

SUMMARY DETAILS – ADACEMIC YEAR – 2021 -2022

3.1.1 Grants received from Government and non-governmental agencies for research projects / endowments in the institution during the year (INR in Lakhs)

Name of the Project/ Endowments, Chairs	Name of the Principal Investigator/Co- Investigator	Department of Principal Investigator	Year of Award	Amount Sanctioned	Duration of the project	Name of the Funding Agency	Type Government / Non Government)
Design and Performance Evaluation of Battery Powered Compact Power Supply for Dielectric Barrier Discharge Devices	Mr.G.Vikram	Electrical and Electronics Engineering	2021-22	7,500	3 Months	Tamilnadu State Council for Science and Technology	Government
Design and Fabrication of Garbage Collection Machine in Beach	Dr.M.Subramanian	Mechanical Engineering	2021-22	7,500	3 Months	Tamilnadu State Council for Science and Technology	Government



D. Somaiah
Principal
Adithya Institute of Technology
Coimbatore- 641107



தமிழ்நாடு அறிவியல் தொழில்நுட்ப மாநில மன்றம்
TAMIL NADU STATE COUNCIL FOR SCIENCE AND TECHNOLOGY
(Established by Government of Tamilnadu)
Directorate of Technical Education Campus, Chennai – 600 025
Ph : 044-22301428, Telefax : 044-22301552 www.tanscst.nic.in

Dr.R.Srinivasan, M.Sc., Ph.D.,F.I.C.S., M.A.C.S.(USA),
Member Secretary

11.03.2022

Lr.No.TNSCST/SPS/2021-2022/
To
The Principal
Adithya Institute of Technology
Kurumbapalayam, Coimbatore-641107

Sir/Madam,

Sub: TNSCST – Student Project Scheme (2021-2022) – approval intimation–grant release- reg.

With respect to the above scheme, the list of projects approved by the State Council is enclosed along with terms and conditions. You are requested to adhere to terms and conditions such as submission of UC and seminar paper in time.

No	Guide Name and Institutional Address	Title of the Project	Students Name	Project Code	Amount
1	Mr.G.Vikram Assistant Professor, Department of EEE Adithya Institute of Technology Kurumbapalayam, Coimbatore-641107	Design and performance evaluation of battery powered compact power supply for dielectric barrier discharge devices	A.Divya, S.Karthick, B.Pradeep	EEE-0886	7500/-
2	Dr.M.Subramanian Associate Professor, Department of Mechanical Engineering Adithya Institute of Technology Kurumbapalayam, Coimbatore-641107.	Design and fabrication of garbage collection machine in beach	Vignesh.D Raksath Ahamed.K Kanish.R	EME-0399	7500/-

Herewith enclosed the cheque for the approved grant and disburse the grant to the concerned students through the guides at the earliest.

Kindly send the utilisation certificate (format enclosed) and seminar paper (Ref.T&C-No.5&6) on completion of the project.

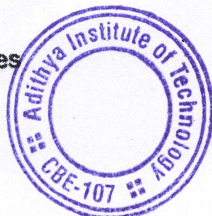
Thanking you,

Yours faithfully,

11.3.22
Member Secretary.

- Encl: a) Terms & Conditions (T&C)
b) Format of Utilisation Certificate (UC)
c) Cheque for Rs. 15,000/- No: 207064 dt: 11.03.2022

Copy to: The individual guides



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Adithya Institute of Technology
Coimbatore- 641107

DESIGN AND FABRICATION OF BEACH CLEANING MACHINE

D. Vignesh, K.Raksath ahamed, R. Kanish

Department of Mechanical Engineering, Adithya Institute of Technology,
Coimbatore-641107.

Abstract

The main aim of this project is to design and fabrication of a machine system to cleaning of the beach in easy way. This system may operate with or without electrical power and it comprises the major components like geared electric motor, 12V Battery and chain conveyor and dust collector. The movements of the system from one place to another by manually. For collection of wastes from beach, the motor is operated by 12v DC power supply and the conveyor having hooks arrangement to pick up the waste and transfer it to the dust collector. This system is helpful to cleaning the beach for eco-clean environment.

Introduction

The beaches are main attraction for tourism, so in attracting tourist the beach must be keep clean , For the purpose of cleaning the beach , some cleaning machine must be used so we have manufactured a cleaning machine which is helpful in clean the beaches. The motor is responsible for the driving mechanism of the conveyor. The strainer attached to the conveyor will collect the wastages from the surroundings and transfer it to storage container through the conveying belt. The motor is operated by 12v DC power supply and the conveyor having hooks arrangement to pick up the waste and transfer it to the dust collector.

Motivation

The motivation for this project is based on to clean the environment with economic and low cost budget by using simple components. The operation and maintenance of this system is easier and eco-friendly. There is no need of skilled operator to operate this system.

