Date: 24/5/2023

Place: Barrackpore

DECLARATION

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We confirm that the work has not been submitted to any other Institute for any degree or diploma. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Ripa Bakshi
Subasish Maity
Paritam Nandi
Laboni Sen
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Milan Bania
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Signature of the Students

Date: 24/5/2023

CERTIFICATE

This is to certify that the Report entitled, "**DEVELOPMENT OF COOLING SYSTEM FOR INDUCTION MELTING FURNACE**" submitted by "**Ripa Bakshi, Adil Ejaz, Laboni Sen, Sahil Mandol, Milan Poria, Pritam Nandi, Subir Das, Subhashis Maity**" to Regent Education and Research Foundation Group of Institutions (*Affiliated* to MAKAUT), Barrackpore, West Bengal, India, is a record of bonafides Project work carried out by them under my supervision and guidance and is worthy of consideration for the award of the degree of Bachelor of Technology in Mechanical Engineering of the Institute.

Signature of Supervisor

Dr. Rahul Kanti Nath
Assistant Professor
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ACKNOWLEDGEMENT

We are happy to present this report on, “DEVELOPMENT OF COOLING SYSTEM FOR INDUCTION MELTING FURNACE” in partial fulfillment of the requirement for the award of B.Tech, Degree in Mechanical Engineering. We take this opportunity to express our deep and sincere indebtedness to our esteemed guide Dr. Rahul Kanti Nath, Assistant Professor, RERF, a source of constant motivation in successfully completing our project.

We intend to express our thanks with sincere obedience to Sabyasachi Mukherjee, Head of the Mechanical engineering department and Dr. Pabitra Majhi, for facilitating the execution of this work. Lastly, we will be grateful to one and all who have contributed either directly or indirectly in completion of the project.

Abstract

In coreless induction furnaces, water cooling system is the heart of the induction coil which consists of a hollow section of heavy duty and high conductivity copper tubing, and the coil must be water-cooled because of its high temperature about 550 K. The purpose of the present study is to prevent overheating and damage to the induction coil due to heat generated by the passage of alternating current to induce the charge around the coil and heat transferred through the refractory lining from the molten metal. Due to this, cooling system is designed and practically constructed for coreless induction furnace. The induction coil is linked to the 40-liter water reservoir using a DC 12 Volt water pump. Which provides constant water flow to prevent the induction coil from overheating. In addition, a vapour compression system-based refrigeration equipment is installed in the water reserve. This ensures the reservoir water's steady temperature during the induction melting furnace's extended operation.

Keywords: Cooling system; Compressor; Induction melting furnace; Refrigeration system;

HYBRID REINFORCEMENT IN ALUMINIUM MATRIX COMPOSITES

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Swarup Biswas

Abujafar Malita

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Divya Bani Pandit

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HYBRID REINFORCEMENT IN ALUMINIUM MATRIX COMPOSITES

Report submitted to

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MAY 2023

REPORT APPROVAL

This project report entitled "HYBRID REINFORCEMENT IN ALUMINIUM MATRIX COMPOSITES" by "Titas Sarkar, Swarup Biswas, Abujafar Malita, Aadrish Dey, Divya Bani Pandit, Ashok Kumar Mandal, Pijush Ranjan Naskar" are approved for the degree of Bachelor of Technology in Mechanical Engineering.

Examiners

A. Biswas 24/5/23

DR. ABHIJIT BISWAS

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MR. PUSPENDU CHANDRA CHANDRA

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MR. SABYASACHI MUKHERJEE

HOD, ME RERFGOI

Regent Education & Research Foundation ★ HOD, ME

Date: 24/5/2023

Place: BARRACKPORE

DECLARATION

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We confirm that the work has not been submitted to any other Institute for any degree or diploma. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Titas Sarkar

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Adrish Dey.

Divya Bani Pandit

Ashok Kumar Mandal

Pijush Ranjan Naskar.

Date:

Signature of the Students

CERTIFICATE

This is to certify that the Report entitled, "**HYBRID REINFORCEMENT IN ALUMINIUM MATRIX COMPOSITES**" submitted by Titas Sarkar, Swarup Biswas, Abujafar Malita, Aadrish Dey, Divya Bani Pandit, Ashok Kumar Mandal, Pijush Ranjan Naskar to Regent Education and Research Foundation Group of Institutions (*Affiliated* to MAKAUT), Barrackpore, West Bengal, India, is a record of bonafide Project work carried out by them under my supervision and guidance and is worthy of consideration for the award of the degree of Bachelor of Technology in Mechanical Engineering of the Institute.

Puspendu chandra chandra

Signature of Supervisor

MR. PUSPENDU CHANDRA CHANDRA

Assistant Professor

Department of Mechanical Engineering

Regent Education and Research Foundation Group of Institutions

Barrackpore, West Bengal, India

May 2023

ACKNOWLEDGEMENT

We would like to express our sincere gratitude to our advisor, Puspendu Chandra Chandra sir for the invaluable guidance and support throughout our report thesis writing. His expertise and encouragement helped us to complete this research and write this thesis.

We would also like to thank all faculty members of our college and our classmates for serving on our thesis committee and providing helpful feedback and suggestions.

We are grateful to chairman HOD, ME RERFGOI for providing us with the opportunity to conduct our research at MAKAUT and for all of the resources and support they provided. I would also like to thank our friends and family for their love and support during this process. Without them, this journey would not have been possible. Finally, We would like to thank all of the participants in our study for their time and willingness to share their experiences. This work would not have been possible without their contribution.

With Regards,

Titas Sarkar

Swarup Biswas

Abujafar Malita

Aadrish Dey

Divya Bani Pandit

Ashok Kumar Mandal

Pijush Ranjan Naskar

ABSTRACT

Composite materials are in trend in research and industrial fields due to superior mechanical properties and easy processing techniques. While there are different processing techniques to fabricate the composite materials, powder metallurgy finds unique place in fabrication of composite materials. In this study, a powder metallurgy process has been used to make Al nano-composite fabricated by B_4C and Carbon nanofibers. An efficient and cost-effective method has been approached for fabricating B_4C and CNF hybrid composite. It is observed that, as the volume percent of B_4C increases, the mechanical properties (Microstructure, compressive strength, Vickers Micro Hardness, wear rate) increases making it more suitable for heavy work. The grain structure of the reinforcement are observed through metallurgical microscope.

ABRASIVE JET MACHINE

Akash Bhukta
Soham Dutta
Subhradeep Ghosh
Manob Koley
Motalim Hossain
Narendra Kumar Sharma

Department of Mechanical Engineering
Regent Education and Research Foundation
Barrackpore, Kolkata

MAKAUT
2023

ABRASIVE JET MACHINE

Report submitted to

Regent Education and Research Foundation Group of Institutions

for the partial fulfillment of the degree

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Bachelor of Technology (B. Tech.)

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By

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Assistant Professor, Department of Mechanical Engineering

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REGENT EDUCATION AND RESEARCH FOUNDATION
BARRACKPORE, KOLKATA

MAKAUT
2023

REPORT APPROVAL

This project report entitled "Abrasive Jet Machine" by "Akash Bhukta, Soham Dutta, Subhradeep Ghosh, Manob Koley, Motalim Hossain, Narendra Kumar Sharma" are approved for the degree of Bachelor of Technology in Mechanical Engineering.

Examiners

A. Biswas 24/05/2023

DR. ABHIJIT BISWAS

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MR. SABYASACHI MUKHERJEE

HOD, ME RERFGOI

Date: 24/05/23
Place: Barrackpore

DECLARATION

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We confirm that the work has not been submitted to any other Institute for any degree or diploma. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Akash Bhukta.

Soham Dutta

Subhradeep Ghosh

Manob Koley

Motaiim Hossain

Narendra Kumar Sharma

Date: 24/05/23

Signature of the Students

CERTIFICATE

This is to certify that the work in this thesis report entitled "**Abrasive Jet Machine**" submitted by **AKASH BHUKTA, SOHAM DUTTA, SUBHRADEEP GHOSH, MANOB KOLEY, MOTALIM HOSSAIN, NARENDRA KUMAR SHARMA,** in partial fulfilment of the requirements for the degree of Bachelor of Technology in Mechanical Engineering Session 2019-2023 in the department of Mechanical Engineering, Regent Education & Research Foundation, is an authentic workcarried out by him under my supervision and guidance. To the best of my knowledge the matter embodied in the thesis has not been submitted to any University/Institute for the award of any Degree or Diploma.

Arpan Mandal 21/05/2023

Mr. Sabyasachi Mukherjee
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Barrackpore, Kolkata

Mr. Arpan Mandal
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Barrackpore, Kolkata

Date: 24/5/2023

ACKNOWLEDGEMENT

It gives me immense pleasure to express my deep sense of gratitude to my supervisor Prof. Arpan Mandal for his invaluable guidance, motivation, constant inspiration and above all for his ever-co-operating attitude that enabled me in bringing up this thesis in the present form.

