

ADVANCED TYRE FROM RECYCLED PLASTIC MATERIAL

Hybrid tyre for Bicycle and two wheelers

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Abstract— *the present study experimentally investigated the effect of tyre burst and sudden tyre failure of emergency vehicles, patrolling vehicles or vehicles of regular use. This sudden failure causes accidents, injuries and deaths .when it comes to emergency services vehicles this is matter of life and death .while newer advanced material have been designed with tyre safety but at expensive price. So our team have been designed it with tyre safety burst less and puncture less tyre with use of recycled incompressible plastic material at cheapest price . This new solution on tyre problem will help to save life of people and increases safety from accidents and injuries. It will also help to drive vehicles in harsh terrain where special tyres are required so this tyre have positive impact on society.*

Index Terms—*recycled plastic, molds, incompressible pipes, rubber pipe, tubes.*

I. INTRODUCTION

In now a day's people using diverse type of vehicles with variety of tyres but due to improper use and maintenance of tyre usually tyre get puncture sometimes burst or sudden tyre failure. This leads to accidents, injuries and deaths. Study explores that accidents which involves tyre failure has 12% cases of tyre blowouts and 8% due to improper tyre pressure. So to cure that we developed solution, which transfers recycled plastic material into hybrid tube It will cure problem faced by emergency services and peoples from ruler areas also people lives in harsh terrain. It is better solution to cure this problem at lowest price. It particularly helps two wheelers as bicycle, motorcycles, carts, e-bikes. Handicapped persons also have benefit from this tyre hybridization for their vehicles. It has highly important uses for army vehicles, policing vehicles, patrolling vehicles, vehicles from harsh terrain; mountaineers. It mainly contains recycled plastic molds with incompressible shape and size with high material strain with supportive shapes. It gives same results as tyre with full air pressure. This tyre allows movement in special terrains with ease where special tyres are required for high performance. It also sustained in various tests and conditions. Recycling plastic is one of major ecological beneficial factor. Recycling helps in reducing the cost of product without any drawback.

II. METHODS

It generally divided into four sections

- a) Designing
- b) molding
- c) Assembling
- d) Finishing.

Primary procedure is designing; designs of required size and shape are prepared with use of software's. It is followed by making of plastic structures by molding with use of shredded plastic material of three categories. Special structures are used to give rigidity or elasticity to tyres as per need. It provides high compressive strength to tyre. Then different types of structures assembled in project covered with soft coating to absorb shock.

Assembling of material assembles in three coatings.

- 1) Primary coating (20mm)
- 2) Secondary coating (25mm)
- 3) Tertiary soft coating (30mm)

Primary coating and secondary coating structural tubes are made from recycled plastic. Tertiary coating is mainly designed for suspension purpose. Soft shredded plastic of 50 micron and below plastic which is not recyclable or single use plastic has been used for soft coating and core formation for primary coating.

Finishing process includes removing of excessive material, to give final touchup, it includes alignment of tyre. Shredded plastic is used to fill gaps for suspension purpose.

III. DIAGRAMMATIC REPRESENTATION (SCHEMATIC REPRESENTATION)

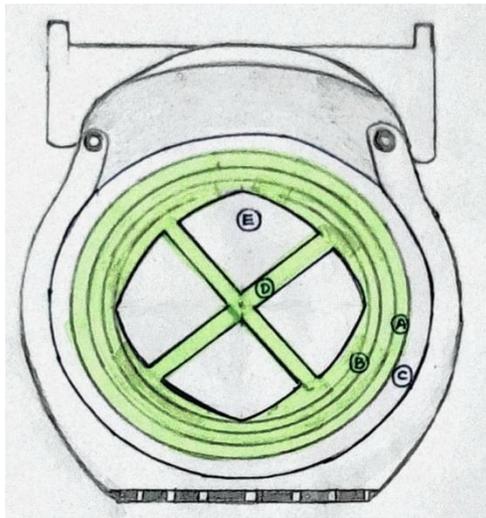


Fig. (1) Cross section area of hybrid tyre.

