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RESEARCH ARTICLE

Design and Fabrication of Standing Wheel Chair

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ABSTRACT

The wheelchair clients are presented to numerous physical and mental medical issues related with delayed situated stance with being inert in wheelchair, e.g., weariness, torment in hip joint, pressure injuries, and so forth Other related issues are expansion in guardian reliance, lower back torments among parental figures, and injury rates during move support, and so forth Numerous old subjects who can walk are confined in wheelchairs because of the absence of standing capacity. With less parental figures and expanded quantities of lower appendage handicapped and older subjects, there is a significant need of improved wheelchair plans focused on upgraded autonomy of wheelchair clients. The focal point of present work was at planning a novel reconfigurable wheelchair joined with stand and sit abilities with the end goal of improvement of freedom and personal satisfaction of lower appendage incapacitated and old subjects. Further work presents a general item plan and improvement periods of a reconfigurable wheelchair. The significant commitments of paper can be summed up as Modeling and creation of a proposed wheelchair and testing it in an ongoing requirement with load application. The proposed creative answer for the issues of long haul wheelchair clients has a promising potential to upgrade autonomy and personal satisfaction of crippled individuals.

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Introduction

By and large, wheelchairs should ship debilitate people groups with seating position as it were. A standing wheelchair is assistive innovation, like a standing casing, that permits a wheelchair client to raise the seat from situated to standing position and the other way around. Precisely worked standing wheel seat is a change of essential wheel seat to improve the existence of impair people groups by giving them an intend to stand and move anyplace. It is social cordial, simple to utilize, solid and reasonable since it is full precisely worked. Planning of standing wheelchair depends on the stuff instrument, belt drive, chain drive, and fastener. This wheelchair is monetary cordial and upkeep agreeable.

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Literature Review

Tianxiang Mo Yufeng Sun Yonghao Yang - New Mechanism Used in Standing Wheelchair

It is inescapable for any nation to have individuals with inabilities or experience difficulty with standing up, particularly joint inflammation patients. The most well-known utilized gadgets for impaired individuals are wheelchairs. In addition, the existence nature of debilitated individuals and patients has gotten consideration by society. Modernized wheelchair has become a well know designing test for quite a long time. We meant to plan another mechanical framework in wheelchair to help individuals stand up, this instrument ought to be more secure, more straightforward in structure, less force devouring and more monetary. A parallelogram structure was intended for

wheelchair to fit the common human standing stance. Springs introduced at two nonadjacent vertexes can gather energy. An engine with less force and less expensive costs is sensible, energy-saving and effectively give the ability to lift up. After exploration and estimation, this parallelogram structure diminished practically 45% force contrasted and unadulterated engine drive one. What's more, the exertion of each part can well help human's body to shape a characteristic and agreeable interaction. The standing wheelchair we planned may assist individuals with handicap to flood confidence; arrive at objects put high, convey discourse on platform. Incidentally, it's exhausting for an individual to sit for long time.

Arun S, Mathew John, Adarsh U, Ijas Ahamed MK, Mohammed Ajmal KV-Design and Fabrication of Wheelchair for Paraplegia Patients

In India the quantity of incapacitated people is expanding each year. Portability helps are valuable for patients for transportation and a substitution for strolling particularly in indoor and outside climate. Moving the patients from wheel seat to other medium like bed, vehicle and so forth is consistently an issue for the orderly or aide. Understanding the different issues in regards to the versatility gear and presenting a superior plan will be a resource for the clinical field and assistance for incapacitated people. This is an assistive instrument to give a simple, protected and helpful method of moving wheel seat clients from wheel seat to different mediums and facilitate the existence of parental figures. It definitely lessens the endeavors of guardian in treatment of patient particularly giving exchange. The wheelchair likewise gives standing instrument with no gadgets segments. This is an expense diminishing undertaking which assists mostly deadened patients with doing their everyday things.

Nirmal Mistry Mitpanchal Bhadreshmangroliya Avinash Kumar Labana - Design and Fabrication of Convertible Wheelchair

It is unavoidable for any nation to have individuals with incapacities or experience difficulty with standing up, particularly joint inflammation patients. The most usually utilized gadgets for incapacitated individuals are wheelchairs. Likewise, the existence nature of crippled individuals and patients has gotten consideration by society. A modernized convertible wheelchair has become a famous designing test for quite a long time. We intended to plan another mechanical framework in the wheelchair to help individuals stand up also as they can rest and rest, this instrument ought to be more secure, less difficult in structure, less force burning-through and more financial. The construction is intended for the wheelchair to fit the characteristic human standing, sitting and resting stance. The standing and resting convertible wheelchair we will configuration may assist individuals with incapacity to flood confidence; arrive at objects put high, convey a discourse on the platform. Coincidentally, it's exhausting for an individual to sit for quite a while.