I am extremely thankful to Prof. Sabyasachi Mukherjee, Head of Department of Mechanical Engineering for their help and advice during the course of this work.

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INDEX

DEVELOPMENT OF INDUCTION MELTING FURNACE

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Sayan Paramanik

Sayan Das

Pritam Das

Deebjyoti Saha

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Under the guidance of
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MAY 2023

Report Approval

This project report entitled “DEVELOPMENT OF INDUCTION MELTING FURNACE” by “Souvik Nath Sayan Paramanik, Sayan Das, Pritam Das, Deebjyoti Saha, Shovan Mandal” is approved for the degree of Bachelorof Technology in Mechanical Engineering.

Examiners

Banarsi Pandey

_____

_____

_____

Supervisor(s)

_____

_____

Chairman

_____

HOD, ME

Date: _____

Place: _____

DECLARATION

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We confirm that the work has not been submitted to any other Institute for any degree or diploma. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Signature of the Students

CERTIFICATE

This is to certify that the Report entitled, "DEVELOPMENT OF INDUCTION MELTING FURNACE" submitted by "Souvik Nath, Sayan Paramanik, Sayan Das, Pritam Das, Deebjyoti Saha, Shovan Mandal"" to Regent Education and Research Foundation Group of Institutions (*Affiliated* to MAKAUT), Barrackpore, West Bengal, India, is a record of bonafides Project work carried out by them under my supervision and guidance and is worthy of consideration for the award of the degree of Bachelor of Technology in Mechanical Engineering of the Institute.

Signature of Supervisor
Dr. Rahul Kanti Nath
Assistant Professor
Department of Mechanical Engineering
Regent Education and Research Foundation

DESIGN AND ANALYSIS OF A 3D PRINTER

Sayan Ghosh

Sougata Maity

Sukanta Paik

Amarnath Ghosh

Pritam Das

Department of Mechanical Engineering

Regent Education and Research Foundation Group of Institutions

Affiliated to Maulana Abul Kalam Azad University of Technology

DESIGN AND ANALYSIS OF A 3D PRINTER

Report submitted to

Regent Education and Research Foundation Group of Institutions

for the partial fulfillment of the degree

of

Bachelor of Technology In Mechanical Engineering

by

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Under the Guidance of

Dr. Abhijit Biswas

Professor ME dept

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MAY 2023

REPORT APPROVAL

This project report entitled "Design and analysis of a 3d printer" by " Sayan Ghosh, Sougata Maity, Sukanta Paik, Amarnath Ghosh, Pritam Das" is approved for the degree of Bachelor of Technology in Mechanical Engineering.

Examiners

Puspendu chandra chandra

MR. PUSPENDU CHANDRA CHANDRA

Banarsi Pandey 24/05/23

MR. BANARSI PANDEY

24/5/23

DR. RAHUL KANTI NATH

Supervisor

Abhijit Biswas 24/05/23

DR. ABHIJIT BISWAS

Chairman

MR. SABYSACHI MUKHERJEE

HOD, ME RERFGOI

Research Education & Research Foundation HOD, ME

Date: 24/5/23

Place: BARRACKPORE

DECLARATION

We declare that this written submission represents my ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We confirm that the work has not been submitted to any other Institute for any degree or diploma. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Sayan Ghosh
Sougata Maity
Sukanta Paik
Amarnath Ghosh
Pritam Das.

Date: 24/05/23

Signature of the Students

CERTIFICATE

This is to certify that the Report entitled, "Design and analysis of a 3d printer" submitted by "Sayan Ghosh, Suygata Maity, Sukanta Paik, Amarnath Ghosh, Pritam Das" to Regent Education and Research Foundation Group of Institutions (*Affiliated* to MAKAUT), Barrackpore, West Bengal, India, is a record of bonafide Project work carried out by them under my supervision and guidance and is worthy of consideration for the award of the degree of Bachelor of Technology in Mechanical Engineering of the Institute.

Abhijit Biswas 24/05/23

Signature of Supervisor

DR. ABHIJIT BISWAS

Department of Mechanical Engineering

Regent Education and Research Foundation Group of Institutions

Barrackpore, West Bengal, India

ACKNOWLEDGEMENT

It gives us pleasure to submit our final year project report to the Department of Mechanical Engineering, REGENT EDUCATION AND RESEARCH FOUNDATION, Barrackpore, Kolkata-700121

Our management deserves special thanks for their support and encouragement.

We would like to thank Prof. Sabyacachi Mukherjee, HOD, Regent Education and Research Foundation, Kolkata- 700121 for allowing us to work on this project.

We express our gratitude to Dr. Abhijit Biswas, Assistant Professor, Department of Mechanical Engineering, for his unwavering support, insightful recommendations, and direction by sharing his vast knowledge, all of which contributed to the project's successful completion.

We owe him a great debt of gratitude for sharing his knowledge and providing us with helpful advice and encouragement.

Our parents owe us the greatest debt of our lives for giving us with a decent education and instilling in us good ideals in life.

Finally, we want to express our gratitude to everyone of the teaching and nonteaching staff Regent Education and Research Foundation at Department of Mechanical Engineering for their support and co operation.

With due regards

Sayan Ghosh

Sougata Maity

Sukanta Paik

Amarnath Ghosh

Pritam Das

ABSTRACT

3D printing, also known as additive manufacturing, is a process that involves depositing material layer by layer to build an object. To begin 3D printing, we must first generate a 3D model in CAD software. The model is then sliced or split into layers, which is called slicing. Then, layer by layer, material is deposited to construct the model you require. Fused Deposition Modelling (FDM), stereo-lithography (SL), Laser sintering (LS), high speed sintering (HSS), and other 3D printing processes are available. After conducting a literature review, we decided to use the FDM method for 3D printing and ABS as the printing filament.

In the designing part of the project, we created the 3D Model of the various parts of 3D Printer like Extruder, Printing Bed, Controller Board, Stepper Motors (NEMA ± 17 & NEMA ± 23) and other parts in SolidWorks 2018 and assembled them to create a 3D Printer Model, then we had done the thermal analysis on the Nozzle of the 3D Printer from where the filament is extruded and the Future Scope of 3D Printing Technology is also discussed in this paper.

DESIGN & DEVELOPMENT OF A PICK & PLACE MECHANICAL ARM

Report submitted to

Regent Education and Research Foundation Group of Institution for

The partial fulfilment of degree

Of

Bachelor of Technology

In

Mechanical Engineering

BY

Asis Sarkar	[26300720052]
Arghya Roy	[26300720053]
Ankit kr. Gupta	[26300720054]
Sambodhi Ghosh	[26300720055]
Sudipta Sarkar	[26300720056]
Tanmay Dutta	[26300720057]

Under the guidance of

Aninda Das

Assistant Professor, Department of Mechanical Engineering

Regent Education and Research Foundation Group of Institution

Affilicated to Maulana Abul Kalam Azad University of Technlogy

May 2023

REPORT APPROVAL

This project report entitled **"Design & Development of a Pick & Place Mechanical Arm"** by **"Asis Sarkar, Arghya Roy, Ankit kr. Gupta, Sambodhi Ghosh, Sudipta Sarkar, Tanmay Dutta"** is approved for the degree of Bachelorof Technology in Mechanical Engineering.

Examiners

Puspendu Chandra Chandra

Arpan Mandal

Debtanu Patra

Supervisor(s)

24/5/23

Chairman

Education & Research Foundation ★ HOD, ME

Date: 24/5/2023

Place: Barrackpore

DECLARATION

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We confirm that the work has not been submitted to any other Institute for any degree or diploma. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Arghya Roy
Asis Sarkar
Ankit Kr. Gupta
Sambodhi Ghosh
Sudipta Sarkar
Tanmay Dutta

Signature of the Students

Date: 24/5/2023

CERTIFICATE

This is to certify that the Report entitled, **"Design & Development of a Pick & Place Mechanical Arm"** submitted by **"Asis Sarkar, Arghya Roy, Ankit kr. Gupta, Sambodhi Ghosh, Sudipta Sarkar, Tanmay Dutta"** to **Regent Education and Research Foundation Group of Institutions** (*Affiliated* to MAKAUT), Barrackpore, West Bengal, India, is a record of bonafides Project work carried out by them under my supervision and guidance and is worthy of consideration for the award of the degree of Bachelor of Technology in Mechanical Engineering of the Institute.

