



Open access Journal

International Journal of Emerging Trends in Science and TechnologyIC Value: 76.89 (Index Copernicus) Impact Factor: 4.219 DOI: <https://dx.doi.org/10.18535/ijetst/v4i5.14>

Product Transfer Line

Authors

**Aditya Wasadikar¹, Onkar Pingale², Pravin Pathak³, Ajinkya Surashe⁴, Yogesh Shelke⁵
A.S.Adkine⁶**

^{1,5}B.E.(Final Year) Mech. Dept. SYCET Aurangabad

⁶Assistant Professor Mech. Dept. SYCET Aurangabad

Abstract

As we know that many industries carry their jobs manually and it creates defects in job. Many times we see that the job handling is difficult task. So this transfer line helps to transfer the job from one place to another with the help of kinematic link arrangement. with the less initial cost and less maintenance cost. Thus the product transfer is easy with the help of this transfer line. As the delay can be provided automatically with the specific kinematic arrangement so that the operations like drilling, punching etc could be perform. this project is beneficial for small scale industries with less cost.

Keywords –Kinematic analysis, Dynamic analysis, Optimization,

Introduction

A product transfer mechanism is made with the help of kinematic links. Generally it is used for assembly lines, production line or for packing line. A mechanical linkage is used to transfer objects from one stage to another movement of objects can be achieve easily. This invention relates to improvements in transfer and conveying devices, and it relates particularly to devices for transferring set-up cardboard boxes from a box folding or forming machine to the operator of a semi-automatic box wrapping machine. A great many manufacturers of fancy wrapped or covered cardboard boxes used for packaging candies, cakes, and other confections, cosmetics and other articles are equipped with the so called quad staying machines by means of which a box blank is folded or set-up into boxlike form. These set-up boxes are transferred by means of a conveyor to an operator, who picks up the boxes and places and centres them on wrappers with which the boxes are to be covered. The boxes and wrappers are then conveyed to a box wrapping machine where the wrapper is folded around and glued to the box. Usually, the operation of the wrapping machine is controlled by means of a

switch actuated by the box forming machine so that their operating speeds are related to each other.

Fully automatic machines are available for both setting up the boxes, placing them on the wrappers and feeding the assembly to the wrapping machine. In many instances, however, the cost of replacement of the semi-automatic machines with fully automatic machines, is so great that it cannot be justified by the increased rate of production possible with automatic machines.

The principal difference in the rate of operation of the fully automatic machines and the semi-automatic machines resides in the human factor, namely, the operator or feeder of the semiautomatic wrapping machine.

Concept of project

Product transfer by using simple kinematic linkage. A mechanical linkage is an assembly of bodies connected to manage forces and movement. The movement of a body, or link, is studied using geometry so the link is considered to be rigid. This linkage is connected to a fix body.

When the link rotate with the supply of air motor or servo motor with pneumatic arrangement then

object moves forward because of arms placed at link. Moving of workspaces with the help of kinematic links within less power and as per required speed on the assembly line that is the main concept of this project

Work Plan

Stage 1: Collecting the Materials

The links are drawn by using the auto cad 2010 software then this diagram printed in a A2 sheet. Then xylem sheet brought from a xylem shop dimension 610*420. Then paste the A2 sheet on the hylem then it will be cutter by using cutting machine and it drilled by the drilling machine Dc wiper motor and dc battery brought from an automobile spare shop. After completing these works the frame would be designed in welding work shop

Stage 2: Fabrication of Components

The following components are fabricated for the box shifting machine 26 Dc battery It is used to run the wiper motor. When power required then that time it give the power to the wiper motor. Dc motor It is used run the whole linkages. Bolt and Nut It is used to connect the linkages and used to fix linkages on the frame. Steel Frame It is used hold whole parts of this machine. It is made by using G.I rectangular pipes and sheets. Linkages These linkages are made by using xylem boards done by cutting operation

Stage 3: Process for Fabrication

1. Welding

In welding process, the electric arc is used to melt the two metals and joint them permanently. Electrode is used to produce electric arc .The gap between electrode and metal is 3mm. If welding is overlapped, it affects the quality of metal joint. It is used to inter connect the columns.

2. Metal Cutting

The square circular shaft and xylem board cut for our required dimension by using metal cutter. The circular shaft acts a column of box shifting machine. The xylem pieces are act as linkages. Metal cutter cuts all material to required dimension.

