IJAREEIE

e-ISSN: 2278-8875
p-ISSN: 2320-3765

International Journal of Advanced Research

in Electrical, Electronics and Instrumentation Engineering

Volume 11, Issue 5, May 2022

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.18

| e-ISSN: 2278 – 8875, p-ISSN: 2320 – 3765| www.ijareeie.com | Impact Factor: 8.18|

||Volume 11, Issue 5, May 2022||

|DOI:10.15662/IJAREEIE.2022.1105019 |

Implication of Electrical Energy Generation by using Domestic Ceiling Fan

Dr. P. Selvan, S. Lingeswaran, T. Gunasekaran, N. Leelavathi, E. Dinesh

Professor, Department of EEE, Erode Sengunthar Engineering College, Perundurai, Erode, Tamil Nadu, India

UG Scholar, Department of EEE, Erode Sengunthar Engineering College, Perundurai, Erode, Tamil Nadu, India

UG Scholar, Department of EEE, Erode Sengunthar Engineering College, Perundurai, Erode, Tamil Nadu, India

UG Scholar, Department of EEE, Erode Sengunthar Engineering College, Perundurai, Erode, Tamil Nadu, India

UG Scholar, Department of EEE, Erode Sengunthar Engineering College, Perundurai, Erode, Tamil Nadu, India

ABSTRACT-A fan is a machine used to create a flow in a liquid, usually a gas like air. The fan consists of a rotating array of blades or vanes that act on the fluid. The rotating set of blades and hub is called an impeller, rotor or impeller. It is usually contained in some kind of case or box. Fans are despite the most widespread items in India wide availability of chillers and air conditioners. Because the initial investment costs of solar systems are still quite high. When it comes to generating electricity for domestic use and saving energy. Since power generation is a big problem for mankind, this document introduces a method of power generation using a ceiling fan. The generated energy can be used or stored in a battery.to power some other devices.

KEYWORDS: Powersources, Supply, Generation, Innovative

I. INTRODUCTION

We understand that electricity cannot be produced or destroyed, but it can be converted from one form to another. But we are losing the assets that can produce electricity as if it were infinite. If the wasted power can be renewed and reused, it could somehow contribute to the problem of power shortage, which is an essential risk of Gift International. The company aims to develop machines that use ceiling fans to electrify rural areas using wind power. Wind power is treated as a non-renewable source. Early civilizations used wind power to grind grain, pump water from deep wells, and power sailboats. Pre-industrial European wind turbines were used in a variety of applications such as irrigation and drainage pumping, grain milling, wood sawing, and processing of a variety of commodities such as spices, cocoa, paints, dyes and tobacco. rice field. Before the United States built infrastructure for power lines, water pumps, wind turbines, and small wind turbines, wind turbines were essential to agriculture and planting in the Great Plains and the West of the United States. Over the past few decades, the company has completed wind turbines and converted wind power into electricity.

Wind turbines have many benefits, especially in parts of the world where transmission infrastructure is not fully developed, making them attractive power sources. It's modular and very quick to set up, so you can easily provide and challenge healthy strength. Fuel and wind are loose and abundant, eliminating or reducing the desire to buy, ship and store expensive fuel.Perhaps most important is the generator does not produce any dangerous emissions withinside the method of producing the strength, not like many different technology sources. Then, every day in our life we use a greater number of small voltage electronics devices like mobile, emergency light, emergency fan and some other emergency products. But the problems are this small voltage electronics device's takes around 230 voltages (alternative current) instead of small Voltage (direct current). Due this big difference we spend lot of amounts for converter circuit's (e.g., Mobile charger) and conversion losses. For generation of electricity, we have to think about innovative and feasible methods. One of the methods for generation of electricity is through the ceiling fan with DC generator.