24/5/23

Signature of Supervisor

Aninda Das
Assistant Professor
Department of Mechanical Engineering
Regent Education and Research Foundation Group of Institutions
Barrackpore, West Bengal, India
May 2023

ACKNOWLEDGEMENT

We would like to express my sincere gratitude to my advisor, Aninda Das, Assistant Professor, RERF for their invaluable guidance and support throughout our B. tech program. Their expertise and encouragement helped us to complete this research and write this thesis. We would also like to thank Rahul Sir Assistant Professor, RERF forserving on my thesis committee and providing helpful feedback and suggestions. We are grateful to Sabyasachi Mukherjee (HOD,ME Department) for providing me with the opportunity to conduct my research at Regent Education & Research Foundation group of Institution, and for all of the resources and support they provided.

We would also like to thank my friends and family for their love andsupport during this process. Without them, this journey would not have been possible.

Finally, We would like to thank all of the participants in my study for their time and willingness to share their experiences. This work wouldnot have been possible without their contribution.

SURFACE ALLOYING OF HSS USING TUNGSTEN ELECTRODE IN MICRO-ELECTRICAL DISCHARGE MACHINE

A Thesis Submitted

in Partial Fulfillment of the Requirements

for the award of the degree

Of

Bachelor of Technology

in

Mechanical Engineering

by

AVIJIT ROY

(ROLL NO. : 26300720070)

Under the guidance of :

Prof. BANARSI PANDEY

(Department of Mechanical Engineering)

Regent Education and Research Foundation

(Affiliated to MAKAUT, West Bengal)

Barrackpore, India 700 121

June, 2023

Report Approval

This project report entitled "**Surface alloying of HSS using Tungsten Electrode in micro-Electrical Discharge Machine**" by Avijit Roy (**Roll No. : 26300720070**) is approved for the degree of Bachelor of Technology in Mechanical Engineering.

Examiners

1. Puspendu Chandra Chandra
2. Arinda Das

Supervisor(s)

Banani Pandey

24/05/23

Chairman

24/5/23

Date: 24.05.2023

Place: Barrackpore.

Declaration

I declare that this written submission represents my ideas in my own words and others' words have been included, I have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I confirm that the work has not been submitted to any other Institute for any degree or diploma. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Date: 24/05/2023

Signature of the Student

Certificate

This is to certify that the Report entitled, **"Surface alloying of HSS using Tungsten Electrode in micro-Electrical Discharge Machine"** submitted by Avijit Roy (**Roll No. : 26300720070**) to Regent Education and Research Foundation Group of Institutions (*Affiliated* to MAKAUT), Barrackpore, West Bengal, India, is a record of bonafide Project work carried out by them under my supervision and guidance and is worthy of consideration for the award of the degree of Bachelor of Technology in Mechanical Engineering of the Institute.

Signature of Supervisor

Prof. Banarsi Pandey

Assistant Professor

Department of Mechanical Engineering

Regent Education and Research Foundation Group of Institutions

Barrackpore, West Bengal, India

May 2023

To,

My Parents

REGENT EDUCATION AND RESEARCH FOUNDATION

BARRACKPORE – 700 121, WEST BENGAL, INDIA

ACKNOWLEDGEMENT

I am extremely fortunate to be involved in an exciting and challenging project on Surface alloying of HSS using Tungsten Electrode in micro-Electrical Discharge Machine. It has enriched my life, giving me an opportunity to look at the horizon of technology with a wide view and to come in contact with people endowed with many superior qualities.

I would like to express my deep gratitude and respect to my guide Prof. Banarsi Pandey (Professor, Dept. of Mechanical Engineering) for his excellent guidance, suggestions, immortal comments and supervision at each step without which the accomplishment of project could not be possible.

I also like to convey my special thanks to Prof. Sabyasachi Mukherjee (Head of Dept., Mechanical Engineering) and Dr. Rajorshi Bandyopadhyay (Principal, RERF) for providing me the necessary facilities in the department to learn and perform.

I would also like to extend my sincere thanks to all of the staff members of Mechanical Engineering Department, RERF, Barrackpore for their valuable suggestions, constant encouragement during project and wishes for successful completion of this thesis.

A PROJECT REPORT ON

Modeling And Static - Structural Analysis Of Connecting Rod

Prepared by

SOUMAJIT DEY

DHRUBO JYOTI DUTTA

Department of Mechanical Engineering

Regent Education and Research Foundation Group of Institutions

Affiliated to ***Maulana Abul Kalam Azad University of Technology***

A PROJECT REPORT ON

Modeling And Static - Structural Analysis Of Connecting Rod

Report submitted to

Regent Education and Research Foundation Group of Institutions for the partial fulfillment of the degree

of

Bachelor of Technology in Mechanical Engineering

by

NAME OF THE STUDENT	ROLL NO.
1. SOUMAJIT DEY	26300720058
2. DHRUBO JYOTI DUTTA	26300720029

Regent Education & Research Foundation

(A Private Engineering College Affiliated to Maulana Abul Kalam Azad University of Technology)

KOLKATA-700121

MAY 2023

Report Approval

This project report entitled **"Modeling and Static - Structural Analysis of Connecting Rod"** by SOUMAJIT DEY and DHRUBO JYOTI DUTTA is approved forthe degree of Bachelor of Technology in Mechanical Engineering.

Examiners:

1) Pushpendra Chandra Chandra

2) R K Nath

Supervisor(s)

Banarsi Pandey

Chairman

Recurrent Education & Research Foundation HOD, ME

Date: 25/5/2025

Place: Barrackpore

Declaration

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We confirm that the work has not been submitted to any other Institute for any degree or diploma. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

1. Shreeba Jyoti Dutta
2. Soumajit Dey

Date: 25/05/2023

Signature of the Students

Certificate

This is to certify that the Report entitled, "**Modeling and Static - Structural Analysis of Connecting Rod**" submitted by **"Soumajit Dey and Dhrubo Jyoti Dutta"** to Regent Education and Research Foundation Group of Institutions (*Affiliated* to MAKAUT), Barrackpore, West Bengal, India, is a record of bonafide Project work carried out by them under my supervision and guidance and is worthy of consideration for the award of the degree of Bachelor of Technology in Mechanical Engineering of the Institute.

25/05/23

Signature of Supervisor

Mr. Banarsi Pandey
(Assist. Prof.)

Department of Mechanical Engineering

Regent Education and Research Foundation Group of Institutions

Barrackpore, West Bengal, India

May 2023

ACKNOWLEDGEMENT

We would like to convey our,sincere gratitude and regards to our project supervisors,and dissertation guide Mr Banarshi Pandey Assistant professor, Department.of Mechanical Engineering, RERF, Kolkata, for his brilliant guidance ,encouragement and untiring support throughout theprogram,has been a major facto which leads to the successful progress of this dissertation.the dissertation progress would not have culminated into the present form without their invaluable suggestion ans generous help.we are practically indebted to them who meticulously observed our day to day process,provide us withimportant document,facilities and gave us a useful suggestion for the successful completion of the dissertation progress work.

Furthermore, we want to extend special thanks towards our college as well of our faculties because without their resources then none of what is seen now could have been possible in terms of creative or intellectual development.

Last but not least, everyone involved with this think thank deserves recognition such as family members and friends. They all played an important role when it came down to giving motivation at times where there was no hope left.

ABSTRACT

Connecting rod is one of the most important part in automotive engine. Connecting rod is the link between piston and crank shaft. Which it converts reciprocating motion of piston into rotary motion of crank shaft. In internal engines connecting rod is mainly made of steel and aluminum alloys (for light weight and absorb high impact loads) or titanium (for higher performance engines and for higher cost) or composite materials, composite materials is a material made from two or more constituent materials with significantly different physical or chemical properties that, when combined, produce a material with characteristics different from the individual components. The individual components remain separate and distinct within the finished structure. The new material may be preferred for many reasons: common examples include materials which are stronger, lighter, or less expensive when compared to traditional materials. As a connecting rod is rigid, it may transmit either a push or a pull and so the rod may rotate the crank through both halves of a revolution, i.e. Piston pushing and piston pulling. Earlier mechanisms, such as chains, could only pull. In a few two-stroke engines, the connecting rod is only required to push.In which it undergoes structural deformations. Thus in this project we are modeling a connecting rod in fusion 360 design software and doing static structural analysis in ansys work bench 14.5 software by using advance materials.Thus the part which is modeled is converted into IGES file to import in ansys work bench and static structural analysis is carried out at 16MPa of pressure load by applying various materials such as Aluminum Alloy, Al6061 +B4C(Aluminum boron carbide) and 42Cr2Mo4 (special alloy steel) materials used in this project. By applying these boundary conditions on connecting rod the unknown variables such as stress, deformation, and strain are found using the FEM Analysis based software (ANSYS14.5).

