

Design and Manufacturing of Automatic Height Adjustable Stretcher

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Abstract

In India convenience helps are significant for patients for transportation and a replacement of patient beginning with one Bunk then onto the following Stretcher. Bunk are the most routinely elaborate clinical stuff for the transportation of patients. Moving the patient from bunk or to the clinical stretcher is reliably an issue for the escort or clinical overseer during bouncing on skewed surface.

Understanding the various issues as for the convenience gear and introducing a prevalent arrangement will be an asset for the clinical field and some help for impeded progressing forward skewed surface(slope). There is a necessity for a level changing stretcher to work with the hindered patient's movability furthermore, to give better clinical stuff to use in the Indian centers.

Embracing various kinds of investigation methodologies helped with getting more information about clinical centers compactness helps and for data collection. Patient feel trouble while on he/she on incline. The eventually old stretcher arranged isn't satisfying the client's need. From the perceived need and issue, new components like level adaptable stretcher which can be introduced.

Keywords : *clinical equipment, level change, bunk, patient's transportation*

I. Introduction

Emergency clinic stretcher utilized by medical care experts are worked physically generally speaking during patient taking care of, which require some actual exertion. In most recent couple of many years it is primarily centered that limiting dangers brought about by among others errors and incapacitation of the clinical work force happening during the vehicle of patients in hazardous circumstances. Arrangements incorporate computerization of stretcher development through mechanized gadgets, for both useful and transport purposes. Moreover, it concerns gadgets that will permit the exchange of a patient from one spot to another, gadgets giving occasional programmed difference in a lying patient's situation in request to forestall the rise and high level computerized stretcher. The specialized advancement of such a gadgets and their application in the emergency clinic climate are confronting numerous troubles furthermore, constraints. This work presents a plan answer for the emergency clinic stretcher level change instrument created inside the targets connected with the prerequisites set for one of the medical clinics. The primary target for the component configuration is to give solace and wellbeing to the patient as well concerning the clinical staff while performing symptomatic tests.

A clinic stretcher uniquely intended for patients or others needing some type of wellbeing care. These stretchers have extraordinary highlights both for the solace and prosperity of patient and for the comfort of medical services laborers. Normal highlights incorporate movable level for the whole stretcher, the head and the feet and movable side rails with adjacent gadgets. While planning emergency clinic stretcher the main boundary is wellbeing of patient. The advanced elements of clinic stretcher are as per the following: - Wheels empowers simple development of the stretcher, either inside pieces of the office in which they are found or inside the room. Some of the time development of the stretcher a couple crawls to not many feet might be essential in-patient consideration. Wheels are lockable, for wellbeing wheels can be kept while moving the patient in or out of the stretcher. stretcher can be raised or brought down at the head, feet and their whole level. while on more

seasoned stretcher this is finished with wrenches generally found this component is electronic. Raising the head (known as fowlers position) can give a few advantages to the patient, staff or both. The fowlers position is utilized for sitting the patient upstanding adversary taking care of or then again certain different exercises or in certain patients can ease relaxing. Raising and bringing down the level of the stretcher can assist with carrying the stretcher to an agreeable level for the patient to get on and out of stretcher. stretchers have a side rail that can be raised or brought down. These rails which act as assurance for the patient and some of the time can cause the patient to have a solid sense of safety can likewise incorporate the buttons utilized for their activity by staff and patients to move the stretcher. There are assortment of various kinds of side rails to fill various needs. While some are basically to forestall patients fall, others have hardware that can help the actual patient without truly keeping then persistent to stretcher.

