

DESIGN OF COMPACT PATIENT CARRYING TRAILER

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Abstract : In daily life we can observe the difficulties of carrying the patients, old people, physically challenged people in remote areas where there is no any phase of carrying patients to hospitals for that reason there is intake to make Ambulance that can be attached to any automobile. The purpose of the project is to show that it is possible and relatively simple, to build a multipurpose attachment to any automobile. Designing and modeling a concept vehicle which can carry patients even in narrow space with good stability was done. Drawings are made by hit & trial method. A trailer which can accommodate two persons is designed. Drawings are drafted using 'CATIA' software. The trailer is designed to carry patients and physically challenged people easily which can be attached to any vehicle.

Index Terms – Patients, trailer, attachment.

I. INTRODUCTION

A trailer is an unpowered vehicle towed by a powered vehicle. It is commonly used for the transport of goods and materials. Sometimes recreational vehicles, travel trailers, or mobile homes with limited living facilities where people can camp or stay have been referred to as trailers. In earlier days, many such vehicles were towable trailers. In daily life we can observe the difficulties of carrying the patients, old people, physically challenged in public places like airports, railway stations, bus stands, hospitals, college campuses etc. To aid such people we decided to a design a trailer which can be attached to any vehicle to ease the task of carrying patients. The final objective is to carry patients to hospitals in rural or hilly areas where transportation is difficult. this trailer can be attached to any vehicle (Two wheeler, Three wheeler, or Four wheeler) available at the spot of accident or at residential place of patient.

1.1Types of trailers:

Some trailers are made for personal (or small business) use with practically any powered vehicle having an appropriate hitch, but some trailers are part of large trucks called semi-trailer trucks for transportation of cargo. Enclosed toy trailers and motorcycle trailers can be towed by commonly accessible pickup truck or van, which generally require no special permit beyond a regular driver's license. Specialized trailers like open-air motorcycle trailers, bicycle trailers are much smaller, accessible to small automobiles, as are some simple trailers, pulled by a drawbar and riding on a single set of axles. Other trailers, such as utility trailers and travel trailers or campers come in single and multiple axle varieties, to allow for varying sizes of tow vehicles.



Fig. 1 Trailer attached to bicycle to carry goods

Patient carrying trailer is used in remote rural areas to convey wiped out or harmed individuals to the close-by healing facilities. In earlier days bicycle ambulances are used to carry patients from rural areas to hospitals. But bicycle ambulances are not well suited for emergency transport. The majority of the population lives in villages or homes within the mountainous and hilly regions. This creates a much more complex problem, as reaching medical service centers with the resources to address emergency cases are distant for a majority of the population. Unlike bicycle ambulances, there are currently less emergency transportation options that incorporate a motorcycle. These motorcycle ambulances are more expensive than their bicycle ambulance counterparts, but are more adept to transport heavier loads through terrains.

1.2 Types of Bike attachments for Ambulance Carrying Vehicle:

Attachment links to the back, similar to a trailer bed or wagon. Person's orientation can vary facing towards or away from the bike. This attachment is helpful for the driver because it is easiest to control the movement of the motorcycle, as the ambulance is in line with the direction of the motorcycle.

II. DESIGN

2.1 Design Requirements for the trailer

The design requirements are important for systematically evaluate improvements to existing bike ambulances. This also allowed us to formalize criteria for emergency transport systems based upon our need finding results and prior research.

The requirements are as follows:

- Easily cleanable/hygienic
- Vibrations minimized
- Balanced Horizontal movements/effects from turns, brakes, and acceleration
- Protection from environmental elements (e.g. weather, motorcycle exhaust)
- There is space for driver, patient, and additional passenger
- Light weight design (to promote fuel efficiency)
- Capital cost is affordable
- Durable materials and design
- Comfortable interior design (seat, additional materials)
- No sharp edges, points, or hazardous components
- Safe connection mechanisms
- Availability of first aid box in the trailer

2.2 Design of the trailer :

To maintain accuracy in designing, the trailer is designed in CATIA - 2016 software.