REGENT EDUCATION & RESEARCH FOUNDATION

A Final Year Project Report

On

OPTIMIZING POWER CONSUMPTION IN COMPRESSION PROCESS OF VAPOUR COMPRESSION REFRIGERATION CYCLEUSING TAGUCHI REGRESSION ANALYSIS

Submitted By:-

SAYAN MONDAL
4th YEAR, MECHANICAL ENGINEERING
ROLL NO. - 26300720033
REG. NO. - 202630100720031
REGENT EDUCATION & RESEARCH FOUNDATION

REGENT EDUCATION & RESEARCH FOUNDATION

OPTIMIZING POWER CONSUMPTION IN COMPRESSION PROCESS OF VAPOUR COMPRESSION REFRIGERATION CYCLEUSING TAGUCHI REGRESSION ANALYSIS

A Final Year Project Report

Submitted to the Department of Mechanical Engineering in complete fulfillment of the requirement for the award of the degree
Of

Bachelor of Technology

In

Mechanical Engineering

By

SAYAN MONDAL
(Roll No.: 26300720033)
(Registration No.: 202630100720031)

Under the guidance of

Banarsi Pandey
Assistant Professor, Department of Mechanical Engineering
REGENT EDUCATION & RESEARCH FOUNDATON, REGENT
'A private college under Maulana Abul Kalam Azad University of Technology (formerly known as WBUT), Kolkata', May 2023

DEPARTMENT OF MECHANICAL ENGINEERING

REGENT EDUCATION & RESEARCH FOUNDATION

ACKNOWLEDGEMENT

This project deserves a huge mention of my honorable mentor **Mr.Banarsi Pandey** Assistant Professor, Department of Mechanical Engineering, Regent Education & Research Foundation. His continuous and boundless efforts have immensely helped me to steer through the entire process right from the beginning to the end. It would have been nearly impossible to initiate and go through this project as his authentic ideas and priceless suggestions have shaped the course of the study throughout the period of research. I take the opportunity to express my sincere heartfelt gratitude to such a stalwart, who is shining example of a great teacher and a powerhouse of some superb concepts. This project is a reflection of his brilliant guidance.

I owe my sincere thanks to all those who have helped me in several ways throughout the process.

Roll no. 2026300720033
Reg. No. 202630100720031
B. Tech, 4th Year (ME)

DEPARTMENT OF MECHANICAL ENGINEERING

REGENT EDUCATION & RESEARCH FOUNDATION

CERTIFICATION

This is to certify that the report entitled ***"Optimizing power consumption in compression process of vapour compression refrigeration cycle using Taguchi Regression Analysis" being*** submitted in partial fulfillment by **SAYAN MONDAL** for the award of degree of Bachelor of Technology (Mechanical Engineering) from REGENT EDUCATION & RESEARCH FOUNDATION, is a record of research work carried out by him under my supervision and guidance. He has worked for about 12 months (July 2022 to May 2023) on the above title, and this has reached the standard fulfilling the requirements and the regulations relating to the degree.

The contents of this report, in complete fulfillment, have not been submitted to any other university or institution for the award of any degree or diploma.

Banarsi Pandey

Mr. Banarsi Pandey
Assistant Professor,
Department of Mechanical Engineering,
REGENT EDUCATION & RESEARCH FOUNDATION,

Barrackpore, West Bengal.

DEPARTMENT OF MECHANICAL ENGINEERING

REGENT EDUCATION & RESEARCH FOUNDATION

CREDENTIALS

Upon completion of the final year project report entitled ***"Optimizing power consumption in compression process of vapour compression refrigeration cycle using Taguchi Regression Analysis" being*** submitted by **Sayan Mondal, 4th Year, Mechanical Engineering, Roll No.-26300720033,** for the award of Degree of Bachelor of Technology from Regent Education & Research Foundation, is a record of research work carried out by him under his supervisor/mentor. He has worked for about 12 months (July 2022 to May 2023) on the above title and has reached the standard fulfilling of the requirements and the regulations relating to the degree.

The contents of this report, in complete fulfillment, have not been submitted to any other university or institution for the award of any degree or diploma.

Mr. Sabyasachi Mukherjee
Assistant Professor & Head,
Department of Mechanical Engineering
Regent Education & Research Foundation
Barrackpore, West Bengal.

APPROVAL

The foregoing thesis is hereby approved as a creditable study of an engineering subject carried out and presented in a manner satisfactory to warrant its acceptance as a pre-requisite to the degree for which it has been submitted. It is to understood that by this approval the undersigned does not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the thesis only for the purpose for which it is submitted.

Board of Examiners……

DEVELOPMENT OF INDUCTION MELTING FURNACE

Report submitted to
Regent Education and Research Foundation Group of Institutions
for the partial fulfillment of the degree
of
Bachelor of Technology
in Mechanical Engineering
by

Souvik Nath

Sayan Paramanik

Sayan Das

Pritam Das

Deebjyoti Saha

Shovan Mandal

Under the guidance of
Sabyasachi Mukherjee
Assistant Professor in Department of Mechanical Engineering

Department of Mechanical Engineering

Regent Education and Research Foundation Group of Institutions

Affiliated to Maulana Abul Kalam Azad University of Technology

MAY 2023

Report Approval

This project report entitled “DEVELOPMENT OF INDUCTION MELTING FURNACE” by “Souvik Nath Sayan Paramanik, Sayan Das, Pritam Das, Deebjyoti Saha, Shovan Mandal” is approved for the degree of Bachelorof Technology in Mechanical Engineering.

Examiners

Banarsi Pandey

_____

_____

_____

Supervisor(s)

_____

_____

Chairman

_____

HOD, ME

Date: _____

Place: _____

DECLARATION

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We confirm that the work has not been submitted to any other Institute for any degree or diploma. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Signature of the Students

CERTIFICATE

This is to certify that the Report entitled, "DEVELOPMENT OF INDUCTION MELTING FURNACE" submitted by "Souvik Nath, Sayan Paramanik, Sayan Das, Pritam Das, Deebjyoti Saha, Shovan Mandal"" to Regent Education and Research Foundation Group of Institutions (*Affiliated* to MAKAUT), Barrackpore, West Bengal, India, is a record of bonafides Project work carried out by them under my supervision and guidance and is worthy of consideration for the award of the degree of Bachelor of Technology in Mechanical Engineering of the Institute.

Signature of Supervisor
Dr. Rahul Kanti Nath
Assistant Professor
Department of Mechanical Engineering
Regent Education and Research Foundation

DESIGN & DEVELOPMENT OF A PICK & PLACE MECHANICAL ARM

Report submitted to

Regent Education and Research Foundation Group of Institution for

The partial fulfilment of degree

Of

Bachelor of Technology

In

Mechanical Engineering

BY

Asis Sarkar	[26300720052]
Arghya Roy	[26300720053]
Ankit kr. Gupta	[26300720054]
Sambodhi Ghosh	[26300720055]
Sudipta Sarkar	[26300720056]
Tanmay Dutta	[26300720057]

Under the guidance of

Aninda Das

Assistant Professor, Department of Mechanical Engineering

Regent Education and Research Foundation Group of Institution

Affilicated to Maulana Abul Kalam Azad University of Technlogy

May 2023

REPORT APPROVAL

This project report entitled **"Design & Development of a Pick & Place Mechanical Arm"** by **"Asis Sarkar, Arghya Roy, Ankit kr. Gupta, Sambodhi Ghosh, Sudipta Sarkar, Tanmay Dutta"** is approved for the degree of Bachelorof Technology in Mechanical Engineering.

Examiners

Puspendu Chandra Chandra

Arpan Mandal

Debtanu Patra

Supervisor(s)

24/5/23

Chairman

Education & Research Foundation ★ HOD, ME

Date: 24/5/2023

Place: Barrackpore

DECLARATION

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We confirm that the work has not been submitted to any other Institute for any degree or diploma. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Arghya Roy
Asis Sarkar
Ankit Kr. Gupta
Sambodhi Ghosh
Sudipta Sarkar
Tanmay Dutta

Signature of the Students

Date: 24/5/2023

CERTIFICATE

This is to certify that the Report entitled, **"Design & Development of a Pick & Place Mechanical Arm"** submitted by **"Asis Sarkar, Arghya Roy, Ankit kr. Gupta, Sambodhi Ghosh, Sudipta Sarkar, Tanmay Dutta"** to **Regent Education and Research Foundation Group of Institutions** (*Affiliated* to MAKAUT), Barrackpore, West Bengal, India, is a record of bonafides Project work carried out by them under my supervision and guidance and is worthy of consideration for the award of the degree of Bachelor of Technology in Mechanical Engineering of the Institute.