Materials and Methods

The main components used in these systems are Geared motor, Bearings, Chain and Sprockets, Wheels, 12 V Battery and Dust collector. These components are easily available and cost wise low. The Structural body is made with help of L- angle steel frame. These components are properly located and checked the functionality and operation of this system.

Major process used

The different kinds of manufacturing processes like drilling, welding, sheet metal forming etc. are used to construct this system.



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Working

The device is placed across a beach and so that only sand can get through the lower basement. Floating waste like bottles, plastic cans, other waste, etc. is picked by hook and transfer to the conveyor. The chain revolves with the sprocket wheel which is driven by the geared motor.

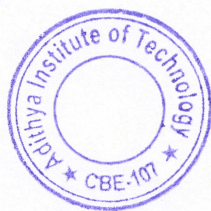
Results and Discussion

The collection of waste by using this fabricated beach cleaning machine is very useful for cleaning the beaches for affordable price and easy maintenance with low power consumption. The function of the conveyor system is to pick the waste with the help of hooks arrangements in conveyor and transfer the collected waste to the collector container. The movement of this system from one place to another by manual operation.

Conclusion

As compared to the previous beach cleaning machine, this project is efficient and cheap and is user-friendly. In this, the hooking system will scoop out the debris from the sand and lift with the help of belt conveyor. This machine works for collection of different kinds of wastes like seaweed, dead fish, shells, wood, and virtually any unwanted debris. It can work on both wet and dry sand conditions. In future, the system can be automated with remote operating conditions.

Guide: Dr.M.Subramanian, Associate Professor, Department of Mechanical Engineering, Adithya Institute of Technology, Coimbatore-641107.




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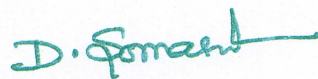
STUDENT PROJECT SCHEME: 2021-2022
UTILISATION CERTIFICATE

1. Name of the Guide and Address : Dr.M.Subramanian,
Associate Professor, Mechanical Engineering,
Adithya Institute of Technology, Coimbatore – 641107.
2. Name of the Student(s) : Mr.D.Vignesh
Mr.K.Raksath Ahamed
Mr.R.Kanish
3. Title of the Project : Design and Fabrication of Garbage Collection Machine in
Beach
4. Project Code : EME - 0399

It is certified that a sum of Rs.7500 (Rupees Seven Thousand Five Hundred Only) Sanctioned by the council for carrying out above mentioned student project has been utilized for the purpose for which it was sanctioned and the sum of Rs...Nil.. remaining unutilized is refunded.



Signature of the Guide


Signature of the HOD


Signature of the Principal with Seal

Principal
Adithya Institute of Technology
Coimbatore- 641107




Principal
Adithya Institute of Technology
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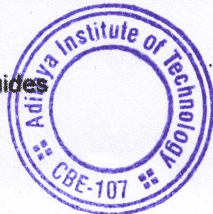
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Coimbatore- 641107

Design and performance evaluation of battery powered compact power supply for dielectric barrier discharge devices

VIKRAM. G, DIVYA. A, KARTHICK. S, PRADEEP. B
Department of Electrical and Electronics Engineering,
Adithya Institute of Technology, Coimbatore -641107.

Abstract

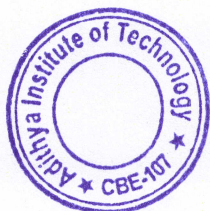
Dielectric barrier discharging (DBD) is one of the important ways to produce non-thermal plasma (cold plasma) for wide range of industrial, environmental, and biomedical applications such as for ozone production, toxic gas treatment, water treatment, surface treatment, plasma medicine applications, supersonic beam, and thin film deposition. Unfortunately, most existing DBD power system require expensive, bulky, and specialized equipment, and are not suitable for onboard applications like point-of injured wound treatment and fuel reformer in automobiles. Hence, there is high demand to develop battery powered, portable, high performance dielectric barrier discharge power supply for produce non-thermal plasma. The main objective of the proposal is to design, construction, and performance evaluation of battery powered high frequency, high voltage dielectric barrier discharge power supply for generating plasma for biomedical applications, specifically for point-of injured in battlefields or rural areas. The proposed power supply will be cost effective and compact in size and has the advantage of over current protection and convenient control for voltage and frequency selection. The power supply can generate high voltage pulses of up to 4-6 kV at the repetitive frequency range up to 20 kHz.


Introduction

Sterilization describes a process that destroys or eliminates all forms of microbial life and is carried out in health-care facilities by physical or chemical methods. Steam under pressure, dry heat, O₂ gas, hydrogen peroxide gas plasma, and liquid chemicals are the principal sterilizing agents used in health-care facilities. In our project, we are using dielectric barrier discharge device to attain the necessary power to make the plasma capable of sterilization. The device is compact and can be used without any safety measures.

