

PROJECT REPORT
ON

Walker+Wheelchair+stretcher

Submitted by

Abdullah SHAIKH	(16ME66)
Shafiullah Shaikh	(16ME85)
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Thapa Chetman	(16ME90)

In Partial fulfillment for the award of the degree

Of

BACHELOR OF ENGINEERING

IN

MECHANICAL ENGINEERING

UNDER THE GUIDANCE

Of

PROF.ASLAM HIRANI

Co-Guide -Dr.Mohd. ASIF GANDHI



DEPARTMENT OF MECHANICAL ENGINEERING

Anjuman-I-Islam's

KALSEKAR TECHNICAL CAMPUS

NEW PANVEL

NAVI MUMBAI – 410206

UNIVERSITY OF MUMBAI

ACADEMIC YEAR 2020-2021

INTERNAL EXAMINER

PROJECT COORDINATOR



Anjuman-I-Islam's KALSEKAR TECHNICAL CAMPUS

(Approved by AICTE, recog. By Maharashtra Govt.DTE,
Affiliated to MUMBAI UNIVERSITY)

Plot No. 2 & 3, Sector - 16, Near Thana Naka, Khandagaon,
New Panvel, Navi Mumbai, Maharashtra – 410206

CERTIFICATE

This is to certify that the project entitled
Walker+Wheelchair+stretcher
submitted by

Abdullah SHAIKH	(16ME66)
Shafiullah Shaikh	(16ME85)
Siddiqui Zulfikar	(16ME88)
Thapa Chetman	(16ME90)

Of the Kalsekar Technical Campus, New Panvel is a record of bonafide work carried out by them under supervision and guidance, for partial fulfillment of the requirements for the award of the degree of Bachelor of Engineering in Mechanical Engineering as prescribed by University Of Mumbai is approved.

Prof.Gazi Altamash
(Project Guide)

Prof.Zakir Ansari
(HOD)
(Mechanical Department)

Dr.Abdul Razzak
(HOD)



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DISSERTATION APPROVAL SHEET

This is to certify that the B.E. project titled, **Walker+Wheelchair+stretcher** ,
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Is approved for the Degree of Bachelor of Engineering, in Mechanical Engineering from
University of Mumbai.

Internal Examiner

Seal of the Institute



***DEDICATED
TO
OUR PARENTS***

ACKNOWLEDGEMENT

It is indeed a matter of great pleasure & privilege to be able to present this synopsis report on **“WALKER CONVERTABLE TO WHEELCHAIR & STRETCHER”** under the guidance of **Gazi Altamash** professor of Department of Mechanical Engineering – Anjuman Islam School of Engineering & Technology.

We are grateful and would like to express our sincere gratitude to our superior Professor **Shafiullah Shaikh** for his great ideas, invaluable guidance, continuous encouragement and constant support in making this research possible. We also sincerely thank him for the time spent proofreading and correcting our many mistakes. We really appreciate the consistent support from the first day we applied to this study to these concluding moments. We are truly grateful for his progressive vision about our training in science.

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I also place on record, my sense of gratitude to one and all, who directly or indirectly, have lent their helping hand during the period of this project.

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We acknowledge our sincere indebtedness and gratitude to our parents for their love, dream and sacrifice throughout our life, which consistently encouraged us to carry on our higher studies in Mumbai University.

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Introduction

A walker is a walking aid used by people who have difficulty walking around without any support and wheelchair is a mobility device which has wheels on chair mostly used by people who are unable to walk even with the help of walking aids. Over the years many attempts have been made to unify this and this is our attempt in unifying them with an added advantage of it being able to convert into stretcher. And by doing so reduce the cost of buying multiple walking aids and provide an emergency backup long after the products usage/life cycle is completed.

The goal of this design project was to create a single product that can replace 3 different products which are use for similar problems at varying degree of the users condition. The 3 different products here are – walker, wheelchair & stretcher. Walker and wheelchair are both walking aids for people who are partially or completely unable to walk. It is walker that can be converted into a wheelchair so that the handicap person can use it however he likes or however the situation demaands it. The best part is that it is very flexible in terms of how you can assemble it. It can be converted into wheelchair if the user wants to travel in a wheelchair or just a regular chair if he/she is tired of using the walker and is just looking for some rest.

Literature Review

It is a walker with modification made such that it can be easily converted into a wheelchair or a chair and if there is a need for a stretcher it can also be used as a stretcher.

The aim was to create a replacement for both walker and wheelchair in order to make it more economical and also have a stretcher in case of an emergency. The final product should be light weight and mechanically well supported. By our approximation it would weigh just 50% more than the traditional walker while providing all the modularity to be converted into a chair, wheelchair and a stretcher.

The cost should be between walker and wheelchair leaning more on the walker side. One of the major drawback is that this wheelchair cannot be operated by a single person and will require someones assistance to convert it or travel with it.

Material used-

- 1. Aluminum 3003 hollow pipes**

For the light weight , good machinability, weldability & corrosion resistance

- 2. Canvas Fabric**

As the clothing material for the stretcher & wheelchair.

Problem Defination

People involve in an accident maybe completely unable to walk at first but later down the treatment they might be able to partially walk so this people first buy a weelchair and then a walker. This increase the cost as they have to buy 2 things, we aim to change this by making a model that which is capable of doing both while costing less than wheelchair and can also be converted into a stretcher in case of an emergency as this people are very prone to further injuries. The walker can also be used by elderlies and will even work as chair for them. It is well known that the inital case of an accident or fracture might not be that serious but carelessly carrying and handling of the patient will in most cases make the situation worse. Therefore the stretcher can always be of use in case of emergency not just for patient but for any member of the family, this will provide a use case for long after the initial purpose of the walker & wheelchair has been achieved.

Buying 2 or 3 different things for one underlying problem is not just uneconomical but also creates a waste that is detrimental to environment and also takes alot of space to store. So we are trying to provide a model to replace them both and when the need for both of it's done it won't be just be a place holder in your storage but an emergency stretcher which can be used whenever the need arises.