24/5/23

Signature of Supervisor

Aninda Das
Assistant Professor
Department of Mechanical Engineering
Regent Education and Research Foundation Group of Institutions
Barrackpore, West Bengal, India
May 2023

ACKNOWLEDGEMENT

We would like to express my sincere gratitude to my advisor, Aninda Das, Assistant Professor, RERF for their invaluable guidance and support throughout our B. tech program. Their expertise and encouragement helped us to complete this research and write this thesis. We would also like to thank Rahul Sir Assistant Professor, RERF forserving on my thesis committee and providing helpful feedback and suggestions. We are grateful to Sabyasachi Mukherjee (HOD,ME Department) for providing me with the opportunity to conduct my research at Regent Education & Research Foundation group of Institution, and for all of the resources and support they provided.

We would also like to thank my friends and family for their love andsupport during this process. Without them, this journey would not have been possible.

Finally, We would like to thank all of the participants in my study for their time and willingness to share their experiences. This work wouldnot have been possible without their contribution.

.

CONTENTS

PAGE NO.

ABSTRACT

Mechanical arm is a widely used in industry which is an open or closed kinematic chain of rigid links interconnected by movable joints. In some configurations, links can be considered to correspond to human anatomy as waist, upper arm and forearm with joint at shoulder and elbow. In this projectpick and place mechanical arm is designed and developed for loading and unloading.

Regent Education and Research Foundation

ESDT : 2023

NAME : RIJU DEY

DEPT : ME

ROLL NO : 26300720001

YEAR : 2023

SEM : 06

1. Introduction
2. Safety
3. Hand Tools
4. Measuring Tools
5. Lathe
6. Shaping
7. Milling
8. Grinding

WORKSHOP & MACHINESHOP PRACTICE LAB MANUAL

(18MEL38A/48A)

DEPARTMENT OF MECHANICAL ENGINEERING

VISION OF THE INSTITUTE

To be center of excellence recognized nationally and internationally, in distinctive areas of engineering education and research, based on a culture of innovation and invention.

MISSION OF THE INSTITUTE

BIET contributes to the growth and development of its students by imparting a broad based engineering education and empowering them to be successful in their chosen field by inculcating in them positive approach, leadership qualities and ethical values.

VISION OF THE DEPARTMENT

The department endeavors to be a center of excellence, to provide quality education leading the students to become professional mechanical engineers with ethics, contributing to the society through research, innovation, entrepreneurial and leadership qualities.

MISSION OF THE DEPARTMENT

1. To impart quality technical education through effective teaching-learning process leading to development of professional skills and attitude to excel in Mechanical Engineering.
2. To interact with institutes of repute, to enhance academic and research activities.
3. To inculcate creative thinking abilities among students and develop entrepreneurial skills.
4. To imbibe ethical, environmental friendly and moral values amongst students through broad based education

PROGRAM EDUCATIONAL OBJECTIVES (PEO'S)

1. Enable to understand mechanical engineering systems those are technically viable, economically feasible and socially acceptable to enhance quality of life.
2. Apply modern tools and techniques to solve problems in mechanical and allied engineering streams.
3. Communicate effectively using innovative tools, to demonstrate leadership and entrepreneurial skills.
4. Be a professional having ethical attitude with multidisciplinary approach to achieve self and organizational goals.
5. Utilize the best academic environment to create opportunity to cultivate lifelong learning skills needed to succeed in profession.

PROGRAM SPECIFIC OUTCOMES (PSO'S)

PS01:-Apply the acquired knowledge in design, thermal, manufacturing and interdisciplinary areas for solving industry and socially relevant problems.

PS02:-To enhance the abilities of students by imparting knowledge in emerging technologies to make them confident mechanical engineers.

REGENT EDUCATION AND RESEARCH FOUNDATION

Name -. Samar Das

Roll No-. 26300720005

Reg No-. 2026301007100l4

Subject - PROJECT -II

Subject code - PW-ME681

Year - 3rd Semester - 6th

Department - Mechanical Engineering

NAME- SAMAR DAS

ROLL NO- 26300720005

RGSTRI NO-202630100710014

DEPT- ME YEAR-3RD

SEM-6TH

IGNITION SYSTEM:

- The ignitionsystem is a system used to generate a very highvoltage from the carbattery and to send it to each sparkplug in turn thereby igniting the fuel-air mixture in thecombustion chamber of the engine.

- **TYPE OF IGNITION SYSTEM:-**

1.Magneto ignition systems

2. Battery coil ignition systems

3. Electronic ignition system

MAGNETO IGNATION SYSTEM.:-

- This type of ignition systemis mostly used in motorcycles, scooters and racing cars. The magneto Ignition system with main components is shown in

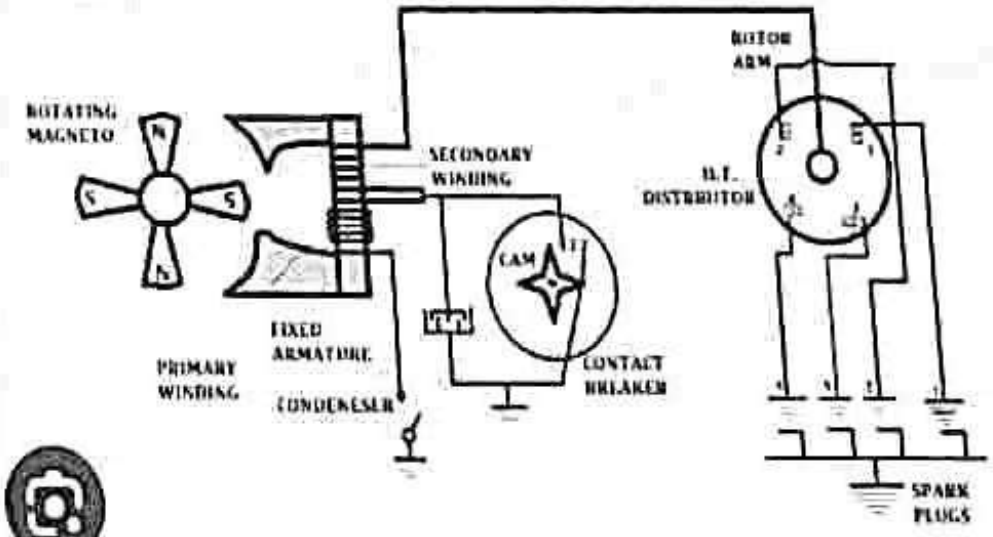


FIG: MAGNETO IGNITION SYSTEM

- Magneto ignition systemis a special type of ignition system with its own electric generator to provide the required necessary energy for the vehicle system. It is mounted on the engine and replaces all components of the coil ignition system except the spark plug. A magneto when rotated by the engine is capable of producing a very high voltage and doesn't need a battery as source of external energy.
- There are two important types of magneto ignition system. They are

1) Rotating armature type .

2) Rotating Magnet type.

20/05/20

Report

Name: Debajit Sarkar
Roll number:26300720010
Department: Mechanical engineering
Btech

Name : - Debajit Sarkar

project report on carburetor

Carburettor Introduction

Carburetor is the most important item in the fuel feed system of spark ignition engines. IT is connected between the fuel filter and the induction manifold . It supplies the air-fuel mixture of varying proportions to suit engine operating conditions . The fuel enters the float chamber of the carburetor. The air enters the air horn of the carburetor. Mixing of the fuel and air takes place when both pass through the venture in the mixinbg chamber OF THE OF THE carburetor. This air – fuel mixture then goes to the intake manifold.

Carburettor

The carburetor is a device for atomizing and vaporizing the fuel and mixing it with the air in varying proportions to suit the changing conditions of spark ignition engines. The air-fuel fuel mixture so obtained from the carburetor is called the combustible mixture. The process of mixing the gasoline fuel with air to obtain the combustible mixture is called carburetion .

Hence, the terms vaporization and atomization should be understood clearly. Vaporization is the change of state of the fuel from liquid to vapour . Atomization is the mechanical breaking-up of the liquid fuel into small particles (but not actually breaking-up into atoms , as the name implies) so that every particle of the fuel is surrounded by air. In order to produce very quick vaporization of the liquid fuel , t is sprayed into the Air passing through the carburetor. Spraying of the liquid turns it into many fine particles, so that the vaporization occurs almost instantly.

The carburetor supplies the air-fuel mixture of varying proportions to suit the changing conditions of the engine. The mixture must be rich (have a higher percentage of fuel) for starting, acceleration and high speed operation. The mixtures should be lean (HAVE a lower percentage of fuel) for operation at intermediate speed with a warm engine. The theoretically perfect mixture of air and gasoline contains 15 parts of air and 1 part of gasoline by weight. An ideal carburettor would pass the mixture of completely vaporized fuel and air in the proper proportion to the intake manifold and cylinder. But in the present – day carburetors , the complte vaporization of fuel is not achieved, due to the heavy nature of fuel and other limitations . The heated intake manifold and hot spots in the manifold vaporize part of atomized fuel . Even until the end of the compression stroke in the cylinder, the gasoline does not vaporize completely, although the heat and pressure during the compression stroke are applied to it .