II. LITERATURE SURVEY

Arunkumar K N, Charan Kashyap K, Chirag B C, Kausthubh R, Keerthan J. work done on, Configuration, Analysis and Manufacture of Multipurpose Stretcher for Patients, as indicated by his work, A multipurpose stretcher is a high level stretcher where we can move patient from stretcher to stretcher with least human mediation. Assuming we see go by ordinary technique mishaps and dismal to the patient is more. This paper depicts the plan and manufacture of a multipurpose Stretcher for patients. We are expected to plan and make a multipurpose Stretcher which utilizations cog wheels and belts for sidelong development and pressure driven jacks for change of the level of the stretchers. The stretcher will be controlled physically with a wheel for lead screw and an expansion switch for pressure driven jacks utilizing legs. Right now the stretcher is just intended for direct development. Notwithstanding, plans to consolidate man mover capacity and different capabilities can be carried out after the first phase of the improvement makes progress. The vast majority of the times moving people or overseers are in disarray to move patient on the grounds that the current exchange framework is finished by physically or utilizing fabrics and furthermore the new gear's are not utilized effectively. They are fostering a framework to beat this disarray and help in simple exchange of patient. While moving of patients from stretcher to stretcher or the other way around, wounds occur and which might even exasperate the current injury or harm. We are fostering a stretcher which limits or take out such accidents.[1]

Akshay Hirudkar , Chetan Bhusari ,Akshay Khedkar,Akshay Parekar , Prof.S.P. Daf, work done on, Automatic Stretcher Cum Wheelchair, as per his work, These days, in India the number of crippled people is expanding consistently. For patients versatility helps are valuable for transportation and a swap for strolling particularly in indoor and outside climate too. Wheelchairs and stretchers are generally involved clinical types of gear for the transportation. There is dependably an issue looked by the specialist or medical caretaker of moving the patients from wheelchair to stretcher or to the clinical stretcher. Understanding the different issues with respect to the versatility hardware what's more, presenting a superior plan will be a resource for the clinical field for impaired people. The need for a wheelchair cum stretcher to work with the crippled patient's versatility and to give a novel clinical hardware for use in the emergency clinics. Taking on different sorts of exploration were assisted with getting more data about clinic versatility helps and for information assortment. The quantities of impaired people are expanding by various types of mishaps are being noticed consistently. As of now wheelchairs and stretcher are the regularly utilized versatility help for universally handy any place required. After the client concentrate on the resource of a need of wheelchair cum stretcher was found out for the Indian emergency clinics. The as of now utilized wheelchair and stretcher configuration isn't addressing the client's need. From the distinguished need, new elements like convertible wheelchair which can be changed over into stretcher is presented which can be control by electrical framework. [2]

Fajobi M. O. Awoyemi E. A. furthermore, Onawumi A. S., work done on, Ergonomic Assessment of Clinic Stretcher Plan and Anthropometric Portrayal of Grown-up Patients in Nigeria, as per his work, The utilization of stretchers and other comparative furniture are not confined exclusively to medical clinics, yet in addition found tremendous applications in other medical services offices and settings, for example, helped residing offices, nursing homes, short term facilities, as well as in home medical services services. The plan of emergency clinic stretcher depends generally on clients' anthropometric attributes to guarantee solace, security and efficiency of medical care administration. In this work the degree of wellness of existing stretchers in emergency clinics in Nigeria to actual requests of patients' body estimations were examined with a defined irregular example size of 87 subjects (55 guys and 32 females comprising of the guardians and the overseers) chose from subjects in the review region for scientific investigation furthermore, anthropometric portrayal utilizing the Participatory Ergonomic Mediation (PEI) approach. Organized survey was directed to distinguish the degree of ergonomic mindfulness what's more, execution regarding existing emergency unit stretchers and clinical/careful stretcher plans. Observing guideline technique, four anthropometric aspects (Height, Popliteal Height, Vertical-Hold

Reach and Elbow Length) pertinent to standard stretcher configuration were gathered utilizing aligned anthropometric hardware. It were inspected and examined under the to Exist work environments blend of various anthropometric aspects and plan determinations. Autonomous test was utilized to decide the connections between persistent's actual anthropometric attributes what's more, ergonomic variables while assessment of the utilitarian connections was done between anthropometric variables answerable for the recognized clients' abilities through Scientific Pecking order Interaction (AHP). In view of the plan details and standard qualities from the writings, the examinations of the outcomes oddballs coming about from some lacks in the current plans of the workstations which elements were tracked down liable for back torment, weakness, unfortunate blood flow and other related outer muscle issues among the clients. A proposed plan determinations were suggested thinking about the use of the plan for limits. The outcome of the autonomous test on the proposed plan shows that there are solid relationships between's the subject's anthropometric qualities and ergonomic elements and that the most appropriate ergonomic variable is stretcher length. It is prescribed that due thought be given to clients' anthropometry in the plan and production emergency clinic stretcher for neighborhood use. [3]

