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DESIGN AND FABRICATION OF DIY COCONUT SCRAPER

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Abstract : *This mini project report outlines the development of a DIY coconut scraper, focusing on its design, construction, and practical applications. The goal is to create a user-friendly tool that enables quick and efficient extractio0n of coconut meat, a key ingredient in many global cuisines. The scraper is made from accessible materials, including wood for the handle and stainless steel for the blade, ensuring both durability and affordability .The report covers the project methodology, highlighting material selection, design choices, and step-by-step assembly instructions. Key features of the scraper include an ergonomic handle for a comfortable grip, a sharp blade for effective scraping, and a compact design for easy storage. Safety is emphasized with detailed guidelines to minimize risks during both the construction and usage of the tool. The DIY approach not only empowers users to create their own tools but also supports sustainability by encouraging the use of local, readily available materials .Additionally, the report explores the cultural significance of coconut in various cuisines and how the scraper can improve culinary practices, particularly in regions where coconut is a dietary staple. Overall, the project reflects a commitment to self-sufficiency in food preparation and encourages creativity in the kitchen.*

Keywords *- DIY coconut scraper ,Coconut meat extraction ,Tool design ,Ergonomic handle , Self-sufficiency*

I. INTRODUCTION

The increasing demand for fresh coconut meat in culinary practices has highlighted the need for efficient and accessible tools to extract it. Traditional coconut scraping methods can be labour intensive and often require specialized equipment that may not be readily available to everyone. This mini project report addresses this challenge by presenting a do-it-yourself (DIY) coconut scraper, designed to simplify the process of coconut meat extraction while being cost-effective and user-friendly.

The topic of this project revolves around the development of an innovative coconut scraper that leverages readily available materials to create a functional and practical tool. The motivation behind this investigation stems from the cultural significance of coconut in various cuisines, where fresh coconut meat is essential for a range of dishes. By focusing on a DIY approach, this project not only promotes selfsufficiency but also encourages individuals to engage in sustainable practices by utilizing local resources.

II. LITERATURE REVIEW

[1] Prof. Saifullah khan, Vaishnavi Ambatkar ,Chetan Gabhane-, Vinayak Goswami, 2024[1] Scraping is faster and uses less time and power than traditional methods, requiring minimal manual labour. A multi-blade system powered by a single motor can greatly reduce the effort needed for coconut scraping. Developing a Coconut Scraper Machine with a high-torque DC motor could enhance food processing. This innovation promises increased efficiency, automation, and sustainability.

[2] Anmol Bhatia Abheek Arora, Nischay Arora and Vaibhav Manchanda, 2019[2] This study presents a design for a multipurpose machine that can de-husk, cut, and grate. The machine can be used in various settings, such as temples and by market sellers. Its benefits include being eco-friendly and causing no harm to the environment, while also reducing the effort needed from people.

[3] M. T. Abu Seman, M. N. A. Hamid, N. R. Mat Noor,2019[3] This section summarizes the discussions and conclusions from the research. It also highlights the contributions of the study and suggests future work. The paper focuses on reducing hand-arm vibration using a new 10 adapter for the coconut scraper machine. The goal was met by designing and building this adapter, which effectively lowers vibration levels during operation. After the experiment, several improvements for the adapter were recommended. Future research could include creating an automatic mechanism to hold the coconut shell in place before machining. Additionally, using lighter and anti-corrosive materials would be beneficial since the adapter will be used in the food industry. Increasing the number of spring rings could also enhance its damping effect.

[4] Nwamba, Charles Obinna, Anyandi, Josephat Adie, Ovat, Friday Aje, Kubiat Effiong Akpan 2023 [4] In this project, a machine was created for the cracking and scraping of coconuts, suitable for both domestic and industrial applications. The machine underwent full development and testing for the cracking and scraping components. Its overall efficiency reached an average of 86% at a motor speed of 2300 RPM. This machine completely eliminates the risk of injuries to operators that often occur with traditional methods of cracking and scraping.

