ISSN No:-2456-2165

# Portable Suitcase Car

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**Abstract:- The thing is to set up a compact vehicle, which is efficient to carry some load and easily get transported or transport it. People are more reliable on motorcycles in India, if the distance is less than a kilometre it is not affordable to everyone thus, The design evolved into a bitsy foldable wallet auto, which can carry peoples and it's powered with the help of electric motor with power source as battery and the battery can be charged with the help of bowl the auto is compact in size and can be carried veritably fluently and is as like a wallet. The slide link of the steering chopstick ensures the foldable medium and allows humans to tote it, which ensure the purpose of lower distance, foldable and compact vehicle.**

***Keywords:-*** *Foldable Suitcase; Electric Vehicle; Battery; Easy to carry; Compact.*

## I. INTRODUCTION

Electric vehicles also called as BEVs and more frequently called as EVs. The electric vehicle industries are continuously evolving day to day. One type of electric vehicle is electric bike [e-bike]. E-bikes are run by taking battery as source. The batteries can easily charge to ordinary domestic sockets or shops at cheaper costs. Here we are developing e-bike into 3 wheels vehicle because 1 member can sit easily and can go and mainly it can take where ever we want and can easily assemble and disassemble with in time. The vehicle run by electric motor which receives power from battery. Here we are using Bldc motor [Brushless Direct Current motor]. The vehicle speed can be controlled driver by using throttle which is connected to handle bar. Here the controller is placed between the motor and battery the power is divided and sends to motor depends on how much the throttle was turned. Based on that the vehicle will move. The project presents a way of how electric vehicle designed and implemented. From, gests, we know that indeed at current high oil painting prices, reactionary fuelled vehicles are more favoured over bikes. We should search for other druthers that are electric bikes ore-bikes. The premise of this design is to overcome numerous this hedge by technology means at minimal cost to produce a usable transport for public use.

## II. LITERATURE REVIEW

Mazda developed the suitcase car concept, and introduced by Mazda company by their employee into an inter departmental event 'Fantasyard' in 1991. The contest was held up to see which department will come with an innovative idea for creating moving machine.

1990 was successful era for Mazda so to launch the wallet auto. A group of 7 masterminds from Manual Transmission Testing and Research Group worked on this design. They bought the largest Samsonite wallet they could find and pocket motorbike. The33.6 cc,1.7 hp two- stroke machine, bars and 4- 6 inch- periphery tires from the Pocket Bike were also fitted into the wallet. The hinder bus was placed outside of the case while the frontal wheel was popped out from removable door in the front. The wallet auto took twinkles to assemble and had a maximum speed of 30km/ h. The original prototype was accidentally destroyed after many months of the Fantasyard event, one wallet auto still exists, and it works as good as it worked 24 times gone. [1]

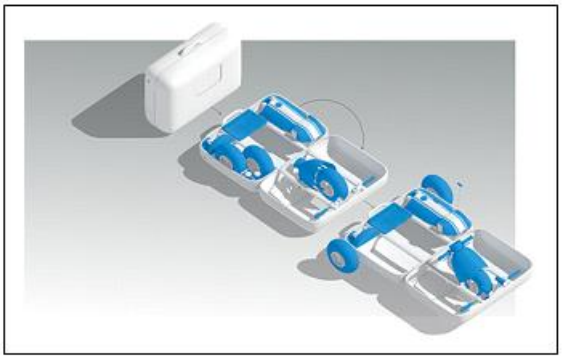

Fig. 1. Mazda's Super Suitcase Car

Vivek Garg and Rajesh Kumar Professors of MED, SoET, Bhaddal, India corresponding author: vg_guru768@yahoo.co.in, in their research paper have discussed about Design and Fabrication of Suitecase Car. Experimenters at MIT from General Motors Corp, are erecting a featherlight electric vehicle which can be mass produced cheaply, can be rented by shared use business, folded and arranged like grocery wagons at galleries or other spots. The flying and folding auto from cartoon 'The Jetsons'. The upcoming Hiriko fold doesn't fly, but folds. The Hiriko Driving Mobility Group, from Basque region in Spain, visited MIT in 2009, and accompanied Spanish government funding to develop the Hiriko Fold. The Fold is into production in Europe coming year, priced around $16,400. [2]