Dr. Sukanta Roga, Abhijeet Kumar, Aman, Animesh Singh and Bijesh Kumar, work done on, Design and Creation of Wheelchair cum Stretcher with Multi Crease, as indicated by his work, In this paper lead screw system is utilized to change over a wheelchair into stretcher as well as the other way around. At the point when lead screw component is worked, the footstool which is descending goes till the degree of seat of wheelchair and all the while the back help goes down to a similar level making, it stretcher as well as the other way around, when it is changed over into wheelchair from stretcher. Beneath the seat, a poop framework has been given which is separable and is worked by sliding component. It is planned and manufactured so that it tends to be utilized in clinics as well concerning individual use at home. In this report it is examined that the requirement for the wheelchair stretchers framework in current world what's more, the various components that can be executed. It is presumed that now a-days in emergency clinics completely atomized stretchers, wheelchairs and stretchers are utilized for the patient taking care of direction. In any case, they are exorbitant and are not reasonable to every one of the medical clinics. The anxieties created during the treatment of patient in both, i.e., patient and staffs are same for all the medical clinic. Another plan of wheelchair cum stretcher for patient taking care of has been finished. Cost of such sort of wheelchair cum stretcher will be reasonable for all sort of clinics and it will be useful for patient taking care of. The item will hence probable be a productive portability help in emergency clinics. [4]

V.Vignesh, R.Prakash, S.Mathew Stephen, S.Anish Kumar, work done on, Design And Improvement of Two Out of One Foldable Stretcher Cum Wheel Seat, as per his work, In this project the stretcher and wheel seat utilized in clinics are joined with one another, so it can be utilized for multi-reason as opposed to utilizing the two of them independently. It can decrease the portability issue of the patients. In ICU there is an issue of moving the seriously harmed or cracked patients from stretcher to wheel seat those issues can be diminished by utilizing this item. It is used to take ECG and Output report for the patients without changing from stretcher to wheelchair. This model comprises of three rectangular lounge chairs which are consolidated. These joints are not a long-lasting joint with the goal that it tends to be movable to any points and furthermore collect or destroy of this item will be simple. These plates are joined by blasted joints, so every one of the plates can be foldable to stretcher or to wheel seat. Four wheels are fitted in the base. The aspects utilized for this project is created for Indian guidelines. Every one of the aspects are taken from "Anthropometric and strength information of Indian agrarian specialists for ranch gear configuration" distributed by focal establishment of agrarian designing, Bhopal. Every one of the parts utilized in this venture are comprised of tempered steel 202 for the Item advancement. The adaptive poles are utilized to change the required length and point the openings gave in the adaptive line are utilized to overlap the stretcher into different point. The item cost is Rs 14500 which is 40% not exactly the regular items. [5]

Arunkumar S M, Abhijith P K, Haneepsab A Karoshi, Chetan C., work done on, Plan furthermore, Creation of Stretcher cum Wheelchair, as per his work, Mobility aids are valuable for crippled patients for transportation and a swap for strolling particularly in indoor and outside climate. Wheel seats and stretchers are the most usually involved clinical gear for the transportation of patients. Moving the patients from wheelchair to stretcher or to the stretcher is continuously an issue for the patients and for the orderlies also. This might even outcomes in musculoskeletal requests to the people who are not prepared to do so especially, with regards to the guardians. So there is a requirement for a wheelchair cum stretcher to work with the handicapped patient's portability and to give novel clinical hardware to use in the Indian clinics. This paper was planned to foster an idea of wheelchair convertible stretcher with the inspiration of saving space and forestall effort of patient as well as by ensuring that the patient doesn't get injured. The instrument and security of patient were our primary needs while planning the stretcher cum wheelchair. Our review shows that saving half space by utilizing stretcher cum is conceivable wheelchair instead of utilizing wheelchair and stretcher independently. [6] Arif Duran, Hayrettin