[5] Adie, Josephat Anyandi, Nwamba, Charles Obinna, Ovat, Friday Aje and Kubiat Effiong Akpan2020[5] A coconut cracking and scraping machine was designed, with its structural components undergoing stress analysis. The machine efficiently performs coconut processing tasks. Using Inventor Professional 2020, the analysis revealed principal stress values between 90.9608 MPa and 119.357 MPa, with a safety factor of 15. These results indicate that the machine can operate effectively under various stress loads, including fatigue, impact, tension, and compression

III. PROBLEM STATEMENT

1. Inefficiency in Traditional Methods: Scraping coconuts using traditional methods takes a lot of time and effort, making it hard for people to use fresh coconut in their cooking which makes it difficult for them to access fresh coconut, especially in rural areas.
2. Accessibility of Tools: Many people can't afford or find commercial coconut scrapers
3. Transforming Coconut Preparation: Many people struggle to scrape coconuts efficiently using traditional methods, which can be time-consuming and labour intensive. Additionally, these methods can pose safety risks and lead to injuries. There is a need for a simple, affordable, and effective DIY coconut scraper that makes the process quicker and safer for everyone.

IV. OBJECTIVE

The objective of this project is to design and fabricate a DIY coconut scraper that enables efficient and precise extraction of coconut meat, providing a user-friendly tool for tasks such as ingredient preparation, culinary use, and promoting sustainable practices.

V. METHODOLOGY

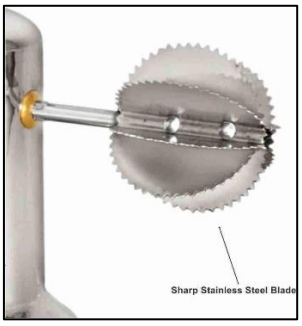
The DIY Coconut Scraper project aims to create an innovative, eco-friendly kitchen tool that utilizes sustainable materials and simple mechanical principles. This systematic approach includes several key phases: a comprehensive market survey to identify consumer needs and existing challenges, followed by a clear problem statement that addresses the difficulties associated with traditional coconut scraping methods. The design phase incorporates a userfriendly scraper mechanism and ergonomic handle, ensuring efficiency and ease of use. Materials are carefully selected for their lightweight and durable properties, optimizing the scraper's performance and longevity. The assembly process focuses on precision craftsmanship and the integration of practical features for improved functionality

The different parts of Diy coconut scraper and their material:

1] Wooden Board: The wooden board provides stability and support for the DIY Coconut Scraper, crafted from durable hardwood or bamboo. It is designed for longevity, featuring a food-safe finish and non-slip surfaces for safety and ease of use.

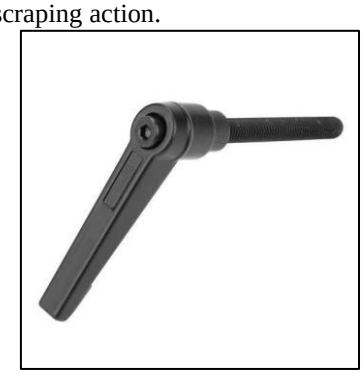
2] DC motor: The 12VDC Motor that we construct is rated from fractional horsepower to 2 HP, running at speeds up to 5,000 RPM. These 12V DC Motors can also be designed for applications that require different voltages, such as 24 Volts, 36 Volts, and others up to 180 Volts

3] Sharp Metal Blade: Sharp scrapper blades made with robust steel keep a long life. This coconut scrapper has a rubber grip which mounts this scrapper firmly on the surface. Coconut Scraper is a handheld tool made of high-quality stainless steel. It comes with sharp blades made of durable steel, ensuring a long lifespan.

