

A Cover for the Single-Person Pedal-Powered Vehicle

Introduction

The invention of the single-person pedal-powered vehicle has made a great difference to people's daily ways of transportation. Completely driven by manpower, it needs neither fueling nor charging, and doesn't cause any pollution at all. Moreover, it is made of iron and aluminum, which makes it affordable for most people. Though widely welcomed for being convenient and environmentally friendly, the single-person pedal-powered vehicle has been met with many safety worries owing to the fact that its driver is exposed.^[1]

There have been several studies working on the problem. A recent study showed that a number of people tended to fix an umbrella on the vehicle to keep out the rain. Some people who were very concerned about the safety might use a steel "egg" to cover their vehicle.^[2] A French group also designed a "cage" made of carbon fiber, which featured light weight and elegant shape.^[3]

However, the above methods are far from solving the problem. An umbrella or a "cage" provides no substantial protection for the driver of the vehicle in traffic accidents, according to a previous study. Moreover, the wind resistance of the umbrella and "cage" and the weight of the "egg" greatly increase the driver's physical exertion. The "egg" and the "cage" also have a fatal flaw that they are too expensive for most users of the single-person pedal-powered vehicle.^{[2][4]}

Our aim is to design a light and firm cover with an affordable price. To achieve this, we used aluminum and Plexiglas instead of steel and preserved a wide field of view for the driver of the vehicle. For the sake of reducing cost, we gave up the streamlined shape and adopted a polygonal shape made of multiple pieces. The advantage of this is that all pieces can be mass-produced directly from molds. At the same time, we added telescopic carbon fiber tubes inside to support the entire structure and provide driver protection in traffic accidents.

References

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