Fig. 2 Isometric view

III. RESULTS AND DISCUSSION

Emergency ambulance was prepared as per the CAD design and the views are as given in the Fig 3.1

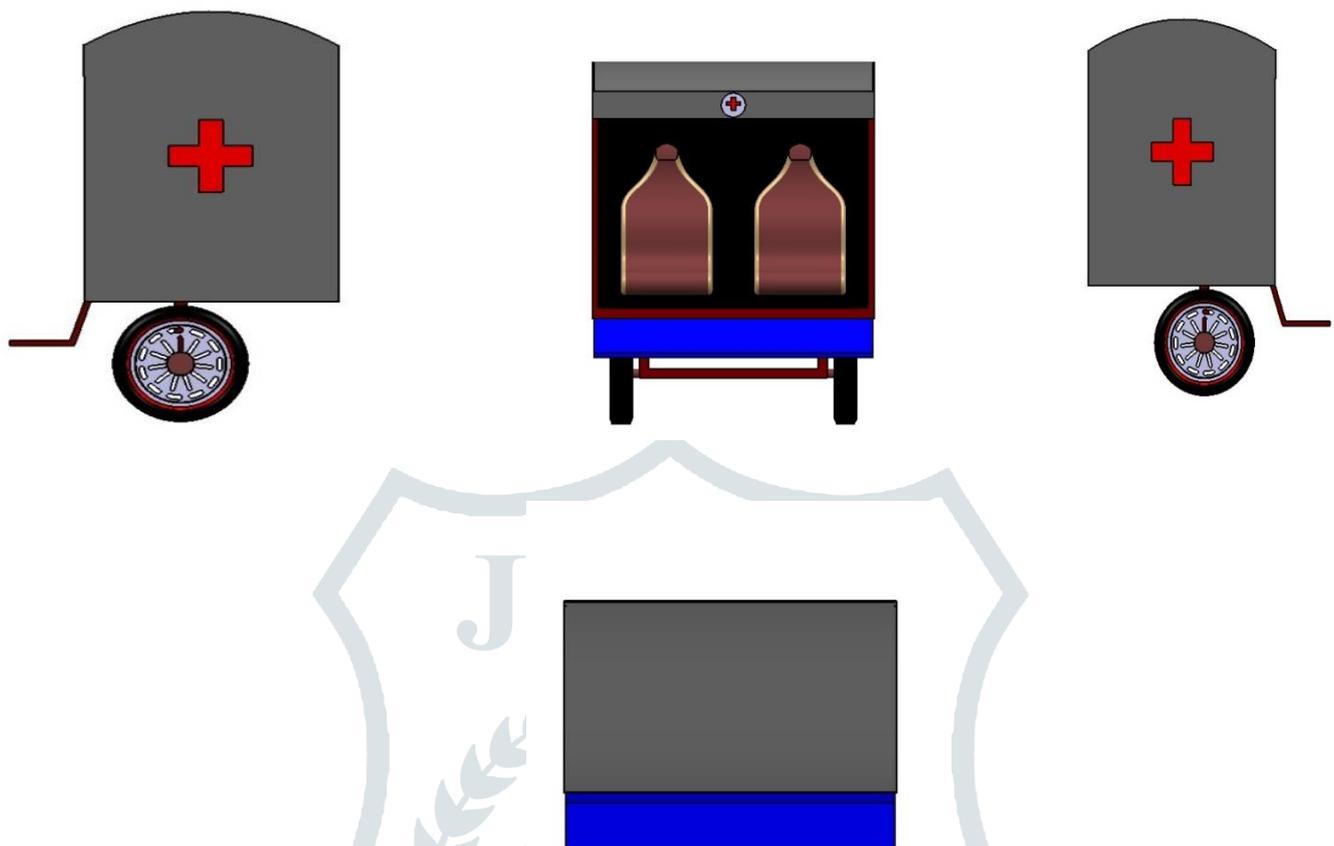


Fig. 3 CATIA views

The designed vehicle is very compact (5ft * 6.8ft) and able to carry patients easily on plain roads and hilly areas. The designed vehicle able to carry small commodities and helps physically challenged people to travel.

1. Can carry two patient at a time and can be attached to any vehicle depending upon the availability and transport facility.
2. Trailer can be used for multipurpose (can carry goods, etc).
3. Physically challenged people travel along with their family.
4. Service can be provided to the patient as soon as possible by fixing first aid box in the trailer.

IV. CONCLUSIONS

A Patient carrying trailer is designed which can carry two persons such as patients at agency areas and also can be used to carry physically challenged or old people with ease in public places or industries, agency areas and campuses. The utilization of Carrier reduces the cost and weight of the vehicle and also can bear greater loads. As the trailer is designed with low height with better ground clearance and enough width and length provides greater stability to the vehicle. The trailer can carry 2 persons easily and even it can climb short ramps when attached to any vehicle. As the design is lighter and cheap to produce, the Govt. or social bodies can adopt it and prepare such trailer to meet the public need and can decrease the death rate.

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