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Design and Development of Humanscale Wheelchair cum Stretcher

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Abstract: *Now a day common scenario observed in the medical field that person suffers from many more diseases and some kind of diseases required more care like to paralyzed patients. Wheelchair is a devise that is used to improve the accessibility of mobility challenged persons. This study will illustrates the new fully comfortable design for physically handicapped person comparative to available designs in general use. The objective of this study is to design the convertible wheelchair to stretcher easily by means of design software and obtain the idea in actual practice.*

Key Words: PRO-E, Wheelchair, Stretcher.

1. INTRODUCTION

The terminology of the wheelchair has defined already in various types. Wheelchairs are used by physically challenged people i.e. people who have difficulty in sitting and walking often make use of wheelchair. The reason of the study to design, development and analysis of new wheelchair which is suitable for various range of users and which are easily adjusted and obtain at very low cost than already exists wheelchair. Analyzing the market survey it can provide alternative option by eliminating high cost, less adjustable wheelchair for rehabilitation. Taking all existing considerations related to wheelchair in account prepared a model design with different base frame model using PRO-E software on the basis of user's data considering average data among it. The assessment of wheelchair design is performing by computer analysis software which can focus on performance features such as static strength, weight and stability of it.

1.1 Project Concept

Generally the patients in the hospitals is restricted to be on bed or completely in wheelchair and if patient taken to other places for various tests then wheelchair in the hospitals are not converted into the stretcher and hence main aim of this section to developed the chair that can obtain the stretcher form by various mechanism and it is the idea to form a design of wheelchair that can be also convert into the stretcher which will lead to occupy place of chair as well as stretcher and we don't need to move patient from chair.

1.2 Handling Problems

Transferring patient from the one place to another place in hospitals is most common problems for all working members at there. When the patient tends to transfer on the same floor it develops various stresses and pain in body of both patient as well as nursing staff. Various accessories transportation is also more difficult when patient is in serious condition in manual handling. Hence the above problems can be eliminated by developing new Wheelchair cum Stretcher to handle the patients.

2. Design of Model

2.1 Design of Wheelchair and Stretcher

Taking in account all the considerations related to physically handicapped people our design provide simple and cost effective construction. On the basis of marketing survey and all problems of complexity and economy, we design new product which is user-friendly and automated. Proper material selection improves product life and cost effectiveness by evaluating its analysis. All design is of wheelchair as well as stretcher is created in PRO-E software by studying and evaluating all ergonomics of wheelchair as per medical fields review. The actual model is shown in fig,1. Since the concept of this project is that wheelchair turns into stretcher form also and hence the stretcher form design is also evaluated and shown in fig.2.

Fig.1: Design of Wheelchair

Fig. 2: Stretcher Assembly in PRO-E

3. Advantages

1. Aim to convert easily from wheelchair to stretcher and stretcher to wheelchair.
2. There is no need of special training.
3. Since operation is smooth so handling of patient is more secured.
4. Comfort level of system as well as patient is increased.
5. Space requirement is minimized.
6. Predicted damages are reduced for patient while handling.

4. Conclusion

With the help of software based design we conclude all possible ideas to the model before implement it in actual system. The main purpose of this study to enhance the design of wheelchair and stretcher, showing sit tilting mechanism by means of linear actuator system which leads to optional source for physically challenged. The aim to provide a better solution for patient handling to those hospitals having limitations for use of fully automated bed or wheelchair cum stretcher.

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