FEASIBILITY STUDY OF A FREE ENERGY DEVICE

A thesis

by

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Department of Mechanical Engineering

SONARGAON UNIVERSITY (SU)

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Submitted to the
DEPARTMENT OF MECHANICAL ENGINEERING
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In partial fulfillment of the requirements for the award of the degree
of
Bachelor of Science in Mechanical Engineering

CERTIFICATE OF RESEARCH

This is to certify that the work presented in this Project was carried out by the author under the supervision of **A M M Samsul Alam**, Associate Professor, Department of Mechanical Engineering, Sonargaon University Dhaka, Bangladesh.

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CANDIDATES DECLARATION

In this regard, we Sonargaon University students certify that the project report entitled "Feasibility Study of a Free Energy Device" is our own unique creation. The concepts, information, and analysis in this project are the outcome of our separate endeavors. All consulted and cited sources have been appropriately credited.

We attest that no other degree or qualification, in whole or in part, has received a submission of this project from any other institution. We assume full responsibility for the project's outcomes, findings, and conclusions. We further declare that we have complied with Sonargaon University's norms for academic integrity, and that any infractions will result in the proper disciplinary punishment.

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First, we started in the name of almighty Allah. Then out special thanks to our friends and colleagues for their support.

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ABSTRACT

The " Feasibility Study of a Free Energy Device " project aims to explore and harness mechanical energy from a flywheel system to generate electricity with minimal external input. A flywheel, known for its ability to store rotational energy, is used as the core component of the system, leveraging its momentum to sustain motion over extended periods. The system works by converting the stored kinetic energy into electrical power via a generator attached to the flywheel. The flywheel is initially powered by an external source, such as a motor, and once accelerated, it maintains its rotation due to inertia, reducing the need for constant energy input. As the flywheel spins, it drives an alternator or generator, producing a steady output of electricity. The project focuses on maximizing energy efficiency, minimizing energy losses through friction reduction, and evaluating the system's potential as a sustainable energy solution for small-scale applications. This concept presents an innovative approach to energy generation, where the inherent advantages of flywheel technology, such as high energy density and low maintenance, are utilized to create a cost-effective and environmentally friendly energy system. The project also explores possible integrations with renewable energy sources to further enhance efficiency and sustainability.

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LIST OF ARONOMIES

DC	Direct Current
MIG	Metal Inert Gas
TIG	Tungsten Inert Gas
HP	Horsepower
AC	Alternating Current
RPM	Revolutions per Minute

Chapter 1

Introduction

1.1 Background of Study

The term Free-Energy generally means a method of drawing power from the local environment, without the need to burn a fuel. There are many different successful methods for doing this and these methods span many countries and many years. The amount of power which can be collected can be very high and the few kilowatts needed to power a household are most definitely within the reach of most of the devices mentioned. Free energy means zero cost energy. Mechanical energy which drives windmill or Solar energy in solar cell which is converts into DC current other energies obtained are from wind power, water power & telluric power. Free energy generator is a process to generate these types of energy. Free energy suppression is the notion that corporate energy interests intentionally suppress technologies that may provide energy at very low cost. Other remaining untouched forces of nature which are well familiar in the scientific literature include earth batteries, atmospheric electricity, telluric currents, and pressure system changes. The energy from perpetual motion is considered fantastical forces. These devices utilize quantum vacuum energy, quantum vacuum perturbation, rotating magnets and purported methods to crack hydrogen. Free energy suppression is the notion that corporate energy interests intentionally technologies that may provide energy at minimum cost. All other remaining untouched forces of nature which are well familiar in the scientific literature, which includes earth batteries, atmospheric electricity, telluric current and pressure system changes. Nikola Tesla once said that, all people should have energy sources for free. There is electricity everywhere present in limitless quantities and can drive the world's equipment without the need for gas, coal or oil. Free Energy generally means a method of drawing power without fuel to be burnt from the local environment. There are many different ways for doing this. These ways span many years and countries. The amount of power which can be obtained can be very high and the few kW needed to power a household are most definitely within the reach. The bottom line is that energy can definitely be drawn from the local environment in sufficient quantities to supply all of our needs. For whatever reason, conventional science appears determined not to accept this basic fact and denies it at every opportunity. It seems likely that vested financial interests are the root cause

of this refusal to accept the facts. The true scientific method is to upgrade scientific theory in the light of observed fact and new discoveries, but the true scientific method is not being followed at the present time.

