

# Design and Optimization of Energy less Conveyor Machine

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## ABSTRACT

There are many methods used for safe transportation of material and this system widely used in industries for material handling conventionally and automatically. Therefore different industries uses this method for Transportation of materials because Material handling equipment are designed such that they facilitate easy, cheap, fast and safe loading and unloading with least human interference and at the same time improve efficiency. Automated conveyor systems are being increasingly used in a number of automated conveyor systems are quite easy to install in a warehouse and is also much simpler to operate than a forklift and other similar material handling equipment.

**Keyword:** - Conveyor, Material handling equipment.

## 1. INTRODUCTION

A conveyor system is a common method used for material handling equipment that moves materials from one location to another. Conveyors are especially useful in applications involving the transportation of heavy or bulky materials. Many kinds of conveying systems are available and are used according to the various needs of different industries. Has been identified for lifting or transporting bulk materials or products from one place to another in the manufacturing industries depending on the speed of handling, height of transportation, nature, quantity, size and weight of materials to be transported. In today's fast moving, highly competitive industrial world, a company must be flexible; cost effective and efficient to survive. Material handling involves short distance movement within the confines of a building or between a building and a transportation vehicle. It uses a wide range of manual, semi-automated, and automated equipment.

## 2. EARLY USE OF CONVEYOR SYSTEMS

Conveyor systems have been in use for over a century. Farmers used conveyor belts to load grain on ships as early as the late 1700's. Imagine the farmer's relief upon reaching the conveyor, after toiling in the fields! Unlike the highly technical, fluid motion of the conveyors assembled by the Eagle Technologies Group (shown above), early conveyor systems were built using a wooden framework. The belts were made of cloth or rubber. They were used to move large amounts of bulky products, such as crops.

In the early 1900's factories began to use conveyor systems to move items from one point to another during the material handling. Engineers developed conveyor systems in the "Roaring 20's" that could transport goods over longer distances. Cotton and rubber covers were used on conveyors at this time. Underground mines began to utilize conveyor systems to transport coal.

### 3. CONCEPT OF DESIGN

Material Handling involves the movement of materials from one place to another for the purpose of processing or storing. According to American Material Handling society, 'Material Handling is an art and science of involving the movement, packing and storing of subsystems in any form. Thus material handling function includes all types of movements vertical, horizontal or combination of both and of all types of material fluid, semi fluid and discrete items and of movements required for packing and storing. The material handling function is considered as one of the most important activities of the production function as out of total time spent by the materials inside the plant area, about 20% of the time is utilized for actual processing on them while remaining 80 % of the time is spent in moving from one place to another, waiting for processing or finding place in sub-stores. Moreover about 20 % of the total production cost is traceable as material handling cost.

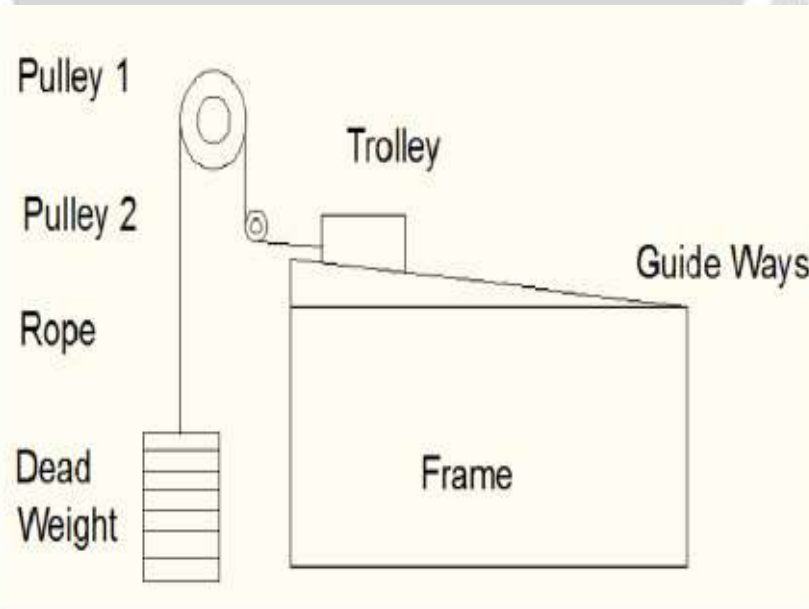
In this paper we studied about how to use factor and basic component in a conveyor system and avoid accident and defective parts by using control system. The angle of inclination in case of inclined conveyor is limited to certain value. The inclined conveyor also consumes large amount of space. The lift is another equipment to transfer the material from ground to first floor. The height achieved is higher compared to others. Robots are also used to transfer precise parts from one level to other. Lift and robot are effective but are expensive. Spiral conveyor is also an important development in vertical material handling system. Push bar conveyor is another system in which a bar supports the object on an inclined conveyor.

### 4. PROBLEM STATEMENT CONCLUSIONS

1. In industry conventional conveyor that are used are Belt, Chain, Roller, conveyor etc.
2. This conveyor are normally operated by electric motor and reduction gear box and requires separate positioning in form an electric circuit compromising of switches and relays.
3. The overall cost of setup is extremely high and complex to operate & requires frequent maintenance.
4. Presently in industry while manufacturing and transporting part from one station to another station, it is transferred by manual handling which is very time consuming.
5. The Energy Saving in belt & chain Conveyor is an best solution which fulfills all the above requirements.

### 5. DESIGN

Our proposed model "Design and optimization of energy less conveyor machine" need so many raw materials which are mentioned.



## 6. OBJECTIVES

Objective of automatic conveyor system:

1. To Increasing in productivity and reduce human efforts.
2. To reduce accident with the help of sensor and monitoring.
3. To reduce time and cost of material handling.
4. Minimize delays and interruptions by making available the materials at the point of use at right quantity at right time.

## 7. COMPONENTS OF DESIGN

1. Dead weight
2. Frame
3. Pulley 1&2
4. Rope
5. Guide ways
6. Trolley

## 8. CONCLUSION

Thus we have concluded that by using gravitational force energy required to drive the conventional conveyor system is totally eliminated. The electrical power and maintenance which is vital in most of conveyor system can be avoided. In the case of regulating the speed of the conveyor belt, the specific energy capacity of the conveyor belt takes a constant minimum value, independent of the value of the load flow entering the conveyor.

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