UNIVERSITI TEKNOLOGI MARA

DESIGN OF A WASTE COLLECTOR CART WITH MANUAL CONTROL

DANIEL HAKIM BIN ZAMBRI

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ABSTRACT

The Waste Collector Cart (WCC) introduces an innovative solution to the pressing challenges of waste cleaning in inaccessible and hazardous environments, aiming to reduce both the manpower required for garbage collection and reduce the accumulation of waste debris in the environment. This project's objective is to fabricate a mini car that has the capability to move around with manual control and to pick up waste on the ground effectively. The WCC incorporates manual control which enables the operator to remotely control the WCC's movements and supervise garbage collection tasks in real-time. At the heart of the WCC lies its garbage collection system, consisting of a conveyor roller mechanism that has brushes mounted on the conveyor. This empowers the car to efficiently pick up the garbage into the plastic in the storage unit. By having all these abilities, the WCC is expected to reduce the amount of accumulated waste by cleaning the streets, public spaces, or industrial spaces and navigate narrow alleys and other places where humans can't reach and minimize the amount of manpower needed. To summarize, the Waste Collector Cart represents a transformative advancement in waste management technology, offering a practical and sustainable solution for addressing the complexities of garbage collection in challenging environments.

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INTRODUCTION

1.1 Background of Study

Littering is the act of improperly disposing of rubbish in public spaces, such as roads, parks, beaches, and water bodies, rather than in designated receptacles like trash cans or recycling bins. It encompasses a wide range of materials, including paper, plastic, glass, metal, cigarette butts, food wrappers, and more. While it might seem like a minor issue, the consequences of littering can be significant and far-reaching, affecting environmental, social, and economic aspects of communities.[1]

From an environmental perspective, littering poses serious issues and problems to ecosystems and wildlife. Discarded waste can contaminate soil, waterways, and air, leading to pollution and habitat destruction. Plastic waste is a major concern due to its non-biodegradable nature. Marine animals often mistake plastic debris for food, resulting in ingestion and entanglement, which can be fatal. Moreover, littered areas can become breeding grounds for pests and disease vectors, exacerbating public health risks.[2]

The current solution to this problem is supported by the local government. Economically, the costs associated with littering are substantial. Local governments carry the financial burden of cleanup efforts, including street sweeping, waste collection, and landfill maintenance. This taxpayer money is supposed to be allocated to essential services for the people but instead it is diverted to address litter-related issues. In 2021, the federal government of Malaysia spent about 2.2 billion Malaysian ringgit in pollution management. Furthermore, another 803 million Malaysian ringgit is used in domestic waste management.[3]

To address this problem, a much more cost-effective solution is needed to reduce the cost of the manpower and the equipment needed. The suggestion is a waste collector cart. This cart will pick up the waste and rubbish in public spaces. With this, less manpower is needed.