

Design of a Resizable Display Stand

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Abstract - This is the design of a customizable display stand. Items like printed flex sheets can be displayed on this display stand or it can be used for purposes such as projector screen. The length of the display area can be increased up to 12 feet and width can be increased up to 6 feet. The height of the stand can also be changed. The product is made light weight so that one can carry it around with ease and without help of a second person. Also it can also be folded into smaller size for easy transport, for example, inside a five seater car.

Key Words: Carry, Customizable, display stand, light weight.

1. INTRODUCTION

Display stands are widely used in various purposes related to education, entertainment, advertising etc. But existing designs are not customisable regarding the case of display size and height or atleast when it comes to combining both these features. Now things will change with this super expandable, super compact and user friendly display stand.

2. LITERATURE REVIEW

2.1. Display Stands

By the term display stand we mean any supporting device used for any type of displays, for examples it can be a stand for displaying a printed flex, a stand for a projector screen, a stand for a notice board, etc. Existing designs of display stands and display boards vary much in the way items are attached and how they are supported.. The design may be hung from roof, attached to walls or placed on the floor.



Fig 1



Fig 2



Fig 3



Fig 4

2.2. Advantages of Proposed Design

The length and width of display are resizable and height is also adjustable. Aluminium is used to make the product so it is light weight. The arms of the stand can be folded and so with reduced size its portability is increased. The joints are movable or can rotate but still design remains stable. It can be easily packed inside a car.

2.3. Disadvantages of Proposed Design

The design may not be stable for using outdoors especially if the display area is large because it catches wind.

2.4. Existing designs with similar concept

The existing projector screen stand designs offer almost similar but reduced functions. It can be folded into single unit and also the display area is extensible but it has only height wise resizing.

3. DESIGN PROCESS

3.1. Problem identification/Need Gap

Existing display stands have limited span and resizing and hence cannot be used for multiple display sizes.

3.2. Problem Statement

To design a light weight, user friendly, display stand with a resizable display area.

3.3. Problem Definition

The length and width of the display area should be resizable so that display of any size can be attached to it. Height of the stand should be adjustable. Product should be of light weight so it is easy to carry and setup by two persons. The mechanism of attaching the display should be simple and anyone knowing or not knowing about the product should be able to use it. The design should be foldable into a slender shape and one must be able to pack it inside a car for easy transport. The design should be stable and the stand should not fall down or fall apart due to weight or any small disturbances.

3.3.1. Need Tree

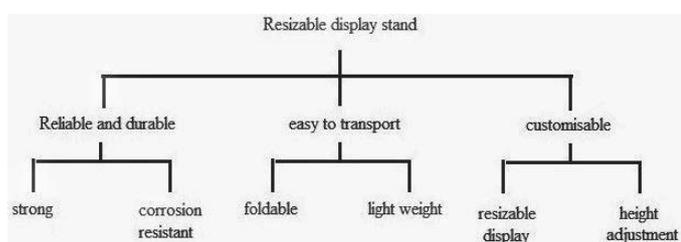


Fig 5

3.3.2. Objective/Desired features

- Corrosion resistance
- Strength
- Durability

- Simplicity
- User friendliness
- Eco-Friendliness
- Reusability
- Cost efficiency
- Ease of Manufacture
- Expandability & Fold ability
- Aesthetics
- Multiple Functionality
- Compactness
- Ease of transport
- Serviceability
- Stability
- Reliability

3.3.3. Design Means

Adjustable arms, sliding mechanisms and clips.

3.4. Conceptualization

3.4.1. Standardization Needs

There are no welded joints or riveted joints. All joints are made by nuts and bolts so that frame can be easily dismantled if needed. Nuts and bolts used in the design are of standard sizes so that replacement is easy. Main frame of the product is made of Aluminium square pipes, angle sections and flat pieces of standard sizes. This increases the serviceability of the product. If a part of the frame is damaged or bent by impact repair or replacement is easy.

3.4.2. Design detailing

Support base - 60 cm diameter circular shape. (Adapted from Pedestrian fan base)

Main mast and sliding section - 180 cm long, 5 cm side square pipe. Provided with grooves for sliding joints and 0.5 cm diameter holes for fixing pins for setting height.

Main arms - 2 pieces, each 180 cm long, 2.5 cm x 2.5 cm angle section.

Drop down arms - 4 pieces, 90 cm long, 2.5 cm x 2.5 cm angle section pressed into flat piece.

Nuts and bolts - 10 mm, double nut and clips.

3.4.3. Construction

The whole product was made using Aluminium pipes and sections. The base of the stand is a circular metal base which is same as that of a pedestal fan base. The main mast is 180 cm long and has holes at intervals of 30 cm. A 30 cm long horizontal section slides along this pole and can be fixed by pins. This section has the two main arms bolted to its ends and the arms can rotate to allow length adjustment. The arm widening is designed to be done symmetrically about the main mast using certain support mechanisms so that display

is held horizontal. The ends are attached with foldable flat pieces. The frame has clips at four corners to hold the display item in place. Nuts and bolts are used for all joints.

3.5. Prototyping

A prototype is made and its different configurations are shown below:



Fig 6. Folded state for packing and transport



Fig 7. Intermediate size



Fig 7. Full size (12 feet x 6 feet)



Fig 8. Display stand with a 8 feet x 4 feet flex

4. CONCLUSION

It was entirely novel and different from the existing Display Boards and for the same reason it was really a challenging task. This new design has great use since it can be used for displays of any size in a variety of situations. The resizable display stand can hold flex sheet of maximum length 12 feet and maximum width 6 feet .So now it is easy to present displays of different size with ease. The size and height of the flex stand can be changed accordingly. As we use displays of different sizes, it is difficult to make new frame for every new need. It is costly and time consuming. With this product coming to the market, it would help the users save time and money. This can also be used as a projector screen stand. This product is mainly designed to be kept indoors and at places having less wind and is not stable in very strong winds.

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