Motivation

The main objective of the proposal is to design, construction, and performance evaluation of battery powered high frequency, high voltage dielectric barrier discharge power supply for generating plasma for biomedical applications, specifically for treating injuries, wounds and sterilizing medical equipments. It can also be used in home for treating foods, keys and sterilizing, hands replacing the hand sanitizer. It is of high degree of sterilization than using sanitizer and it is less harm.




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Materials and Methods

Dielectric barrier discharging (DBD) is a combination of electrical & electronics used for manufacturing high voltage from battery and recharging the battery. DS965 NPN Transistor, Fly back Transformer, Push button, LEDs, PCB, Terminal Blocks, Resistor 150k, 1k, 220, 330 2Watts, Capacitor 1nF/3KV, Capacitor 1000uF, Capacitor 470nF/400V, Capacitor 105/3KV, 1N4007 Diode, Zener diode, On/off switch and Battery 3.6 V & 9V.

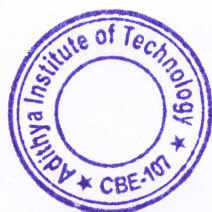
Characterization

To achieve the purpose of being safe and user friendly, these devices have be develop to avoid electric shock and thermal damage. The majority of the required high-voltage and high-frequency AC supplies employed by DBD devices have been based on resonant-type power electronic converters (PEC's Nonetheless, resonant PEC's typically are neither small nor lightweight, which make them less desirable for supplying DBD devices in biomedical applications. Handheld, battery-operated DBD plasma which does not rely on an external power sources (e.g. mains power or a power generator).

Working

The multi-stage structure will consist of multiple DC-DC step-up PEC's supplied from batteries, it will feed a multi-level DC-AC PEC, which will be operated to produce high voltages over a wide range of high frequencies. The main issue in the development of plasma devices for the biomedical applications is the prevention of electric shock and thermal damage. To address this issue, the plasma jets must operate at a low voltage with a ground electrode. Therefore, we were able to adjust the current in a low range of about 1 mA to avoid both electric shock and thermal damage.

When power is applied to the circuit, the transistor and the transformer instantly start oscillating at the specified high frequency. This forces the battery current to pass across the transformer winding in a push pull manner. The above switching generates a proportional induced high voltage across the secondary winding of transformer. To further enhance and lift this voltage to a level which may become suitable for generating a flying spark, a charge pump circuit involving a ladder network is used at the output of transformer. This network pulls the 200V from the transformer to about 5kV. This high voltage is rectified and applied across a bridge rectifier where the voltage is appropriately rectified and stepped up by the 2uF/1KV capacitor. As long as the output terminals across the 2uF capacitor are held at some specified distance, the stored high voltage energy inside the capacitor is unable to discharge, and stays in a standby condition.



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Advantages

- Unique and harmless to human being.
- Plasma sterilizes much faster and safe compare to other methods.
- Cost effective and compact in size.
- Less bulky, eco friendly used for sterilization.

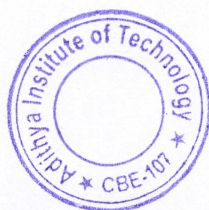
Application


- Medicine especially in wound treatment
- Dentistry like sterilizing dental devices
- Environment –waste water treatment, exhaust gases.
- Agriculture –sterilizing fruits and vegetables before eating.

Conclusion

The Power supply Devices for plasma jets and DBD plasma have been developed for application to a living body. A dc-ac inverter issued for high-voltage sinusoidal power with a frequency of several tens of kilohertz. The battery-operated handheld surface DBD plasma source which is designed for the treatment of narrow and deep channels such as the nasal cavity is reported. So there is no feeling of heat or electrical shock at all when one holds the plasma wand. It is necessary to avoid electric shock and thermal damage and to maintain safety, less bulky and user-friendly operation to provide a solution for biomedicine and sterilization.

Guide: Mr.G.Vikram, Assistant Professor, Adithya Institute of Technology,
Coimbatore-641107.



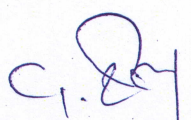

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1. Name of the Guide and Address : Mr.G.Vikram,
Assistant Professor,
Electrical and Electronics Engineering,
Adithya Institute of Technology, Coimbatore – 641107.
2. Name of the Student(s) : Ms. A.Divya
Mr. S.Karthick
Mr. B.Pradeep
3. Title of the Project : Design and Performance Evaluation of Battery Powered
Compact Power Supply for Dielectric Barrier Discharge
Devices
4. Project Code : EEE-0886


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