----Hospital aspect

Methodology

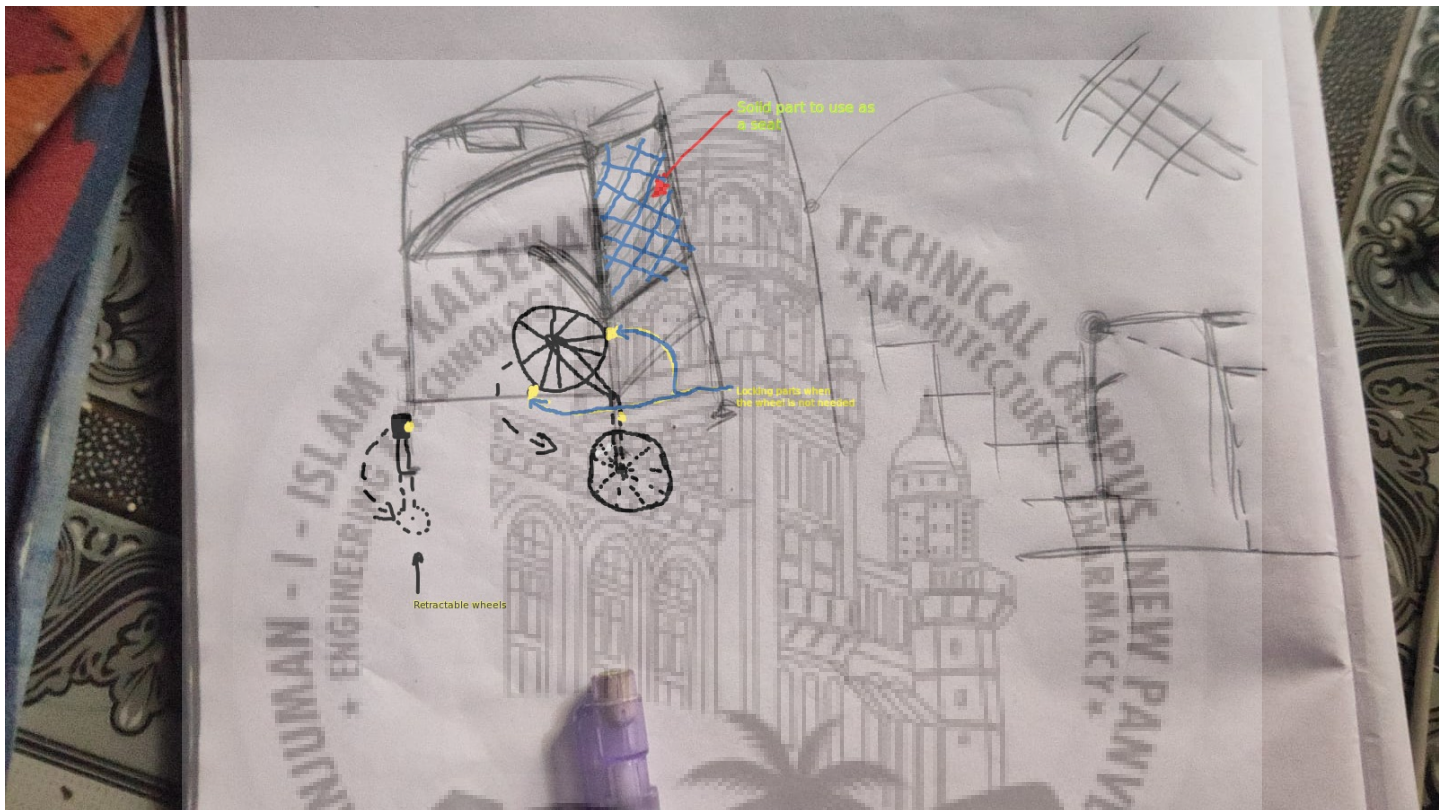
Road accidents is still one of the leading cause of death and the people who survive the accident are severely injured. We interviewed one of my friend who was involved in a bike accident 2 years ago. After the operation he was told to completely rest for the next 1-2 months and after that only way he could travel was using a wheelchair so he bought one and used it for about a year and 6 months and then the recovery was going fine and now he finds it inconvenient to travel with a wheelchair so he is using a walker now and the wheelchair is abandoned and is just taking a place in his store room he dont want to throw it in case someone else in the future need it and just like his wheelchair soon his walker will also be stored be without any purpose just in the hope that in future someone might need it.

Our design make it possible to use it for the full cycle of recovery and while stored it can be used as a stretcher for not just for the person having the leg injury but for all sorts of emergencies.

So just like my friend many people are in the same position and can be benefited from this economiacly and get the best use of their money. And this design is completely modular so it can also be used just as a walker + chair which can be used if there are any elderlies in the house.

