iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 7 **Issue:** IV **Month of publication:** April 2019

DOI: https://doi.org/10.22214/ijraset.2019.4115

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887
Volume 7 Issue IV, Apr 2019- Available at www.ijraset.com

Automated Ware Housing System for Differently Abled Person

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Abstract: Automated warehouse system is used in our day to day life and it requires space less than conventional ware house. The concept which eliminates the process of manually carrying the items, the need of the workers carrying the items and to maximize vertical space utilization is suggested. They allow for improved ware housing is used good distribution and optimum material flow. The design of an electrically operate vertical ware house storage system is carried out and tested successfully. The principle of design is based on the adaptation of vertical carousel ware house system. The 'Shelves Automated' is motor driven vertical storage equipment that brings shelves up and down so that they can be easily available for the user. The system performance was tested on fabricated model. It has wide applications in material handling for industrial, domestic and commercial purpose. In this project, we have modified this carousel system for the physically challenged people those who are blind & handicapped person. Braille text is also incorporated in this system which can help the blind people. This system enhances the standard of physically challenged people and increases their employability. This system changes the standard of physically challenged persons.
Keywords: Automated ware housing system; automated Shelves; material handling equipment; Hand lever; limit switch

I. INTRODUCTION

An automated storage and retrieval system (ASRS or AS/RS) consists of a variety of computer-controlled methods for automatically placing and retrieving loads from specific storage locations. Automated shelves is a material handling equipment. Various manufacturing processes are carried out on multiple floors. For example while manufacturing wafers, soaps, biscuits and other cookies and also on various assembly lines different processes are carried out at multiple stations. These stations are built on multiple floors for optimizing the space utilization. Also the finished goods are stored at a higher level on racks. Thus Organizations are trying to utilize every inch of space. In wholesale stores, there is limited storage space available. Business owners try to capitalize on their existing space to accommodate maximum goods. Due to this, the in cure losses due to damage of goods. Also, they have to employ people specifically to handle the goods which are stored at the places which are not easily accessible. This paper presented the design of an efficient system which will transfer the material between lower to higher level. A system is designed in such a way so as to maximize the utilization of vertical air space and reduce the floor space consumption. The purpose of this work was to design and fabricate an automated vertical material handling system in order to ease the process of storing and handling the products stored at inaccessible heights. The system is designed for the storage of shoes in the stores. The capabilities of the proposed system are not limited to the storage of shoes but also designed to carry books or similar sized products when applied for commercial or domestic use.the Vertical Carousel Storage System used in industry. The major parts of the system are the main frame, electronic brake AC motor, the chain drive for motor power transmission, the transmission shaft, main chain drives for the shelves, chain to shelf attachment, shelves and control system. These parts are fabricated / selected and then assembled following the design specifications. The 'shuttles' that make up the system travel between fixed storage shelves to deposit or retrieve a requested load (ranging from a single book in a library system to a several ton pallet of goods in a warehouse system The resulting automated factory thereby becomes a unique blend of human effort with advanced technologies. The automated factory requires the use of numerous key elements such as automated production machines, numerically controlled machining centres, robotics, automatic assembly machines, and the technologies of automated storage/retrieval systems (AS/RS), which include automated storage, automated transportation, automated materials identification and tracking equipment, and real time computer control of inventory.

