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Development of Belt Conveyor: A Review

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Abstract: The project title "Development of belt conveyor." There was a belt conveyor machine in which it takes more man power and time. Then we modified the belt conveyor machine. After modification we changed small belt conveyor and installed in front side of the machine. After modification it reduces man power, time consuming and less man stress. This small belt conveyor moves upward and downward. Due to this concept it is easy to keep bags in a proper layer and it is easy to move the bags from one place to another place by small belt conveyor machine. When we installed the small belt conveyor, then the main belt conveyor is also moveable like, forward and backward direction. In this belt conveyor we have also used, motor Hydraulic system, belts, gearbox, wheels, etc.

Keywords: Idler rollers, Feeder,Cleats

I. INTRODUCTION

The project titled " Development of belt conveyor machine " is an innovative endeavor aimed at addressing the growing need for reduce time, labor and also money solutions. As increasing industrial work, then we have find out the solution of this problem. The belt conveyor is the satisfied answer for this problem. This project seeks to tackle this issue by designing a compact, user-friendly, and reducing money. This machine that can be used in industries for mining and manufacturing company, grains storage or go-down etc. The belt conveyor machine is designed for transport the bags from one place to another place which can be used in industries and go-down. This is not only helps in reducing the money but also contributes to reduce the labor cost.

Main problem was it has required large labor count, as well as it required lots of money and it gives lots of time Then the project involves a detailed study of the belt conveyor, understanding the requirements for effective conveyor, and designing a machine that can meet these requirements in a compact form. The development phase involves the actual construction of the machine, testing its performance, and making necessary adjustments to ensure it works efficiently. This report presents a comprehensive account of the design principles, development process, and performance evaluation of the belt conveyor machine. It is hoped that this project will inspire further innovations in the field of industries or godown and contribute to a more sustainable future. Belt conveyors are the most commonly used powered conveyors because they are the versatile and the least expensive.

Product is conveyed directly on the belt so both regular and irregular shaped objects, large or small, light and heavy can be transported successfully. These conveyors should use only the highest quality premium belting products, which reduces belt stretch and results in less maintenance for tension adjustments.

II. LITERATURE REVIEW

Author Name: G. Fedorko et al.
Book or Paper Name - Failure analysis of belt conveyor damage caused by the falling material. Part 1: experimental measurement and regression modal.
This author written many books of polytechnic and engineering. And we are very helpful for his book name education on Belt conveyor. In this book he written all knowledge about belt conveyor i). Introduction, ii) Applications of belt conveyor III) Types of belt conveyor, IV)Advantages of belt conveyor

Author Name: Mr. P. P. Sarkar et al.
Book or Paper Name - Studies on adhesion between rubber and fabric in heat resistance conveyor belt Adhes (1989)
Who presented Paper on A Review of “Improved Automated Conveyor with Auto Separated System for Oil Packaging Industry”.in this case we identify the necessary to sensors and monitoring system for detects the defective products with help of electronic system. This proposed system gives the convenient approach of automatically.

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Author Name: Mr. D. B. Hastie et al.

Book or Paper Name - Experimental validation of particle flow through conveyor transfer hoods via continuum and discrete element methods Mech Mater (2010)

He was paper presented on "Implementing an Automated Sorting System" include the how to sorting product on conveyor system. We are discussed about this project was to create a simulated and theoretical automated process to sort product coming out of the distribution centre.

Author Name: Mr. Y. Hou et. al

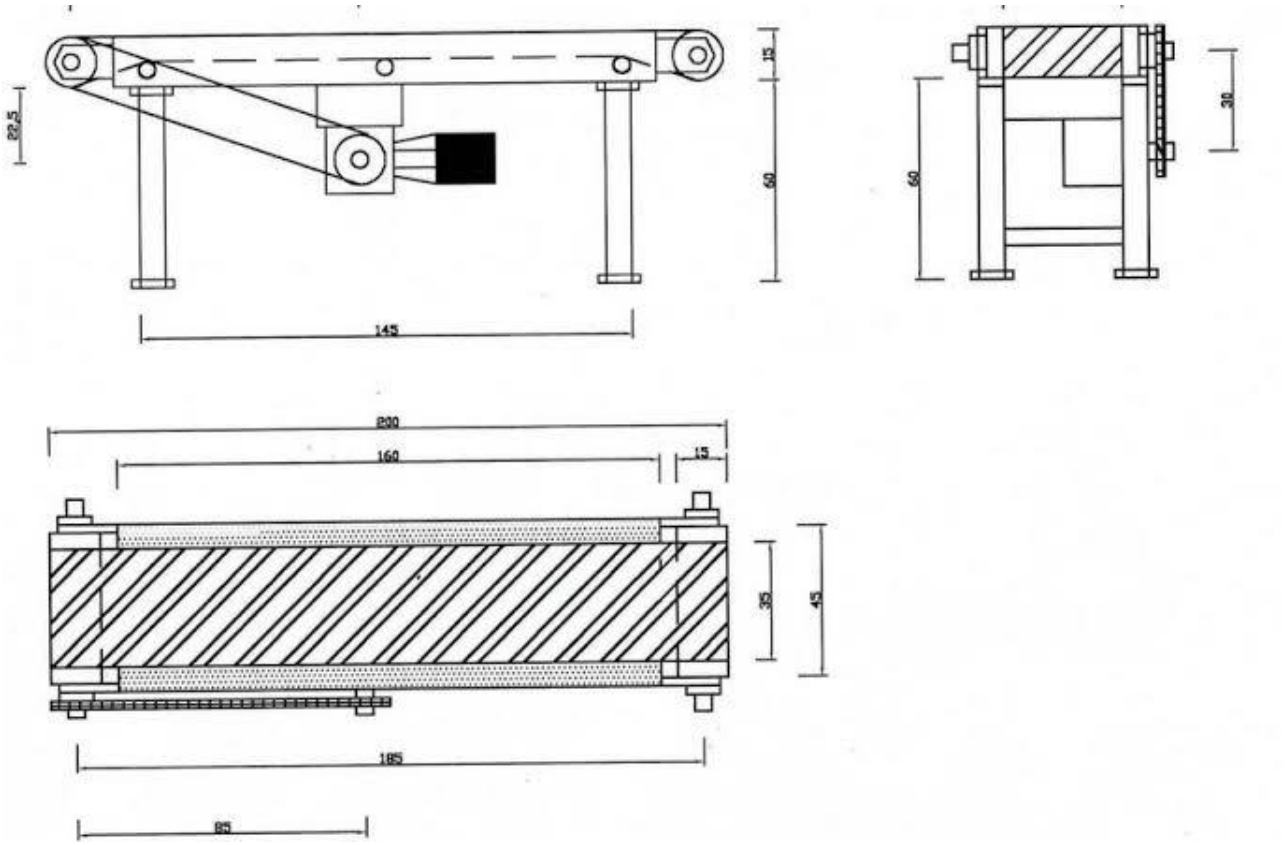
Book or Paper Name - Dynamic characteristics of conveyor belts (2008)

