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Study and Analysis of Prototype of Powerless Automation

Prof. Mitali Gore[1]
[1]*Mechanical Engineering Department, P.K. Technical Campus*

Abstract: ***This work deals with the Study and analysis of Prototype of Powerless automation. In Industry, the material (work piece) handling is done by manually or either by electrically operated conveyer. If we handled the work piece manually then there is chances of slipping from the hand, it will damage the work piece. To overcome this problem, manufacturing industries shifted towards electrically operated conveyor but it is found that electrical conveyor system consumes more power, so that working cost per product may gets increase and another major drawback is, as it works on electric power during cut-off of electricity then there is a shutdown of whole production line. To overcome this problem, powerless automation is appropriate solution.***

Keywords: Automation, Work piece, Conveyor, Mechanical elements.

I. INTRODUCTION

Automation can be defined as the technology by which a process or procedure is performed without human assistance. In other words, automation and automatic control is the use of various control systems for operating equipment such as machinery, processes in factories, boilers and heat treating ovens, switching on telephone networks, steering and stabilization of ships, aircraft and other applications and vehicles with minimal or reduced human intervention, with some processes have been completely automated. Automation has been achieved by various means including mechanical, hydraulic, pneumatic electrical, electronic devices and computers usually in combination. Complicated systems, such as modern factories, airplanes and ships typically use all these combined techniques. The benefits of automation include labour savings, savings in electricity costs savings in material costs, and improvements to quality, accuracy and precision. Today the automation has become an integral part of process and manufacturing industries. It is needed because of the various technological commercials at social reasons. This work deals with the Study and analysis of Prototype of Powerless automation.

II. LITERATURE SURVEY

Melanie Rants, Terry Gregory and Ulrich Syrah[1] et.al has explained the exposure to automation should be measured at the level of jobs rather than occupations. When doing so, still one in ten jobs is highly exposed. While some of these workers may only need to adjust their tasks, others might actually lose their jobs. Yet, whether this leads to net job losses depends on the relative sizes of job- creation and job-destruction effects being automated in the near future, irrespective of the task variation across workplaces within this profession .However, according to our task data, many workers in such highly exposed occupations also perform tasks that machines struggle with, such as problem solving or influencing.

Jonathon C. Ralston, Chad O. Hargreaves, Mark T. Dunn,[2] et.al has explained Automation technology has significant potential to provide meaningful solutions by facilitating more accurate methods, incorporating sensing to optimally control equipment, and increasing personnel safety through remote process operation. These benefits include reduced operating cost, higher productivity, new operation culture, a reduced environmental footprint, and increased operator safety. Technology innovation needs to be ultimately guided by the vision, culture and process of the organization.

Blake Ash forth,[3] et.al has explained that Powerlessness is defined as a lack of autonomy and participation. Unexpected or undesired powerlessness is argued to generate, sequentially, reactance, helplessness, and work alienation. These stages are further argued to be mediated or moderated by generalized expectations of control, social isolation, the perceived legitimacy of organizational controls, and expectations.

Romani Hanzaki and P.V.M. Rao b, S.K. Saha[4] et.al has explained that Kinematic and sensitivity and-pinion steering linkages a combined kinematic and sensitivity optimization of a rack-and- analysis and optimization of planar rack-pinion steering linkage are presented for the first time. Since the variations of the linkage parameters cannot not be avoided in practice, attention to the sensitivity analysis and optimization. The kinematic optimization of the steering linkage is carried out using three homogenous

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design parameters all having the unit of length as a requirement for post-optimal sensitivity analysis. A simple but generalized methodology based on rack and- pinion steering linkage cognates is proposed to analyze the central take-off configurations. The results are applicable to side take-off configuration of the steering linkage as well. The analysis of the linkage shows that the systems is very sensitive with respect to variations of the links lengths close to optimum and are different left and right of the optimum point.

Automation and mechanization create and eliminate work. Given that a social division of labor based on sex gives rise to a sex segregated modern work force, automation and mechanization do not affect men and women alike. Development, in Crustrializing countries or the highly industrialized, is the context within which automation and mechanization usually occur. Only recently have scholars attune to the differential impact by sex. Theories of modernization and its liberalizing effect on attitucies are generally based on samples. The study of Taiwanese youths includes both boys and girls and reveals that while city vs. rural boys hold traditional values in significant areas, the reverse is true for girls. Development produces a differential effect on behaviour as well attitudes of field work opens opportunities for men, but often eliminates much of women's work leaving for example, 40% of non-rural female workers in Latin America paid work as servants. Technological change in manufacturing often displaces women artisans. Chinchilla reports that although manufacturing may provide cheaper goods for many, it seriously 471 affected the independent art an industry in Guatemala, and hence women's participation in manufacturing. Bose up's classic study of Woman Role in Economic Development (1970) documents various patterns of agriculture around the world female and male intensive patterns and ways which some kinds of development widen the differences in power between men and women, (the right to own land, for example, became a right for meanly with help of emissions in the Congo) study of differential mortality rates by sex in India with rates for women to those of men during industrialization Chinese agriculture describes changes in relationships between men a women in African Lesotho, wherein export mining drew men from the villages.