AIR-FUEL RATIO

The carburetor must supply the air- fuel mixture of varying proportions to suit the different operating requirements. The mixture must be rich for starting ; and must be relatively lean for idling

and intermediate speeds. FIG 1 SHOWS the air –fuel ratio for different speeds of a car.For starting, the air- fuel ratio is 9:1. It is a rich mixture. For idling , the ratio is 12:1. It is a lean mixture . for intermediate speeds , between 35 to 105 km/h, the mixture further leans out 15:1. But at higher speeds 120 to 150 km/h, with a wide open throttle, the mixture is again enriched to about 13:1. For acceleration at any speed the throttle is suddenly opened which causes a momentary enrichment of the mixture. Two examples of acceleration are shown by dotted lines, one at 25km/h and the other at 45 km/h

For different cars , the air – fuel ratio also varies with speeds. The mixture must be rich for initial start, because the engine and the carburetor are cold, the fuel vaporizes very poorly. Thus , extra amount of fuel is needed so that enough will vaporize for starting. Similarly , by sudden opening of the throttle for acceleration , air rushes suddenly. Hence , extra fuel must come at the same time. The carburetor must be designed to supply correct air-fuel mixture for all the above operating conditions.

Classifications of carburetors

The carburetors are classified on the following basis :

1. According to the arrangement of float chamber:
   (a)Eccentric (b) concentric
   2. according to the direction of air-flow:
   (a) Down draft (b) side draft
   3. According to the number of units:
   (a)single (b) dual
   (c) FOUR – BARREL
   4. ACCORDING TO THE type of metering system:
   (A) Air-bleed jet (b) metering rod type.
   5. according to the type of venturi :
   (a) Plain venture (b) Double venture
   © vane venture (d) Nozzle- bar venture
   (e) Triple venture .
   6. according to the pressure above the fuel in the float chamber;:
   (a)unbalanced (b) balanced.
   7. according to the type of power system;
   (a) Manually operaterd (b) vacuum controlled.
   8. According to the method of varyi ng the mixture strength:
   (a) constant choke carburetor
   (b)constant vacuum carburetor.

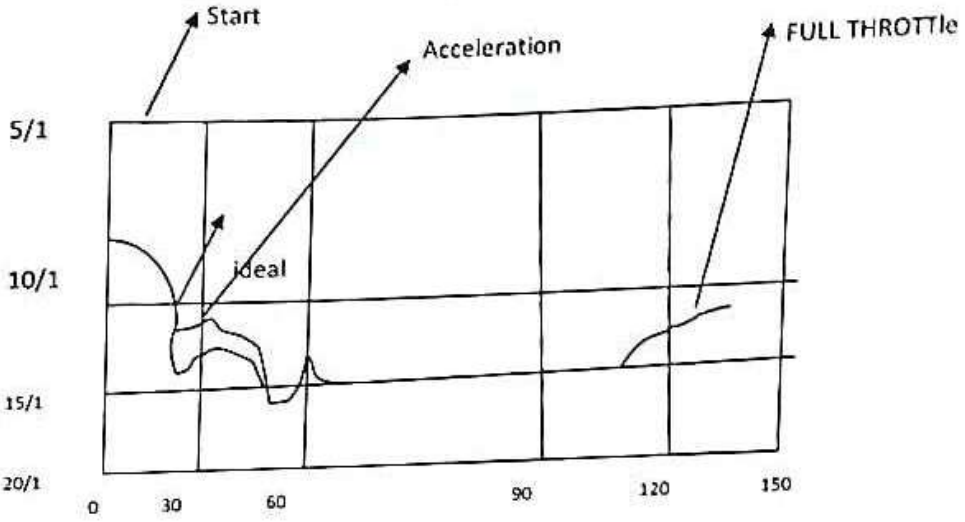
Carburetor according to the arrangement of float chamber

In eccentric float chamber type carburetor, the float chamber is placed at a side of the venture tube . IN concentric float chamber type carburetor, the float chamber is placed around the venture tube.

The eccentric float chamber type carburetor does not provide correct air –fuel mixture when thwe vehicle is ascending or descending a grade. When the vehicle is running on horizontal road, the level of the gasoline in the float chamber and the discharge jet is normal , and the

carburetor provides correct air-fuel mixture to the engine . When the vehicle is ascending or descending a grade , the carburetor is tilted and the level of the gasoline changes In the discharge jet as (B) AND (C). This causes too much or two title gasoline to be supplied by the jet giving incorrected mixtures.

The concentric float chamber type car burettor does not have this difficulty. The level of the gasoline in the discharge jet remains approximately constant , which provides correct air-fuel mixture to the engine in all the positions of the vehicle.



AIR FUEL RATIOS FOR DIFFERENT SPEEDS OF A CAR

Carburettors according to the direction of air flow

In downdraft carburetor , the air enters top of the carburetor and leaves at the bottom .in side draft carburetor , the air enters the top of the carburetor and leaves at the side . in updraft carburetor the air enters the bottom or side of the carburetor and leaves at the top . in semi downdraft carburetor , the direction of air flow is inclined from top to bottom.

In most passenger cars, the downdraft carburetor is used. In this type of carburetor the gravity assists the flow of mixture. Therefore, the engine sucks it better at lower speeds under load . higher volumetric efficiency of the engine is achieved. The location of the carburetor above the engine is more accessible for inspection , adjustment or repair. The air entering the carburetor is cooler.

Carburetors ACCORDING TO THE NUMBER OF UNITS

SINGLE BARREL carburetor has only one barrel. Dual barrel carburetor has two barrels , each containing a fuel jet , venture tube idling system , choke and throttle . it may have a single air inlet, choke and float fue chamber , although it frequently has two floats one for each jet. It has only one accelerating pump. Usually, the passenger car engines of eight or more cylindes are provided with dual carburetors and having dual intake manifold. Each barrel of the dual carburetor feeds one branch of the intake manifold . this arrangement provides uniform distribution of the fuel mixture to the cylinders.

Four- barrel carburetor is made up of two dual carburetors in one unit. The primary side to a complete dual carburetor containing a choke, an accelerating pump, a power valve, a complete main metering and ile system. The secondary unit has its own float bowl; and a dual carburetor main metering system and idle system.

CARBURETTORS ACCORDING TO TYPE OF METERING SYSTEM

IN AIR BLEED JET TYPE carburetor, the fuel is supplied to the main discharge nozzle through the main metering jet at low speeds . the air bleeds are connected to a vent tube located inside the main discharge nozzle so that air is mixed with fuel as it is drawn into the carburetor venture. AS the suction of the main discharge nozzle increases at higher speeds, more air is drawn through the main air bleed and correct air- fuel mixture is maintained.

In metering rod type carburetor, the amount of fuel is controlled by a rod which extends into the jet. The metering rod has three steps of different diameters which opens the space in the jet through which the fuel passes. The metering rod is connected to the throttle shaft by suitable linkage so that it is raised when the throttle valve is opened; and lowered when the throttle valve is closed. When the rod is raised up , it provides more area between the jet and the rod; and more fuel passes to match the flow of air at high speeds.

Carburetors according to the type of venture

Different types and number of venturies are used in the carburetor design, according to which the carburetors are classified. The carburetor may have plain , double , vane , nozzle- bar and tripple venture, as shown in fig14.5 .

REGENT EDUCATION AND RESEARCH FOUNDATION GROUP OF

INSTITUTIONS

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Year : ***3rd***

Topic name : ***CRDI systems of automobile***

Regent Education & Research Foundation
HOD, ME

CONTAINS

Introduction

***CRDI** Stand for common rail direct injection, which is the advance technology now a days used in diesel & petrol engine..In the engines a high pressure common rails used to inject the fuel in individual valves. In this method a common and single line is used to inject the fuel. This common line is connected to all the fuel injectors in the system, this common line is known as common rail.*

A Report On

Braking System

Of

Automobile Vehicle

For

the partial fulfilment of

B. TECH in

Mechanical Engineering

Submitted by:

PUSPENDU BERA

(26300720014)

Project II(PW-ME681)

Regent Education and Research Foundation

Affiliated to MAKAUT, West Bengal

Barrackpore, India 700121

INDEX

ABSTRACT:

The automobile industry has experienced remarkable advancements and transformations since its inception. This abstract provides a concise overview of the evolution of automobiles, exploring the major technological advancements, societal impacts, and prospects. The paper begins by delving into the early days of automobiles, tracing their origins to the late 19th century. It highlights the contributions of key inventors and pioneers, such as Karl Benz and Henry Ford, who revolutionized transportation by introducing the internal combustion engine and implementing assembly line production, respectively. The abstract then proceeds to discuss the significant technological breakthroughs that have shaped the modern automobile industry. The emergence of electric vehicles (EVs) and hybrid technologies are explored, with a focus on their potential to reduce carbon emissions and address environmental concerns. Additionally, the integration of advanced driver assistance systems (ADAS), including autonomous features, is examined, underscoring their potential to enhance road safety and redefine the concept of mobility. Moreover, the societal impacts of automobiles are analysed. The abstract delves into the effects of automobiles on urbanization, the economy, and individual lifestyles. It explores the role of automobiles in facilitating commuting and long-distance travel, as well as the challenges associated with congestion, air pollution, and dependence on fossil fuels. Looking ahead, the abstract concludes with a glimpse into the future of automobiles. It discusses ongoing research and development in alternative fuel sources, including hydrogen fuel cells and renewable energy integration. Additionally, the anticipated rise of shared mobility and the potential for connected and autonomous vehicles to reshape transportation systems are examined. In summary, this abstract provides an overview of the evolution of automobiles, emphasizing the technological advancements, societal impacts, and prospects. It underscores the transformative power of automobiles as a mode of transportation and highlights the ongoing efforts to address environmental concerns, enhance safety, and revolutionize mobility.

