

Conceptualization of Pneumatic Uplift Mechanism for Live Roller Conveyor

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Abstract - The applications of conveyer are increasing day by day in the manufacturing industries due to its flexibility and accuracy in material handling. Industries like packaging and food processing uses conveyer for the rapid production and less power utilization in material handling. In general only a single type of object like bottles or trays are monitored and controlled on a single conveyer in industries. The trays on the conveyer are to be stopped at the required station and material to be filled in the trays on conveyer. This can be done using the induction type proximity sensors and load sensors placed at different positions in the system. The IR sensor is used for safety as interlock. In given system we can do the Design & fabrication of roller conveyer used in the packaging & transportation system in industries. The number of trays/boxes to be filled can be set in the indexing sequence using pneumatics stopping arrangements & proximity sensors. Trays/boxes after reaching the desired output the system will be automatically stopped/start flow of boxes on conveyer. The output packaging fixed can be easily altered in between the process. These roller conveyer can transfer material either forward or reverse motion similarly its can be capable to hold the box as per requirement at a position by using pneumatic system at for assembly work.

Key Words: Live rollers, Material Transport, Bidirectional, and Pneumatic uphold position

1. INTRODUCTION

A conveyor system is a common piece of mechanical handling equipment that moves materials from one location to another. Conveyor systems are commonly used in many industries, including the automotive, agricultural, computer, electronic, food processing, aerospace, pharmaceutical, chemical, bottling and canning, print finishing and packaging. Although a wide variety of materials can be conveyed, some of the most common include food items such as beans and nuts, bottles and cans, automotive components, scrap metal, pills and powders, wood and furniture and grain and animal feed. Many factors are important in the accurate selection of a conveyor system. It is important to know how the conveyor system will be used beforehand. Some individual areas that are helpful to consider are the required

conveyor operations, such as transportation, accumulation and sorting, the material sizes, weights and shapes and where the loading and pickup points need.

Conveyor is used in many industries to transport Goods and materials between stages of a process. Using conveyor systems is a good way to reduce the risks of musculoskeletal injury in tasks or processes that involve manual handling, as they reduce the need for repetitive lifting and carrying. Conveyors are a powerful material handling tool. They offer the opportunity to boost productivity, Reduce product handling and damage, and minimize Labor content in a manufacturing or distribution Facility. Conveyors are generally classified as both Unit load conveyors that are designed to handle specific uniform units such as cartons or pallets, and Process conveyors that are designed to handle loose Product such as sand, gravel, coffee, cookies, etc. Which are fed to machinery for further operations or mixing It is quite common for manufacturing plants to combine both process and unit load conveyors in Its operations. The conveyors are usually flat belt driven to transport boxes, luggage or other items to different destinations through a network of conveyors. The conveyor systems have scanners that read barcode labels attached to the item to determine the final destination. When the item needs to be diverted to the adjacent conveyor a paddle or push bar will push the item to the adjacent conveyor.

2. PROBLEM DEFINITION

The Gravity roller conveyor assembly normally involves the use of channels, rollers and shaft that are heavy by virtue of their structure and the material used as steel. There is only belt conveyer having indexing operating by using electronics system but it consumes continuous power. To overcome this problem we can use Gravity roller conveyor with pneumatic indexing system. These roller conveyer can transfer material either forward or reverse motion similarly its can be capable to hold the box as per requirement at a position by using pneumatic system at for assembly work.

3. OBJECTIVE

The main objective is to suggest for roller conveyor for design optimization. The following are important points regarding this objective of study –

Study existing roller conveyor system and its design.

- 1) Geometric modeling of roller conveyor.
- 2) Recommendation of new solution for optimization.
- 3) To reduce the power consumption during packaging.
- 4) To maintain the accuracy in production.
- 5) To develop automation unit, so that m/c can easily be adopted in today’s automated packaging plants.
- 6) To make a machine at low cost, low maintenance, low capital investment in less space.
- 7) To perform the most rigid operation with high speed packaging.

4. PROCESS FLOW CHART & WORK METHODOLOGY TO SOLVE THE PROBLEM

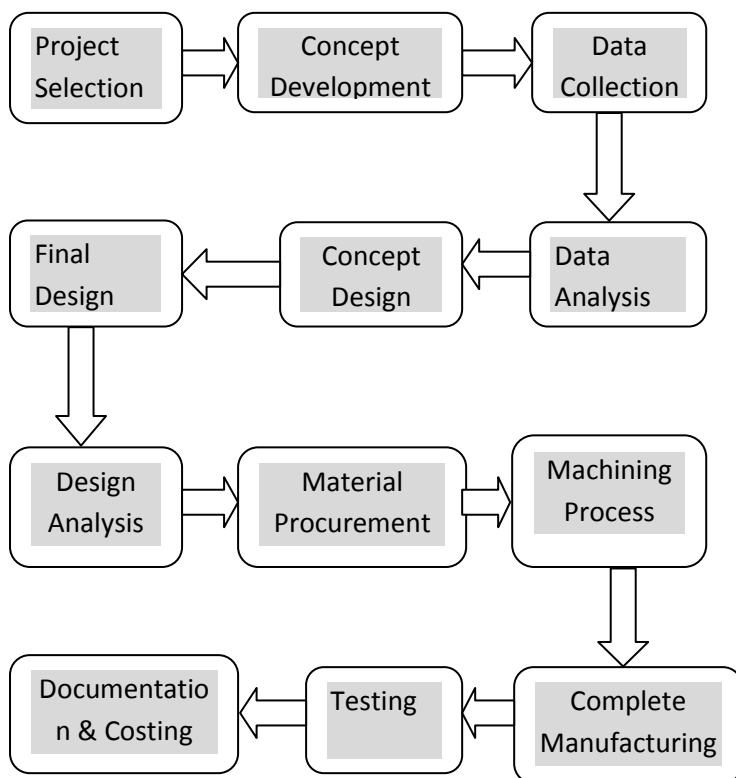


Chart 1: Flow chart & work methodology to solve the problem

5. APPLICATION

This conveyor can use in packaging industries where indexing time can be handle by worker packaging efficiency ex. In pharmaceutical industry for box packing in replacement of belt conveyer.

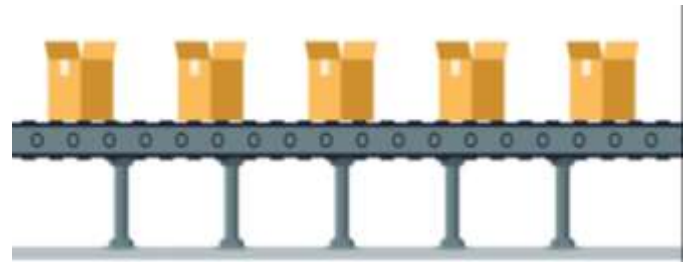


Fig. 1: Application of the concept

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