1.2 Aims and Objectives

We have some specific objectives for this project and they are pointed below:

1.2.1 To Design a Flywheel Based Energy System.

To design a flywheel system capable of storing kinetic energy efficiently and converting it into electrical power. This includes optimizing the design to reduce friction, improve energy retention, and maximize the rotational speed for higher energy output.

1.2.2 To Evaluate the Performance of the System.

To analyze the energy efficiency of the flywheel in terms of input energy required for rotation versus the amount of electricity generated. The study aims to minimize energy losses due to mechanical friction, air resistance, and other factors.

Chapter 2

Literature Review

2.1 Introduction

This chapter is arranged on Literature Review. Here's a look at some of last year's literature, like our project. By reading them, we can overcome the mistakes of the previous project and make a more effective project.

2.2 Related Research/Works

As the global demand for energy continues to rise, there is increasing pressure to transition from fossil fuel-based energy systems to more sustainable, renewable alternatives. Conventional energy sources such as coal, oil, and natural gas contribute significantly to environmental degradation, including greenhouse gas emissions, air pollution, and climate change. While renewable energy technologies like solar, wind, and hydropower are making strides in addressing these issues, they face challenges such as intermittency, storage inefficiencies, and high initial costs. This has spurred interest in alternative methods of energy generation and storage, particularly those that can provide reliable power while minimizing environmental impact. One promising yet underutilized technology is the flywheel energy storage system.

S.U.Maji , M. S. Mane C, Kshirsagar, A. Jagdale, D. Malgar has worked on free energy using flywheel. This Paper deals with the concept of free energy and its generation using flywheel system. A mains motor of half horsepower capacity is used to drive a series of belt and pulley drive which form a gear-train and produces over twice rpm at the shaft of an alternator. The intriguing thing about this system is that greater electrical output power can be obtained from the output of the alternator than appears to be drawn from the input motor. This is done with the help of Gravity wheel. The gravity wheel or flywheel is coupled with the gear-train in order to produce more excess energy or free energy. Detail study is done with various parameters of flywheel to obtain the maximum free energy out of the system.

Siddharth Shroti has worked on Free Energy Generation Advanced Research. A mains motor of capacity (1/4horsepower) is used to drive a series of belts and pulleys which

form a gear-train which produces over twice the rotational speed at the shaft of an electrical generator. The intriguing thing about this system is that greater electrical power can be drawn from the output generator than appears to be drawn from the input drive to the motor. How can that be? Well, Mr Tseung's gravity theory explains that if a energy pulse is applied to a flywheel, then during the instant of that pulse, excess energy equal to 2mgr is fed into the flywheel, where "m" is the mass (weight) of the flywheel, "g" is the gravitational constant and "r" is the radius of the centre of mass of the flywheel, that is, the distance from the axle to the point at which the weight of the wheel appears to act. If all of the flywheel weight is at the rim of the wheel, the "r" would be the radius of the wheel itself. This means that if the flywheel is driven smoothly at constant speed, then there is no energy gain. However, if the drive is not smooth, then excess energy is drawn from the gravitational field. That energy increases as the diameter of the flywheel increases. It also increases as the weight of the flywheel increases. It also increases if the flywheel weight is concentrated as far out towards the rim of the flywheel as is possible. It also increases, the faster the impulses are applied to the system.[2].

