

FABRICATION OF MULTIPURPOSE WHEEL CHAIR

Mani R¹, Gokulnathan.J², Karthi.L³, Nandhakumar.R⁴, Naveen.A⁵

¹ Associate Professor, Mechanical Engineering, Vidyaa Vikas College of Engineering and Technology, Tamil Nadu, India

^{2,3,4,5} UG Scholar Mechanical Engineering, Vidyaa Vikas College of Engineering and Technology, Tamil Nadu, India

ABSTRACT

The main objective of this project is to design and fabricate the device for transferring patients from one place to another place in an effective and comfortable way for the patient and the caregiver. This project shall enhance our knowledge in the structural design of mechanical links. This is friendly assisting device for physically challenged, bone fracture patients and others.

Keyword: - Links, Patient and Structural design etc....

1. INTRODUCTION

With increasing demand for efficiency in the healthcare sector, we introduced multipurpose wheel chair to patients for shifting usage. This device works on simple mechanical control principles and it helpful to who cannot shift from the bed

2. DESCRIPTION OF EQUIPMENTS

2.1 Wiper Motor

Wiper Motor, the power source of the wiper blade, is the core of the whole wiper system. Therefore, the quality of the wiper motor must be guaranteed to ensure its performance. The wiper motor is a permanent-magnet direct current (DC) one.

It is equipped on the front windscreen glass with the mechanical parts of the worm gear. The worm gear functions to slow down and increase torque. Its output shafts spur four-bar linkage, by which the movement is changed from rotary to swinging

2.2 Electric Wheelchair

The foremost electric wheelchair was invented by George Klein with the purpose to help the wounded soldiers of the World War II. With time, it has evolved into many designs and forms. The power chairs comprise a range of functions like reclining, tilting, seat elevation, chin controller, hand controller and many more. Some of the models are portable that is they can be disassembled and carried along while travelling. The electric wheelchair is characteristically categorized into three categories

2.3 Frame

The frame consists of a chassis that carries two motorized locomotion units, a support for two electrical gear-motors, two idle triple wheels units and a battery pack. The chassis consists mainly of two tubular structures, connected by means of crossbars; two triangular tubular structures on the front support the triple wheel units. Connection points are hinges for the linkage mechanism. The triple wheel units consist of a spider, rotating around a central axis, with three idle wheels placed at its vertices. Wheel size was chosen on the basis of the consideration that large wheels can better absorb vibrations caused by uneven terrain, while small wheels reduce overall dimensions. Accordingly, larger wheels were selected for the locomotion unit and for the pivoting wheel, which are

in contact with the ground most of the time, while smaller ones were chosen for the triple wheel units, in contact with the terrain only during the stair climbing operation.