II. OVERVIEW

2.1. PowerGeneration

To generate energy, it has a DC motor that acts as a generator. Initially a DC motor (DC dynamo 12V DC) is selected to paintings as generator and a appropriate pulley is selected which could match flawlessly on fan. A pulley is selected

| e-ISSN: 2278 – 8875, p-ISSN: 2320 – 3765| www.ijareeie.com | Impact Factor: 8.18|

||Volume 11, Issue 5, May 2022||

|DOI:10.15662/IJAREEIE.2022.1105019 |

as in step with the specified revolution. Generator is clamped to the plastic field the usage of clamp to limitation the axial motion of the DC generator. Hence because the fan begins offevolved rotates which in flip runs the motor shaft at better rpm and consequently energy is generated. The energy technology is proven with the aid of using a DC lamp. Motor begins offevolved producing the energy. This energy is used to fee the Ni-Cd Battery.

2.2 Need of Generator

A dynamo may convert mechanical energy to electrical energy. The dynamo can generate alternating current regularly. This current can be utilized to power AC-powered equipment or converted and used for DC-powered devices. The quantity of electricity created by a ceiling fan-mounted generator from a dynamo is sufficient to power low-power gadgets. Most electronic devices, such as cell phones and iPods, may be charged with this.

2.2 Principle of construction of Generator

It is known that when an electric conductor intersects a magnetic field, EMF is guided to the conductor. When the circuit is closed between both ends of a moving conductor, an electric current is generated, which reacts to a magnetic field and exerts a force that tends to stop the movement of the conductor. Arrow a indicates the direction of movement. Of reaction force.

If the conductor continues to move against this force, the current will continue to flow, but since it is necessary to move the conductor against the opposite force, electrical energy can be obtained, so it can be said that dynamic energy has been converted into electrical energy. The cost of mechanical effort. A generator, well known as a generator, is a mechanism that uses this principle to generate electrical energy. For Dynamo and Generator, these names are often omitted

III. EXPERIMENTATION AND RESULTS

3.1 Working principle

A motor turns electrical energy into rotational mechanical energy. To transform mechanical energy into electrical energy, some motors can be used as generators. A permanent magnet motor can be used to charge batteries as a generator. The generator on the ceiling fan is turned by the rotating shaft. The electrons in the copper wire migrate from atom to atom, creating electricity. The number of spins of a generator's coils, the strength of the magnet, and the rate at which the magnet turns all influence the voltage it produces

3.1.1 Block diagram

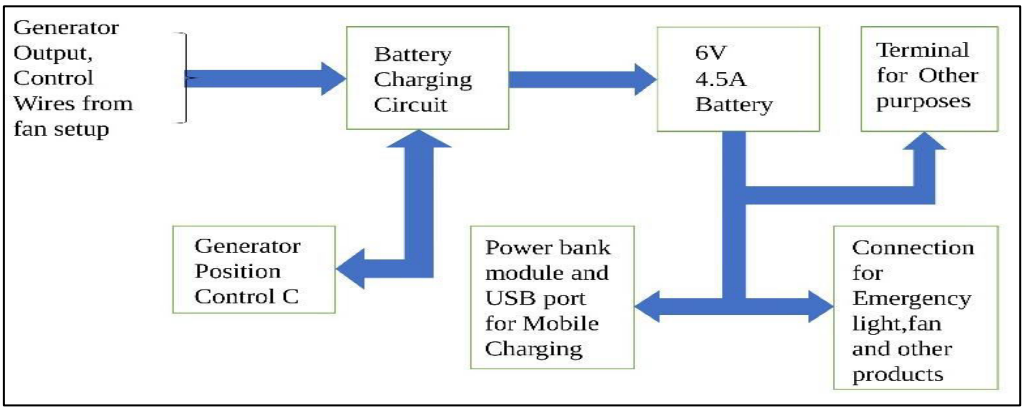


Fig-1: Block diagram of whole process

| e-ISSN: 2278 – 8875, p-ISSN: 2320 – 3765| www.ijareeie.com | Impact Factor: 8.18|