III.MECHANISM

Assembling (joining of the pieces) is done by welding, cutting, machine binding with adhesives, riveting, threading, or even yet more bending in the form of a crimped seam. Structural steel and sheet metal the usual starting materials for fabrication, along with the welding wire, flux, and fasteners that will join the cut pieces. As with other manufacturing processes, both human labour and automation are commonly used. The product resulting from fabrication may be called a fabrication. Shops that specialize in this type of metal work are called flab shops. The end products of other common types of metalworking, such as machining, casing and forging, may be similar in shape and function, but those processes are not classified as fabrication.

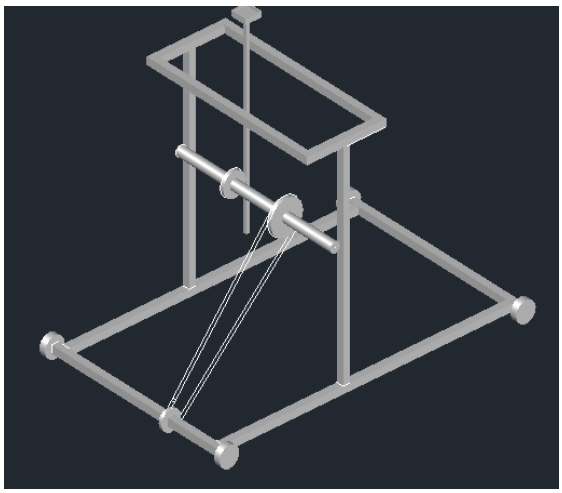


Fig. 1 Design of Powerless automation model

A. Component

The main components of overhead conveyor are as follows

1) *Spring:* A compression spring are coil springs storing energy when they are closed by a force. Compression springs are designed to operate with a compression load, so the compression spring gets shorter as load is applied to the spring. Stored energy in the spring is brought back to original state after force is removed to lengthen the spring and push against the object that compressed it.

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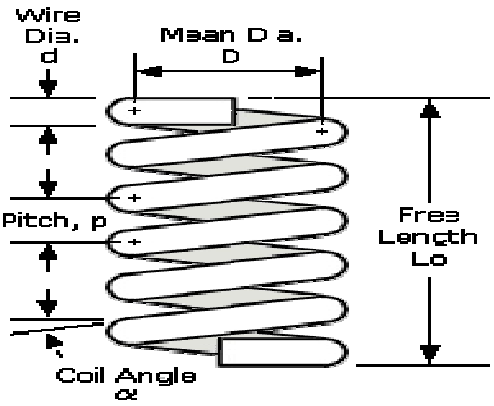


Fig.2 Spring

2) *Rack and Pinion:* A rack and pinion is a type of linear actuators that comprises a pair of gears which convert rotational motion into linear motion. A circular gear called "the pinion" engages teeth on a linear "gear" bar called "the rack"; rotational motion applied to the pinion causes the rack to move relative to the pinion, thereby translating the rotational motion of the pinion into linear motion.

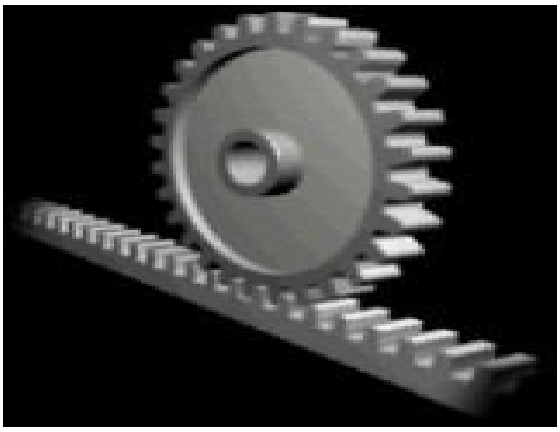


Fig.3 Rack and Pinion

3) *Chain Sproket:* A sprocket is a toothed wheel that is used to transmit motion and torque from one shaft to another. Chains that are used to transmit motion and force from one sprocket to another are called power transmission chains**.** Unlike gears that have to mesh to transmit motion and torque from one gear to another, sprockets. . Sprockets are connected by a chain sprocket with a hole that matches the diameter of the shaft is chosen and slid onto the shaft.

