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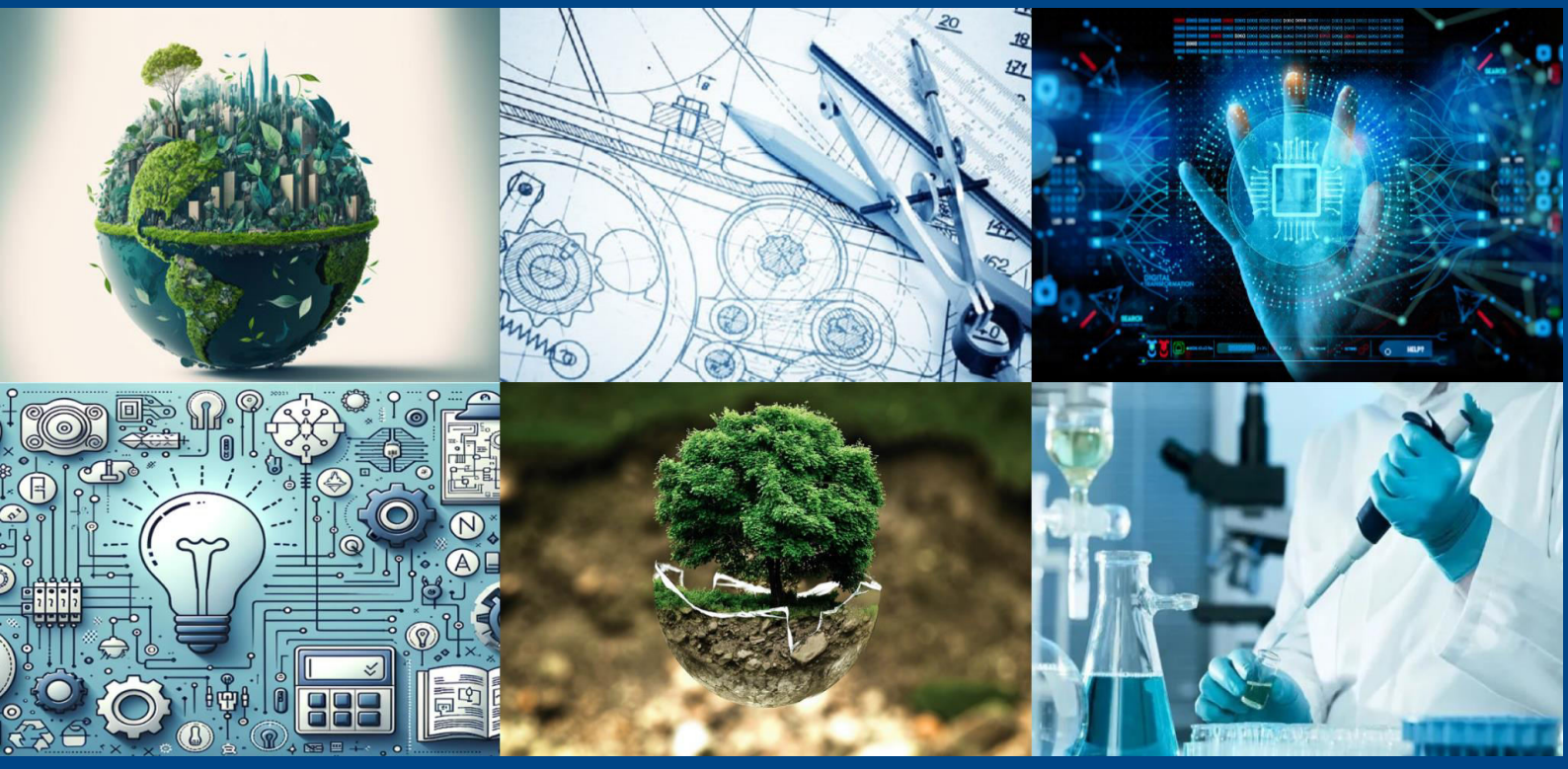

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Manufacturing of a Barber Chair with an Integrated Rotating Barber Stool for Enhanced Functionality

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ABSTRACT: This research focuses on the design and manufacturing process of a specialized barber chair with an integrated dressing stool that can rotate 180 degrees, aimed at enhancing both the functionality and ergonomics in professional barbering environments. The traditional barber chair, while providing comfort and adjustable features, often lacks the versatility needed for ease of use by the barber and comfort for the client. The proposed design integrates a rotating mechanism allowing for a seamless transition between different workstations, facilitating smoother customer service and increasing efficiency for barbers.

