

# Self Erecting Tent Using Telescopic Mechanism

Prof. A. J. Bamnote<sup>1</sup>, Aniruddha Deshpande<sup>2</sup>, Kaunteya Deshpande<sup>3</sup>,  
Vedang Moharil<sup>4</sup>

<sup>1</sup>Assistant Professor, Department of Mechanical Engineering, Yeshwantrao Chavan College of Engineering,  
Nagpur, 441110

<sup>2,3,4</sup>Students, Department of Mechanical Engineering, Yeshwantrao Chavan College of Engineering, Nagpur,  
441110

Corresponding Author: Vedang Moharil

Submitted: 30-03-2021

Revised: 06-04-2021

Accepted: 09-04-2021

**ABSTRACT:** Tents are predominantly found at different places for different applications. Nowadays, a huge tent helpful for wellbeing camps, military purposes, evacuee covers, cataclysmic events and so forth in health-related crisis at distant territory, are generally utilized for giving restorative treatment. In this survey, various sorts of Self-Erecting tents are considered. The current constraint for setting up of huge tents includes various individuals (labour). The idea of this paper is to conquer the issue of Self-erecting inflatable tent which are inclined to penetrates or prone to punctures. These tents having vigorous development are not accessible in market. This investigation essentially centres to make it simpler for individuals and associations to liberate up an enormous tent as hands-free as could really be expected.

**KEYWORDS:** Self-erecting tent, man power, robust construction, prone to punctures, large tent.

## I. INTRODUCTION

In the post pandemic situation, every single work should be executed with less or no human contact however much as could reasonably be expected. A tent is something which is utilized broadly for various purposes, for example, wellbeing camps, transitory sanctuaries during catastrophic events, different military purposes, and so forth. Yet, setting up enormous tents is anything but a simple undertaking and it needs at any rate two to six people to set up a huge tent.

Automation has been going on in each area subsequently. Considering the current situation, it's not a viable option to use inflatable tents as they are prone to punctures. The current market doesn't have a great deal of self-erecting tents. The ones which are available in the market are the inflatable ones. Despite the fact that these inflatable tents can be raised at the press of a solitary catch, these are inclined to penetrates which limit their utilization by large scale. Accordingly, there is an incredible

breadth to improve here. The possibility of telescopic tube tent may conquer the issue of penetrates. The tent will have a plan as unbending and vigorous as could really be expected.

This review paper gives detail data about different kinds of Self-erecting tents.

## II. SELF-ERECTING TENTS

The primary point is to contemplate existing self-raising systems and structures and to find out the best framework that is productive, less tedious, adaptable and less inclined to perforations and suitable for desired application. The diverse self-raising frameworks and structures and frameworks studied in various patents are stated below:

[1] This design of a self-erecting tent by Heinz Roder can be raised in different sizes and shapes and is portrayed by the way that the tent can be changed. It tends to be mounted on a movable or rolling and acceptable stage, which can be changed over from a vehicle position into an erection position. The tent comprises of an adaptive help pole and a majority of adjustable arms, the collapsed rooftop fabric being associated with the endmost expanded component of each arm to give pressure or tension and backing when it is broadened and foldability when it is withdrawn.

[2] In this patent, at least one inflatable tube is utilized to help a self-erecting tent. On the off chance that at least two tubes, they may have in any event one gets over befuddled in the way of traditional domed tent posts. The tube or tubes are gotten or releasably got to the tent so the tent is self-raising as the tube or tubes are expanded. At the point when at least two tubes are utilized, the tubes might be associated by a helper tube so that driving compressed air into one tube brings about all tubes swelling at the same time. The closures of the tubes are self-fixing to oblige moderately high pneumatic force inside the tube, in the request for 20-30

pounds for each square inch swelled pressing factor, in this way giving an altogether inflexible construction from which the tent is suspended.

[3] This automated collapsing tent by Pei-Chuan Liu incorporates at any rate a majority of main brackets, auxiliary brackets, connecting rod groups, elevation devices, and a tent fabric. After the main brackets and the auxiliary brackets are rotated, the interfacing pole bunches for supporting the helper sections to unfurl are arranged between the primary sections and the helper sections. The auxiliary brackets are assembled at a top square, the elevation device is arranged on a top finish of the primary section and is power-associated with the interfacing bar gathering, and the tent fabric is wrapped on top of the main brackets and the helper sections. Appropriately, the elevation devices are controlled to simultaneously work through a far-off regulator, to activate the main brackets to rise and plunge, and to impel the helper sections to unfurl or overlay, subsequently naturally working the tent to overlap and unfurl.

[4] Kadestrick D. Russel patented an auto-erecting tent where corners of said tent incorporate automated extending members that work at the same time to broaden and withdraw along the lines of raising or lowering the tent on a case-by-case basis. Every one of the extending members incorporates an engine that drives the extending part to degree and withdraw depending on the situation. The tent is square or rectangular across a story surface, and extending members are situated at each edge of the floor surface. Two extending members are given at a first edge, and are associated through a first sidelong part though the excess two extending members are associated by means of a second horizontal part. A top, extending support connects to the main parallel part and the second sidelong part to help a rooftop surface of the tent.

