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Design and Development of Smart Convey or System for Coating of Inlet Air Manifold

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Abstract: *The compact transports are moreover developing quick in the development area and constantly 2014 the buy rate for transport frameworks in North America, Europe and Asia is probably going to become considerably further. Generally bought transport gear's are Line shaft roller transport, chain transports and transport lines at bundling plants and mechanical plants where for the most part item completing and observing are conveyed. Business and common parts are progressively executing transports at air terminals, shopping centers, and so on. The expanding development of shopping centers and air terminals around world shows positive degree and development for makers of transport lines.*

1. INTRODUCTION

The objective of our project is to produce a mechanism that delivers this stop and move motion using mechanical linkages. The advantage of our system over the conveyor system is that the system has a time delay between moving jobs and this delay can be used to introduce any alterations in the package or move the package for any other purpose and likewise. While in conveyor system such actions cannot be performed unless programmed module is used to produce intermittent stopping of the belt which basically is less costly. The prototype design requires electric motor, shafts and the frame of which the frame and platform on which the packages are moved is fabricated.

P. Sunderam et.al. stated that typical manufacturing plant material handling compromise of 50 to 55% of all company space, 20 to 25% of all employees, 85% of the production time, and 70 to 75% of the total cost of a product. Material handling means movement of material to the right place, in right quantity, in right time and in sequence to achieve the optimum production cost. Aniket A Jagtap et.al. studied the rocess, abrication, roduction r manufacturing industry, the raw needed to be transfer from one manufacturing location to the other manufacturing location or in a assemble line. Material handling equipment are designed such a way that they gives fast, easy, safe, and cheap loading and unloading with minimum human interaction.

Seema S. Vanamane, et.al The Belt conveyor systems are used to transfer the material form one place to another with the capacity up to the 30000t/h and the length of the conveyor path up to the 3-4 km. The study of DISA pattern moulding machine to meet the requirement for higher weight casting. From that specification conveyor system is designed with the use of different standards like CEMA (Conveyor Equipment Manufacture's Association). The conveyor system and lifting machines are mainly divided into the two categories, Intermittent motion and continues motion.

Konakalla Naga et.al. studied the purpose of designing the conveyor some basic information is need to be considered like material to be conveyor its shape, size, tonnage per hour, distance to which it is carried and also temperature and other environmental factors which impacts on the conveyor material. There are following parameters considered for the design of the belt like Belt speed, Belt width, Absorbed power, gear box selection, Driver pulley shaft. Compared to load reduction in the weight of conveyed material per linear meter of conveyor and therefore there is reduction in the cost of structure of frames and belt also.

2. TYPES OF CONVEYOR SYSTEMS

2.1. Pneumatic Conveyor Systems

Every pneumatic system makes use of pipes or ducts called transportation lines that carry a mixture of materials and a stream of air. These materials are such as dry pulverized or free flowing or light powdery materials like cement, fly ash etc. These materials can be transported conveniently to various destinations by means of a stream of high velocity air through pipe lines. Products are moved through various tubes via air pressure, allowing for extra vertical versatility. This will all depend on what the engineers think will be the most efficient and economical way of developing the system. Three basic systems that are used to generate high velocity air stream.

2.2. Vibrating Conveyor Systems

A Vibrating Conveyor with a solid conveying surface which is turned up on the side to form a trough. They are used extensively in food grade applications where sanitation, wash down, and low maintenance are essential. Vibrating conveyors are also suitable for harsh, very hot, dirty, or corrosive environments. They can be used to convey newly cast metal parts which may reach upwards of 1,500 °F (820 °C). Due to the

fixed nature of the conveying pans vibrating conveyors can also perform tasks such as sorting, screening, classifying and orienting parts.

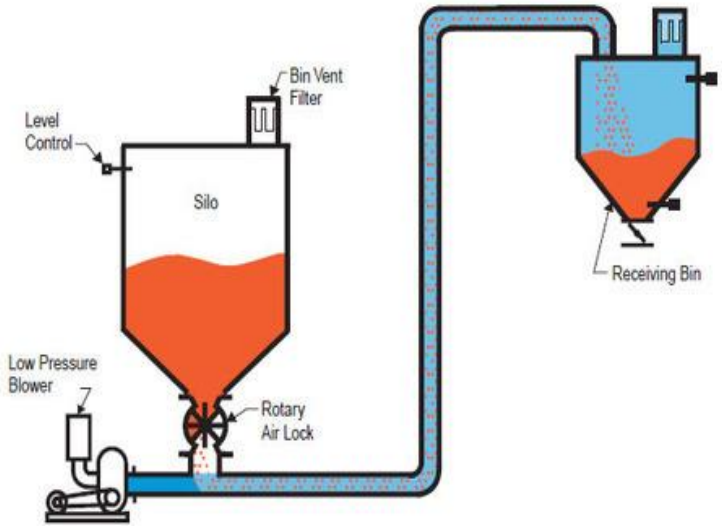

Fig1: Pneumatic Conveyor

2.3. Flexible Conveyor Systems

The flexible conveyor is based on a conveyor beam in Aluminum or stainless steel, with low friction slide rails guiding a plastic multi-flexing chain. Products to be conveyed travel directly on the conveyor, or on pallets/carriers. These conveyors can be worked around obstacles and keep production lines flowing. They are made at varying levels and can work in multiple environments. They are used in food packaging, case packing, and pharmaceutical industries but also in retail stores such as Wal-Mart and Kmart.