||Volume 11, Issue 5, May 2022||

|DOI:10.15662/IJAREEIE.2022.1105019 |

3.1.2 Proposed View

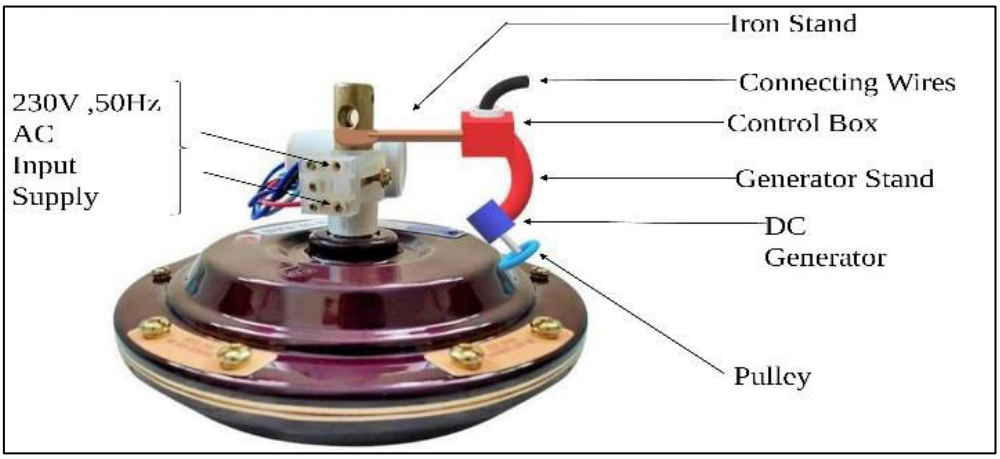


Fig-2: Proposed View of Ceiling fan setup

3.2. Result Analysis:

RPM Vs Watts (Without DC Generator)

Regulator position	Watts	RPM
4	70	396
3	65.4	370
2	59.6	348
1	56.43	304
0	0	0

Graphical View

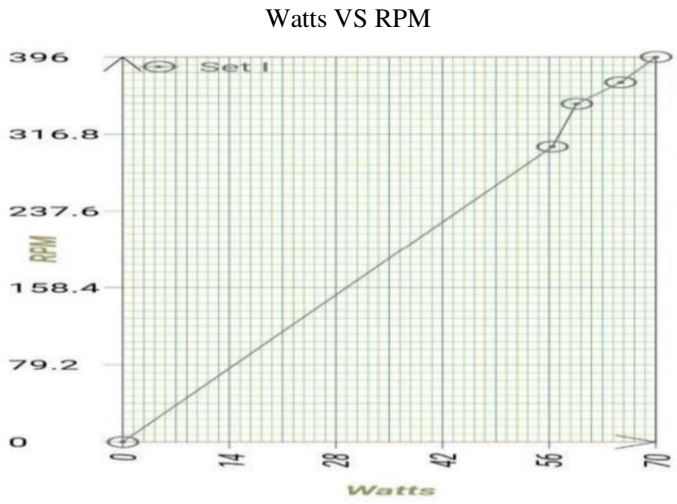


Fig-3: Graph between RPM vs Watts (Without generator)

| e-ISSN: 2278 – 8875, p-ISSN: 2320 – 3765| www.ijareeie.com | Impact Factor: 8.18|

||Volume 11, Issue 5, May 2022||

|DOI:10.15662/IJAREEIE.2022.1105019 |

RPM Vs Watts (With DC Generator)

Regulator position	Watts	RPM
4	70.03	395
3	65.5	368
2	59.7	346
1	56.4	303
0	0	0

Graphical View

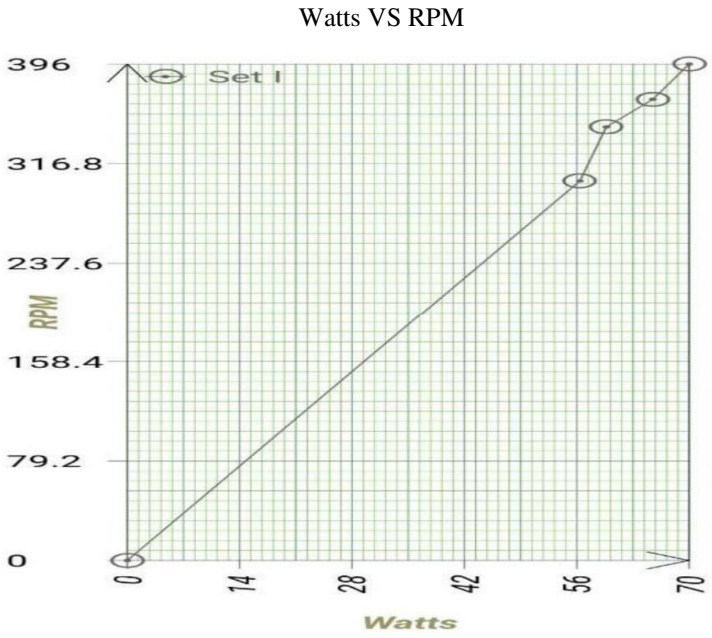


Fig-4: Graph between RPM vs Watts (With generator)