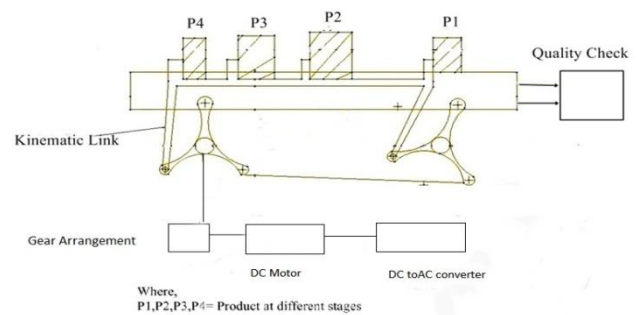
3. Drilling

Drilling is used to screwing the screw through the drilling. To tight the linkages, the screw is screwing through the drilling and helps to fix the linkages.

Stage 4: Assembling the Components

All the components are assembled in a correct manner. Then is will be re checked again and undergoes to the painting process and the demo model of the project gets ready to use in the industry and wherever it is possible in the industry.

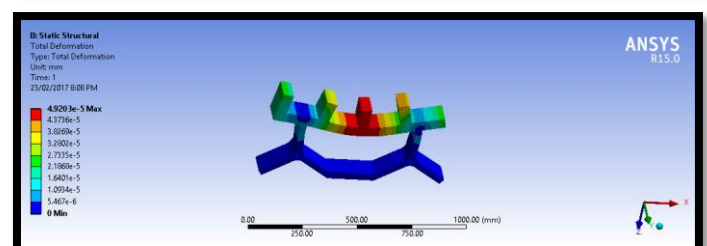
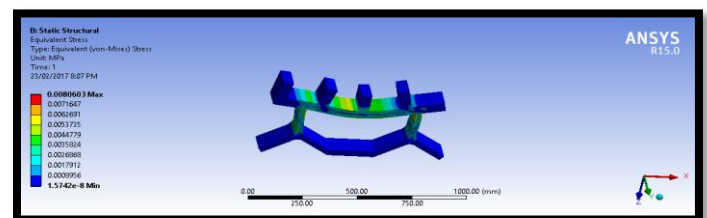
Assembly Diagram



Objectives

- Minimize time of material or work piece handling.
- Reduction of man power.
- Increase in handling delicacy.
- Safety in material handling.
- Reduce time to market.
- Simple and efficient construction of transfer line.
- Economically beneficial transfer line

Ansysresult



Material Specification

Name of Material	Specifications
M S Square Pipe	Material: Mild steel Size: 20 mm x 20 mm x 20 ft Thickness: 2 mm
Gear box	Ration: 20 : 1 Type of gear: helical gear Input shaft: 12 mm Output shaft: 16 mm
M S angle	Material: M S Size: 20 mm x 20 mm
DC rotor	Johnson DC Motor Voltage 12 V Speed 60 RPM
DC to AC converter	

Actual Image



Benefits

1. Less Lubricant required.
2. Simple to construct.
3. Low speed motor is sufficient
4. Easy maintenance.
5. Less skilled operator.

Cost Required: Total Cost 15150 /-

Application

- Medical production fields.
- Bottle filling process.
- Cold drinks production companies.
- Packaging Industry.
- Printing Industry.

Conclusion

1. This setup is useful to increase efficiency by reducing manpower involvement.
2. It is compact so less space is needed for installation.

3. It requires low maintenance because there is no leakage problem of working medium.
4. Easy operation with high rate of production.

References

1. By Shrikant R. Patel, D. S. Patel, B. D. Patel, review on “Kinematic and Dynamic Analysis of Mechanism” International Journal of Advance Research In Science And Engineering Vol. No.4, Issue 05, May 2015 page no.12-18
2. By Mohammad Ranjbarkohan, Mansour Rasekh , Abdol Hamid Hoseini , Kamran Kheiralipour review on ” Kinematics and kinetic analysis of the slider-crank mechanism in otto linear four cylinder Z24 engine” International Journal of Advance Research In Science And Engineering Vol.No.2, May 2014 page No.22 – 30.
3. By G. BRETTHAER, D. OSSWALD, MARTIN, C. BURQHART, R. MIKUT, H. WORN Review on “Design and fabrication of pneumatic transfer for material handling” International Journal of Engineering Science and Innovative Technology Vol. No.5,May2013,page no.32-38