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### DESIGN OF FOLDING BICYCLE

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#### ABSTRACT

The Currently available Foldable bicycles in the Indian market are expensive which make them difficult to buy. The prices of the bicycles are also generally not affordable to the common man. Many of them are not foldable in a configurable geometrical order, because of which their transportation becomes very difficult. It also leads to a lot of difficulty, when it is to be stored for future use. This paper aims at evaluating the existing foldable bicycles in the Indian market and proposing a compact foldable bicycle which is less expensive and overcomes all the limitations in the currently available bicycles in the Indian market. The proposed bicycle is designed in such a way that it is foldable by providing fasteners at the joints. The design structure imparts stable bicycle geometry.

*Keywords:- foldable bicycle, expensive, conceptual design..*

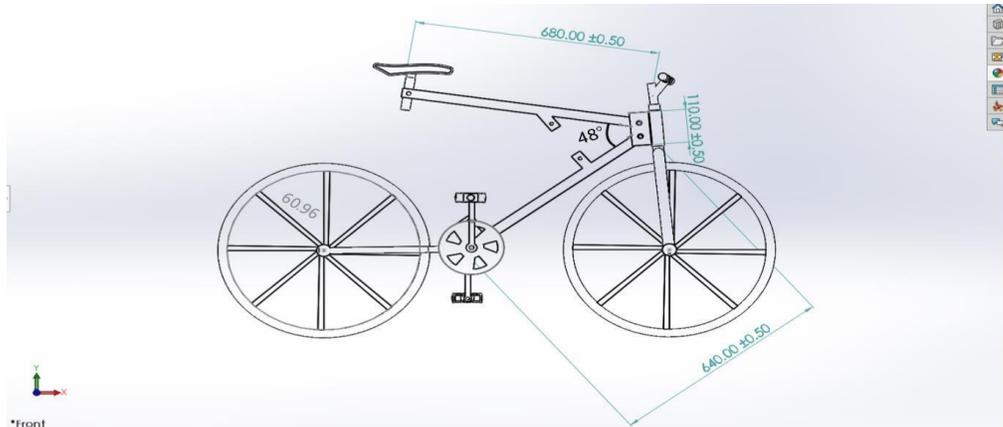
#### I. INTRODUCTION

A folding bicycle is a bicycle designed to fold into a compact form, facilitating transport when folded, the bicycle can be more easily carried into buildings and workplaces or on public transportation and more easily parked in compact living quarters or aboard a car, boat or plane. Folding mechanisms vary, with each offering a distinct combination of folding speed, folding ease, compactness, ride, weight, durability and price. Distinguished by the complexities of their folding mechanism, more demanding structural requirements, greater number of parts, and more specialized market application, folding bicycle may be more expensive than comparable non-folding models. The choice of model, apart from cost considerations, is a matter of resolving the various practical requirements: a quick easy fold, compact folded size, or a faster but less compact model. There are also bicycles that provide similar advantages by separating into pieces rather than folding. Folding bicycles for accommodating different riders, because the frames are usually only made in one size. While folding bicycles are usually smaller in overall size than conventional bicycles. The material used for the folding bicycles are Carbon fibre, Aluminium, Steel etc. Selection of material depends upon the weight, cost, rigidity, stress. Etc. Different material have different property depending on the material is selected for the bicycle. By knowing this, the question raises, why we should used this type of bicycle? .The bicycle is the one of the most convenient way of transportation or traveling from one place to another. There are different ways of traveling such as bike, train, bus, But this all are costly as compare to bicycles. The cost of bicycle is nearly 10-12 times lesser than bike. As the folding bicycle can be folded in a compact form, it is very easy to carry it in a bag from one place to another and it can be again unfold in a shorter period of time. There are different countries that, using folding bicycles as a main source for traveling. In this way they are not only saving the quantity of fuels but also the human resources. It also helps to be a fit and fine. Japan is the one of a country who's around 75-80% people's uses folding bicycles for travelling. Even different country such as U.S.A, France, and many more uses.

#### II. METHOD AND MATERIAL

The Main part which is used in our cycle which will help for folding is C-Clamp, we have use two C-Clamp joints in our bicycle model, one is for joining two Frame Bars with handle and another one is for connecting frame to the chain mechanism. C-Clamp is connected to Frame as well as sprocket chain with Nut & Bolt mechanism which provides easy motion for folding. Handle C-Clamp consist of two Nut & Bolts.