Öztürk, Ümit Yaşar Tekelioğlu, Tarık Ocak, Mücahit Emet, work done on, The impact of stretcher type on security and simplicity of treatment in a crisis division, as per his work, Stretchers are regularly used to move patients in the crisis office. Wellbeing and solace of the stretcher are significant elements for the staff and patients. The present review examined the impact of stretcher type on understanding security and treatment in a crisis division. Specialists, attendants, assistants, crisis clinical experts, and patient guardians at the Abant İzzet Baysal College Clinical Personnel Emergency clinic crisis office finished a poll on stretcher security and solace. Six stretchers were traditional (bunch A), 6 had new mechanical particulars (bunch B), and 6 stretchers in bunch C were like those in bunch B with regards to mechanical particulars however were more costly. The security and solace of stretchers with good ergonomics and moderate expense are like those of higherpriced stretchers. [7]

Dr. K.P.Chandraiah, Manoj Kumar Sharma, work done on, Plan of Stretcher Which Consequently Conform to Flat Situation While Moving Along Rise, as per his work, In this approach they happened looking for a stretcher which can change the top to keep up with the even position constantly and wheels of stretcher ought to be made proficient to facilitate the dealing with. In this they are exhibiting obviously the plan of stretcher which can change its top while moving along the height. For this the stretcher of stretcher with switch connection is associated to D.C. engine. This D.C. engine is associated with the MOSFET. Potentiometer will detect the point of rise and convey message to IC, which thusly is associated with MOSFET. As indicated by this sign the D.C. engine change the stretcher to even position. They presume that the venture gives a little commitment to settle what is going on of a patient in emergency clinic by supplanting an ordinary stretcher via programmed level changing stretcher. It is a model and when it is tuned to this present reality it would track down an extremely wide execution. This kind of hardware could be introduced in a clinics. In this work they are utilizing both mechanical and electronic linkages. Subsequently they get exact change of stretcher to even position. The improvement of this kind of stretcher assume a significant part, as it gives serious level of solace to patient and furthermore it tends to be without any problem moved with practically no aggravation. As us all realize I configuration is an iterative cycle, even the stretcher can be planned/highlights to more modern and progressed to expand the dismal and patient security. [8]

Shao Hng Lim and Poh Kiat Ng, work done on, The Plan and Improvement of a Foldable Wheelchair Stretcher, as indicated by his work, This study broadens a past examination that conceptualized a foldable wheelchair stretcher (FWS) by promoting its plan and improvement process. The material and part choices are represented in this review. Reproductions are done utilizing various burdens to examine the pressure, uprooting and security component of the stretcher plan. Bowing and greatest burden investigations are utilized to review prospects of misshapening. The convenience tests assessed the (1) standard, (2) collapsing and (3) substitute elements of the stretcher. The information for tests 1 and 2 are examined utilizing t-tests, while test 3 information are investigated utilizing an observational agenda. The FWS carried out its standard role essentially more slow than the ordinary stretcher by around 2 s because of its heavier weight. Its presentation can in any case be thought of as similar to a customary stretcher's presentation. The FWS's collapsing capability performed essentially quicker than the typical stretcher because of its less difficult plan. The point increase test couldn't be executed due to specialized imperatives and the wheelchair capability is tried without a situated client. Notwithstanding, the mobility of the FWS as a wheelchair was effectively checked. At long last, an expense investigation inferred that a business prepared FWS can be sold at 600 MYR, which is somewhat less expensive contrasted with its rivals. [9]