IV. EFFICIENCY OF DOMESTIC CEILING FAN

Sometimes you are given the parameters of a motor, such as its torque (force applied about an axis of rotation) and its revolutions per minute (rpm). You can use the relationship
η = Po/Pi,
where **Po** is output power,
to determine efficiency in such cases, because Pi is given by
I × V, or current times voltage, whereas Po is equal to torque τ times rotational velocity **ω**. Rotational velocity in radians per second is given in turn by **ω = (2π) (rpm)/60.**

η = Po/Pi

$$Po = (\tau \times 2\pi \times rpm/60) / (I \times V).$$

| e-ISSN: 2278 – 8875, p-ISSN: 2320 – 3765| www.ijareeie.com | Impact Factor: 8.18|

||Volume 11, Issue 5, May 2022||

|DOI:10.15662/IJAREEIE.2022.1105019 |

$$Pi = (\pi /30)\ (\tau \times rpm)\ /\ (I \times V).$$

4.1 Full-Load Efficiency

4.1.1 *Without Generator:*

Po (Power Out) = (τ × 2π × rpm/60)

τ	1.69 Nm
RPM	396
I	0.4Amps
V	230V

Po = (1.69×2× π×396/60)
=70.082W
Pi = (0.4×230)
=92W

Efficiency:

$$\eta = Po/Pi$$

=70.082/92
=76.17% *(Approximately 76%)*

4.1.2 *With Generator:*

Po (Power Out) = (τ × 2π × rpm/60)

τ	1.7 Nm
RPM	395
I	0.4Amps
V	230V

Po = (1.7×2× π×396/60)
=70.3W
Pi = (0.4×230)
=92W

Efficiency:

$$\eta = Po/Pi$$

=70.3/92
=76.413% *(Approximately 76%)*

V. FINAL VIEW

The following images depict the project's ultimate result, as well as how it will seem once implemented.

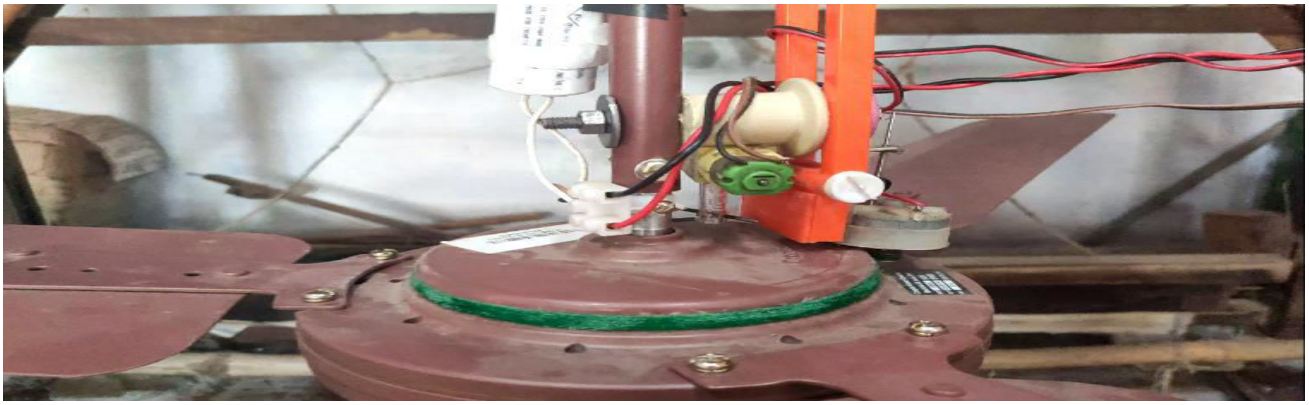


Fig-5: Ceiling fan setup actual view

| e-ISSN: 2278 – 8875, p-ISSN: 2320 – 3765| www.ijareeie.com | Impact Factor: 8.18|