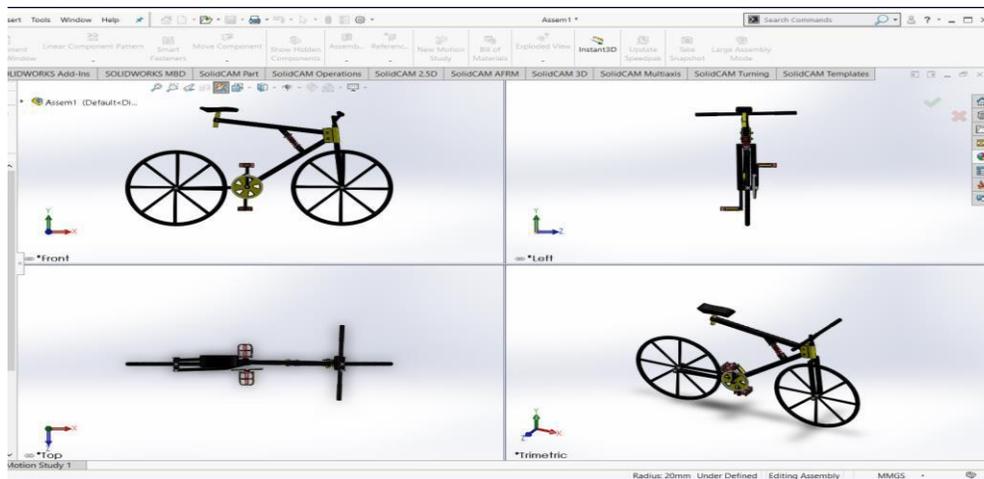
Figure:



Dimensions of Bicycle

We have used “Mild Steel 1018” material which is easily available in market with less cost, which also have more Strength as compare to other material like Aluminium, Carbon Fibre, Titanium etc. Also Manufacturing is easy with Mild Steel. Mild steel can also sustain more load as compare to other Materials.

Figure:

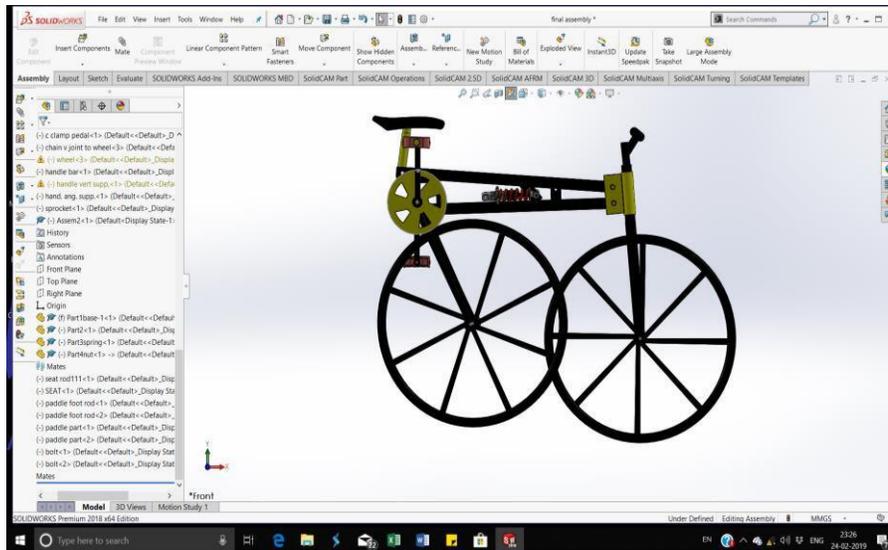


Diff. Views Of Bicycle

### III. FOLDING MECHANISM OF BICYCLE

The Bicycle consist of Two Folds mechanism as compare to other Folding Bicycle Which are having more than two Folds.

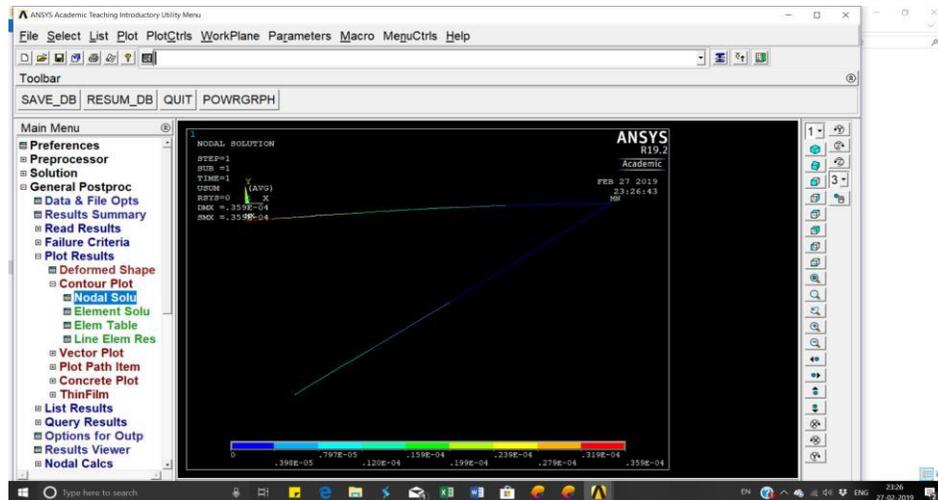
Figure:



#### IV. RESULT AND DISCUSSION

Analysis of Bicycle on ANSYS Software is given below

Figure:



Ansys

#### V. CONCLUSION

- We have completed design and Manufacturing of foldable Bicycle.
- We have used Mild steel so overall Manufacturing cost is less.
- Design consist of only two folds which makes it easy for folding.
- We have used skewer hub for tyres which is easily removable in less time.
- C-Clamp is used for folding purpose which is less expensive than other joints

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