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The Foldable E-tricyc bag

Prof ravindra kurane
Mct. Rajiv Gandhi Institute of Technology,
Mumbai, Maharashtra

Siddhesh Rane
Mct. Rajiv Gandhi Institute of Technology,
Mumbai, Maharashtra

Chinmay Rege
Mct. Rajiv Gandhi Institute of Technology,
Mumbai, Maharashtra

Siddhi Patil
Mct. Rajiv Gandhi Institute of Technology,
Mumbai, Maharashtra

Swarang Salunkhe
Mct. Rajiv Gandhi Institute of Technology,
Mumbai, Maharashtra

ABSTRACT

The design of a folding E-tricyc bag is to improve the user experience of commuters and to provide ease in transport. The final concept presented in this report is a new design that focuses on the ease of use and comfort of the rider as well as the practicality and space efficiency of the product. But regular bicycles occupy sufficient space to park, are not easy to carry around, and are probable to theft. Transport has been one of the most important issues to be dealt with in the present-day situation as commuting from place to place within the city has become a tedious and expensive task. It is very difficult to reach the nearest public transport facility and in many cases, the destination will be very far from the main roads where the public transport might not be able to commute or it might be very expensive. This tricyc is powered by an 8-inch BLDC hub motor and is backed up by a 24-volt li-ion battery and with help of controller all the electronics have been handled i.e. throttles, brakes, LEDs, etc., this all components are mounted on a rigid light frame with help of all this the rider can easily go to its desired location and to overcome a common problem faced by society, an idea is conceptualized to design and fabricate a foldable tricyc which can be fitted in a simple bag. This tricyc may reduce carbon footprints to a great extent, statistic suggest that 75% of cars and bikes emit harmful exhaust during a typical six km trip, this bike would be pence to a go green commute but uses less energy and power than a motorbike. We already have seen many foldable bikes in the global market but the main idea of this project is to provide a foldable tricycle that is light & sleek yet rigid & safe, easy to go, easy to handle, and easy to maintain. Unlike the conventional cycles, this tricycle will occupy very little space and also is very easy to be carried around. The main objective is to design and develop a foldable tricyc that is comfortable to ride and economical.

Keywords— *BLDC Hub motor, Li-ion battery, Controller, Frame and Bag.*

1. INTRODUCTION

Folding tricyc are very practical and efficient modes of transport. This tricyc is designed in such a way to fold it in a compact form and adjusting the whole model in a bag facilitating transport and easy park.

As the weight of the folding bicycle is less than the conventional bicycle it is easy to carry from one place to another. Generally, the weight of the bicycle is around 15-18kg and the weight of the folding bicycles is around 8-10kg with the same rigidity. This is due to the material used in folding bicycles. The cost of the tricycle is nearly 10-12 times lesser than a bike. No doubt that a bike required less energy than a tricycle but a tricycle helps to make our self-fit & fine. It do-not required fuel for its working. As the folding tricycle 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 unfolded in a shorter period.

We all are aware from the cost of fuels and at what speed it is increasing in such condition everyone can't use the services which runs on fuels. In such conditions, the folding bicycle plays a very important role it not only saves the fuels but also helps to keep our self-less tired as the weight of the folding tricycle is less than the conventional bicycle it is easy to carry from one place to another.

Despite the recent increasing research and innovation in the world of folding bikes, the current market offer does not meet the desires of commuters using them for the multimodal commute. The need for a folding bike that is designed to fulfil the demands and wishes of present-day commuters initiated this design process. The project started with initial user tests in which test subjects had to execute each aspect of a folding bike commuter's

customer journey. These tests revealed several shortcomings of the current market offer of the folding bike

It is, therefore, an objective of the present invention to provide an electric tricycle capable of being folded for decreasing its storage space and being easy to move by wheeling by the hand.

2. EXISTING MODELS

[1] Hajime Ishida (1977): This invention, which provides a folding bicycle, comprises a foldable frame structure including a front support assembly having handlebars and arranged to be rearward foldable. According to the invention, the user can very quickly and easily fold by manually rearward folding the front support assembly which includes upper and lower section interconnected by hinge.