||Volume 11, Issue 5, May 2022||

|DOI:10.15662/IJAREEIE.2022.1105019 |

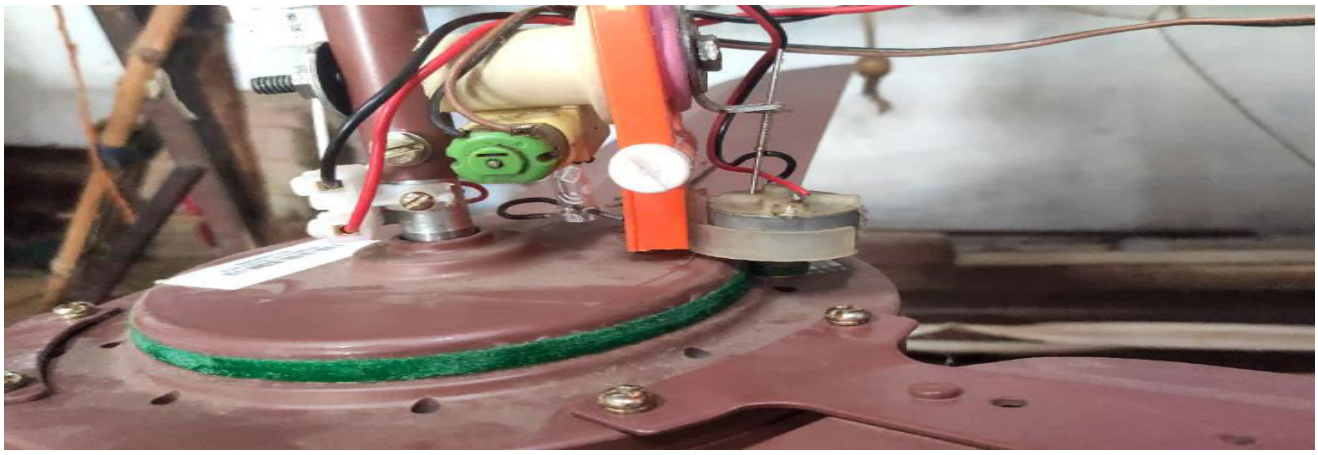


Fig-6: Ceiling fan setup deep view

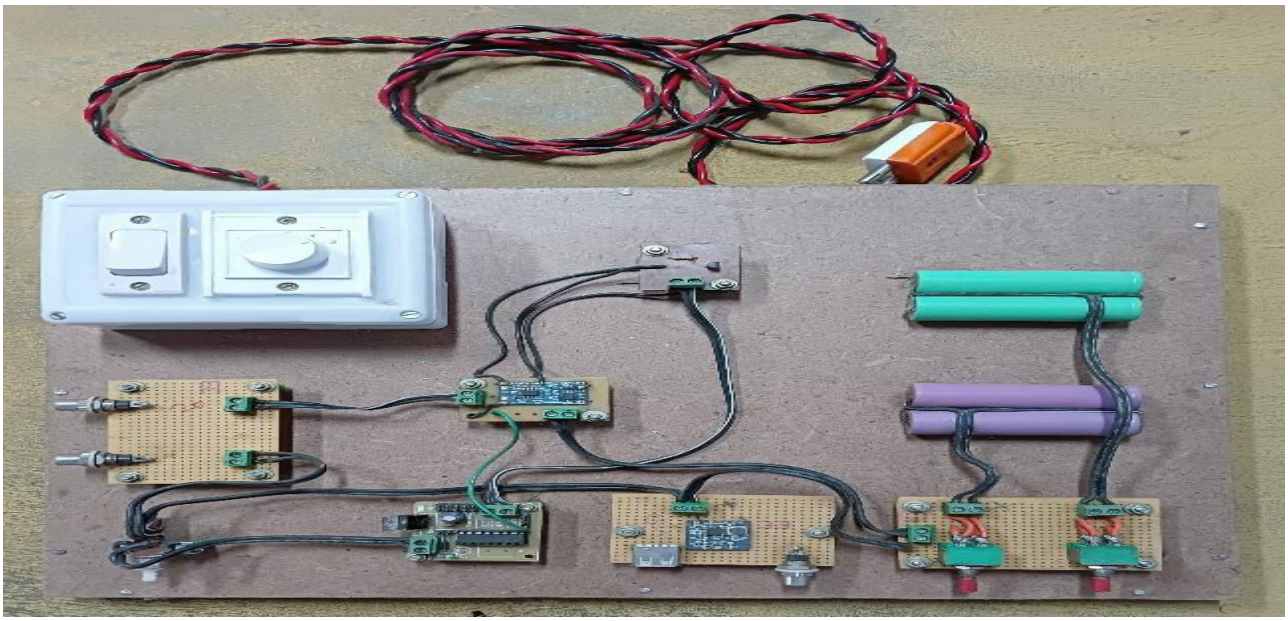


Fig-7: Power kit

VI. CONCLUSION

At a time when there is a global crisis, it is necessary to investigate alternative renewable energy sources. This presentation will discuss one such alternative energy source. The dynamo's rotating energy can be used to power a number of small powered gadgets. You can utilize a dynamo or an alternator. Laptops, cell phones, and other electronic devices may all be charged using this energy. Many Indian villages also use bicycles as their primary source of transportation. The majority of these settlements are without electricity.

