UNIVERSITI TEKNOLOGI MARA

DESIGN, ANALYSIS AND FABRICATION OF AIR CONVEYOR

ALVIN ANAK FRANCIS

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ABSTRACT

Conveyor systems have been used for hundreds of years in various forms to transport materials and goods. In the late 18th century, the first conveyor system was used in coal mines to transport coal over short distances[1]. Over the next century, conveyor systems continued to be developed and refined, with the introduction of powered belts and rollers, which made it possible to transport heavier loads over longer distances. The problems with these conveyor systems are belt slippage, belt tracking, material spillage, belt wear and tear, and belt mistracking[2]. Therefore, the air conveyor system is designed to overcome these problems of belt slipping off, belt tracking due to misalignment of the belt to low maintenance of the belt due to wear and tear. Research from various source is used in this project research, and this air conveyor system should be able to move lightweight items inside a manufacturing and packaging facilities.

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CHAPTER ONE
INTRODUCTION

1.1 Background of Study

A conveyor system is a mechanical handling equipment that is used to move materials from one point to another[3]. It consists of a series of components such as belts, rollers, chains, and pulleys that are used to transport objects horizontally, vertically, or at an inclined angle. Conveyor systems are commonly used in manufacturing, production, and distribution facilities to automate the transportation of goods and materials, thereby increasing efficiency and reducing labour costs[3]. They are used to move a wide variety of products, from small parts and packages to large and heavy items, over short or long distances[3]. The most commonly used conveyor systems are belt conveyors and roller conveyors.

However, belt conveyors can be subjected to various issues, which can affect their performance and efficiency. The most common issue is belt wear and tear where the conveyor belt can become worn and damaged, resulting in decreased efficiency and increased maintenance costs[2]. Belt wear and tear can be caused by a variety of factors, including abrasion, punctures, and tears. With the conventional belt conveyor, it consists of multiple parts that it needs to work properly and these parts has high tendency to malfunction and needs to be maintained frequently. And when these parts malfunctioned, it will cost a lot to get them fixed.

Therefore, there are many types of conveyor systems that are used in the industry such as, rollers, chains being the common ones. Roller conveyor system is a very fast, safe load transport system thanks to the various sensors and devices[4]. It reduces the risk of goods being damaged. They also withstand heavy-duty loads. Other than that, its parts are tough and durable, so this is an investment that will pay off and can be paid off for years to come. Chain conveyor systems use an endless chain both to transmit power and to propel material through a trough, either pushed directly by the chain or by attachments to the chain and can transport very wide or very long materials and since chain conveyors are made from a series of interlocking chains, they’re easier to fix than their counterpart. Nevertheless, conveyor systems