INTRODUCTION

Automobiles, commonly known as cars or automobiles, are self-propelled vehicles that are primarily designed for the transportation of passengers and cargo. They are one of the most prevalent modes of transportation worldwide and have revolutionized the way we travel, commute, and conduct various activities. The development of automobiles dates to the late 19th century when several inventors and engineers made significant advancements in the field of internal combustion engines and motorized vehicles. This period saw the emergence of pioneers like Karl Benz, Gottlieb Daimler, and Henry Ford, who played pivotal roles in popularizing automobiles and making them accessible to the general public. Automobiles have evolved over time, incorporating technological advancements and improvements in various aspects such as engine efficiency, safety features, comfort, and design. They come in various types and sizes, ranging from small economy cars to luxurious sedans, SUVs, trucks, and even electric vehicles. Modern automobiles are powered by internal combustion engines that typically run on gasoline (petrol) or diesel fuel, although alternative fuel sources like electricity and hybrid systems have gained popularity in recent years. They consist of various components such as the engine, transmission, suspension, braking system, electrical systems, and a wide array of features and amenities designed to enhance the driving experience. In addition to personal transportation, automobiles play a crucial role in industries such as logistics, transportation services, emergency services, and commercial activities. They have greatly influenced society, enabling mobility, facilitating economic growth, and shaping urban landscapes with the development of roads, highways, and infrastructure. However, the automobile industry also faces challenges such as environmental impact, including carbon emissions and reliance on fossil fuels. As a response, there has been a growing emphasis on developing more sustainable and eco-friendly alternatives, such as electric vehicles and advancements in fuel efficiency. Overall, automobiles have become an integral part of modern life, providing convenience, freedom, and mobility to individuals, and contributing significantly to the global economy and transportation systems.

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Summer Training and Internship report on AUTOCAD

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BRANCH	Mechanical Engineering
DURATION	10/03/2023 to 10/04/2023

ACKNOWLEDGEMENT

It is my pleasure to be indebted to various people who directly or indirectly or indirectly helped me to learned this course and who influencedmy thinking behaviour and acts during study.

I am thankful to the instructor of this course for his support and cooperation provided to me during the summer internship training.

I also extend my sincere appreciation to mentor (Debaprasad Pal) who provided their valuable suggestion and precious time for helping me outin completing my course.

I perceive as this opportunity as a big milestone in my career development I will strive to use gained skills and knowledge in the best viable way and I will continue to work on their inprovement to attain desires carrier objective hope to continue cooperation with all of you in the future.

CONTENT

INTRODUCTION

- The Word AutoCAD is made up of two words

  "Auto (logo of company)" and CAD " (computer aided design/drafting)".

- AutoCAD is 2D and 3D modelling software.

- It is developed by Autodesk company.

- AutoCAD is an U.S.A based company.

- It is widely used in industry for 2D drawing and 3D modelling.

- In another way we can say that AutoCAD is a designing course,

  which is performed by the help of computer.

Version of AutoCAD

- AutoCAD software was firstly launched by Autodesk company in Dec. 1982.
- It comes in India in 1988.
- The first version of AutoCAD was R1 after that R2,R3,R4……and so on.
- In 2000, Autodesk launched a version of AutoCAD 2000 after that 2001,2002… so on.
- This time, we have the latest version of AutoCAD in 2020.
- Latest version is easy to use and over come the dificulties ofold version.

REGENT EDUCATION AND RESEQARCH FOUNDATION GROUP OF

INSTITUTTION

DEPARTMENT OF MECHANICAL ENGINEERING

Name of the student	: SUBHAJIT NATH
Roll No	:26300720018
Stream	:Mechanical Engineering
Semester	:6th
Year	:3rd
Topic Name	:Drive systems of Automobile

CONTAINS

What is a automobile

A car or automobile is a motor vehicle with wheels. Most definitions of *cars* say that they run primarily on roads, seat one to eight people, have four wheels, and mainly transport people, not cargo.[1][2]

French inventor Nicolas-Joseph Cugnot built the first steam-powered road vehicle in 1769, while Swiss inventor François Isaac de Rivaz designed and constructed the first internal combustion powered automobile in 1808. The modern car—a practical, marketable automobile for everyday use—was invented in 1886, when German inventor Carl Benz patented his Benz Patent-Motorwagen. Commercial cars became widely available during the 20th century. One of the first cars affordable by the masses was the 1908 Model T, an American car manufactured by the Ford Motor Company. Cars were rapidly adopted in the US, where they replaced horse-drawn carriages.[3] In Europe and other parts of the world, demand for automobiles did not increase until after World War II.[4] The car is considered an essential part of the developed economy.

Cars have controls for driving, parking, passenger comfort, and a variety of lights. Over the decades, additional features and controls have been added to vehicles, making them progressively more complex. These include rear-reversing cameras, air conditioning, navigation systems, and in-car entertainment. Most cars in use in the early 2020s are propelled by an internal combustion engine, fuelled by the combustion of fossil fuels. Electric cars, which were invented early in the history of the car, became commercially available in the 2000s and are predicted to cost less to buy than gasoline cars before 2025.[5][6] The transition from fossil fuels to electric cars features prominently in most climate change mitigation scenarios,[7] such as Project Drawdown's 100 actionable solutions for climate change.

There are costs and benefits to car use. The costs to the individual include acquiring the vehicle, interest payments (if the car is financed), repairs and maintenance, fuel, depreciation, driving time, parking fees, taxes, and insurance.[8] The costs to society include maintaining roads, land use, road congestion, air pollution, noise pollution, public health, and disposing of the vehicle at the end of its life. Traffic collisions are the largest cause of injury-related deaths worldwide.[9] Personal benefits include on-demand transportation, mobility, independence, and convenience.[10] Societal benefits include economic benefits, such as job and wealth creation from the automotive industry, transportation provision, societal well-being from leisure and travel opportunities, and revenue generation from taxes. People's ability to move flexibly from place to place has far-reaching implications for the nature of societies.

Etymology

The English word *car* is believed to originate from Latin *carrus*/*carrum* "wheeled vehicle" or (via Old North French) Middle English *carre* "two-wheeled cart", both of which in turn derive from Gaulish *karros* "chariot".[1][2][3] It originally referred to any wheeled horse-drawn vehicle, such as a cart, carriage, or wagon.[4][5][6]

"Motor car", attested from 1895, is the usual formal term in British English.[7] "Autocar", a variant likewise attested from 1895 and literally meaning "self-propelled car", is now considered archaic.[8] "Horseless carriage" is attested from 1895.[9]

"Automobile", a classical compound derived from Ancient Greek *autós* (αὐτός) "self" and Latin *mobilis* "movable", entered English from French and was first adopted by the Automobile Club of Great Britain in 1897.[10] It fell out of favour in Britain and is now used chiefly in North America,[11] where the abbreviated form "auto" commonly appears as an adjective in compound formations like "auto industry" and "auto mechanic".

History

The first steam-powered vehicle was designed by Ferdinand Verbiest, a Flemish member of a Jesuit mission in China around 1672. It was a 65-centimetre-long (26 in) scale-model toy for the Kangxi Emperor that was unable to carry a driver or a passenger.[12][13] It is not known with certainty if Verbiest's model was successfully built or run.[14]

(Cugnot's 1771 *fardier à vapeur*, as preserved at the Musée des Arts et Métiers, Paris, France)

Nicolas-Joseph Cugnot is widely credited with building the first full-scale, self-propelled mechanical vehicle in about 1769; he created a steam-powered tricycle.[15] He also constructed two steam tractors for the French Army, one of which is preserved in the French National Conservatory of Arts and Crafts.[16] His inventions were limited by problems with water supply and maintaining steam pressure.[17] In 1801, Richard Trevithick built and demonstrated his Puffing Devil road locomotive, believed by many to be the first demonstration of a steam-powered road vehicle. It was unable to maintain sufficient steam pressure for long periods and was of little practical use.