[2] Robert D. Shomo (1981): The author has put forward the concept of folding bicycle, As the folding bicycle of the present invention comprises a large-wheel folding bicycle which exactly duplicates the looks, and feel, rigidity, strength, weight and ride quality of a conventional and popular l0/l2speed touring bicycle. The folding bicycle of the present invention includes a compact frame which is foldable, with the front half of the frame being rotatable about a hinge means to position it against the rear half of the bicycle for easy and efficient transportation.

[3] Kao P. Cheng, Changhu Taiwan (1994): An improved locking hinge for use in a folding bicycle is equipped with a lever arm which is in pivotal connection to a locking hook at the bottom end thereof. The looking hook also pivotally mounted onto the handlebar of a bicycle has a retaining recess which is made to engage with a locking pin mounted onto the steering stem of the bicycle so as handlebar which is put in linear alignment with the to get a folding bicycle in use as long as the lever arm is pushed toward the erected steering stem already.

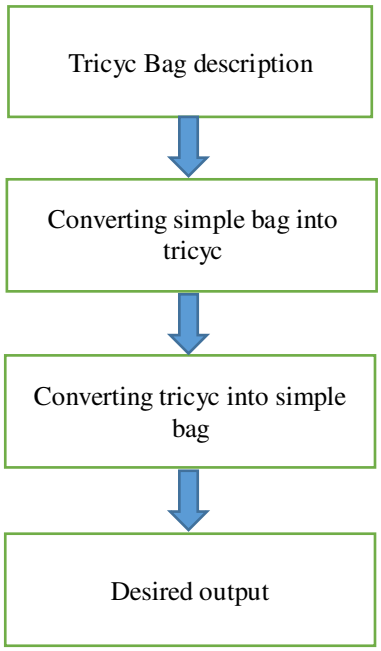
[4] Jaime Herder, Perth, Australia (1998): A folding bicycle in which all the pivoting members have horizontally pivot axes and all the members are indirectly connected to a single collar that slides up and down a seat post. In order to achieve an open or closed state, the collar is made to slide along the post and is then secured by tightening a quick release lever on the collar. Two front tubes mending between the Steering head and the lower Part Of the seat post are parallel.

3. PROPOSED MODEL

The design is said to be the idea of our final product to be manufactured. It is the framework structure of our design to which detritus would be added. The design has the following stages as shown in the fig 2: flow chart.

Fig. 1

Fig. 2: Flow chart



3.1 Tricyc bag and component description

The proposed designed of our model is a folding tricyc bike which is easy to convert into a bag form. It is designed smoothly to transport people and is easy to carry bag anywhere anytime. This folding bike is with three-wheel drive technology where the hub motor delivers power to front wheel with the modest speed of 20 to 30 km/hr.
In our current study of the bike the following sub functions are identified on the basis of the components

- frame
- hub motor
- battery

- simple bag

3.2 Converting simple bag into tricyc (unfolding)

The unfolding stage is segregated into three basic steps

Step 1: unfolding the handle / lifting the handle

In the very first step of unfolding the handle would be mounted on the top most side of the bag so whenever the rider wants to ride he would just have to unclamped the clamp and lift up the handle and adjust the height according to its own comfort to which he would be comfortable in riding.

The main control function like throttling the tricyc, handling of the steering, braking would all be done using the handle.

Step 2: unfolding the front end / unfolding the front wheels

Our design consists of two wheel mounted on the front part but this wheels are mounted in such a way that they are placed on the either side of the bag when folded.

To unfold these wheels, we just have to unclamped them and the wheels would fall down due to gravity effect and we just have to lock them in the desired angle by pushing them in forward direction till the wheels get lock in their position.

There would be an angle between two wheels that would help the rider to steer or turn tricyc properly in an adequate manner using the handle. These wheels would also be having rubber stoppers so that whenever the rider would apply brake it will help the tricyc to slow down or stop.

Step 3: unfolding rear end / unfolding the third wheel

This wheel is placed on the back side of the bag in such a way that whenever the rider has to ride it the rider just has to unzip the bag and pull down the wheel. This third wheel would be connected to the main frame and the seat is also mounted on same frame.

As the wheel is pulled out there would be a locking mechanism which would help the third wheel to remain lock and fixed in its position without causing any difficulty while driving the tricyc, there is a hub motor placed inside the third wheel which helps to drive the tricyc to its desired location.