Akhilesh Barwahe, Amrendra Kumar, Ankit Domde, Deepak Dhakad, Manish Kumar Dhadse, Vishal Wankhade has worked on electricity generation using flywheel—Flywheels have been under consideration to be used for energy storage purposes. In developing countries like India, with rapid growth in the economy, the demand for electricity is also increasing. With the rising demand for reliable, costeffective, and environmentally friendly energy storage, the Flywheel Energy Storage System FESS is quickly coming into its own. This study presents an analysis which shows that using an FESS is a promising alternative in mitigating energy storage problems in decentralized electricity generation projects where an uninterrupted power supply UPS is required. An electrical machine is used as a motor to store kinetic energy when the solar energy is available, and then the stored energy is converted back to electrical energy by running the machine as a generator when the solar energy is no longer available. Flywheel Energy Storage systems FESS using advanced technology have come up as a promising alternative to the traditional electrochemical battery. The amount of energy storage depends on the mass, flywheel shape, and rotational speed of the rotor. A FESS can have energy fed into the rotational mass of a flywheel, store it as kinetic energy, and release it upon demand. Keywords [3].

Sudipta Saha, Abhik Bose, G. SaiTejesh, and S.P. Srikanth has worked on Analysis of Flywheel. The importance of the flywheel design specification selection and its contribution in the energy storage performance. This contribution is demonstrated on the example cross-sections using computer aided analysis and optimization procedure. This Proposed Computer aided analysis and optimization procedure results shows that suitable design of flywheel geometry design could both have a significant effect on the Specific Energy performance and minimize the operational loads exerted on the shaft/bearings due to reduced mass at high rotational speeds.[4].

Yadav R , Punith P , Sharatbabu, Dr. Jyothi P Koujalagi has worked on flywheel based bicycle generator. Transportation is very important connecting people from different places. A mode of transport is a solution that makes use of a particular type of vehicle, with the increase in population the number of vehicles on road is also increasing. The transportation plays a major impact on environmental-creates air pollution, including nitrous oxide and other particulates and is a significant contributor to global warming through emission of co2. This paper presents a Flywheel based Bicycle Generator. A mode of transportation due to their low cost, ease of use, health benefits and mobility. The main objective of this paper is to convert the rotational energy of rare wheel of the bicycle into electrical energy so that we can recharge the battery.[5]

2.3 Summary

The above has been discussed in detail in the past few literature's which has given us a lot of motivation to do this project.

Chapter 3

Working Procedure

In this chapter fully cover with discuss design and fabrication of this project. Here we will discuss about developing steps of this proposed system.

3.1 Required Operation

i. Boring and Shaping
ii. Welding
iii. Cutting
iv. Grinding
v. Fitting

3.1.1 Boring and Shaping

Boring is a machining process used to enlarge or refine an existing hole in a work piece. It is typically performed to achieve a high degree of accuracy in the diameter of the hole and improve its surface finish. Boring can be done using various tools and machines, including lathes, milling machines, and specialized boring machines.



Fig. 3.1.1: Shaping metal shape.

Boring is essential in industries requiring high accuracy and precision, especially in the automotive, aerospace, and heavy machinery sectors. Shaping is a machining process

that removes material from a workpiece to produce flat surfaces, grooves, or specific contours. It involves the use of a single-point cutting tool that moves back and forth across the material, cutting away small amounts with each pass. Shaping machines are typically used for creating linear features, such as grooves, keyways, or flat surfaces.

3.1.2 Welding

Electric welding refers to a range of welding processes that use electrical energy to generate heat for joining metal parts. In these processes, an electric current is used to create an arc between an electrode and the work piece, producing enough heat to melt the metal. Once the molten metal cools, it solidifies and forms a strong bond between the two pieces. There are various types of electric welding, with the most common methods being Arc Welding, MIG Welding, TIG Welding, and Resistance Welding.

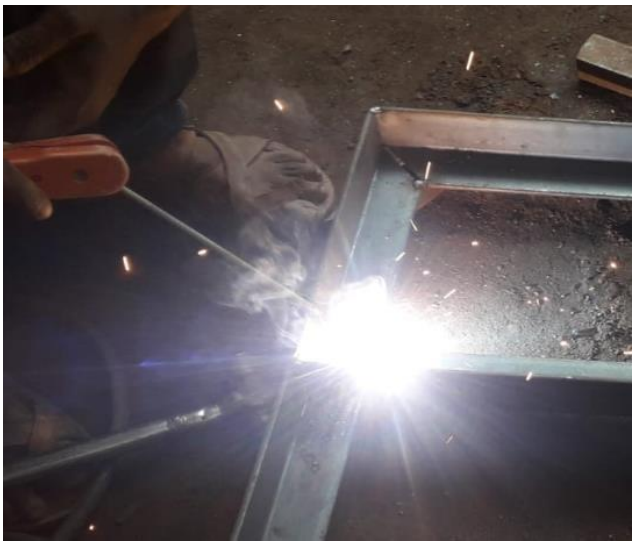


Fig. 3.1.2: Welding in progress.

