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Design and Development of Stair Case Ramp for Disabled Person

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ABSTRACT: This report fully explains the needs of ramps for handicaps who want to move to the other side of stairs, in our project we convert the stairs into a ramp by placing our project on the already fixed stairs, our product will be portable and can be adjusted according to the fixed stair height and after placing our project on stairs the product can be used as both ramp and stair by activating simple mechanism. The mechanism we used in our prototype was also explained in this report very clearly and the forecasting plan for the model creation using the medals was also explained. Our prototype we present here was made on wood and it is just an idea of how we are going to do the model and the product can be used in various field including in house. The main objective of our project is to help handicaps and patients to move by themselves freely.

KEYWORDS: Stair Lift, Comfort, Mobility Problems, Escalators, Traditional Ladders

I. INTRODUCTION

There are many antique and bodily disable peoples withinside the global and its miles tough for them to climb stairs in comparison to everyday folks. To assist them and to assist the folks who cannot come up with the money for raise as their homes are small, the assignment is made. The maximum situation of this assignment is to manufacture a mechanism with a view to raise them up and positioned them down on every occasion they need and at very low budget. A stair with escalator is a mechanical tool for lifting humans up & down. Rail is installed on the steps on which a platform is attached. The platform is lifted through an easy mechanism of rope and pulley through its miles lifted. Person receives at the platform is lifted while he/she activate the plug the motor begins after that the shaft of motor.

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The Excel stairway raise device could be hooked up so that you can supply humans the independence had to circulate round their domestic. The use of character stairway raise structures guarantees that she will be able to without difficulty circulate from degree to degree. A manage located in among the 2 stairway raise structures, with a view to permit them to transport from one chair to the other. A novel far off-center mechanism become



proposed wherein in a stair case can flow alongside the steps. In this device, the perspective of the seat at the mind-set of the chair adjustments alongside the perspective of inclination of the consumer beside the point of the perspective of the stair case. A mind-set sensor alongside a fairly small actuator used, this minimum diploma of lively manipulate made viable. Usually, we discover that humans neither can force stair cases well at go muddy patches nor choppy terrain. Similar is withinside the case of stair wherein one method is found of legs. Advances in robotics have made it viable to construct and manipulate machines in each manner viable. It isn't always tough to construct a stair case with legs that may climb slopes, step over obstacles, which run alongside stairs. In 1987 a four-legged chair advanced through the University of Illinois at Chicago and the Veterans Administration Hines Rehabilitation Research and Development Centre primarily based totally on studies in quadruped strolling become advanced. This invention may want to maintain a weight of round a hundred and ten kg. In addition, has a potential of wearing a payload of 113.6 kg.

II. LITERATURE REVIEW

Pengjia Wang, et al Modular layout, or modularity in layout, is a layout method that subdivides a device into smaller components referred to as modules or skids, that may be independently created after which utilized in exceptional systems. A modular device may be characterised through practical partitioning into discrete scalable, reusable modules; rigorous use of well-described modular interfaces; and utilizing enterprise requirements for interfaces. Besides discount in price (because of much less customization, and shorter gaining knowledge of time), and versatility in layout, modularity gives different advantages consisting of augmentation (including new answer through simply plugging in a brand-new module), and exclusion. The Use of remanufacture engineering associated with layout idea of stairlift used over here. By enforcing the remanufacturing approach on the stop of the product lifecycle, the company can lessen price and enhance competitiveness largely. If the remanufacturing method isn't always taken into consideration while a product is being designed, it is going to be hard to remanufacture the product on the stop of its lifecycle, as a number of the additives and components might have been worn badly, ensuing in a product which cannot be remanufactured. Therefore, it's far important to remember the remanufacturing traits at some point of the section of product layout, to facilitate product reuse, improve and maintenance, and to make it less complicated to disassemble and recover.

Shouhei Shirafujia, et al Belt force, as in line with in machinery, a couple of pulleys connected to typically parallel shafts and related through an encircling bendy belt which can transmit and regulate rotary movement from one shaft to the different. Most belt drives encompass flat leather, rubber, or material belts walking on cylindrical pulleys or of belts with a V-formed go phase walking on grooved pulleys. This paper specializes in the bendy belt drives utilized in engineering packages & systems. Flexible belts, cables and ropes have huge packages in engineering, in which they're used as belt drives for energy transmission among rotating shafts, band breaks to lessen angular pace of rotating system components, hoist gadgets for lifting or decreasing masses in production or mining enterprise, gadgets for fastening marine vessels to the dock, conveyors, and magnetic tape drives, etc.

A S Shriwaskar and S K Choudhary et.al. This paper affords stair mountaineering mechanism through which chair will climb on stair with none assistance. Project revels approximately synthesis, modelling and simulation of mechanism for directing wheels for mountaineering mechanism. Mechanisms like 4 bar mechanism, unmarried slider crank mechanism, double slider crank mechanism, etc., are used for transmitting movement, force, torque, etc... Generally, a mechanism is designed for the preferred overall performance output of the system and those mechanisms are being utilized in case of mountaineering wheels. This venture specializes in offering the improvement of a stairclimbing stair case. This wheel chair is adaptable to mountaineering and descending stair and slopes. Operation on stage floor is just like the operation of a traditional wheel chair.