He was presented paper on "Design and development of automated conveyor system and material handling" and they discussed about the design for belt conveyor system. In this review we study about Materials and products need to be transported from one manufacturing stage to another.

III. PROBLEM DEFINITION

A "problem definition" for a belt conveyor refers to identifying issues that arise during its operation, such as belt slippage, material blockages, tracking issues, excessive wear and tear on the belt or rollers, improper tension, misalignment, noise generation, and potential safety hazards which can disrupt the smooth transportation of materials along the conveyor system, often impacting production efficiency and requiring maintenance intervention.

IV. PROPOSED LAYOUT

- 

V. COMPONENTS OF SYSTEM

The main objectives of a belt conveyor machine are to transport materials and products efficiently and effectively. Here are some things to consider when using a belt

Conveyor: A conveyor is a mechanical device that moves materials, products, or goods from one place to another. Conveyors are used in many industries, including manufacturing, warehousing, and retail.

Material: The material being transported should be considered, including its size, shape, weight, and abrasiveness. For example, fine powders may require an enclosed conveyor to reduce dust, while sharp objects may need a belt with high puncture resistance.

Working conditions:The working conditions, such as temperature and humidity, should be considered.

Belt alignment: If the conveyor belt is not properly aligned, it can run off its intended path, which can cause damageto the belt and increase friction.

Control systems;Control systems are used to manage and operate the conveyor system, including controlling the speed, direction, and bringing the system to a stop.

Idler: The idlers transfer the main resistances, so they have a great impact on the efficiency of belt.

Blockages: Wet or sticky materials can adhere to the belt surface, causing blockages and preventing the conveyor from operating correctly.

VI. METHODOLOGY

The work is planned in following phases:-

Phase I - Topic selection

Phase II Literacture review

Phase III- Selection of different components

Phase IV- Testing of earth augur

Phase V- Finding the final result

- **Advantages**

- **Increased speed**
- Belt conveyors can move more supplies faster.
- Higher conveyor speeds are needed for larger volumes of goods.

- **Safety**
- Automated conveyor belts reduce the risk of accidents and injuries by eliminating the need for manual handling of heavy loads.

- **Efficiency**
- Belt conveyors can automate nearly any aspect of the product creation process.

- **Versatility**
- Belt conveyors can be used in a range of industries and applications, from light to heavy-duty.
- They can carry anything from small light packages up to heavy loads.

- **Disadvantages**

- **Belt mistracking:**
- Can cause belt damage, equipment damage, and material spillage

- **Entrapment damage:**
- Grooves in the belt surface caused by material dropping into the belt sag

- **Heat damage:**
- Heat can warp or melt the conveyor belt, causing operational failures and necessitating frequent replacements

- **Abrasive materials:**
- Can wear down the belt surface, diminishing its durability and effectiveness

- **Application**

- Mining:
- Moving ores from the shaft to the ground.

- Manufacturing:
- Moving products through assembly lines, or feeding products into production lines.

- Logistics:
- Moving boxes and containers in warehouses and distribution centre.

- Retail:
- Moving products through retail stores.

- Packaging:
- Moving products through packaging lines.

- Airport:
- Moving baggage through airports.

- Courier:
- Moving packages through courier dispatch centre.

VII. CONCLUSION

From this review paper, we conclude that belt conveyors have the potential to become a carring boxes or material They offer a promising solution for Safety Efficiency, Improves Productivity, longer transport distance Belt conveyors can also support materials such as rubber, fabric, or synthetic elements that is supported by rollers or a flat pan along its path. Furthermore, they can enhance energy security and reduce injuries, promoting energy self-sufficiency. Belt conveyors can create A belt conveyor can create a continuous, automated flow of materials or products by transporting them from one point to another supporting Belt conveyors can support a variety of items and applications, including flat surfaces, inclines. They can provide a reliable and consistent source of power, reducing energy and promoting energy equity. Belt conveyors can also support the development of smart work and energy promoting increased productivity, efficiency, and cost savings in a production process.

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