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"Design and Fabrication of Box Transfer Mechanism"

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ABSTRACT

This projects aim for the utilization of kinematic systems synthesis (type, dimensional and number) to fabricate a working physical model of an eight link transport mechanism. The mechanism to be developed in its simplest form would perform the function of transporting the boxes/articles which are being fed onto two rails and are moved ahead one by one. The eight bar mechanism allows moving more than one article as compared to its four barcounterpart, transport mechanisms generally move material and their application lies in various industries – manufacturing, assembly, packaging etc.

1. Introduction

There has been a serious demand for intermittent movement of packages in the industriesright from the start. Though the continuous movement is more or less important in the same field the sporadic motion has become essential. The objective of our project is to produce a mechanism that delivers this stop and move motion using mechanical linkages. The advantageof our system over the conveyer system is that the system has a time delay between moving packages 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 conveyer system such actions cannot be performed unless programmed module is used to produce intermittent stopping of the belt which basically is costly. The prototype design requires electric motor, shafts, and the frameof which the frame and platform on which the packages are moved is fabricated. All the links are being made of wood which reduces the weight of the whole system including the head which has a direct contact with the boxes being moved. The system is expected to move as heavy packages as 2-3 kgs approximately.

Fig.01 Box Transfer Mechanism

2. Working Of Mechanism:

Inversion of four bar mechanism: The traditional definition of mechanism basically sums up as where there is a link which is fixed and the other links are moving then it is a mechanism. In four bar different mechanism can be obtained when we adjust the intersecting paths of the axes of the linkages. These are called as inversions of the mechanism. By changing the fixed link, the number of mechanism which can be obtained is equal to the number of links.

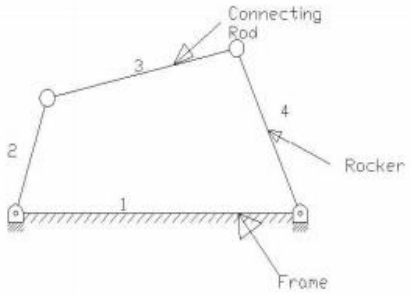

Fig.02 Four Bar Mechanism

3. Literature Review:

A linkage is a mechanism formed by connecting two or more levers together. Linkages can be designed to change the direction of a force or make two or more objects move at the same time. Many different fasteners are used to connect linkages together yet allow them to move freely such as pins, end-threaded bolts with nuts, and loosely fitted rivets. There are two general classes of linkages: simple planar linkages and more complex specialized linkages; both are capable of performing tasks such as describing straight lines or curves and executing motions at differing speeds. The names of the linkage mechanisms given here are widely but not universally accepted in all textbooks and references.

2) Function of linkages Obviously the function of any link mechanism is to produce rotating, oscillating motion from the rotation of crank or vice versa. Linkage functions are as follows Function generation: To provide relative motion Path generation: path of the tracer point Motion generation: motion of coupler link

4. Advantages:

- Lubricants not required.
- Simple to construct.
- Easy maintenance.
- Low speed motor is sufficient.
- Noise of operation is reduced.

5. Conclusion:

The box transfer mechanism plays a major role in industries the process for transporting or shifting products from one place to another. So we just successfully altered this with a box shifting mechanism using the kinematic link and a motor. • Thus this project work might be useful in all industries for practical application this is fabricated for light duty operation.

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1. Source: This Working Model file is adapted from Figure P3.7 on p.150 in Design of Machinery, 3rd ed. By Norton, R.L., McGraw-Hill, 2004.

2. Credits: This Working Model file was first developed by Jie (Jeff) Yang.

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