[5] JuyoungJin presents a tent casing incorporating supporting shafts and an upper edge associated with the supporting posts. The upper edge incorporates a guide post, first and second connectors, upper associating units, and a driving system. The first and second connectors are combined with the guide post. Every upper interfacing unit incorporates at least one upper post sets. Every upper shaft pair incorporates two upper posts vitally associated with one another and framing an "X" shape when unfurled. Of the upper post pair proximal the guide shaft, one upper shaft is critically associated with the primary connector and the other upper post is significantly associated with the subsequent connector. The driving system incorporates an engine for moving either of the first and second connectors along the guide shaft, a force

hotspot for giving capacity to the engine, and a controlling gadget for controlling the engine.

[6] This patent introduces a canopy erectable by a solitary client by utilization of a crank assembly. The covering is developed of an expandable edge including legs, vertical turning individuals, and even pivoting individuals. Every leg has a foot toward one side. One foot has a venturing segment and every one of the leftover feet have a sliding bit. The vertical turning individuals are each associated with one leg and are versatily associated with one another vertical pivoting part at a centre point. The level turning individuals are each rotatably associated between two distinct legs at a fixed point on every leg. Every leg likewise has a versatile section slidably associated with it and the section is rotatably associated with each nearby level pivoting part. A wrench is appended to the leg with the principal foot; wherein the wrench is operably associated with control the situation of the versatile section.

### III. DISCUSSION

The patent audit led above features the progressions in the systems utilized in self-erecting tents. It tends to be seen that a great deal of systems is being developed to raise the tents consequently. Hence it is important to recognize simple and cost-effective systems for the above expressed reason.

'Telescoping' in components can be characterized as the one section sliding out from another, the specific justification the condition being expanding the length of object. In the cutting-edge time this can be accomplished by the utilization of pneumatics and hydraulics. The primary benefit of utilizing this instrument lies in the simplicity of activity and cost adequacy of the component. This instrument will principally be utilized to expand the tallness of the tent.

Another worry in regards to raising a tent consequently is the way to build the territory inside the tent. This can be accomplished by utilizing an appropriate withdrawing and extending component. An umbrella-type mechanism can be utilized for this accurate reason. An umbrella-type system for the most part involves a central post or bar, 4 to 12 ribs, depending upon the size, which are pivotally associated with the bar, a sprinter or a sliding hub, tensioning strings and spring which applies a pulling power on the tensioning strings. This umbrella-type instrument will be impelled utilizing a rack and pinion arrangement. The pinion is attached to a motor which will pivot it and thus will push the rack vertically upwards. At the end-most point of rack is arranged the sprinter or sliding hub which thusly

will grow the ribs of umbrella to take the shape of a canopy.

From the general patent survey conducted, it is obviously seen that there is a wide degree to explore in self erecting frameworks. The frameworks utilized as in [3] 'Automatic Folding tent' and [6] 'Collapsible, erectable canopy shelter with a crank system' is a little complex. There is also a need to develop a simple framework for dealing with punctures.

#### IV. CONCLUSION

Tent, a compact safe house, comprises of an inflexible structure covered by some adaptable substance. Tents are utilized for a wide assortment of purposes, including diversion, investigation, military camp, and public social occasions, for example, bazaars, strict administrations, dramatic exhibitions, and shows of plants or domesticated animals. Tents have likewise been the abodes of a large portion of the migrant people groups of the world, from old civilizations.

These are some of the points that came along while reading the literatures and research papers related to self-erecting structures and frameworks:

1. Dominant part of self-raising structures accessible are inflatable in nature, whose fundamental downside is that they are inclined to punctures.
2. The accessible space inside the inflatable tent constructions is less the specific reason for the circumstance being the expansion in size of system in every direction when loaded up with air.
3. The sturdy and robust self-raising systems accessible are little in size and their uses are restricted generally and erection of large sized tents involves a lot of labour.

The significant element of this paper is to propose a plan to raise a tough and powerful construction with however much less manpower or labour as could reasonably be expected. While there is an extent of progress later on regarding timing motors and sensors to distinguish the development of different parts of the system, by providing a strong and robust design the problem faced due to perforations can be resolved.

#### V. ACKNOWLEDGEMENT

We express our genuine gratitude to every one of the individuals who helped us in various little and huge business related to our project.

#### REFERENCES

- [1]. US5002082A – “Self-erecting tent” (Pub. by: Heinz Roder, Pub. Date: 26<sup>th</sup> March, 1991)
- [2]. US6263617B1 – “Inflatable self-erecting tent” (Pub. by: Jean-Marc Daniel Turcot, John Robert Turcot, Pub. Date: 24<sup>th</sup> July, 2001)
- [3]. US20100006131A1 – “Automatic folding tent” (Pub. by: Pei-Chuan Liu, Pub. Date: 14th January, 2010)
- [4]. US8919364B1 – “Auto-erecting tent” (Pub. by: Kadestrick D. Russell, Pub. Date: 30th December, 2014)
- [5]. US9995058B2 – “Automatically foldable tent frames and mechanisms for automatically folding and unfolding tent frames” (Pub. by: JuyoungJin, Pub. Date: 12th June, 2018)
- [6]. WO2018017857A3 – “Collapsible, erectable canopy shelter with a crank system” (Pub. by: Lucas Ferrari, Paul PAESANG, Pub. Date: 22<sup>nd</sup> August, 2019)



**International Journal of Advances in  
Engineering and Management**  
**ISSN: 2395-5252**



# IJAEM

**Volume: 03**

**Issue: 03**

**DOI: 10.35629/5252**

**[www.ijaem.net](http://www.ijaem.net)**

**Email id: [ijaem.paper@gmail.com](mailto:ijaem.paper@gmail.com)**