Mohan Kumar R., Lohit H.S., Manas Ranjan Mishra, MD. Basheer Ahamed - Design of Multipurpose Wheel Chair for Physically Challenged and Elder People

Wheel Chair is a portability gadget intended for moving patients, moving actually moved individuals starting with one spot then onto the next with the assistance of participant or through self-moving. The wheel seat is partitioned into two unique sorts dependent on the force utilized for versatility: 1. Physically controlled wheelchairs. 2. Electric controlled wheelchairs. Manual controlled wheelchairs are driven by manual force which are again ordered into foldable and non-foldable with or without chest plan. Electrical controlled wheel seats run with electric force anyway manual activity is needed to work the joystick for the development of the seat. The overhaul of manual wheel seat was considered for this venture. The plan of wheel seat began through writing survey to know its assessment from prior to the current age. Market study was completed to know the current contenders accessible in the market with cost investigation of the current item. Ethnography study was done to notice the need, the significance of the current item and to address the plan hole in the current item to the client need through questionaries. The input was taken from various clients and participants, idea age and plan execution had finished by the execution of plan techniques like Quality Function Deployment, Mind planning, Product Design Specification. The last yield is a wheel seat which gives various choice to the client and participant by giving simplicity of crap, cleaning and changing of garments. Flexible back rest, arm rest, leg rest gives solace to the patient while resting. The flexible arm rest give simplicity of moving the patient from seat to the bed or to the vehicle. Office accommodated keeping plate while having food, perusing and keeping water bottle. Extra to this alert office is given to educate the participant that there is a need of his/her essence to the patient. Approval of the model is done and use is discovered agreeable.

Design Description

The wheel seat structure is made utilizing square cylinders and channels by metal cutting and metal joining measure called welding. Four wheels are connected to the casing, in which two at front and other two at back side utilizing hub shafts. The back hub shaft is associated with DC drive with the assistance of chain drive game plan. The guest plan has two rotated connections in which one is pivoted to the base edge and other connection is pivoted to the vertical casing, on the opposite end free finish of each connections is associated with one another. At the focal point of top connection nut is welded which get fit with lead screw associated with a different drive which is mounted to the base casing. The source to work the drive is given the assistance of battery and to control rotational bearing of drive DPDT switch is utilized.

Objective

Chain drive was a mainstream power transmission framework from the most punctual days of the vehicle. It acquired conspicuousness as an option in contrast to the System Panhard with its unbending Hotchkiss driveshaft and all joints. A chain-drive framework utilizes at least one roller chains to communicate power from a differential to the back hub. This framework took into account a lot of vertical hub development (for instance, over knocks), and was less complex to plan and work than an inflexible driveshaft in a serviceable suspension. Likewise, it had less unsprung weight at the back tires than the Hotchkiss drive, which would have had the heaviness of the driveshaft and differential to convey also. This implied that the vehicle would have a smoother ride. The lighter unsprung mass would permit the suspension to respond to knocks all the more viably. Frazer Nash were solid defenders of this framework utilizing one chain for each stuff chose by canine grasps. The Frazer Nash chain drive framework, (intended for the GN Cyclecar Company by Archibald Frazer-Nash and Henry Ronald Godfrey) was powerful, permitting incredibly quick stuff choices. The Frazer Nash (or GN) transmission framework gave the premise to many "extraordinary" dashing vehicles of the 1920s and 1930s, the most acclaimed being Basil Davenport's Spider which held the through and through record at the Shelley Walsh Speed Hill Climb during the 1920s.