Desing

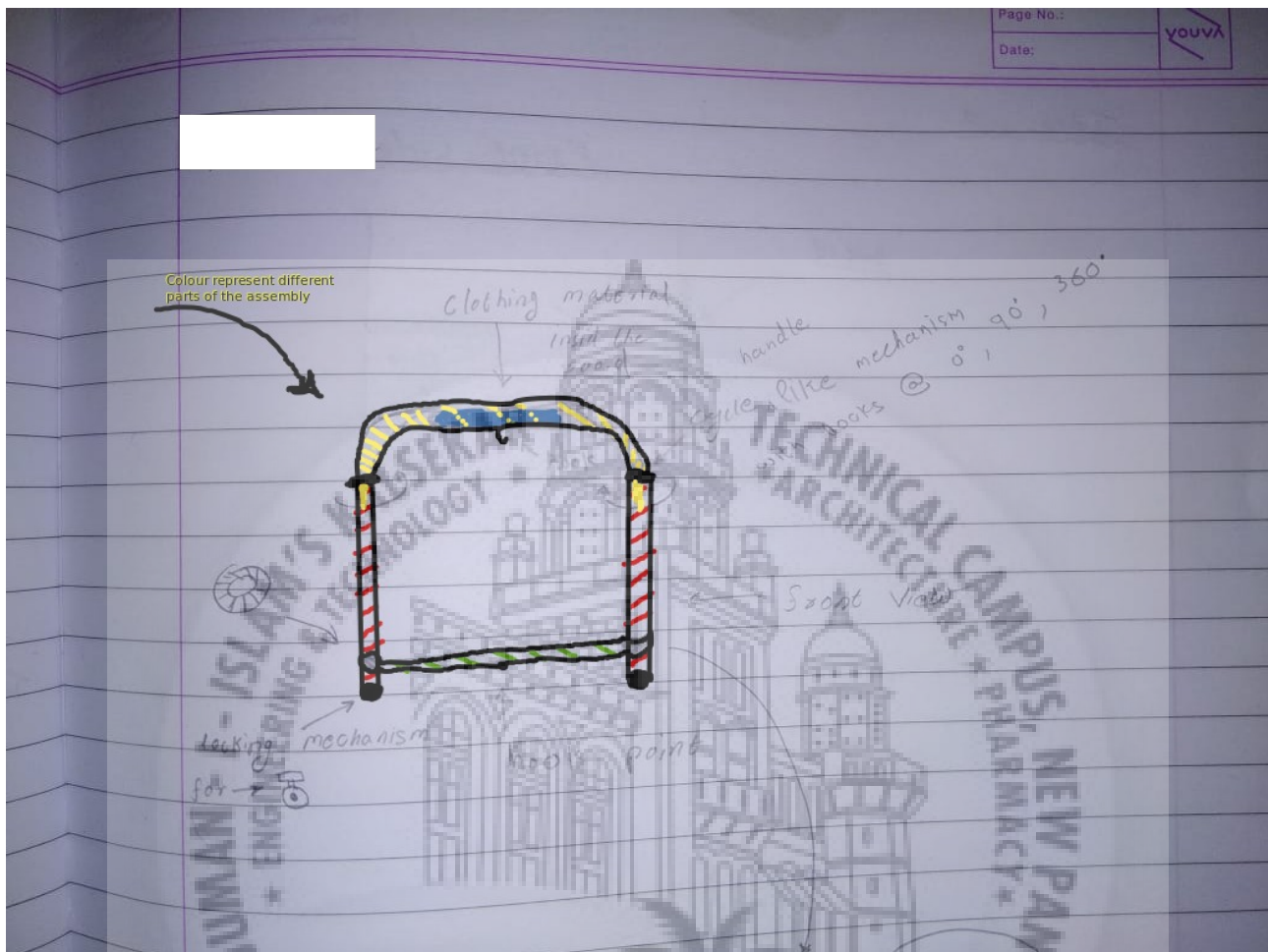
Idea-1



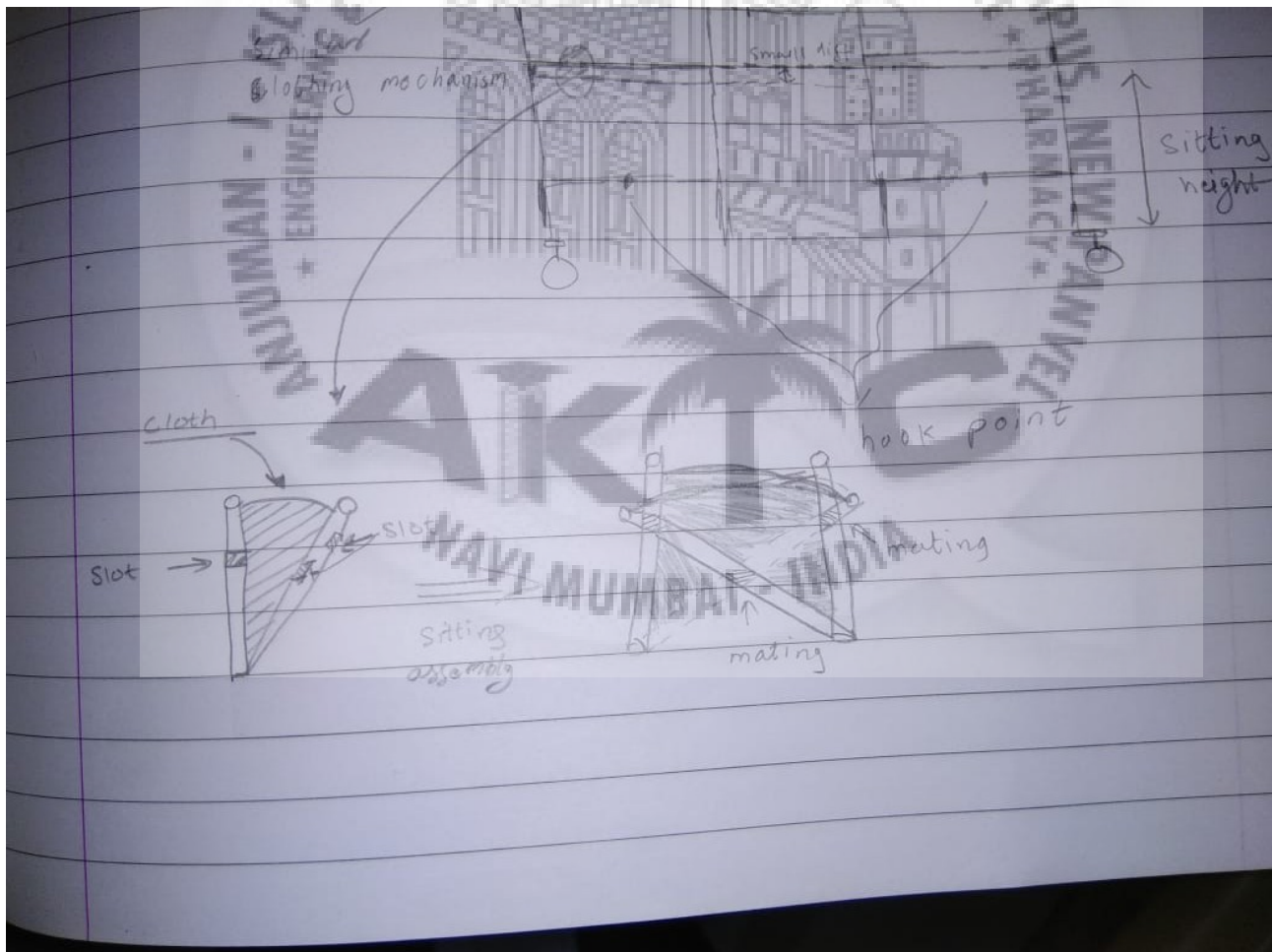
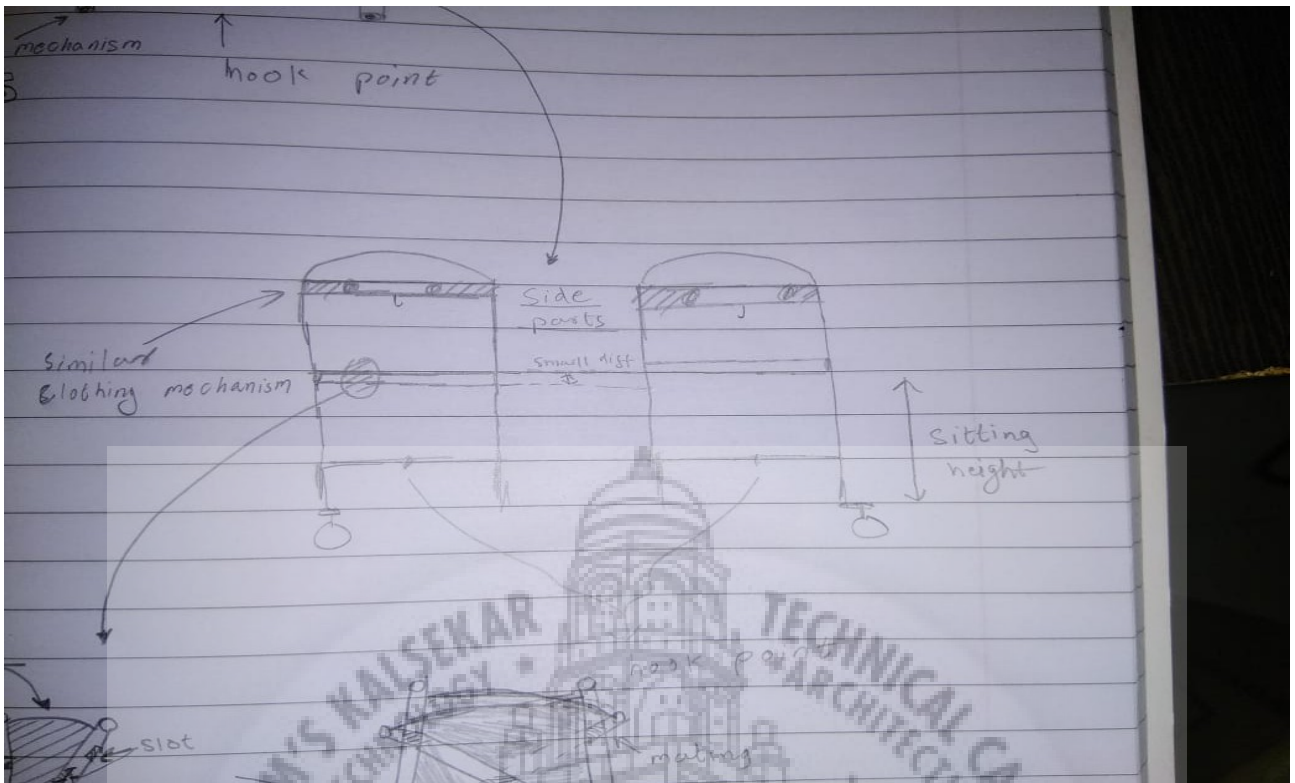
Summary-

Was getting very bulky and we could not think of a way to add stretcher without further increasing the weight.