3.1.3 Cutting

Metal cutting is a manufacturing process in which material is removed from a metal work piece to create a specific shape, size, or surface finish. This is done using various tools and machines that shear, chip, or cut away material. Metal cutting is essential in industries such as automotive, aerospace, construction, and machinery, where precise metal parts are needed.



Fig. 3.1.3: Cutting in Progress.

3.1.4 Grinding

Grinding is a machining process that uses an abrasive wheel or disk to remove material from a work piece, achieving a specific shape, size, or surface finish. It is widely used in manufacturing and metalworking to enhance the precision and surface quality of parts. Grinding can be performed on various materials, including metals, ceramics, and plastics.

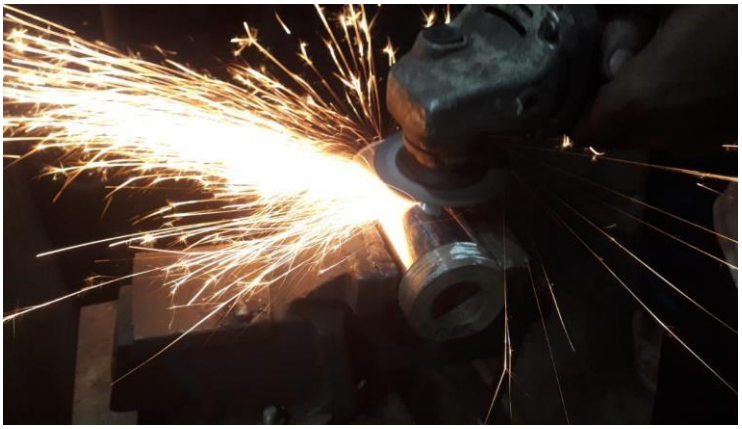


Fig. 3.1.4: Grinding in Progress.

3.1.5 Fitting

Involves the assembly of mechanical components such as gears, bearings, and shafts. It ensures proper alignment and connection to maintain functionality.



Fig. 3.1.5: Full Overview of Proposed System.

3.2 Block Diagram

In this is the block diagram of this proposed system.

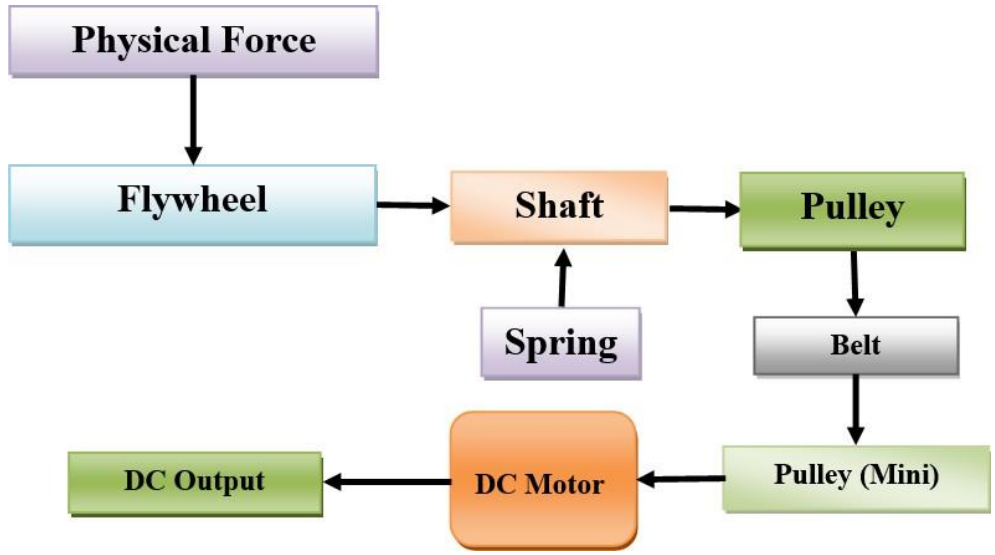


Fig. 3.2: Block Diagram of Proposed System.