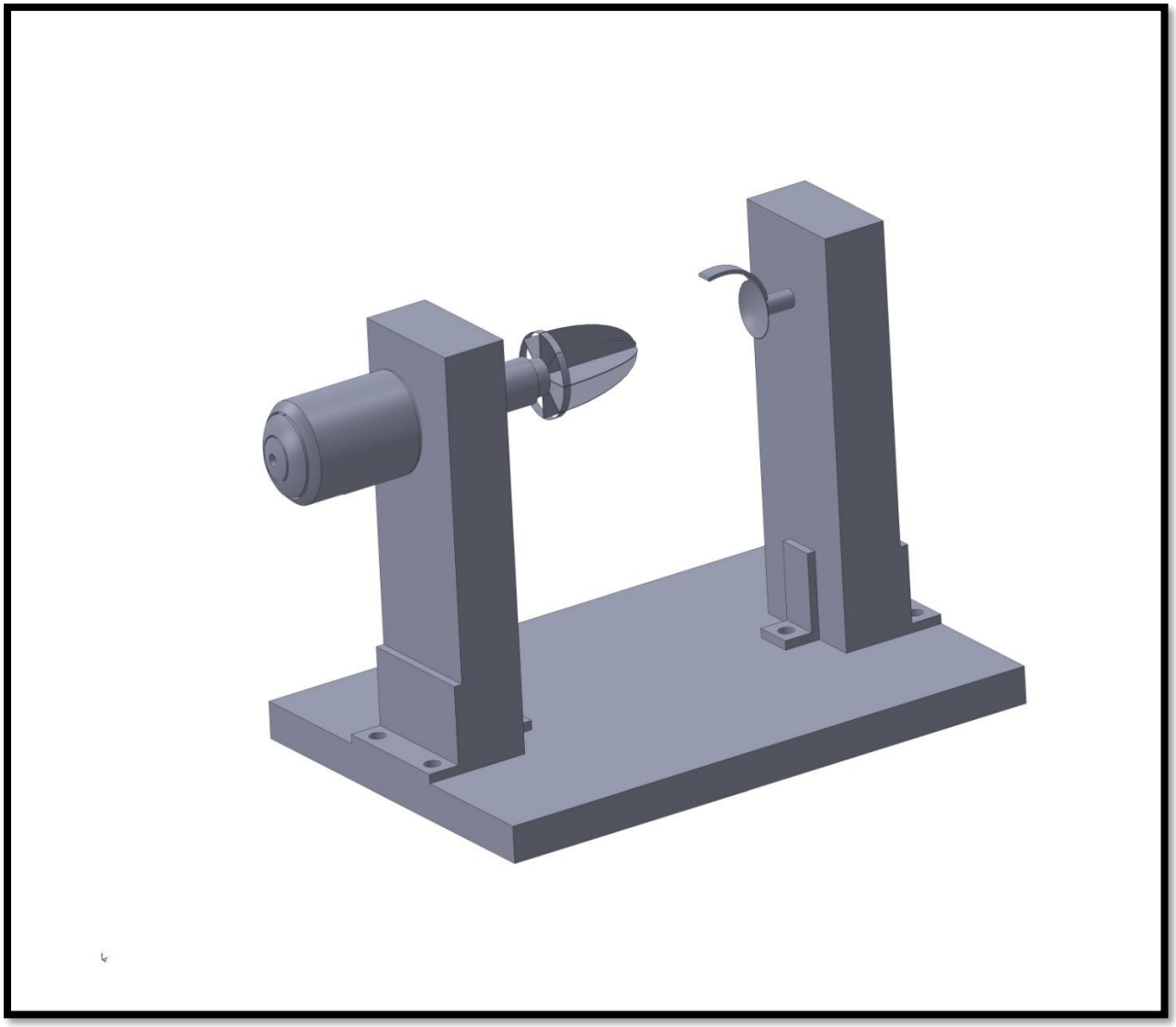


4] Metal Rods: Mild steel rods are indeed widely used in the construction industry due to their excellent ductility, strength, and weldbility. They provide reliable tensile strength for beams and columns, making them ideal for structural applications. Additionally, their costeffectiveness and ease of availability contribute to their popularity in construction projects.

5] Handle: A handle in a coconut scraper is essential for providing leverage and control while scraping the coconut flesh from the shell. Typically made of durable materials like wood or plastic, the handle allows users to apply pressure and achieve a more efficient scraping action.



6] Screws/Bolts and Non-Slip Material: Both screws and bolts play crucial roles in construction, manufacturing, and everyday applications. Understanding their types, applications, and proper installation techniques ensures strong, reliable, and safe connections in any project.



Figure;- 3.1 Diy coconut scraper

VI. CONCLUSION

This project has developed a DIY coconut scraper that addresses the challenges of traditional coconut scraping methods, which are often time-consuming and labour intensive. By using easily accessible materials, the scraper is designed to be affordable and user-friendly, making it suitable for a wide range of users, especially in rural areas. The project not only promotes efficiency in extracting coconut meat but also encourages sustainability and creativity in the kitchen. Overall, this initiative enhances culinary experiences while honouring the cultural significance of coconut in various cuisines

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Given the history of great works, which shows that no great job has ever been completed without the active or passive support of one's surroundings in close quarters, it is easy to see how active participation from my group members could enhance project execution. I am really appreciative to our project guide, Mr. Tejas Chaudhari, for his proactive direction during the project's completion. Finally, I would like to express my gratitude to everyone who was unable to be named here but who did a great job motivating me to pursue the certain.

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