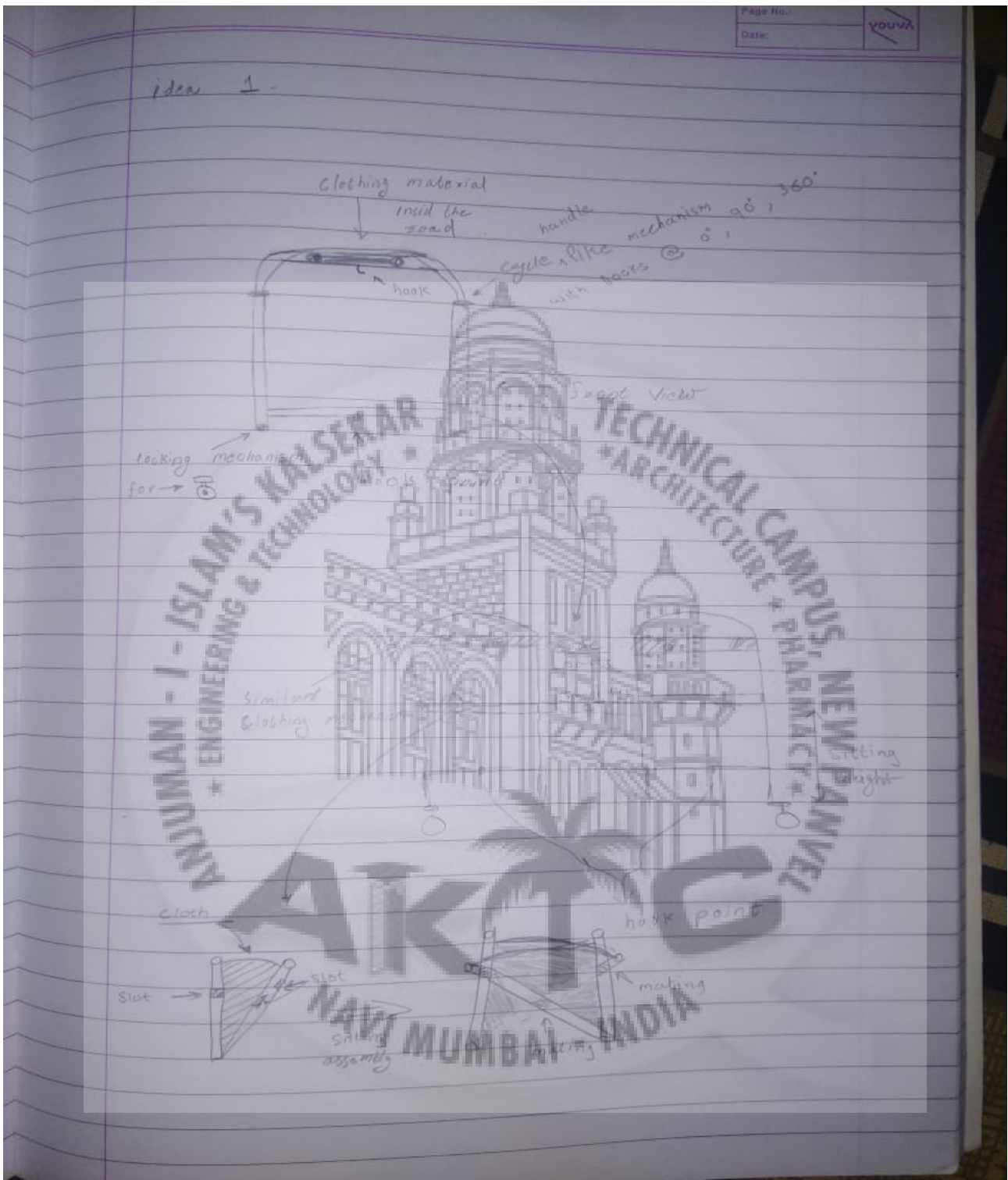
Idea-2



All the different colours show the different parts of the assembly the main mechanism over here was the hand part where it will give the both the side parts 1 D.O.F i.e. rotation and internal locking mechanism will be available @0,90 & 180 degrees.



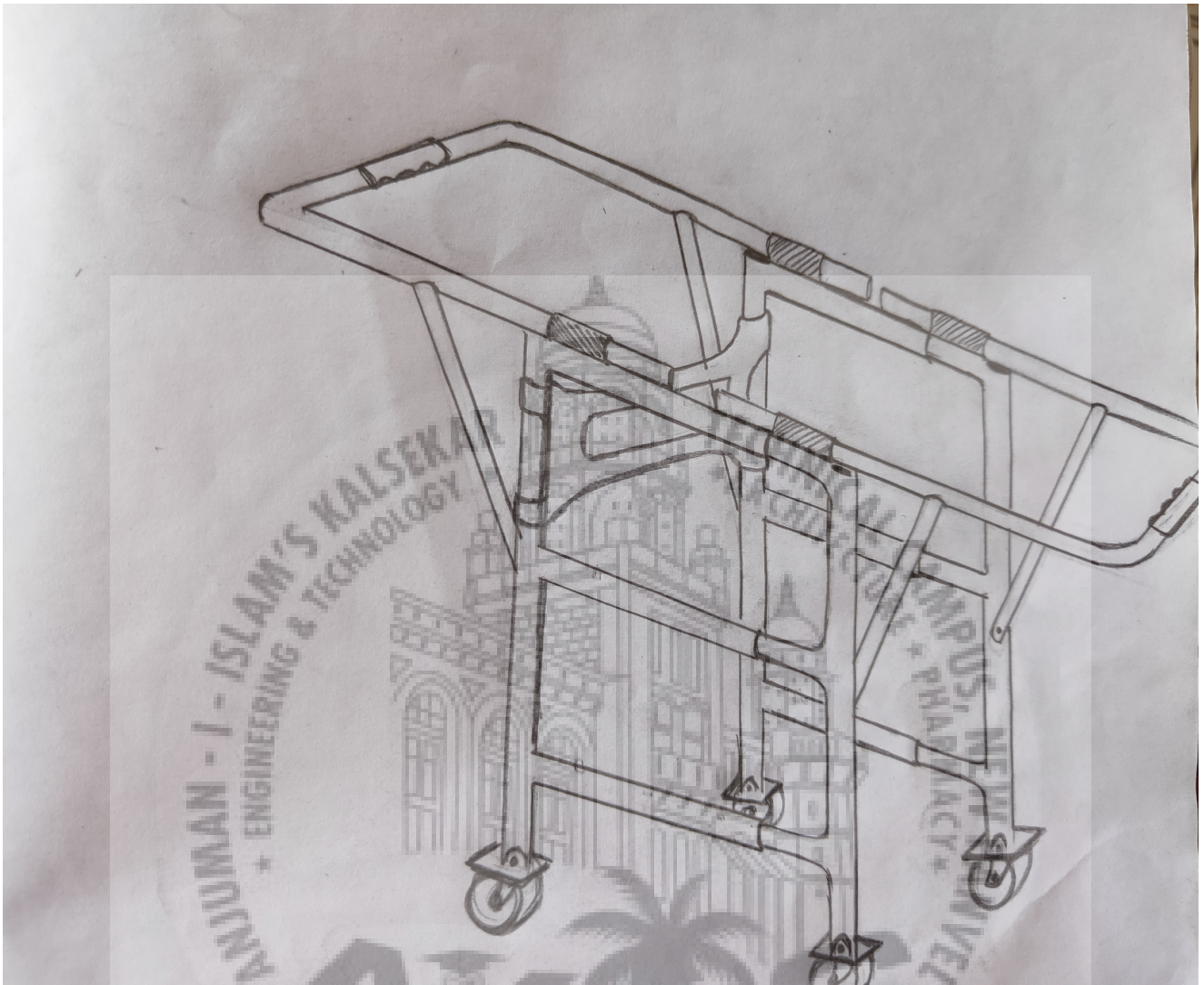
For the unfolding mechanism of the chair will be similar to old Indian hand fans