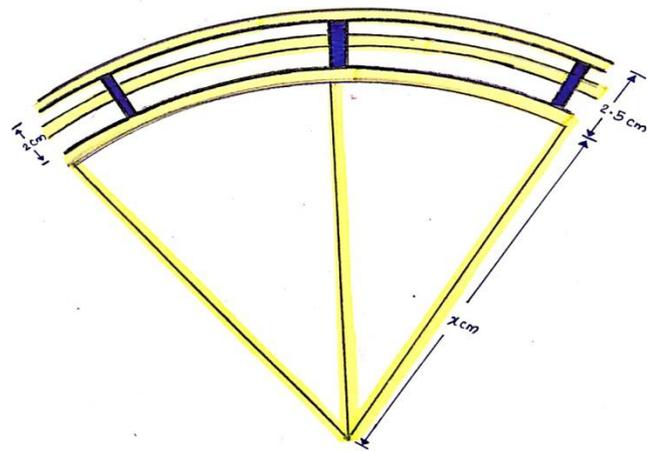


Fig. (2) Side cross section area of tyre and inner material.

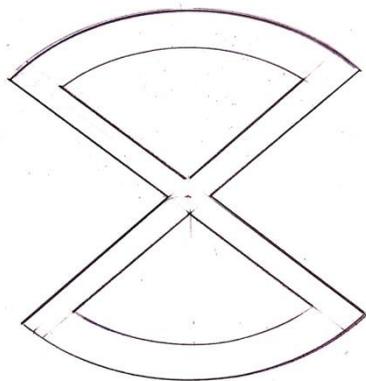


Fig. (3) Supportive plastic structure

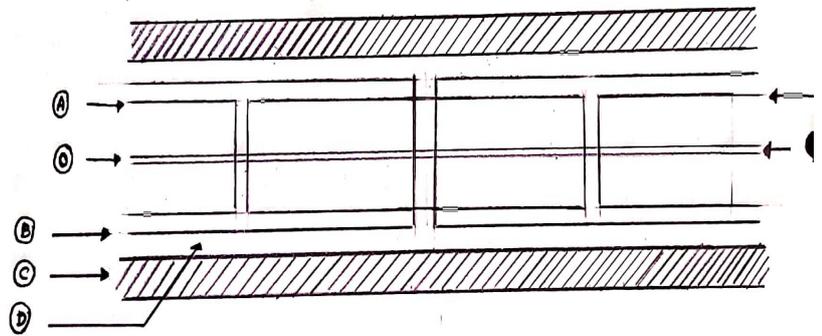


fig. (4) Side cross section of advanced tube.

IV. TABLES

1) Primary informative table.

Sr.no	Type of vehicle	Tyre height (bore) cm.	Tyre circumference
1	Atlas bicycle (24 inch)	2.5	230
2	Atlas bicycle (22 inch)	2.5	207
3	Pleasure scooty	8	130

2) Secondary detailed table.

Sr.no.	Net Tyre weight	Net material weight	Hybrid tyre weight
1	3000 gm.	1000 gm.	4000 gm.
2	2800 gm.	900 gm.	3700 gm.
3	-----	-----	-----

V. RESULT AND DISCUSSIONS

Recycled tyre can absorb low and high accidental to provide suspension without getting puncture or burst. It passed fire test, harsh terrain drive test, mountain drive test, accident test, puncture test. It covered small shocks by rubber coating. It absorbed major shocks by getting deform where normal tyre burst. It does not need air, gas, and liquid for driving purpose. Shredded plastic gives better results for suspension and core part. Performance of tyre give same result as tyre with pressure 70 to 130 psi.



Fig. (5) Advanced tyre.

VI. CONCLUSION

Advanced tyre from recycled plastic material is better solution for reducing costing of process and weight of material. it improved performance with safety which also helps to travel in special terrain. It will help to reduce accidents and deaths due to tyre failure. It will specially helps people of ruler areas for betterment of their journey. It will mainly help peoples serving in army, police, para military and people serving in emergency services. It will be beneficial factor for handicapped person. it will be better solution for puncture less tyre and burst less tyre.

VII. ACKNOWLEDGMENT

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