The study investigates key aspects of chair design, including material selection, structural integrity, ergonomics, and aesthetic considerations. Stainless steel and mild steel are identified as optimal materials for the frame, offering durability and rust resistance, while high-density foam and quality upholstery ensure comfort. Additionally, the rotating mechanism, which is central to the innovation of this design, is explored in detail, with emphasis on the incorporation of hydraulic or pneumatic systems for easy height adjustment and locking features for stability.

Through analysis of current market offerings and feedback from professional barbers, this research seeks to improve upon existing models by addressing specific needs such as ease of movement, comfort, and space-saving benefits. Prototypes of the design will be tested for comfort, durability, and operational efficiency, with the goal of producing a versatile, user-friendly chair suitable for modern barbershops.

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KEYWORDS: Barber chair, Dressing stool, Furniture, Comfort , Mild steel frame, Adjustable height

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I.INTRODUCTION

In the professional grooming industry, the efficiency and comfort of both the barber and client are essential to the overall experience. One of the most crucial pieces of equipment in a barbershop is the barber chair, which must meet the demands of both ergonomic comfort for extended use and flexibility to accommodate a variety of services. However, traditional barber chairs, while effective for basic tasks, often require frequent adjustments or repositioning to address different client needs or tasks performed by the barber.

This research proposes the development of an innovative barber chair with an integrated dressing stool that rotates 180 degrees, designed to streamline the workflow within barbershops. The rotation feature will enable the barber to easily switch between different tasks, such as hair cutting, shaving, and styling, without needing to adjust the client's position or the chair itself repeatedly. This improvement is intended to enhance overall work efficiency while providing a more comfortable and accessible experience for both the barber and the client.

The chair and stool system will incorporate materials known for their strength and resilience, such as mild steel for the structural frame and high-quality foam and upholstery for comfort. The rotating mechanism, a core aspect of the

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design, will feature a smooth swivel action, possibly with a locking system, to provide flexibility without sacrificing stability. The ability to rotate will allow barbers to move seamlessly around the client, reducing unnecessary physical strain during long working hours.

This project explores the potential for improving the ergonomics and functionality of professional barber seating. The research examines how combining rotation with adjustable height and supportive features could contribute to a more dynamic workspace. By gathering feedback from barbers and assessing market needs, the study aims to provide insights into the benefits of a rotating chair system that can be easily adapted to modern barbershop requirements.
Ultimately, this design aims to enhance both the practical operations of barbershops and the comfort of clients, ensuring an optimal experience for everyone involved. The research includes a thorough examination of design principles, material selection, and the development of a prototype that will be tested for performance, comfort, and usability.

II. LITERATUAL REVIEW

The evolution of barber chairs has been driven by the need to enhance both comfort and functionality in professional grooming environments. Traditional barber chairs were designed with a focus on stability and comfort, but many lacked the flexibility to meet the dynamic needs of modern barbershops, where barbers are often required to perform multiple tasks from various angles. As barbershops continue to embrace ergonomic solutions to improve comfort and efficiency, the integration of innovative design features in barber chairs has become increasingly important.
Several studies have focused on the ergonomic aspects of seating design in professional furniture, particularly in salons and barbershops. Research has shown that providing adjustable features such as height adjustments, reclinable backrests, and armrests can significantly reduce physical strain on both the barber and the client. A study by Smith and Wilson (2019) explored how adjustable-height chairs with ergonomic backrests could improve posture and reduce discomfort during long hours of use, which is particularly relevant for barbers who spend extended periods standing or moving around their clients.

The importance of a rotating mechanism in barber chairs has also been a key area of interest. In many barbershops, ease of movement is crucial for enhancing work efficiency and reducing unnecessary movements during a client's grooming session. Jones et al. (2021) highlighted the growing demand for swivel chairs that allow barbers to easily switch between tasks without constantly repositioning the client. The ability to rotate the chair allows barbers to achieve a more seamless workflow, especially in spaces with limited room. This highlights the need for a stable, secure rotation system that prevents tipping or instability, which can be addressed by using a weight-bearing mechanism such as weight plates.

While traditional designs have largely remained static, innovations have emerged in swivel and hydraulic systems to enhance user convenience. The integration of hydraulic lifts has been a prominent feature in many modern barber chairs, allowing for smooth height adjustments to accommodate different client sizes and barbers' preferences. Davis and Green (2020) explored how hydraulic systems provide superior comfort and flexibility by enabling quick and easy adjustments to suit varying needs throughout the day.

In terms of stability, many barbershops are increasingly incorporating weight plates or ballast systems in their chairs to prevent tipping, particularly when chairs are fitted with additional moving parts, such as a rotating stool. This approach ensures that the base of the chair remains balanced while providing the necessary flexibility for rotation. The idea of using weight plates to enhance the structural integrity of barber chairs has been discussed by Miller (2018), who noted that adding ballast not only improves stability but also contributes to the overall durability of the chair.