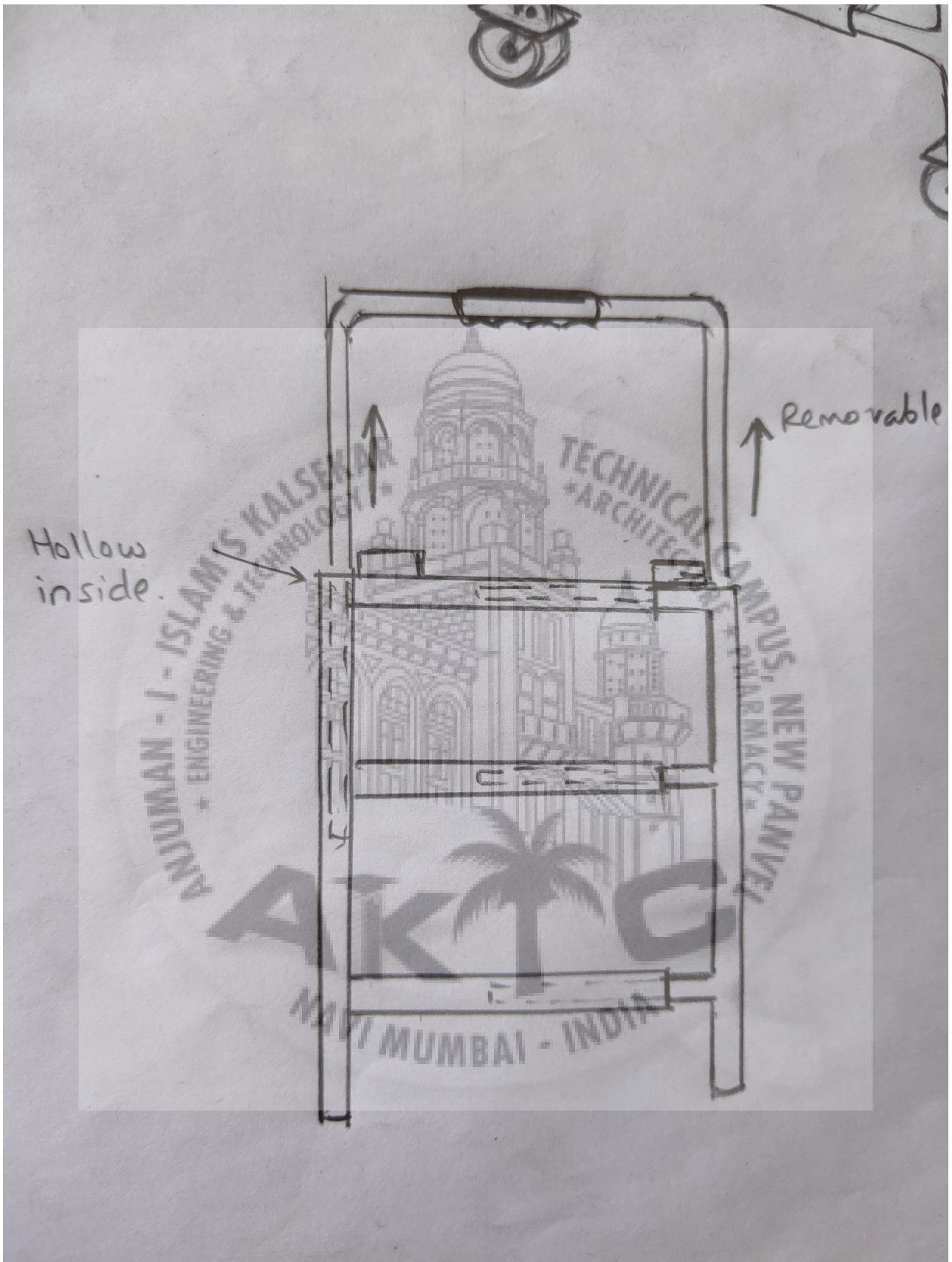
Summary-

We were concerned about the stability of the rotating parts when it had to be used as a stretcher