3. WORKING

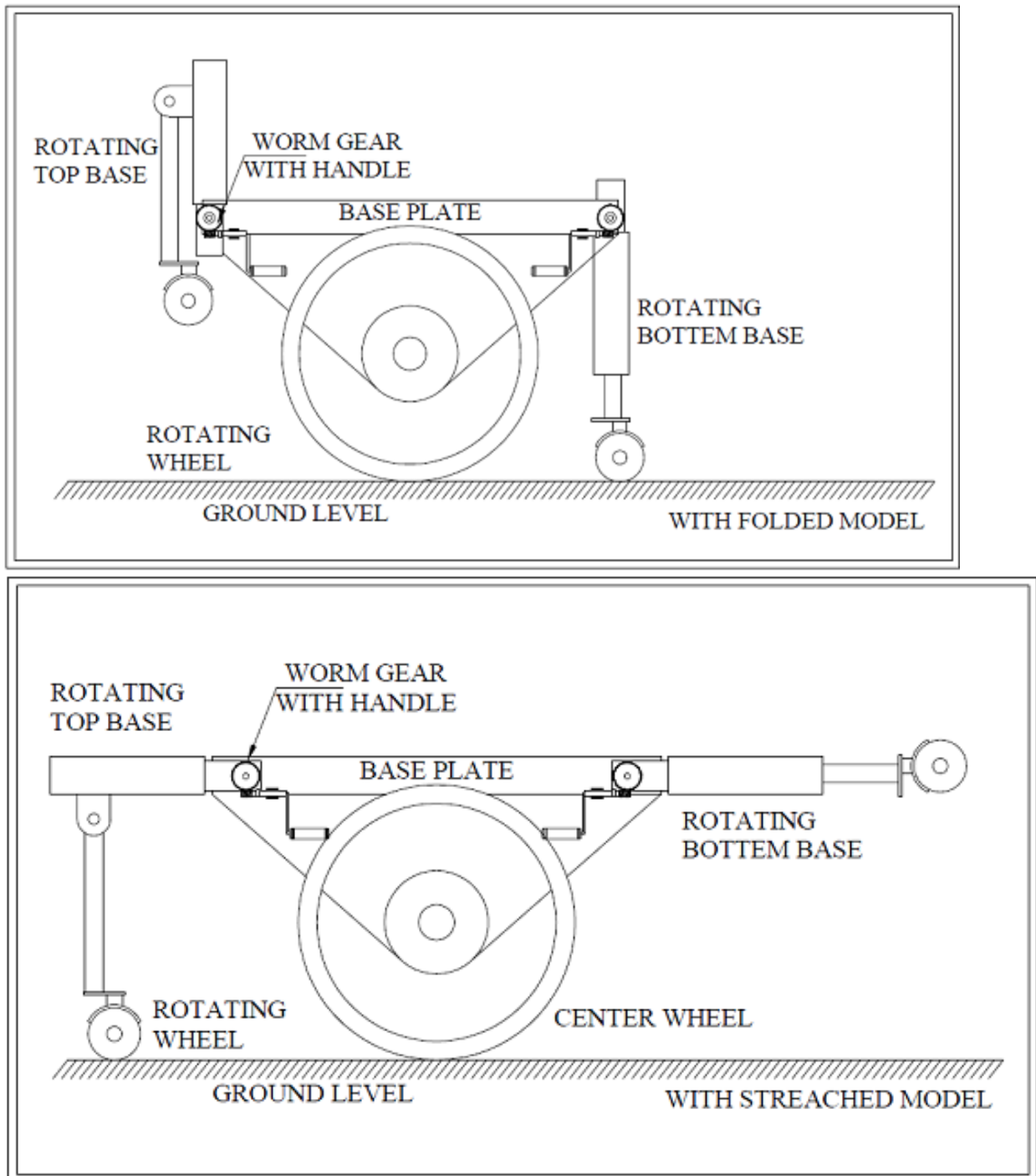


Fig 1 Assembly of Wheel Chair

The equipment is fully operated through the mechanical setup works on the battery source. The handles are provided at the either side of the stretcher model. The model can be folded at the particular time as our requirement. This equipment can be used for mainly two purpose one for stretcher and another one for wheel chair model. Basically

the equipment is spitted in to three parts one is top plate, bottom plate and center plate. These three are linked through the mechanical setup which is clearly shown in the diagram. The worm gear arrangement is placed on the two linkage areas. The stretcher can easily change to the wheel chair by just rotating the worm gear in this arrangement.

4. CONCLUSIONS

The main objective of this product is to make the helper life easy and to make sure the patient is not hurt during the process of treatment. This product eliminates the step of shifting patient from bed or stretcher to wheelchair and vice versa as handling of old age people is very difficult

5. REFERENCES

- [1] Batavia, M., PH. D (1998), “ The wheel chair evaluation a practical guide”, ISBN 0-7506- 7037-1
- [2] Croteau, C. (1998), “Wheel chair mobility hand book”, Park press publishing
- [3] Cooper, R. A., PH.D. (1998) “Wheel chair selection and Configuration”, Demos Medical Publishing Inc
- [4] Bechtel, R., Certified Rehabilitation Technology Supplier: University of Michigan Health Systems Wheelchair Seating Services. (734) 971-8286