Using this three basic steps of unfolding it would be an easy transformation of converting a simple bag into three-wheel moving cycle which can be used as personal transport to reach the desired location.

3.3 Converting tricyc into simple bag

This stage is divided into three steps

Step 1: Folded handle /Rested handle

As we know the design, the handle would be placed on the top side of the bag. The rider just has to push the handle towards the bag, the handle would be resting on the top side of the bag. When the bag is folded it would be attached to the bag helping the rider to use it as a trolley

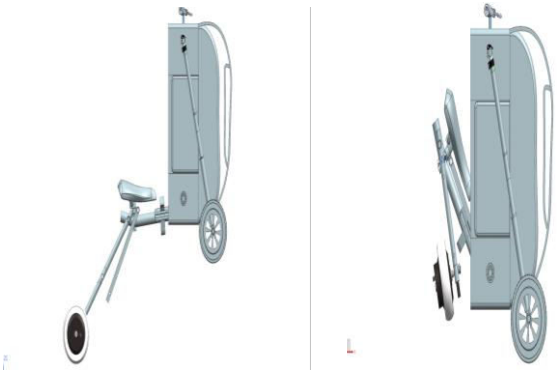
Step 2: Folded front end / Folded front wheels

When the rider is done with riding, the rider has to lift up the front wheels and place the wheels back to its original position and clamp it. The wheel would be back to its normal position that is sideways of the bag

Step 3: Folded rear end / Folded rear wheel (third wheel)

The rider has to lift up the third wheel and the frame, and has to slide it inside the slot provided in the backside of the bag.

Using these three steps of folding will bring the whole tricycle into a form of bag which the rider can carry on his shoulder to its desired location



3.4 Desired output

• LESS WEIGHT: Some folding bikes actually come with small engines that can be turned on and off whenever they are needed. Surprisingly these engines don't add all that much more weight and size to the bike, and are often as big as the engine you'd see on a gas-powered weed eater.
• LOW MAINTENANCE: The maintenance level on a folding bike is very low. Your only priorities consist of keeping the chain lubed, tires inflated, and lights charged up.
• COMPACT: This is the most standard folding bike, size, and refers to anything that is smaller than the normal bike size of a road or mountain bike. The tricyc will be made in such a way that it can easily be converted into to bag and convenient to carry.
• ECOFRIENDLY: This may reduce carbon footprint. Statistics suggest that 75% cars emit harmful exhaust during a typical six mile trip which is made up during the first mile. This bike cost just pence to a go green commute but uses less energy and power than a motor bicycle.

4. CONCLUSION

There are many foldable cycles present in the market but they are not that compact, easy to go, and are very expensive. The proposed model overcomes all the above problems and is comparatively affordable with better durability. This system is one of its types because no tricycle can be foldable and electric at same time. The tricyc is made for all the age group let it be a teenager or middle-aged man or an elderly man. With a simple design and more compact frame it becomes a boon for the user given a common solution for all the day to day life problem related to transportation. This tricyc will find its use in every working-class person's life and can be marketed as an efficient solution for all the daily rising price of transport making average earning man's life easy. The main objective of the model is to provide better transport and reduce the cost of daily travelling and easy to carry your vehicle with yourself to where you go and reducing stress for the security of vehicles.

5. FUTURE SCOPE

- **Regenerative battery:** A chain can be used to connect pedal and the third wheel so that when the tricyc is moving the battery can also get recharged.
- **Handicapped applications:** It can be used for blind and deaf people by converting it into tricyc using Artificial intelligence.
- **Touch screen:** Touch screen facility with Bluetooth can be added which is not available in any of the foldable tricycle.
- **Security:** Since the tricyc is folded inside the bag we can use bag tracker or antitheft alarm on the bag as security option.

6. ACKNOWLEDGMENT

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7. REFERENCES

[1] Hajime Ishida (1977) US patent 111447.

[2] Robert D. Shomo (1981) US patent 4417745.

[3] Kao P. Cheng, Taiwan US patent 2006/0009331 A1

[4] Jaime Herder Perth (Feb 18 1998) US patent6032971.