In this system we need to provide physical energy to our Flywheel then this energy will be converted into rotation of Flywheel. This rotation of Flywheel will be generating mechanical energy that will be shifted to Pulley by using shaft. Pulley will be connected with Mini Pulley of DC motor with a belt, that's why DC Motor will be get the rotation from the belt. After getting start proper rotation of DC Motor, it will produce Electrical Energy to our Consumer side.

3.3 Conclusion

In this chapter we have discussed about different work steps one by one to show a live process of work progress.

Chapter 4

Methodology

This chapter includes the total over view of the device. In this chapter we have followed-up the theory of Spring, Bearing, Polly, Metal Angle, and other components. Here we can know that the total system overview of the projects. And we will also know that how the equipment is working with each other.

4.1 Theory

We've developed the system that can generate power without any types of fuels perfectly.

4.2 Formula

1. Mechanical Power, $P = T \times \omega$

2. Torque, $T = \frac{P}{\omega}$

3. Current, $I = \frac{P}{V}$

4. Voltage, $V = \frac{P}{I}$

5. Kinetic Energy of a Flywheel, $KE = \frac{1}{2} I\omega^2$

6. Moment of Inertia (I) for a Solid Disc Flywheel, $I = \frac{1}{2} m r^2$

7. Angular Velocity, $\omega = \frac{2\pi N}{60}$

Where:
P = power in watt (W)
T = torque in Newton-meters (Nm)
ω = angular velocity in radians per second (rad/s)
I = current in Amps (A)
V = voltage in volts (V)
KE = kinetic energy in joules (J)
I = moment of inertia of the flywheel in $kg \cdot m^2$
m = mass of the flywheel in kilograms (kg)
r = radius of the flywheel in meters (m)
N = rotational speed in RPM

4.3 Components Used

The components mentioned below are in use:

4.3.1 DC Motor 2 HP

A 2 HP treadmill DC motor is a direct current (DC) motor specifically engineered for use in treadmills and other fitness equipment, providing a power output of 2 horsepower (HP). This motor is crucial for delivering the necessary performance and reliability required during various exercise routines. a 2 HP treadmill DC motor is an essential component of many treadmill and fitness machines, designed to provide reliable and efficient performance. Its ability to deliver adequate torque, allow for adjustable speed, and operate continuously makes it an excellent choice for users seeking effective and durable exercise equipment.



Fig. 4.3.1: DC Motor 2 HP

4.3.2 Flywheel

A flywheel is a mechanical device that stores kinetic energy in the form of rotational motion. It consists of a heavy wheel or disc that rotates around an axis and is designed to maintain its momentum when spinning. Flywheels are commonly used in various applications, from simple mechanical systems to advanced energy storage solutions. a flywheel is a versatile and efficient mechanical device that plays a crucial role in energy storage and power management systems. Its ability to store and release energy quickly makes it valuable in various applications, including renewable energy systems, transportation, and industrial machinery. As technology continues to advance, the

potential for flywheels in sustainable energy solutions is likely to grow, contributing to more efficient and reliable power systems.



Fig. 4.3.2: Flywheel

4.3.3 Shaft

A shaft is a rotating machine element, which is used to transmit power from one part to another part using transmission element such as pulleys and gears. Two shaft of length 2ft and 2-inch diameter is used to transmit the motion for flywheel to DC Motor.



Fig. 4.3.3: Shaft

4.3.4 Pulley

A pulley in a flywheel system is a mechanical component used to transfer rotational motion and power between different parts of the system. Pulleys are typically circular

wheels with a grooved rim, which allows a belt or rope to run along the edge.



Fig. 4.3.4: Pulley

They play a critical role in various applications involving flywheels, particularly in systems designed to store and manage energy.

