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A Review of Automatic Conveyor System

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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.

Keywords- *Conveyor, Material and material handling equipment, Automatic.*

I.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.

II.LITERATURE REVIEW

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.[1]

Mr. Nasif Hassan Khan Presented paper on "Fabrication of a Conveyor Belt with Object Sorting and Counting Facility" includes factors and basic component used in conveyor system. 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. In this paper they include design of mechanical and electrical component and program related to control system. [2]

As per Mr. Akshay K. Naphade, Prof. Manish J. Deshmukh 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 detecting the weight of oil bottle on the conveyor system using a PLC for high reliability and fast operation without interruption. [3]

Mr. Abhijit Gaikwad, Prof. Shreekant Pawar are 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. [4]

Mr. Joshua Todd Fluke are 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. [5]

As discuss by Vikas Gupta, Rajesh Bansal, Vineet Kumar Goel, in "A review on material handling equipment And their selection for potential"ApplicationsTransport material handling systems are used to move material for a short or long distance from one location to another like between workshops, between cities, to store, to railway, to ships. The major subcategories of transport material handling systems are given in Figure 1. In addition to manual system, conveyors (like flat belt, trolley), cranes (like gib, gantry), trucks (like light, heavy) and automatic guided vehicles (AGVs and robots) can be used to shift the material. [6]

Figure 1: Types of transport material handling systems

As discuss by Garg Uttam, Bhowad Rugved, Rahul Chorghe, "Vertical material handling system" The various methods used for material handling in vertical direction are inclined conveyor, lift, robots, spiral conveyors etc. 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.[7]

Objective of automatic conveyor system

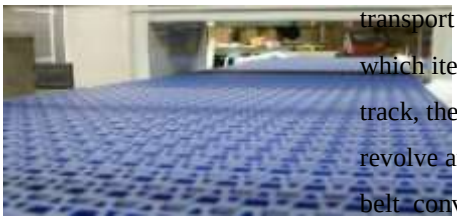
- To Increasing in productivity.
- To reduce human efforts.
- To reduce accident with the help of sensor and monitoring.
- To reduce time of material handling.
- To minimise cost of material handling.
- Minimise delays and interruptions by making available the materials at the point of use at right quantity at right time
- Lower investment in process inventory
- Prevention of damage to materials.

Types of conveyor

Belt conveyor

A belt conveyor consists of an endless and flexible belt of high strength with two end pulleys (driver and driven) at fixed positions supported by rollers. In this work, 3 roll idlers are required for adequate support of materials transported and protection of the belt along its length. Pulleys are used for providing the drive to the belt through a drive unit gear box powered by an electric motor. It also helps in maintaining the proper tension to the belt. The move the belt and its loads. Materials are transported over the required distance as a result of friction generated between the roller surface and the moving belt set in motion by a rotating pulley (drive pulley). The other pulley (driven or idler pulley) acts as a wheel around which the material rotates and returns in a continuous process.

Plastic belt conveyors

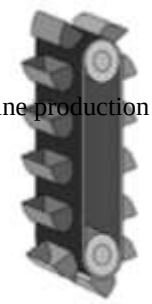


A plastic belt conveyor is a piece of industrial equipment used to transport materials or goods. The system uses a plastic belt on which items can be placed; the belt will then move along a slotted track, thereby facilitating transportation of goods. This belt will revolve around the track so the belt forms a continuous loop. Plastic belt conveyors feature interlocking plastic pieces that allow bending, making the track more versatile and able to move in various directions as needed.

Wire mesh conveyors

Wire mesh belt conveyors can be used in a variety of conditions to conveyor hot, cold, or oily products in oven, cooling, carrying cold items from a freezer, hot food items or other special conditions. A variety of belt types can be used depending on the application. It's designedto interface with existing conveyor systems

Bucket Conveyor



The bucket conveyor presentsa continuous row of overlapping buckets at the inlets and allows for single or multiple selective discharge stations so the system can be used to either split or recombine production lines. The system is available in a range of specifications to suit the application.

Spiral conveyors

Spiral Conveyors offer substantial immediate and long term savings in production costs and form an integral solution for optimum use of factory floor space. Contact us for more information on how you can use spiral conveyors effectively for your production space.

Pneumatic conveyors

Pneumatic conveyors are characterized by pressure or vacuum systems, and use either a dilute phase or dense phase technology to transport material. ... In dense phase systems, material is not suspended and low volume, high pressure air is used to move material through the pipeline

Screw conveyor or auger conveyor

A screw conveyor or auger conveyor is a mechanism that uses a rotating helical screw blade, called a "flighting", usually within a tube, to move liquid or granular materials. They are used in many bulk handling industries.

Application

Today there are different types of conveyor belts that have been created for conveying different kinds of material available in PVC and rubber materials. Material flowing over the belt may be weighed in transit using a belt weighed. Belts with regularly spaced partitions, known as elevator belts, are used for transporting loose materials up steep inclines.

TABLE -

Manually	**Semi-Automatic**	**Automatic**
"Manual warehouses" is synonymous with "man-to-goods" warehouses, where workers move to a pick location, pick the goods, and then move to the delivery dock.	In this system half manually and half machine operated are known semi-Automatic.	In this system are fully automatic systems which are fully machined operated.
It requires more human Effort.	It requires less human effort.	It require very less human effort
It require more time for material handling.	It Require less time for material handling.	It require very less time for material handling
It is hazardous for human.	It is less Hazardous for human.	Does not hazardous for human.
Example- Man itself does work.	Example- Man put the job on conveyor.	Example- Machine do itself of pickup job and put on conveyor

Table no. 1

Conclusion-

We studied different type of conveyors and there configuration and there working. Thus Conveyor System use for material handling to improves the speed of material handling. Also this system reduces the human effort. This system is beneficial and safety for the material handling.

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