II. COMPONENT USED

Flange Bearing

Chain and Sproket

L-Clamp

Plywood

Mild steel plate

Nut and Bolt

Limit Switch

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DC Motor

Push Button

Hand Lever

Sheet metal

Battery

Shaft

1 inch Rod

Cycle Sproket

III. OBJECTIVE

A. This system changes the life standard of physically challenged persons.

B. To applications in material handling for industrial, domestic and commercial purpose.

C. To reduced material handling cost for industry.

D. To most suitable for library and file storages.

IV. DESIGN DIAGRAM

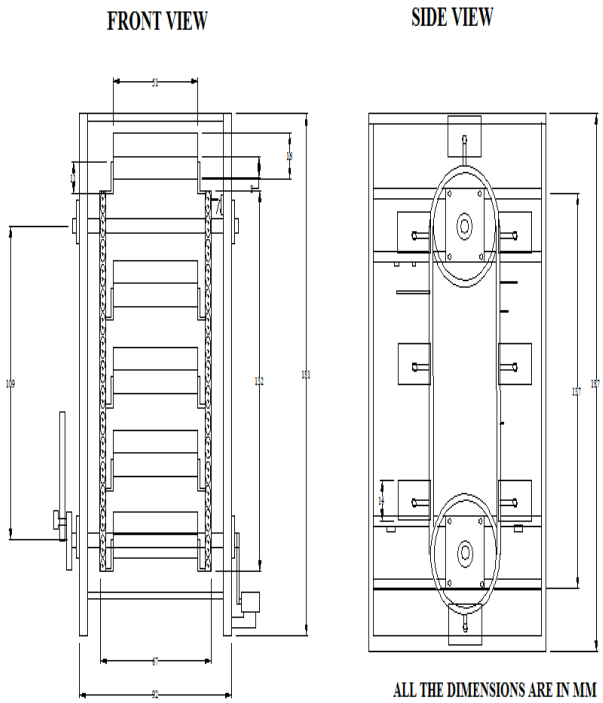


Fig 4.1 Design Diagram

V. WORKING PRINCIPLE

This project consists of collecting boxes linked to electrical and mechanical components. A carousel system is made with integrated electrical and mechanical components or elements .the collecting box or rack is connected with a chain drive. Totally there are eight racks in a single carousel system to maximize the flexibility of the blind and physically challenged people. Collecting box moves vertically either manually or electrically. In the automated ware housing system there are many racks ranging from 1 to 8. In these racks, many books and materials are arranged. The required books can be picked from the racks on seeing manual. The materials loaded in rack 1is selected by operating the 1st button. Accordingly the concerned limit switch operated by brake rod attached to the chain drive which stop rack 1. In the same way other limit switches are also operated using the appropriate button. .In libraries, the books in the rack are arranged 3feet and above with the help of carousel storage system, by pressing the bottom the handicapped people can easily access the book in the height of 2.5 feet. Braille text is also incorporated in this system which can help the blind people. This system enhances the standard of physically challenged people

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and increases their employability. Rollers are fixed at the bottom of the system so that they can easily move and shift the system from one place to another. During shutdown/switch off of power supply ,to operate the machine a manual hand lever is used .a press the hand lever about 95degree can crank rotate the chain on move to one rake to other. The carousel system is designed for the usage of physically challenged people for their convenience. Since the total height of carousel system is 2.5m it is easy to access the materials or objects placed in the carousel system by the physically challenged.of power supply ,to operate the machine a manual hand lever is used .It is a compact system with an easy to access feature for all the applications including libraries, shopping malls.

A. Circuit Diagram

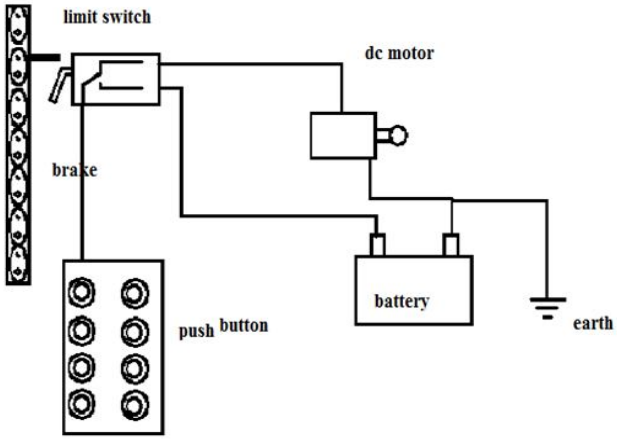


Fig 5.1 Circuit Diagram

Then electrical energy can used press button 1 on power supply to limit switch, it is open the power circuit to run the dc motor. The DC motor connected with the chain drive and rake. It will automatically move across the limit switch it brake to stop rack on automatically.

VI. POWER CALCULATION

A. How Pedaling Power relates to Force and Speed

For example, if the applies a force of 0.02newtons to the pedals (0.02N is the force needed to lift a 2kg mass) and the speed of the pedals in a circle is 2 metres per second (2m/s), the pedaling power output of the cyclist is:

Lever power = force on pedals x speed of pedals
= 0.02 x 2m/s
= 0.04W

B. Power can be used to Calculate Forwards Force

The power at the pedals is0.04W and the speed of the chain is 0.025m/s, then the forwards force acting on the cyclist is:

Lever force= lever power ÷ speed of chain
= 0.04W ÷ 0.025m/s
= 1.6N

C. Carousel Calculation

Maximum take in time taken lever = 1.5sec

Complete a carousal =15 pedal

One press for lever=20cm down a basket

complete one revolution on lever= 25sec

spring take a position =2.2sec

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minimum take in time taken lever = 2.5sec