Regent Education and Research Foundation Group of Institutions

Department of Mechanical Engineering

Project title:: "Solar Ship Project: Harnessing Renewable Energy for Sustainable Maritime Transportation."

Even Semester : (2022-2023)

Name : Santanu Ghanta Roll Number : 26300721022

Subject Name : PROJECT II Subject Code : PW-ME 681

Introduction:

Solar Ship is a revolutionary concept in transportation that combines the use of renewable energy and innovative design to create a sustainable and efficient mode of transport. It represents a breakthrough in the field of green transportation, offering a viable alternative to traditional fossil fuel-powered vehicles.

The concept of Solar Ship revolves around harnessing the power of the sun to generate clean energy that propels the vehicle. Solar panels are integrated into the vehicle's structure, providing a constant source of renewable energy. These panels convert sunlight into electricity, which is stored in onboard batteries. This stored energy can be used to power the vehicle's propulsion system, as well as other essential components.

Solar Ships are designed with aerodynamics and efficiency in mind. Their streamlined shape reduces drag and maximizes energy efficiency, allowing them to travel long distances with minimal energy consumption. These vehicles often incorporate lightweight materials and advanced technologies to further enhance their performance and range.

One of the key advantages of Solar Ships is their ability to operate in remote and off-grid areas. By relying on solar energy, they can operate independently of traditional infrastructure, such as fuel stations or charging

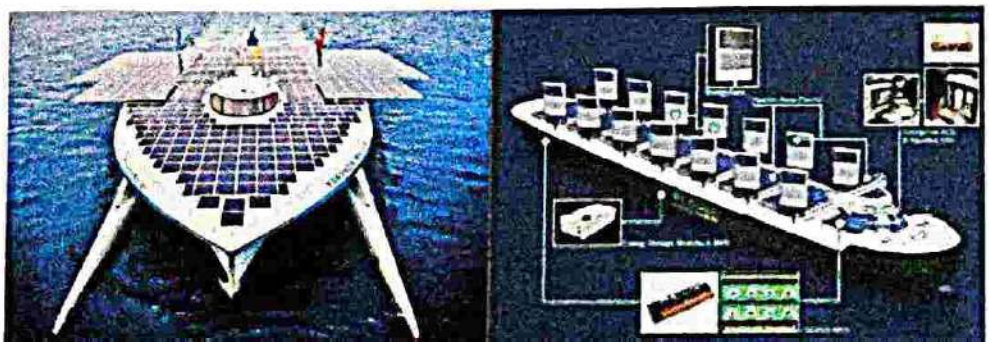
stations. This makes them ideal for applications in remote regions, where access to conventional transportation is limited or non-existent. Solar Ships have the potential to revolutionize cargo transport, medical supply delivery, disaster relief operations, and other critical missions in underserved areas.

Moreover, Solar Ships offer significant environmental benefits. By utilizing clean, renewable energy, they produce zero emissions during operation, contributing to reduced carbon footprint and air pollution. They help combat climate change and promote sustainability in transportation, aligning with global efforts to transition towards a low-carbon future.

While Solar Ships are still in the early stages of development and commercialization, they hold immense potential for transforming the transportation sector. Continued advancements in solar panel efficiency, battery technology, and lightweight materials will further improve their performance and viability.

In summary, Solar Ship represents a visionary approach to transportation, integrating renewable energy and innovative design to create sustainable, efficient, and environmentally friendly vehicles. By harnessing the power of the sun, Solar Ships offer a promising solution to address the challenges of traditional transportation and pave the way for a cleaner and more sustainable future.

Image :



OBJECTIVE : -

The Solar Ship project is an initiative focused on developing and promoting solar-powered airships as a sustainable mode of transportation. The objectives of the Solar Ship project can include:

Environmental Sustainability: The primary objective of the Solar Ship project is to promote environmentally sustainable transportation solutions. Solar-powered airships utilize renewable energy from the sun, resulting in minimal carbon emissions and reduced environmental impact compared to conventional aircraft or ships.

Energy Efficiency: Solar-powered airships aim to harness the power of the sun to generate electricity, which is used to propel and operate the airship. The project aims to maximize energy efficiency by optimizing solar panels, batteries, and other energy storage and management systems.

Remote Access and Humanitarian Aid: One of the key objectives of the Solar Ship project is to enable access to remote and underserved regions. Solar-powered airships can reach areas with limited infrastructure, providing transportation, medical supplies, and humanitarian aid to communities in need, especially in regions lacking proper roads or airports.

Disaster Relief and Emergency Response: Solar-powered airships can be valuable assets in disaster relief and emergency response operations. They can swiftly transport supplies, medical personnel, and equipment to affected areas, particularly when traditional transportation networks are disrupted or damaged.

Research and Development: The Solar Ship project aims to continually improve and innovate in the field of solar-powered airship technology. This includes conducting research, development, and testing of new materials, designs, and systems to enhance efficiency, safety, and performance.

Commercial Viability: While the project has environmental and humanitarian objectives, it also seeks to demonstrate the commercial viability of solar-powered airships. This includes exploring potential applications in industries such as tourism, cargo transportation, surveillance, and communications, aiming to create a sustainable business model around solar-powered airship operations.

Public Awareness and Education: The Solar Ship project aims to raise public awareness about the benefits of solar-powered airships and sustainable transportation. Through educational initiatives, outreach programs, and media campaigns, the project strives to foster understanding and support for innovative and environmentally friendly transportation solutions.

Ship Design and Construction: -

Designing and constructing a SOLAR (Solar-powered Offshore Logistics and Regenerative) ship involves integrating various technologies and principles to create a vessel that operates primarily on renewable energy from the sun. Here are some key considerations for SOLAR ship design and construction:

Solar Power Generation: The ship should be equipped with a sufficient number of solar panels to harness solar energy and convert it into electrical power. These panels need to be strategically placed to maximize exposure to sunlight and ensure efficient power generation.

Energy Storage: To provide continuous power even when sunlight is not available, the SOLAR ship requires an energy storage system. This can involve high-capacity batteries or other storage technologies capable of storing surplus solar energy during the day for use at night or during cloudy conditions.

Electric Propulsion: SOLAR ships typically use electric propulsion systems that are powered by the stored solar energy. Electric motors are employed to drive the propellers, offering quiet operation, reduced emissions, and improved efficiency compared to traditional fossil fuel engines.

Lightweight Construction: To optimize the efficiency of solar power generation, SOLAR ships are often constructed using lightweight materials. Lightweight composites and alloys can reduce the overall weight of the vessel, improving its buoyancy and reducing energy requirements for propulsion.

Efficient Design: SOLAR ships incorporate hydrodynamic design principles to minimize drag and increase energy efficiency. Streamlined hull shapes, bulbous bows, and advanced hull coatings are utilized to reduce resistance and improve fuel economy.

Energy Management Systems: A sophisticated energy management system is essential for monitoring and controlling the flow of energy throughout the ship. This system ensures that the solar power generated is distributed efficiently, prioritizing propulsion, onboard systems, and charging auxiliary equipment.

Regenerative Systems: SOLAR ships often incorporate regenerative technologies to minimize energy consumption and waste. This may include systems for waste heat recovery, water desalination, and waste management, which enhance the ship's sustainability and self-sufficiency.

Navigation and Safety Systems: SOLAR ships require standard navigation and safety equipment, including radar systems, GPS, communication systems, and safety

PRESENTATION

on

AutoCAD

FOR

THE PARTIALFULFILLMENT OF

B. TECH IN

MECHANICAL ENGINEERING

SUBMITTED BY:

STUDENT NAME: SUPRITI DEY

UNIVERSITY ROLL NO.: 26300721024

OUTLINE

- Introduction
- Latest Version
- AutoCAD Screen
- Way to provide command.
- How it Works
- Co-ordinate system.
- Some 2D command.
- Benefits of AutoCAD.
- Careers involving AutoCAD.

INTRODUCTION

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- John Walker Developer of AutoCAD □ It comes in India in 1988.

- The first version of AutoCAD was R1 after that R2, R3, R4..... and so on.

- In 2000, Autodesk launched a version of AutoCAD 2000 after that 2001,2002..... so on.

A Report On

Common Rail Direct Injection System

of

Automobile Vehicle

for

the partial fulfillment of

B. Tech in

Mechanical Engineering

Submitted by:

SUKANYA MONDAL

(26300721033)

Project II (PW-ME681)

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I would like to acknowledge that this project was completed entirely by me and not by someone else.

Sukanya Mondal.

Sukanya Mondal

Abstract

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