4.3.5 Journal bearings

A journal bearing are essential components in mechanical systems, providing support and reducing friction for rotating shafts. Their design, lubrication methods, and load-bearing capabilities make them crucial for the efficient operation of various machinery, including engines, turbines, and compressors. Understanding their function and maintenance requirements is vital for ensuring the longevity and performance of equipment that relies on journal bearings.



Fig. 4.3.5: Journal bearings

4.3.6 Belt

A belt is a loop of flexible material used to link two or more rotating shafts mechanically, most often parallel. Belts may be used as a source of motion, to transmit power efficiently or to track relative movement. Belts are looped over pulleys and may have a twist between the pulleys, and the shafts need not be parallel.



Fig. 4.3.6: Belt

4.3.7 Compression Spring

A 2 HP A compression spring is a type of mechanical spring designed to operate with compressive forces. It works by resisting a load applied along its axis, and as the spring is compressed, it stores mechanical energy. When the load is removed, the spring returns to its original length, releasing the stored energy. Compression springs are essential in any application where space-saving, energy storage, or controlled movement is needed under load.



Fig. 4.3.7: Compression Spring

4.3.8 Iron Angle

Iron Angle is a structural component made from Iron, typically shaped like an "L," where two sides meet at a 90-degree angle. These two sides are called "legs" and can have equal or unequal lengths. Steel angles are commonly used in construction, framing, and fabrication because of their strength and versatility. They can be made

from various grades of steel, such as carbon steel, stainless steel, or galvanized steel, depending on the application.

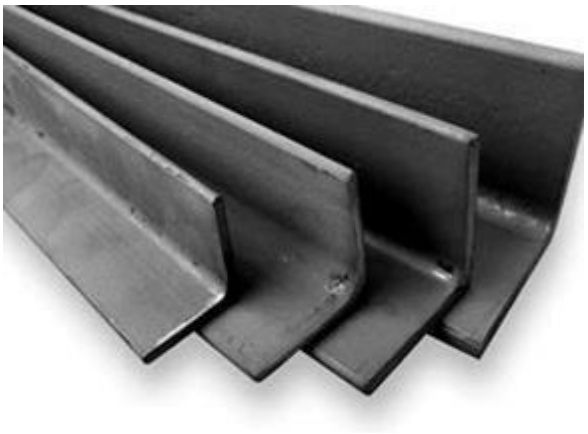


Fig. 4.3.8: Iron Angle

4.3.9 Nut Bolt

A 2 HP A nut and bolt is a type of fastener system used to securely join two or more components together. The bolt is a metal rod with external threads (a helical ridge) along its shaft, while the nut is a small, usually hexagonal block with internal threads that match the bolt's external threads. When the nut is turned onto the bolt, the threads engage, creating a strong, removable connection.



Fig. 4.3.9: Nut Bolt

4.3.10 DC Bulb

A 2 HP A DC bulb is a type of light bulb designed to operate on direct current (DC) electricity, as opposed to alternating current (AC). It typically has a filament (incandescent bulbs) or LED (in newer technologies like LED bulbs) that emits light when electrical current passes through it.



Fig. 4.3.10: DC Bulb

4.4 Cost Estimation

Table:4.4: Cost Estimation

S/N	Particulars	Qty.	Unit Price	Total Price
1	Flywheel	1	7600	7600
2	Metal Shape	2	600	1200
3	Metal Angle	1	3500	3500
4	DC Motor 2HP	1	6500	6500
5	Bearing (Size 4)	6	150	900
6	Bearing Holder	3	250	750
7	Flat Bar	6	120	720
8	Spring	6	80	480
9	Nut Bolt	10	40	400
10	Belt	1	190	190
11	DC Bulb	1	120	120
14	Others	Needed	2000	2000
Total Cost =				24,360/=

Chapter 5

Result & Discussion

5.1 Discussion

While working on our project, we did face some difficulties as it is a very complex system but the end results, we came up with were quite satisfactory. We have put the whole system through several tasks to validate our work and also have taken necessary notes for future improvements. Some future recommendations that we have involves improvement in system design and wiring, adding features for more efficient.

