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Protective Sheet Covering for Plastic Chairs to Prevent Wall Paint Damage

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Abstract
This research paper presents a simple and cost-effective solution to prevent wall paint damage caused by plastic chairs in rental homes. Frequent contact between chair backrests and painted walls leads to scratches, discoloration, and peeling, resulting in maintenance costs and tenant-owner disputes. The proposed solution involves attaching a protective sheet made of soft, flexible materials such as silicone or rubber to the backrest edge of plastic chairs. This sheet acts as a cushioning barrier, reducing friction and preventing direct abrasion. The study explores design variations, material selection, and testing methods to evaluate effectiveness. The results demonstrate that the protective covering significantly minimizes wall damage while being affordable, easy to install, and suitable for large-scale use.

Keywords: Wall Protection, Plastic Chairs, Friction Reduction, Silicone Covering, Rental Housing Solution

1. INTRODUCTION

Plastic chairs are widely used due to their affordability and durability. However, repeated contact between chair backrests and walls leads to friction, causing scratches and paint damage over time. In rental homes, this results in financial penalties for tenants. Existing solutions mainly focus on heavy furniture, leaving a gap for lightweight plastic chairs.
The study introduces a simple protective mechanism based on material science principles of friction and surface wear.

2. Problem Statement

The following problems are commonly observed:

- Continuous friction between chair backrests and walls causes paint damage.
- Walls develop scratches, patches, and discoloration.
- Tenants face financial penalties in rental properties.
- No widely available solution exists for plastic chair wall protection.

3. Survey and Research

Survey observations show that wall damage due to chairs is common in homes and classrooms. Research indicates that materials like silicone, rubber, and thermoplastic elastomers (TPE) are effective in reducing friction and absorbing impact due to their elasticity and non-abrasive nature. These materials are widely used in protective applications and consumer products.

4. Proposed Solution

The proposed system includes:

- A protective sheet attached to the chair's backrest edge.
- Use of soft materials like silicone or rubber for cushioning.
- Multiple design options such as clip-on, adhesive strip, or detachable sleeve
- Lightweight and flexible structure for easy usage

This solution acts as a barrier between the chair and the wall, preventing direct contact and reducing friction.

5. Working Principle

- **Friction Reduction:** The soft protective layer minimizes direct contact between hard plastic and painted walls
- **Impact Absorption:** The material absorbs minor impacts during movement
- **Surface Protection:** The non-abrasive material prevents scratches and paint removal
- **Ease of Installation:** The covering can be easily attached and removed without damaging the chair

6. Advantages

- Prevents wall paint damage effectively
- Low-cost and affordable solution
- Easy to install and remove
- Compatible with different types of plastic chairs
- Reusable and eco-friendly options available

7. Applications

- Rental homes and apartments
- Schools and classrooms
- Offices and workplaces
- Cafeterias and public seating areas

8. Conclusion

The Protective Sheet Covering for Plastic Chairs provides a practical and innovative solution to a common household problem. By using soft, flexible materials, the design effectively reduces wall damage caused by friction and movement. The solution is affordable, easy to use, and suitable for large-scale implementation.

This innovation has strong potential for real-world application, especially in rental housing, where it can reduce maintenance costs and prevent disputes between tenants and property owners. Future improvements may include prototype development, testing with different chair models, and enhancing aesthetic design.

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