3. GROWTH OF CONVEYOR SYSTEMS IN VARIOUS INDUSTRIES

As far as growth is concerned the material handling and conveyor system makers are getting utmost exposure in the industries like automotive, pharmaceutical, packaging and different production plants. The portable conveyors are likewise growing fast in the construction sector and by the year 2014 the purchase rate for conveyor systems in North America, Europe and Asia is likely to grow even further. Mostly purchased conveyor equipments are Line shaft roller conveyor, chain conveyors and conveyor belts at packaging factories and industrial plants where usually product finishing and monitoring are carried. Commercial and civil sectors are increasingly implementing conveyors at airports, shopping malls, etc.

4. THE PROPOSED DESIGN OF SMART CONVEYOR SYSTEM

In the proposed system the location following features are introduced to eliminate the existing problems. The proposed design is shown in figure 2.

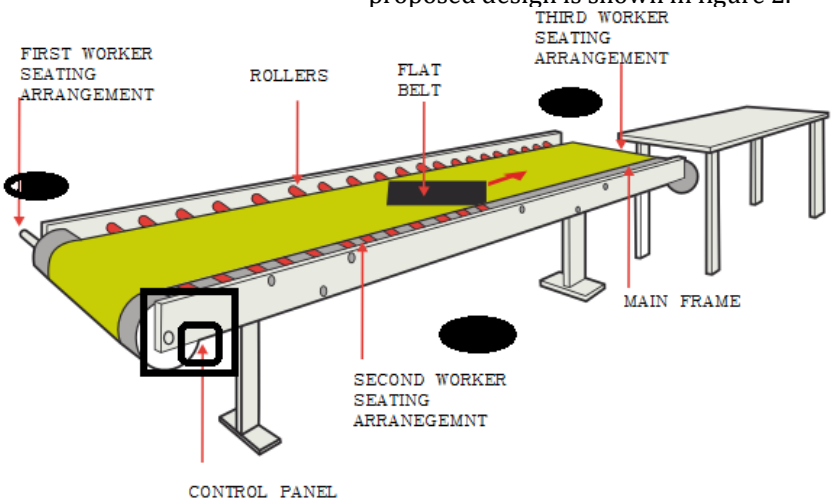

Fig2: Proposed Conveyor System

- The workers position is fixed so that the material handling is reduced.
- The standard speed setting is given as per type of intake manifold so that conveyor and standard system will help to reduce time required for masking.
- The manufacturer easily predict and set the per hour production rate by using developed smart conveyor system.
- Ergonomically seating arrangement is provided so that workers will not get tire.
- The DC motor is proposed to handle the system so that electricity will not require more.

5. MANUFACTURERS DATA

- Length of conveyor from centre to centre:- approx. 3meter
- Either degree of inclination, or distance to belifted or lowered:- Horizontal orientation
- Average capacity per hour:- 20 to 25 manifolds
- Maximum capacity per hour:- 25 numbers
- Material to be conveyed, and weight per piece:- Automobile manifolds(weight approx. 3-4 Kg)
- Average size of material:- Length 300 to 400mm and height 200mm and width 250mm
- Size of largest pieces :- Length 300 to 400mm and height 200mm and width 250mm
- Nature of material– Automobile components.
- Component feeding to belt conveyor:- Manually.
- Components to be discharged from the belt: Manually.
- General indication of supporting structure:- MS fabricated
- Power available for driving:- AC 3 phase 230V

But to drive the PMDC motor we will use adaptor and the motor input supply is 12 V 5 amp current

6. CONCLUSION

This Conveyor Belt System for material handling is improves the speed of material handling. And this system reduces the human effort. The workers are eliminated and the ultimately the operation cost is reduced and profit get increased. This system is beneficial and safety for the material. The following conclusion can be drawn from the work presented in this paper:

- The time and cost required to assemble the new conveyor system were reduced by 57%.
- The weight of the conveyor was reduced by 25%, leading to ease of transport.
- The overall manufacturing cost was reduced by 29% for the new conveyor system.
- Originally 27% of total assembly time for old conveyor design was consumed by fixing mechanical fasteners and joining operations that included riveting and welding. For the new design, the standard operation only consumed 10% of the total assembly time, thus saving significant time.

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