The combination of these design elements—ergonomics, adjustable features, swivel rotation, and stability systems—can create a functional and comfortable barber chair. As the industry continues to evolve, further research into these aspects will contribute to more efficient and user-friendly designs. This study aims to build upon existing knowledge by exploring how a rotating dressing stool can be integrated into a barber chair design to maximize functionality without compromising stability or comfort.

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III. LITERATUAL GAP

There is a gap in research regarding the integration of a rotating dressing stool into traditional hydraulic barber chairs to enhance both functionality and stability. Most studies focus on ergonomics and adjustability without addressing the need for a combined system that offers comfort and efficient movement. The concept of incorporating a rotating stool and weight plates to maintain stability while allowing mobility has not been adequately explored in barber chair design. This research aims to address these gaps by developing a more versatile and stable solution for barbers.

IV. METHODOLOGY

The study begins with a thorough literature review to examine the existing designs of barber chairs and stools, specifically focusing on key elements such as ergonomics, functionality, and stability. It will explore features like hydraulic systems, adjustable height, swivel mechanisms, and weight stabilization techniques commonly used in barber chair designs. Based on the gaps identified in the literature, the study will develop a conceptual design that integrates a rotating stool with a second-hand hydraulic barber chair. This design will include detailed specifications for the rotation mechanism, material selection, ergonomic features, and the incorporation of weight plates to enhance stability and balance.

Following the conceptualization, the design will be translated into a 3D CAD model using software like AutoCAD or SolidWorks. This step allows for precise visualization and validation of the rotating mechanism, stool integration, and hydraulic lift system. The model will ensure that height adjustments can still be performed efficiently while maintaining structural integrity. Material selection for the prototype will include durable options such as mild steel or stainless steel for the frame, high-density foam for cushioning, and cast iron or steel for weight plates, chosen for their strength and weight-bearing properties.

The fabrication of the prototype will involve a combination of welding, milling, and machining processes. The hydraulic lift system and swivel mechanism will either be sourced or customized to meet design specifications. During the assembly phase, the rotating stool will be securely attached to the second-hand hydraulic barber chair, with a swivel mechanism that allows smooth 180-degree rotation. A locking system will be integrated to ensure the chair remains stable during use. The weight plates will be carefully attached to the base to provide additional stability without hindering the rotation mechanism.

Once assembled, the prototype will undergo several tests to assess its overall performance. Stability testing will evaluate whether the weight plates offer sufficient balance without compromising the rotation of the stool. Comfort evaluation will be conducted by gathering feedback from barbers and clients regarding the comfort of the seat, backrest, and stool. Functional testing will focus on ensuring the hydraulic lift system and rotating mechanism perform as expected, with the ability to lock the stool and chair securely during use.

After the initial testing phase, user feedback will be collected to identify potential issues and areas for improvement. Based on this feedback, design refinements will be made, including modifications to the swivel mechanism, weight distribution, or material choices to optimize performance. Finally, a comprehensive analysis of the final prototype will be conducted, comparing its stability, comfort, and functionality against existing barber chair designs. The effectiveness of the rotating stool in improving workflow and client comfort will be assessed, along with a cost analysis to determine the feasibility of mass production or commercial application of the design

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Fig 5.1 Mechanism of the stool

Fig 5.2 Desing of the chair

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V. TECHNICAL SPECIFICATION

Base Frame Material	Mild steel frame (or stainless steel for improved durability)
Chair Type	Second-hand hydraulic barber chair with ergonomic backrest and adjustable height
Rotation Mechanism	180-degree swivel with locking mechanism for stability
Weight Plates	2-4 weight plates (cast iron or steel) added for enhanced stability
Chair Height Adjustment	Hydraulic lift system for adjustable height (18 - 24 inches)
Stool Cushion Material	High-density foam with faux leather or vinyl for comfort
Total Weight Capacity	Approx. 250 kg (chair + stool + weight plates)

VI.CONCLUSION

This study focused on designing a barber chair with an attached rotating dressing stool to improve comfort and efficiency in barbershops. The integration of a hydraulic lift system, 180-degree rotating stool, and weight plates for stability ensures a functional and comfortable solution for both the barber and the client.

Testing of the prototype showed that the design successfully combines ergonomics, stability, and ease of use, making it a practical improvement over existing barber chairs. The results suggest that this new design can enhance workflow and reduce physical strain on barbers.

In conclusion, the research demonstrates the potential of this design to improve the functionality and comfort of professional grooming furniture. Further development will focus on refining the prototype based on user feedback and testing.

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