The design is based on the rotational area of the fan, which is utilized to move a dynamo with the rotation of the fan. We can expect a step forward in the development of energy utilizing fans in the future by altering or enhancing the equipment, such as using a dynamo or other comparable equipment.

REFERENCES

[1] D. Lin, P. Zhou, and A. Bergqvist, “Improved vector play model andparameter identification for magnetic hysteresis materials”, IEEE Trans. Magn., vol. 50, no. 2.

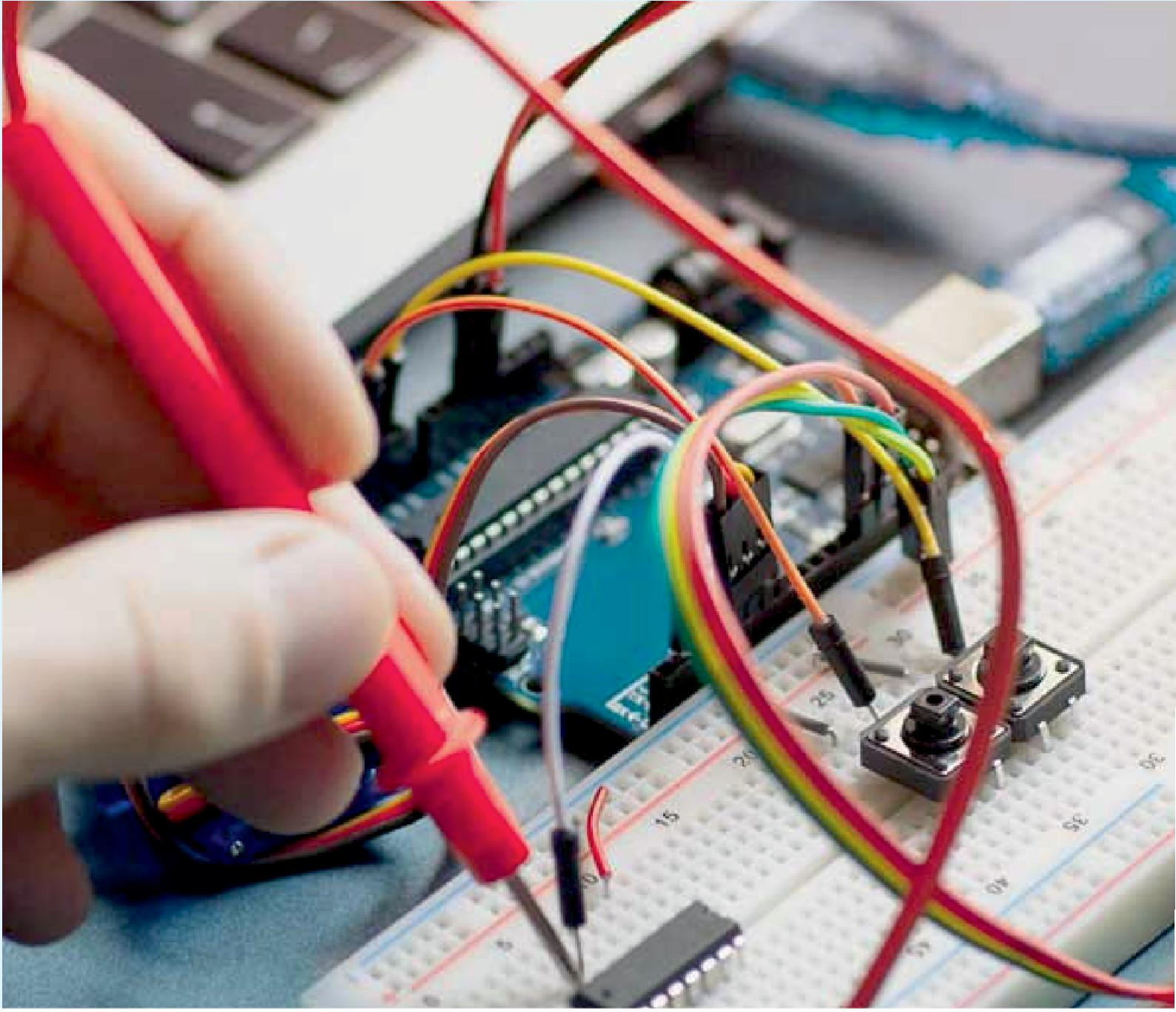
[2] H. Ukaji, K. Hirata, and N. Niguchi, “Claw pole magnetic-geared generator for hub dynamos”, in Proc. Int. Conf. Electr. Mach., Sep. 2014, pp.411–416.