5.2 Result

Here we will try to show the results of our project in bellow:

Table:5.2: Results Analysis Table

S/N	Configuration	Rotation Time (Seconds)
1.	Flywheel, motor, crankshaft, 6 springs, pulley	
	- Spring size 6 inch	6
	- Spring size 4 inch	7
	- Spring size 2.5 inch	9
2.	Flywheel, motor, crankshaft, 4 springs, pulley	
	- Spring size 6 inch	5
	- Spring size 4 inch	6
	- Spring size 2.5 inch	8
3.	Flywheel, crankshaft, 6 springs, pulley (no motor)	
	- Spring size 6 inch	26
	- Spring size 4 inch	29
	- Spring size 2.5 inch	28
4.	Flywheel, crankshaft, 4 springs, pulley (no motor)	
	- Spring size 6 inch	32
	- Spring size 4 inch	35
	- Spring size 2.5 inch	34
5.	Flywheel, crankshaft, 6 springs (size 2.5 inch, no pulley or motor)	51
6.	Flywheel, crankshaft, 4 springs (size 2.5 inch, no pulley or motor)	54

The result was not as expected. Maximum rotation with load was only 5 seconds and without load was 54 seconds. So, the project failed to generate free energy.

5.3 Conclusion

Despite drawing inspiration from a video, our free energy generation project using a flywheel system did not achieve the expected outcomes. Challenges such as design limitations, friction-induced energy losses, and inefficiencies in energy conversion impacted the results. This highlights the complexity of such projects and underscores the need for more detailed research, testing, and refinement to improve performance in future attempts.

5.4 Recommendation

1. Crank angle for the springs may be set as per the multi cylinder engines.
2. The crank radius may be increased to get more torque.
3. Spring size and toughness to be more to achieve the required potential energy from it to get the driving torque.

Chapter 6

Conclusion

6.1 Introduction

The Feasibility Study of a Free Energy Device represents a promising and innovative approach to energy storage and management. By harnessing the kinetic energy stored in a rotating mass, flywheel systems offer several significant benefits, including high efficiency, rapid response times, and long operational lifespans. These characteristics make them particularly well-suited for applications in renewable energy integration, grid stabilization, and transportation. The environmental advantages of flywheel technology cannot be overlooked. By enabling the storage of excess energy from renewable sources, flywheels contribute to reducing reliance on fossil fuels and minimizing greenhouse gas emissions. Additionally, their low maintenance requirements and lack of hazardous materials make them a safer and more sustainable option compared to traditional chemical batteries. As industries and societies increasingly shift towards sustainable energy solutions, flywheel energy storage systems hold great potential to enhance energy resilience and reliability. Their scalability allows for application across various sectors, from residential and commercial settings to large-scale industrial operations.

6.2 Future scope

The future of Feasibility Study of a Free Energy Device technology is promising, given the increasing demand for sustainable energy solutions, advancements in materials and engineering, and the ongoing shift towards renewable energy sources. Here are several key areas where flywheel technology is expected to evolve and expand in scope:

6.2.1 Integration with Renewable Energy

Flywheels enable efficient energy storage for renewable sources like solar and wind, ensuring energy is available during high-demand periods, which enhances grid reliability.

6.2.2 Smart Grid Compatibility

Their ability to provide rapid services such as frequency regulation and voltage support makes flywheels an essential component in smart grid applications, ensuring real-time energy balance.

6.2.3 Automotive Sector Applications.

Flywheels can enhance electric and hybrid vehicles by recovering energy during braking and delivering additional power during acceleration, improving overall vehicle efficiency.

6.2.4 Industrial Energy Optimization.

In industries requiring high bursts of energy, flywheels offer rapid energy delivery, helping optimize energy consumption and reduce operational costs.

6.2.5 Advancements in Energy Storage.

Ongoing research in materials and technology (e.g., composites, magnetic bearings) is expected to make flywheels more compact and efficient, allowing for higher energy densities.

6.2.6 Cost Reduction and Adoption.

With advancements in manufacturing and materials, the cost of flywheel systems is likely to decrease, making them more commercially viable and increasing adoption across diverse sectors.

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