VII. PHOTOGRAPHY



Fig 7.1 photography

VIII. ADVANTAGES

A. Less electrical energy and man power used.
B. Less cost and adopted Braille text
C. Easy can be material handling without electrical energy used.
D. More efficiency and more materials stored.
E. Small size to large size material and product can be loading and unloading by using lever.
F. Easy can be moved one place to other place.
G. Less height people,and differently abled persons also used

IX. APPLICATION

A. Very useful for blinds and handicap
B. Used to small , large , medium scale industry
C. Used to home and department store
D. Library and blind school & college
E. School ,college, office are used

X. CONCLUSION

The system can perform automated ware housing system for differently abled persons is used in industries. It is mostly suitable to store the books in library, departmental store for storing the packed items with less space. This project worked with either electrical energy or mechanical energy for moving the bins. Dedicated project for blinds, handicaps, children are very like in my project.

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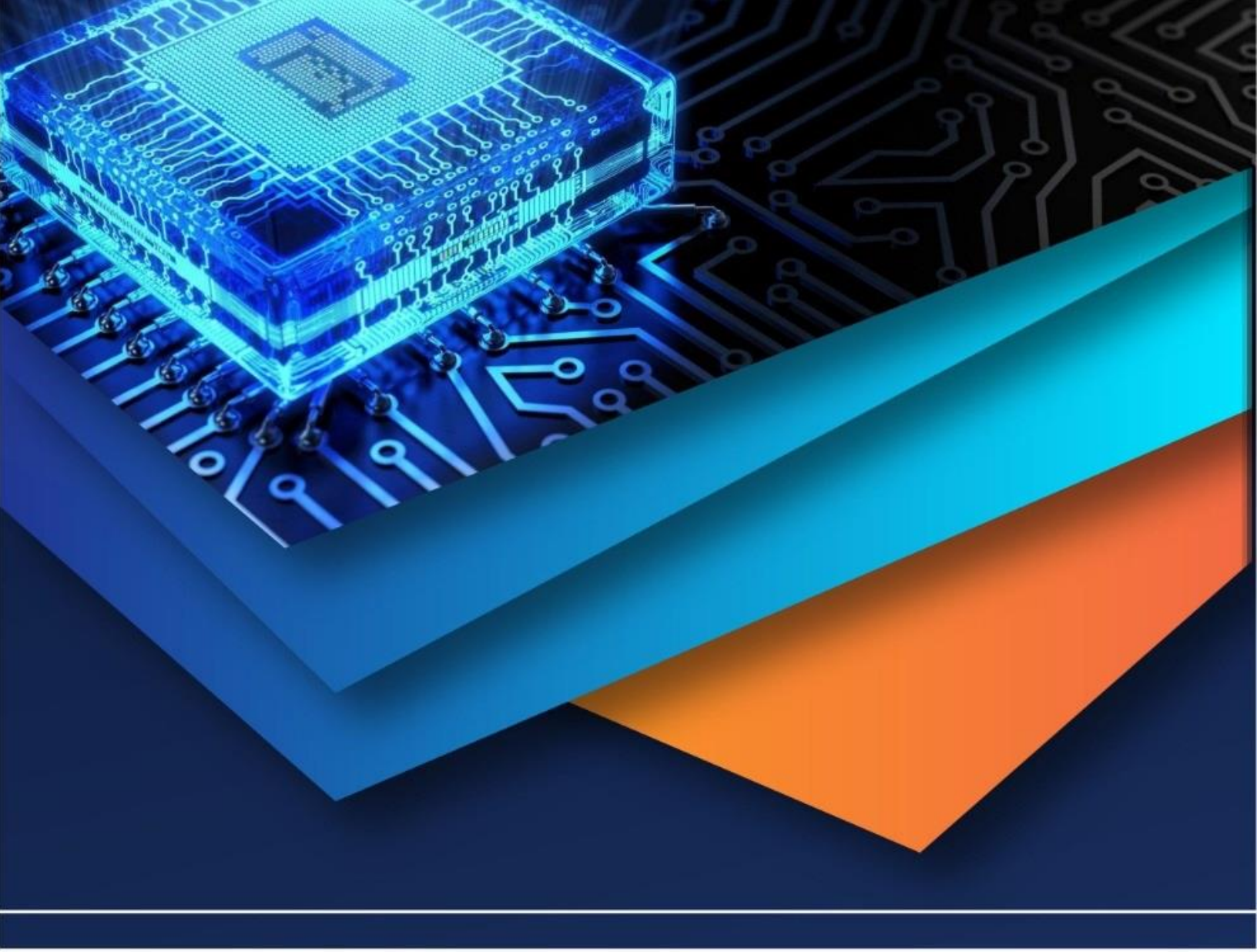
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