

# Design and Fabrication of Folding Bicycle

Punam Manmode<sup>1</sup>, Maitheli Anant Pande<sup>2</sup>, Pratiksha Admane<sup>3</sup>, Prof. V.P. Kulkarni<sup>4</sup>

<sup>1,2,3</sup>Student, Department of Mechanical Engineering, MITAOE Alandi, Pune, India

<sup>4</sup>Department of Mechanical Engineering

\*\*\*

**Abstract** - With the headway of in 21 century. There has been increment in the utilization of oil and gas prompting issues like an unnatural weather change, atmosphere changes, lack of unrefined petroleum, and so on. Because of these reasons car organizations has begun doing research on making new innovation usable into the everyday life that innovation will assume control over the world in future and would turn into the option for petroleum and diesel vehicle however in present day the bike can assume the significant job for day by day transportation reason in human life. The purpose for it is contamination, cost, and deficiency of common assets. To defeat a typical issue looked by society, a thought conceptualized to structure and creation of collapsing bike with tubeless tire. In present way of life man can't devote explicit time for his wellbeing, significance is least given to exercise and body wellness because of time deficiency. Fundamental target is to Design as the world's most conservative collapsing bike intends to upset littler, sheltered, lighter and quicker than customary bikes, This Paper centers around new proposed bike gives greatest opportunity while riding through occupied city lanes and build up the collapsing bike which is rider should agreeable ride.

**Key Words:** Adjustable handle, adjustable seat, linkages and locking system, footlight, tubeless tire, eco-friendly, health, comfort and economy.

## 1. INTRODUCTION

Folding bicycle model but current available bicycles are made up of heavy material which they make difficult to carry. The prices of the bicycle are not affordable to the common man. It also lead lots of difficulty when it is to be store for future use, Depending on selection of material for foldable bicycle is Aluminum, Carbon fiber, steel, magnesium, titanium etc. But magnesium, titanium cost is more than aluminum, steel and carbon fiber so we are using these materials which have light weight, affordable

cost, more rigidity, less stresses etc. The choice of model apart from cost consideration, is a matter of resolving the various practical requirements as compact in size, faster and lesser compact model and quick and easy to fold, there are various models which provided similar advantages by separating into two pieces rather than fold folding bicycle folded into three to four part normal bicycle design in single frame but in foldable bicycle will provide different frame but it will similar to the non-foldable bicycles. we are using some new feature in this bicycle like adjustable seat and adjustable handle it can adjust as per height so it fit to the younger and older users as well as children's and other one we are using tubeless tyre so maintains problem will solve and we will ride bicycle at night with bright light with help of footlight. Some question arising in our mind why we should use this type of bicycle? It can fold in compact size you can carry it in enclosed bag or cover from one place to another place. Parking and transportation problem will solve, You are not able to give specific time to your health so the fitness problem will solve in short period of time, folding bicycle are eco-friendly with nature it save the fuels and not required any charges for its working and keep our self-healthy. Foldable bicycle are available in market but in expensive cost since they are bring importance there are few manufacturers in other country. Hence we have opportunity to provide in low cost by design and manufacturing foldable bicycle.

### 1.1 Material and Properties:

Depending on selection of material for foldable bicycle is Aluminum, Carbon fiber, steel, magnesium, titanium. The physical properties and their characteristics on that basis the designer choose material. Listed below are some properties.

**Density:** It is the proportion of mass per unit volume.

**Stiffness:** It of body is a proportion of the opposition offered by a flexible body to twisting.

**Elongation :** Increment long which happens before a metal is cracked, when exposed to pressure.

**Tensile Strength:** Limit of material or structure to withstand burdens having a tendency to prolong or oppose strain.

**Hardness:** Hardness is a measure of resistance to localized plastic deformation.

**Material and stress:**

**For Mild Steel**

Module of Elasticity	200-250 GPa
Yield Strength	250-395 MPa
Tensile Strength	345-580 MPa
Elongation	26%-47%
Hardness	107.5-172.5 HV

Table no.1

**2. MAIN COMPONENTS OF BICYCLE WITH ANALYSIS**

**Frame:** The edge is the fundamental supporting piece of the bike on which the haggles parts are fitted. Edges are required to be solid, hardened and light, which they do by consolidated shapes.