Weijun Tao, Junyi Xu and Tao Liu et.al. In this newsletter, a assessment of electric powered-powered stair case with stairclimbing cutting-edge era is given and its destiny tendency is mentioned to tell electric powered-powered stair case with stairclimbing researchers withinside the improvement of extra relevant and famous products. According to the writer respective benefits and downsides of various forms of electric powered-powered stair cases with stair-mountaineering are mentioned for a usual contrast of the manipulate method,



price of mechanical manufacture, strength consumption, and adaption to exceptional stairs. Insights into the destiny path of balance at some points of stair-mountaineering are mentioned as it's far a vital issue not unusual place to all electric powered stair cases with stair mountaineering. Finally, a precis of electric powered-powered stair cases with stairclimbing mentioned in this newsletter is provided.

Harout Markarian Et.Al. Stair case customers face problems at the same time as crossing rugged terrains and sidewalks, in addition to mountaineering up and down stairs. With the protection of the consumer as a major concern, the subsequent idea will permit the occupant of the stair case to ascend and descend stairs at the same time as final accurately at the seat. This conceptual layout includes differential force wheels and a -legged mechanism, in addition, it makes use of mild weight material. Using Solid works simulations, the dynamic evaluation of the stair case is provided at the same time as it climbs the stairs. FiNITE detail evaluation is likewise done at the stair case's frame, together with DC motor energy evaluation and manipulate device layout.

Mulik shriniwas, Salunkhe Rohit, Shaikh Shahrukh, Waghmode Dada, Swipnil GaikwadEt.al., This article pursuits is growing a mechanism for smooth transportation of heavy masses over choppy terrain. The want for this sort of device arises from every day necessities in our society. Devices consisting of hand trolleys are used to alleviate the strain of lifting at the same time as on flat floor; however, those gadgets typically fail in relation to sporting the weight over quick height. Several designs had been conceived that could permit a non-business hand trolley to tour over stairs, curbs, or choppy terrain at the same time as lowering the pressure at the consumer. In our venture the trolley is consisting the tailwheel or Tri-Star mechanism eases the motion of trolley in abnormal surfaces like holes, bumps, etc.

Murray J Lawn, Toshihide Sakai, Megumu Kuroiwa and Takakazu Ishimatsu Et.Al., This paper specializes in offering endured improvement of the "Nagasaki Stair climber", A twin phase tracked stairclimbing stair case "the Nagasaki Stair climber" has been evolved in Nagasaki, a twin phase tracked stair case able to negotiating the big range of twisting and abnormal stairs generally uncounted through the citizens dwelling at the slopes that surround the Nagasaki harbour. A manipulate device has been introduced to the established twin song mechanism stair case. The manipulate device offers for automation. Recent traits consist of an car steering device, car levelling of the chair perspective and lively manipulate of the front rear song perspective. Future paintings consist of the ongoing improvement of the manipulate device with reference to advanced automation, protection and well-known robustness. Further refinement is likewise required on lowering the load of device.

III. PROBLEM STATEMENT

There exist few fashions together with escalators and elevators, used to move up and down the steps however these, aren't explicitly for the bodily handicapped. For an instance, a bodily handicapped humans cannot use the escalator. There additionally exist situations in which each elevator and escalators cannot be used because of obstacles in architecture. Elevators occupy extra area. Therefore, implementation in places, in which enough area isn't always available, will become tough. Healthy humans broaden the addiction of relying upon elevators; therefore, bodily hobby reduces. In elevators, humans get caught for hours among flooring whilst the energy is going out and there may be no lower back up for the energy supply

IV. OBJECTIVES

- To collect the information of stair case ramp for disable people.
- To identify the components of stair case ramp for disable people.
- To fabricate the stair case ramp for disable people.
- A Handicap person can stair without any support of another person.

V. METHODOLOGY

- a) Selection of optimized transmission mechanism by testing on actual test model.
- b) Integrating design assembly into product design stage.



- c) Design CAD models
- d) Analysis of stairlift models.
- e) To compare analysis and analytical results to ensure safe design model.



Advantages

The crucial blessings of ramp attachment layout are

- Most within your budget manner of including ramp function to any to be had stair cases.
- Removes the issue of disabled human beings to transport around.
- Can be utilized in domestic for moving antique age human beings from room to cars with much less effort.
- Can be followed for purchasing trolleys.
- Cost effective
- Less maintenance
- Flexible to modifications.

The ramp attachment is fabricated with less expensive and lightweight substances made them smooth to perform and maintain. The layout may be improvised as a destiny scope of labour with the aid of using including pneumatic cylinders for computerized folding and deployment of ramp attachment.

VI. CONCLUSION

The layout of the stair case is compact and for this reason is capable of flow approximately in nearly all of the stairs that we discover at institutions, offices, industries and additionally at a few homes. The layout is made very secure and there may be no hazard of failure of the body and wheels beneath Neath regular situations. The layout of the stair case is compact and for this reason is capable of flow approximately in nearly all of the stairs that we discover at institutions, offices, industries and additionally at a few homes. The layout is made very secure and there may be no hazard of failure of the body and wheels beneath Neath regular situations According to the checks conducted, the stair mountaineering stair case has a ability of wearing a load of 100kgs on flat surface. It has the capacity to ascend a flight of stairs of 40-diploma elevation wearing a weight of 55kgs. The layout of the stair case is compact and for this reason is capable of flow approximately in nearly all of the stairs that we discover at institutions, offices, industries and additionally at a few homes. The layout is made very secure and there may be no hazard of failure of the body and wheels beneath Neath regular situations.



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