UNIVERSITI TEKNOLOGI MARA

DEVELOPMENT OF PORTABLE DRY LEAF SWEEPER POWERED BY A SINGLE MOTOR

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ABSTRACT

Residential landscaping is the art of enhancing the aesthetic appeal and look of the space surrounding a home. Regardless of how beautiful the tree planting is, there are problems like dry leaves falling everywhere. People only clean the dried leaves with the traditional method of sweeping with a broom, which takes a lot of work regularly. Most machines on the market are not portable in size and are not reasonably priced. Therefore, a portable dry leaf sweeper must be designed and developed. This product will go through a design selection process and required to create an isometric view using state-of-art SolidWorks 2018. The designed leaf sweeper will work on electricity and will consist of simple fabrication as a proof of concept. Analytical and finite element analysis of the critical parts shall be carried out. Having this machine shall help to keep the residential areas clean especially surrounding the user house yet reduce the work intensity. As a result, the production of this product can run smoothly and successfully achieve the objectives. This machine has been shown to save energy when sweeping at different surface areas and cost-effective. A few suggestions will be listed to produce more improvements. Generally, this innovation may have the potential to be noticed by users.

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INTRODUCTION

1.1 Background of Study

The ecosystem is incomplete without landscape, especially in the residential area. One of the most visible demands of individuals is landscape, which encompasses topography, vegetation and associated plants and soil, water bodies, and their spatial configuration. A well-made home landscape can increase the value of a property. It is estimated that, for a beautifully landscaped house, its value can go up between 10 to 12 percent [1], compared to a house whose yard is not maintained. So, because of that, house developers will plan to plant trees in front of each house. Besides that, most people living in a residential area will cultivate in their house compound for example planting flowers, vegetable crops, and ornamental trees.

But despite the beauty of the tree planting at home, there is a problem that will be faced by those living in residential areas. The problem they will face is that the dried leaves will fall to the ground in their house compound and fly onto the road. The number of dried leaves fall to the ground depends a lot on how dry the tree is. Moreover, the weather in Malaysia is usually hot. So, there will be a lot of fallen dry leaves on the ground [2]. When a lawn is covered with a lot of fallen leaves, it will have a great impact on the beautification of the residential area [3]. Although, falling leaves may not pose a significant danger, they can sometimes serve as a breeding ground for pests and fungal. In addition, they can clog drains and are dangerous as they can cause slipping. A limited number of leaves, such as those from a single ornamental tree, decomposes quickly to benefit the grass, while heavy layers of leaves can block light and suffocate the grass, especially when the leaves get wet [4].

To avoid such disadvantages, people would sweep the dry leaves on their house compound every day. This is because the dried leaves will always fall daily. For example, when people sweep the dry leaves on today, the next day the dried leaves will be there again. Normally, people prefer the conventional method of using the broom to sweep the dried leaves. This is not only resulting in high work intensity but also inconsistent cleaning efficiency. In the market, the development of leaf vacuum