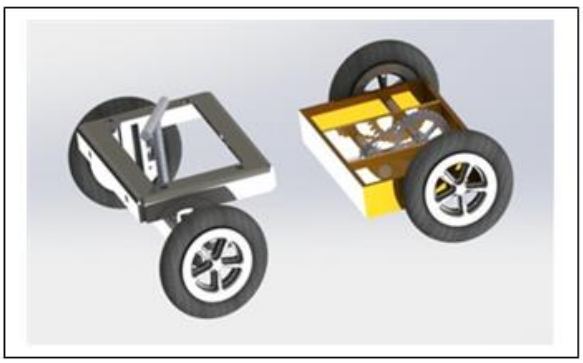

Fig. 2.1. Chassis of Suitcase Car

ISSN No:-2456-2165

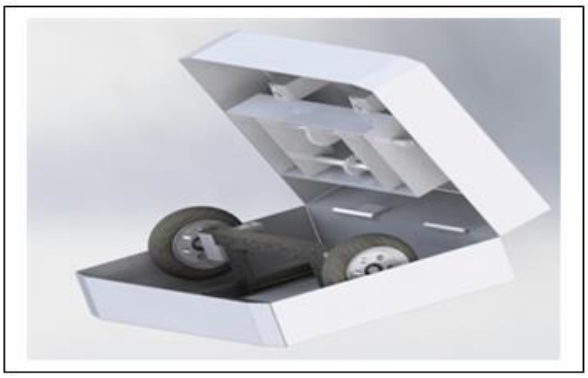

Fig. 2.2. Car turning into a Suit Case

Mr. Akash Chaudhary Raghuvanshi and his platoon had made a way in developing foldable kart lattice. They understood the drive moving towards the conciseness, and its time is to suppose about machine which can be folded fluently and can be carried far and wide as a luggage. By this creative idea, he made structural analysis on the frame of their kart vehicle and developed a GO KART named as "ASHVA" which was suitable to fold at middle with the help of joint that made connection between its two-lattice front and reverse. Because substantially Karts are used to take the experience of a racing auto, knowing this they manufactured an machine that can be commodity unique. The speed of kart varies on power of machine and how important energy does it need considering the fact lattice and joint of kart were made from mild sword, this joint gave further power and stability to the vehicle. They used mechanical chain to transmit power from the machine to the axle of kart, for a better and smooth experience, rack and pinion system was used. Material selection plays an important part on strength and safety of the product that's the reason they chose AS- 202 pristine sword round tubes as lattice material. Also, they chose the material for shaft so that it can repel all the stresses. They made an effort discussing about the material selection procedure and the joints which can be used in foldable vehicle chassis. [3]

Jayesh S. Renge1, Ronak P. Rathore2, Shubham V. Bakade3, Suprit P. Bardekar4 from Department of Automobile Engineering, DPCOE, Maharashtra, India in their research paper, Design and Fabrication of Foldable Electric Motor Powered Three Wheel Vehicle have discussed, as population is increasing there is more demand in automobiles people will need space for parking. As there is limited space available and due to increase in automobiles on roads, they are causing traffic and they need space for parking and pollution is also addition to it due to increase in pollution, idea of creating portable vehicle comes into picture. So, Suitcase Car was made which can be folded in a suitcase and does not require any parking. Size of the suitcase car is 46"x 22" and it is 5 times smaller than normal car. Due to compact nature it can be used in various malls, industries, college campuses etc. It can also be used to cover short distances on roads as transport.

To overcome the disadvantages in present, the engine can be replaced with motor and battery. Due to battery it will add more weight to the design. In this vehicle we used 3 wheels, but power is only given to rear wheels with shaft, and steering of the vehicle is done by front wheel. DC brush motor is used to generate power. If vehicle is not used then it can be disassembled and parts can be kept inside the suitcase. This vehicle can carry weight up to 90kg and its Maximum speed is 20 km/hr. [4]

## III. OBJECTIVE

Design a Suitcase Car that can be folded to form a suitcase and can open to form a car to carry single person and used for transportation.