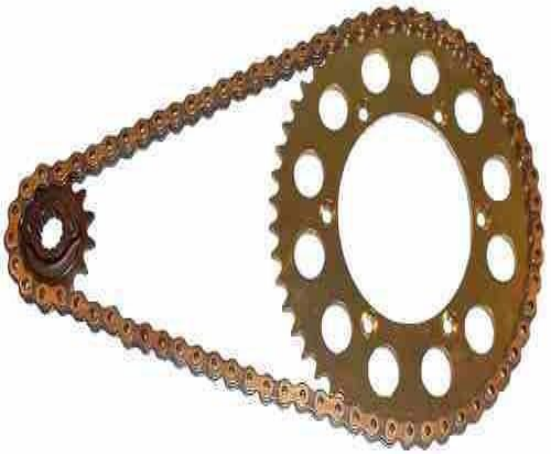


Fig.4 Chain Sproket

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4) Wheels: V-groove wheels are designed to guide equipment by rolling on inverted angle track.



Fig: 5 wheels

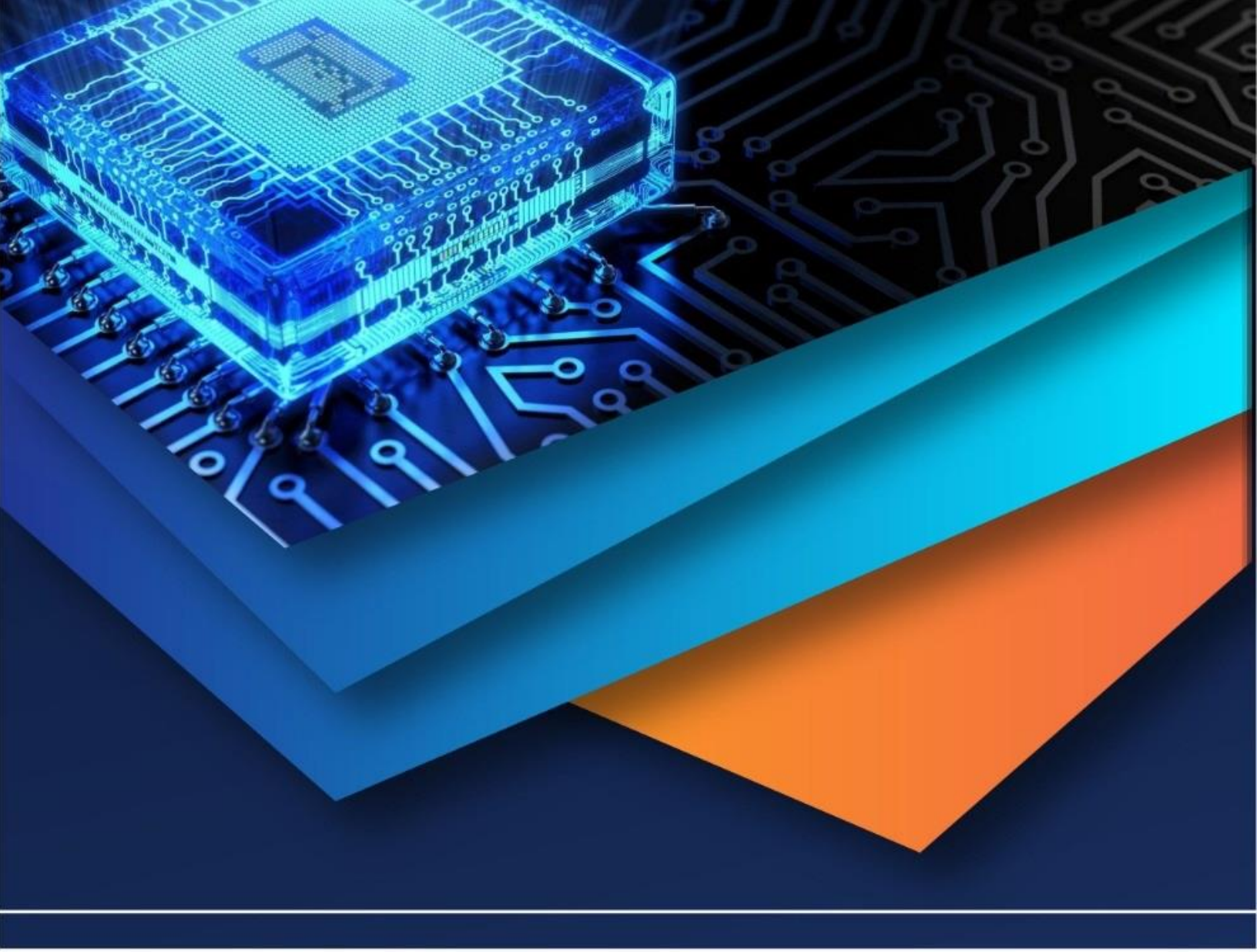
IV. RESULT AND DISCUSSION

We have successfully study on our concept we conclude that modifications and working limitations of Conveyor system will put this work in the main league of use. This concept saves time & energy which leads to efficient working. The constructional work or the infrastructural work demands efficient and user friendly machinery which will lead to more and more use of powerless automatic machine.

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