| e-ISSN: 2278 – 8875, p-ISSN: 2320 – 3765| www.ijareeie.com | Impact Factor: 8.18|

||Volume 11, Issue 5, May 2022||

|DOI:10.15662/IJAREEIE.2022.1105019 |

[3] J. Kitaoet al., "Magnetic field analysis of ring core taking account of hysteretic property using play model", IEEE Trans. Magn., vol. 48, no. 11, pp. 3375–3378.
[4] J. Kitao, Y. Takeda, Y. Takahashi, K. Fujiwara, A.Ahagon, and T. Matsuo, "Loss calculation method considering hysteretic property with play model in finite element magnetic field analysis", IEEE Trans. Magn., vol. 50, no. 2, Sep.2014.
[5] K. Yamazaki et al., "Eddy current analysis considering lamination for stator core ends of turbine generators", IEEE Trans. Magn., vol. 44, no. 6, pp. 1502–1505.
[6] R. Mitsuoka, T. Mifune, T. Matsuo, and C. Kaido, "A vector play model for finite-element eddy- current analysis using the Newton–Raphson method", IEEE Trans. Magn., vol. 49, no. 5, pp.1689–1692.
[7] Nisotropic vector play model incorporating decomposed shape functions", IEEE Trans. Magn., vol. 52, no. 3, 2016.
[8] T. Matsuo and M. Miyamoto, "Dynamic and anisotropic vector hysteresis model based on isotropic vector play model for non-oriented silicon steel sheet", IEEE Trans. Magn., vol. 48, no. 2, pp. 215–218.
[9] T. Matsuo, "Anisotropic vector hysteresis model using an isotropic vector play model", IEEE Trans. Magn., vol. 46, no. 8, pp. 3041–3044.
[10]http://www.lowtechmagazine.com/2011/05/biek/powered-electricitygenerators.html



INNO SPACE
SJIF Scientific Journal Impact Factor

doi cross ref

ISSN INTERNATIONAL STANDARD SERIAL NUMBER INDIA

निस्केयर NISCAIR

Impact Factor: 8.18

International Journal of Advanced Research

in Electrical, Electronics and Instrumentation Engineering

9940 572 462 6381 907 438 ijareeie@gmail.com

www.ijareeie.com

Scan to save the contact details