2D Diagram

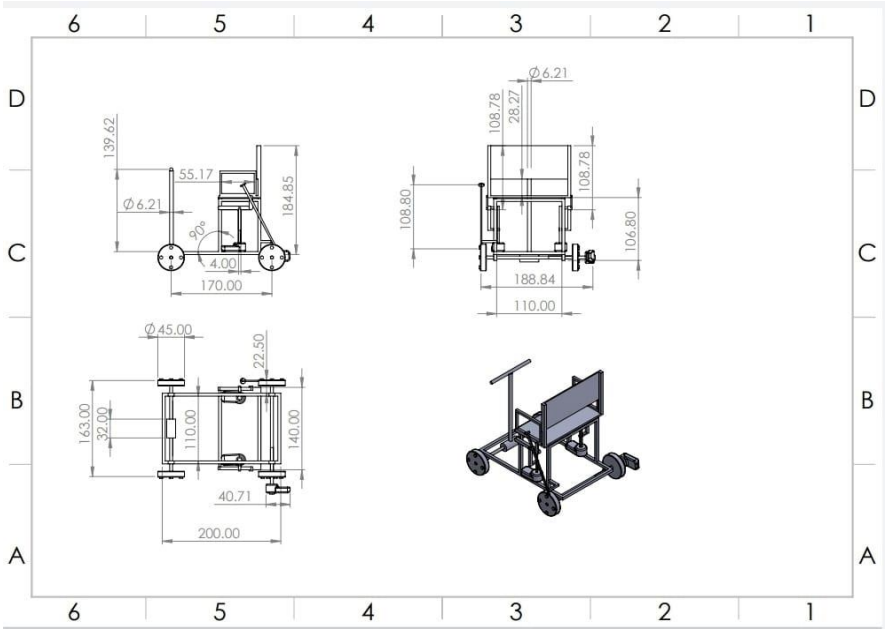

Fig. 1. 2D Layout of Model

3D Model

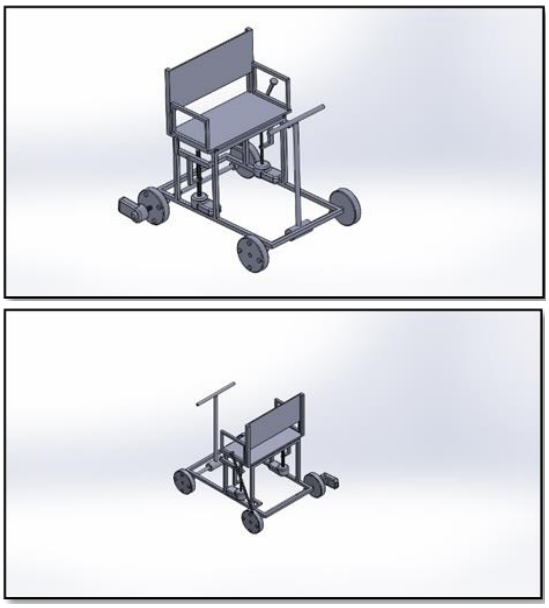

Fig. 2. 3D Model

Working Principle

At the point when the administrator seats on wheel seat and moves the forward position of DPDT switch answerable for the development of wheel seat, at that point it begins enacting the drive associated with back hub and makes wheel seat to push ahead. Likewise, when the position is turned around wheel seat goes in reverse. At the point when the administrator wishes to stand at that point drive which controls lead screw is worked in a clock shrewd heading which makes it turn about its pivot and will in general move the nut towards top which get coincided with it. The development of nut broadens the connection which makes administrator remain with the help of expanded connection, when the situation of drive gets turned around home situation of wheel seat is gotten.

Cost Estimation

Table 1. Cost Estimation of the Standing Wheel Chair

S. No.	Description	Rate
1	DC Motor	2000
2	Frame	1000
3	Shaft	300
4	Metal Strip	200
5	Bearing	800
6	Battery	1000
7	Lead Screw	400
8	Chain Drive	800
9	Sheet Metal	600
10	Two Way Switch	200
11	Wheel	1200
12	Total	8500

Conclusion

The plan of wheelchair is smaller and supportive for some individuals who are incapacitated with paraplegia sickness. They can utilize this wheelchair with no outside guide or a guardian. so this is a multi-practical therapeutic guide zeroing in on the improvement and self-dependability of paraplegia patients. Adjustments made in the common hardware implied for the crippled ones will be incredible use in forthcoming time and we had the option to apply our hypothetical information into training. All information gave are exact as well as could be expected. The undertaking was pointed toward planning and creation of wheelchair for paraplegia patients that can defeat the inadequacies of a regular wheelchair, with center around cost viability and utility. The model presents a wheelchair that is constrained by utilizing with no electrical parts giving most extreme capacities to paraplegia patients. The wheelchair can be constrained by the paraplegia patient alone and switch is utilized to guide the wheelchair, making the development and control of the wheelchair simple for a paraplegia patient. This will help the paraplegia patients to accomplish social regard from the general public by doing little works and mental strength. It will assist the patients with relieving from paraplegia condition. By the venture work, we acquired a great deal of functional information with respect to arranging, buying, machining and collecting. We feel that the undertaking work is a decent answer for connect the doors between the foundation and the businesses. We are glad that we have finished the work with in time effectively.

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