III. CONCLUSION

While finishing up this report, we feel very satisfy in having finished the undertaking task well on time, we had tremendous pragmatic experience on satisfaction of the producing timetables of the functioning venture model. We are consequently, glad to express that the in estimation of mechanical fitness ended up being an exceptionally helpful reason. Albeit the plan standards forced testing issues which, but were overwhelmed by us because of accessibility of good reference books. The determination of decision natural substances helped us in machining of the different parts to extremely close resistance and in this way limiting the degree of adjusting issue. Every engine mounting and couplings were appropriately changed. Later on, we would like to extend highlights and utilization of enormous scope model all together advance its presentation. Unnecessary to accentuation here that we had lift no stone unturned in our possible endeavors during machining, manufacture and gathering work of the venture model to our whole fulfillment to tackle the issue in modern field for social government assistance.

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V. REFERENCES

- [1] FAJOBI M. O., AWOYEMI E. A. FURTHERMORE, ONAWUMI A. S., ERGONOMIC ASSESSMENT OF EMERGENCY CLINIC STRETCHER PLAN AND ANTHROPOMETRIC PORTRAYAL OF GROWN-UP PATIENTS IN NIGERIA, GLOBAL DIARY OF LOGICAL AND DESIGNING EXPLORATION, VOLUME 7, ISSUE 8, AUGUST-2016, pp.640-651.
- [2] Md. Ariful Islam, Md. Asadujjaman, Md. Nuruzzaman and Md. Mosharraf Hossain, Ergonomics Thought for Clinic Stretcher Plan: A Contextual investigation in Bangladesh, Diary of Current Science and Innovation Vol. 1. No. 1. May 2013 Issue. Pp.30-44.
- [3] Ireneusz Malujda , Dominik Wilczyński , Krzysztof Talaśka , Dominik Wojtkowiak , Maciej Szulc Investigation of the model system of level change of the stretcher in emergency clinic stretcher, MATEC Web of Gatherings 157, 02028 (2018), pp.1-11.
- [4] Güzide Güzelbey Esengün and Cem Alppay Guzide Esengun: "A concentrate on analyzing client solace in clinic stretchers". book Advances in Ergonomics in Plan, 2018 ,pp.885-896.
- [5] Vahid Naseri Salahshour, Masoume Sabzali Gol , Shiva Sadat Basaampour, Shokouh Varaei, Mahboube Sajadi, Abbas Mehran, The Impact of Body Position and Early Ambulation on Solace, Dying, and Ecchymosis After Indicative Cardiovascular Catheterization, February 2017 . Volume 3. Number 1, pp.19-26.
- [6] T Jerry Alexander, Betty Martin, J Surya Theja Rao, Azmat Ali, Improvement of A Changeable Electrically Controlled Wheel Seat Into A Health related Crisis Stretcher, T Jerry Alexander et al. Worldwide Diary Of Drug store and Innovation, IJPT| June-2016 | Vol. 8 | Issue No.2, pp. 12793-1280.
- [7] Sachin N Waghmare, Nikhil Sawant, Sneha Dhupal, Navnath Kedar, Prathmesh Patil, Prasad R Dambe, Plan And Examination Of Minimal Stretcher With Elastic Safeguards, Int. J. Engg. Res. and Sci. and Tech. 2015, Vol. 4, No. 2, May 2015, pp.130-135.
- [8] Raveena J. Ramteke, Aishwarya R. Dhurwey, Harshit B. Borkar, Adarsh J. Rai, Ankit Malviya, Ajay A. Mate, Mohammad Aftab Sheik, Vikrant. P. Katekar, Headway in Stretcher and Wheelchair - A Survey, Worldwide Diary for Exploration in Applied Science and Designing Innovation (IJRASET), Volume 4 Issue XI, November 2016, pp.692-699
- [9] Prem Chand Gupta, Suresh Garg, Sachin Maheshwari, Plan and Determination Of Pivot Joint Idea For Setback Departure Rucksack Stretcher Utilizing IPD Apparatuses Like QFD, Worldwide Diary of Designing Science and Innovation (IJEST), Vol. 4 No.01 January 2012, pp. 204-226.