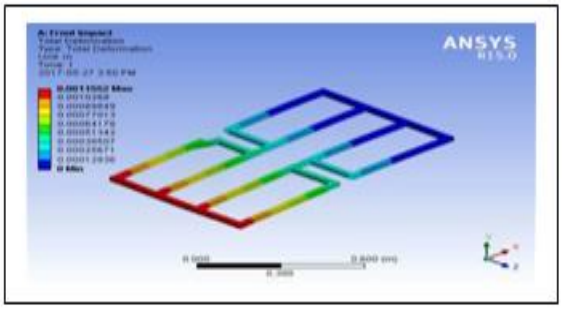


Fig. 3.1. Total Deformation, Front Impact

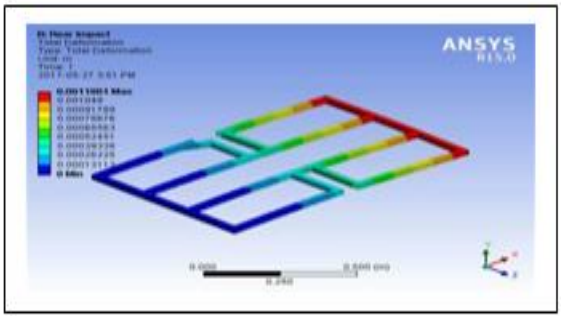


Fig. 3.2. Total Deformation, Rear Impact

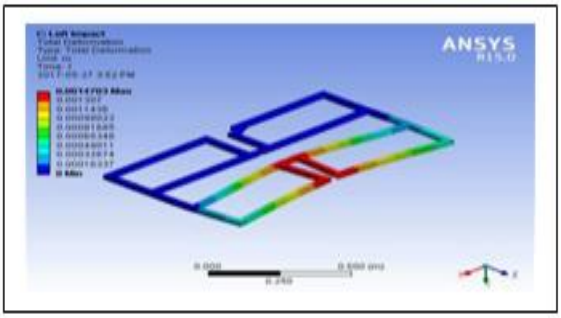


Fig. 3.3. Total Deformation, Left Impact

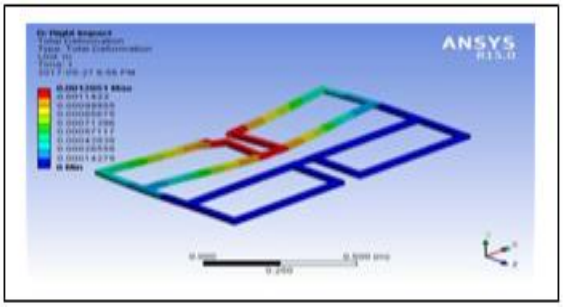


Fig. 3.4. Total Deformation, Right Impact

ISSN No:-2456-2165

Auto should be electric powered and driven with dc geared motors. Torque handling capacity can be increased using a chain drive medium with a coupled shaft for the two dc geared motors. Battery will be handed and turning with steering medium. The advantage of this auto is that it's Eco-friendly, no parking demand, flexible, and low cost. It's a moving medium with no emigration of any poisonous gas.

## IV. WORKING

Suitcase car concept comes with the best ideas with little expense. This can be used as private transportation to travel and is portable. So, one can carry it on the bike or in the car, size of the model is 4ft x 3ft and width 1ft having 3 wheels. When the suitcase is opened it opens 8ft long having 2 driving wheels on the rear and 1 guiding wheel at the front. The handle is fitted to guide wheel which allows the operator to move in any direction, the car has electric motor which is powered by battery which is chargeable; all components used are standardized and are conveniently available in market.

### *A. Advantages*

- *Easy in operation*
- *Performance*
- *Adaptable*
- *Simple construction*
- *Low cost*
- *Easy to setup*
- *Easy conservation*
- *No skill driver needed*
- *Power saving*

### *B. Disadvantages*

- *Posi Limited Speed*
- *Low Ground Clearance*
- *Cannot overload the vehicle*
- *Not Rugged due to compact size*

## V. CONCLUSION

We have developed a compact vehicle which is cheaper and can be used in traffic areas and for short distance run. It's an ideal tech performing device to carry along your coming diurnal commute whether by train, megacity machine, shelter, or your particular auto. The compact size allows it to be stowed under machine/ train seat or inside auto's box. You do n't need to perform complicated procedure to change this unit from briefcase mode to ride mode, you can snappily ride it after getting off machine/ train to move without hassle to your destination. Business jam or parking space will no longer be an issue then. In present day we're studying the chases and cargo analysis that's use in it.

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