Idea-3

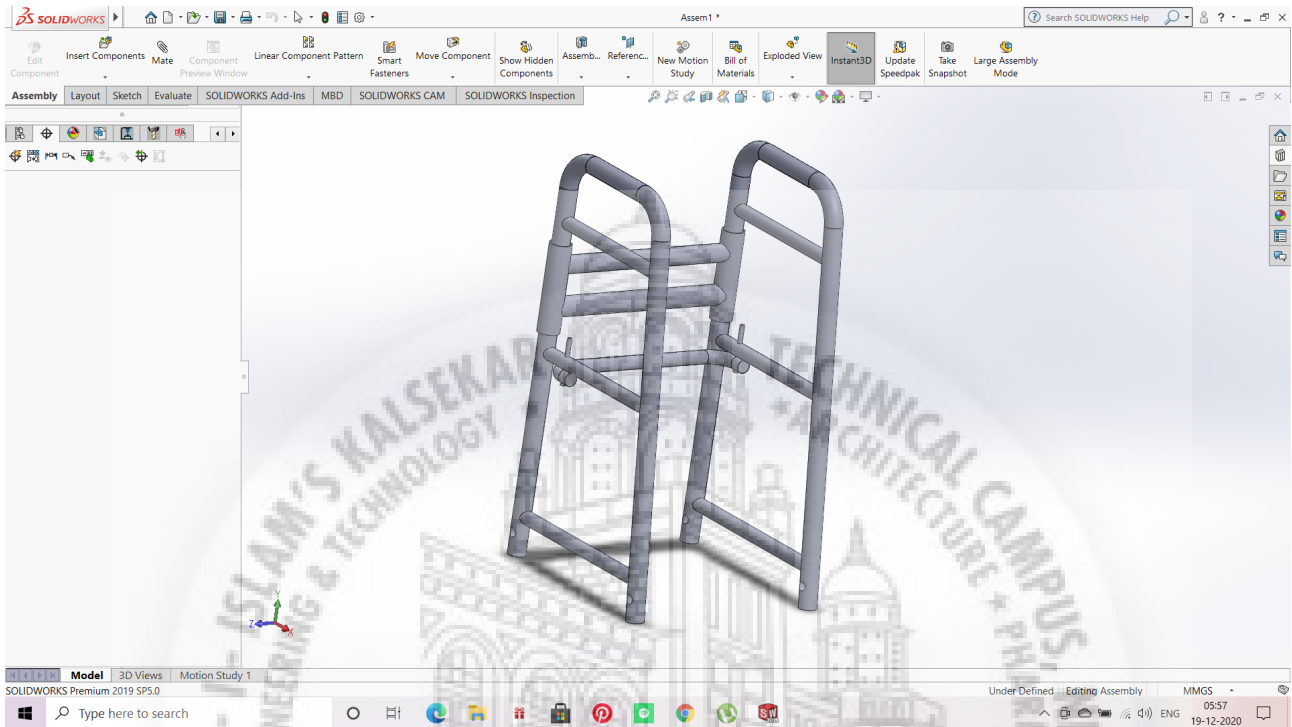




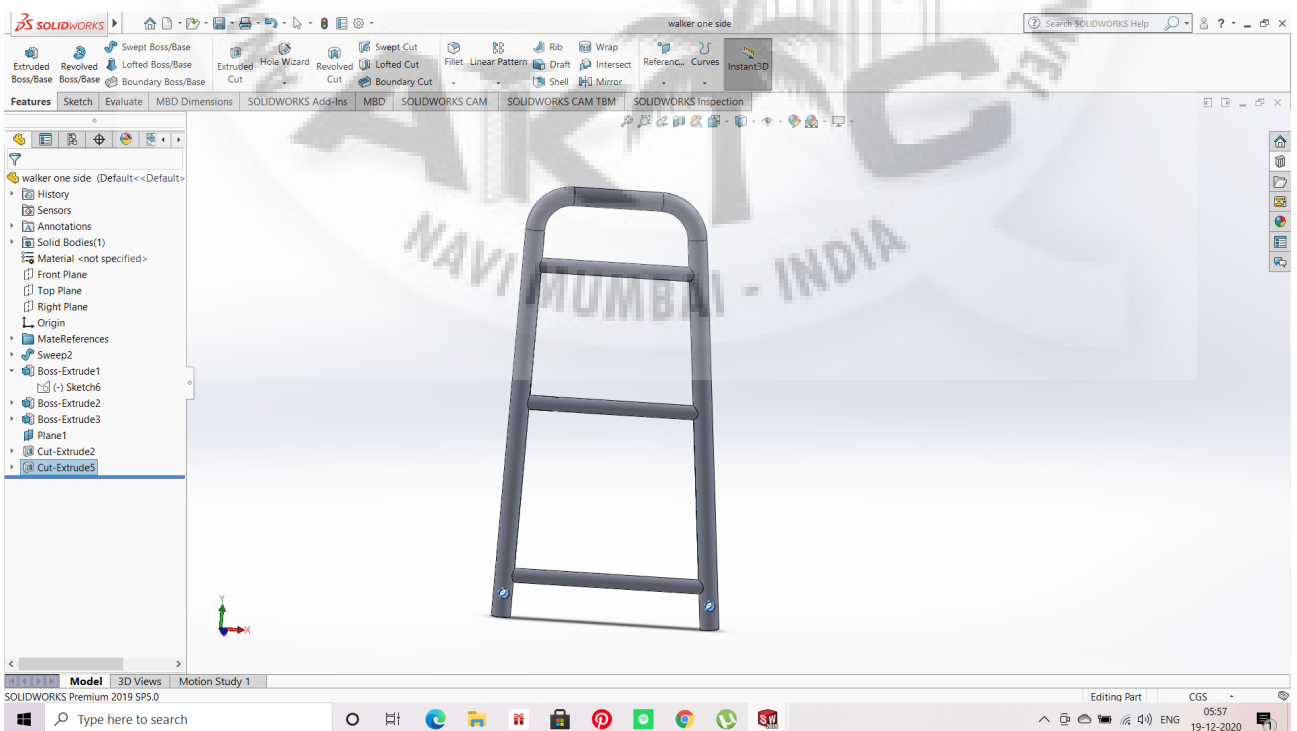


Current progress of the design (i.e. walker + wheelchair)