**Compact joint:** It is joint which give on the casing with the goal that front and back bit can be cover.

**Folding frame:** It resembles typical bike outline distinction is just it cut from center bit of casing utilizing locking course of action to crease the edge we realize edge is supporting arrangement of bike which convey the haggles parts it will overlay in smaller structure.

**Handle:** it is the front segment of bike which used to control the bearing of bike.

**Adjustable handle:** we are utilizing instrument like responding cylinder and chamber in which handle will have two empty funnels which can balanced the stature of handle and bolting framework for locking reason.

**Adjustable seat:** Adjustable seat have same component like an Adjustable handle in which likewise two empty funnels are utilized like responding cylinder and chamber course of action so we can modify the seat can according to stature of client and locking framework for locking reason.

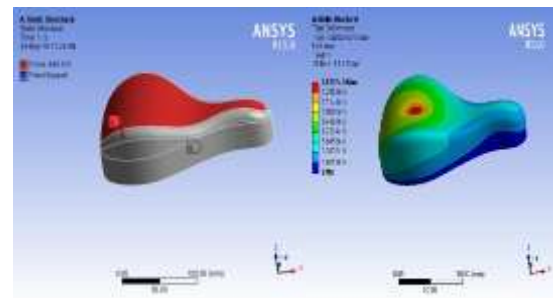


Fig no.3

Fig no.4

**Wheels and tyre :** We are utilizing tubeless tire which don't required internal cylinder which mounted on the metal edge of the haggles will come in legitimately contact with street surface. With the assistance of tubeless tire we lessen keeps up expense of tire and expands the security.

**Footlight:** we will ride bike around evening time with brilliant light with assistance of footlight.

**Transmission instrument:** It is the component which transmits the power from pedal to back wheel through the chain and we are utilizing gear plan to decrease the exertion of rider.

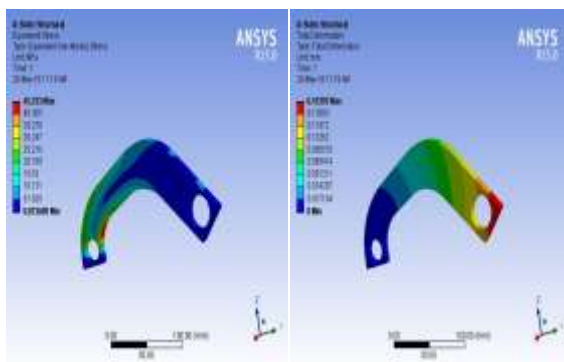


Fig no.1

Fig no.2

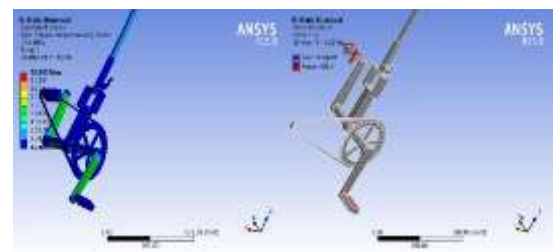


Fig no.5

Fig no.6

## MODELING OF FOLDING BICYCLE



**Fig no.6**

**3. CONCLUSION:** When contrasted with the other bike our collapsing bike with tubeless tire is affordable just as smaller in size so it consumes less space. We utilized streamlined state of edge for diminish the aviation based armed forces and movable seat and flexible handle it can alter according to tallness so it fit to more youthful and more established clients just as kids' and other one utilization of tubeless tire so keeps up issue understand.

The structure of bike was based on standard information and the manufacture was done which materials locally accessible in market.

A thought conceptualized to structure and manufacture of collapsing bike with tubeless tire which is light in weight, inflexible and sheltered, simple to deal with, simple to keep up.

### REFERENCES:

- [1] Beech, "Foldable exercise cycle", united states, 11/1986, 4632386
- [2] [www.bsahercules.com](http://www.bsahercules.com)
- [3] <http://www.ergon-bike.com/us/en/home>
- [4] <http://www.gopdelec.eu/cms/>
- [4] Yousef haik. 2009. Engineering Designs process. Cengage Learning India private limited, New Delhi, India
- [5] Kevin Otto and wood.2012.Product design technique in reverse engineering and new product development, Pearson education, south Asia.