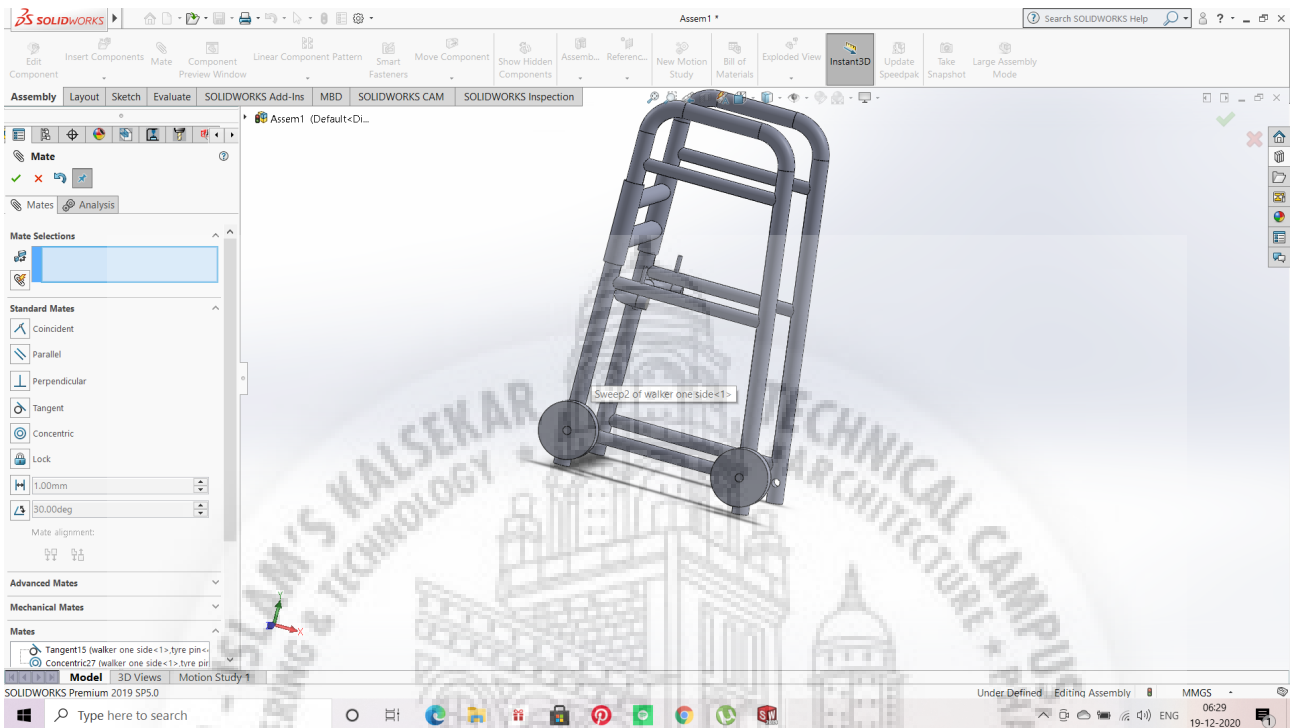
1. Isometric



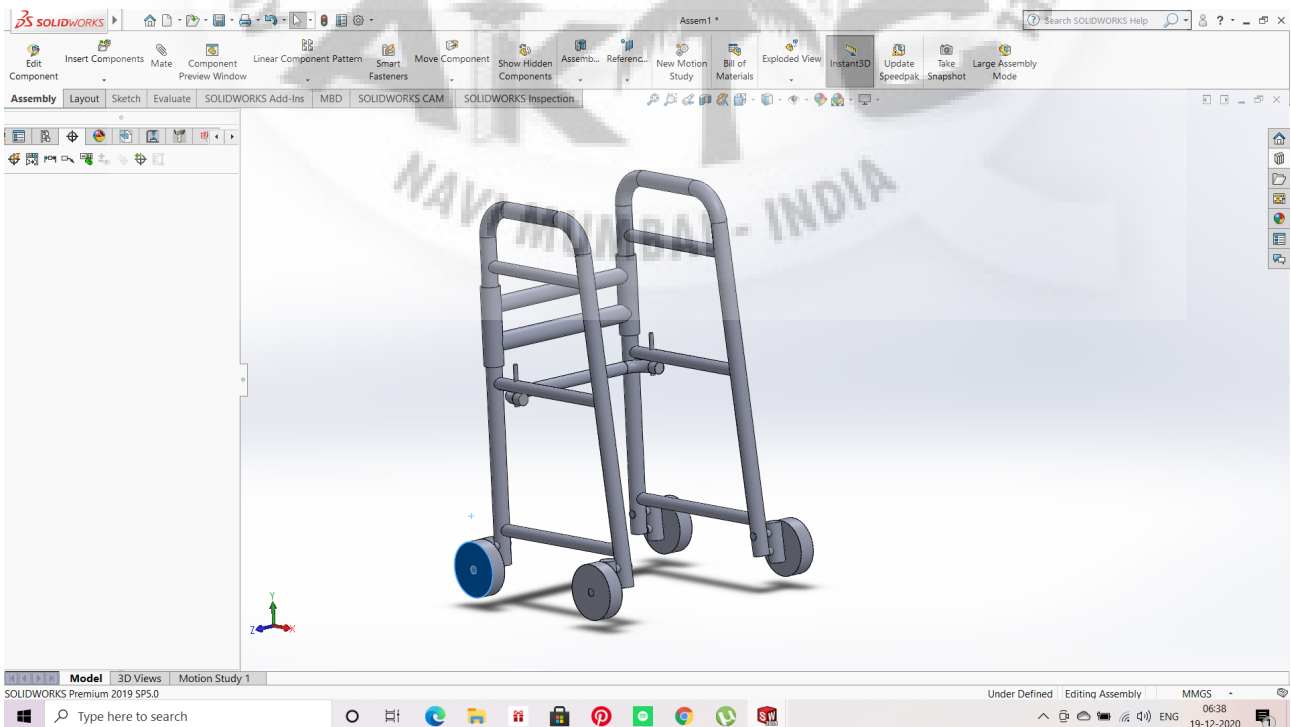
2. Side view



3. With wheels in retracted position



4. As a wheelchair



Validation

Validation of the model will be done through Ansys analysis software and a real life working model will be made.



Result

We have created a model that replaces both wheelchair and walker as one and can even be used as stretcher in case of emergency.



Conclusion

The main objective is to reduce the cost of buying multiple walking aids and to make a convenient chair/wheelchair which is easy to travel with and make the life easier for for the handicap & injured people. In our approach we also made a conscious decision for it to be modular which will give the users the flexibility of modularity, upgradability and customization of the parts.



Futurescope

This model can be design as the 1st iteration of the final product we made this with the time available on our hand. By doing more research on the material we can make this even lighter and sturdier. And if the weight is not an option we can go for a more automated approach.

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