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## Design And Development Of Shoe Washer

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**Abstract:** In modern times we have to have proper attire in any domain since that represents our character, style, and way of working. and the shoe washer is a product which will help to reduce the time for washing the shoes manually and we can have clean pair of shoes to wear. Normal washing machines are compatible with washing shoes, but we are not using them to wash various resinous. Since the washing of shoes can't be done in the washing machine because the machine itself is used for a different purpose which is cleaning clothes and daily used clothes which have to be kept clean and hygienic so we usually don't use the washing machine to wash the shoes because of hygiene purpose and the washer must be clean and shouldn't have order in the machines.

**Index Terms** - Shoes, Washing.

### I. INTRODUCTION

The idea of a shoe washer arrived from the basic need of any person which is clean pair of shoes which is necessary for any domain respectively, every domain has its attire and style which is to be represented cleanly. so how we wash clothes and where them in a clean manner it's necessary that shoes also must be cleaned and hygienic so that it matches our attire and represent our activity. so, there was a gap between a washing machine and a shoe cleaner which was a shoe washer.

We can wash the shoes in the normal washing machine but we usually don't use the washing machine to wash the shoes and so are there is a machine which is specifically made for washing the shoes in future it might even be upgraded to polishing it's also so whereas a shoe cleaner will just clean the shoes, especially the soul of the shoes and some dirt on the shoe surface so it's an opportunity for developing a shoe washer which is specifically made for washing the shoes and which reduce the human effort which is put on washing the shoes manually when it's dirty we usually wash the shoes on Sundays or 15 days once in weekends which is tiring we usually don't like to do but still we do it because it's a necessary part of our life. So, taking this opportunity we are developing a product which is compatible with shoe washing and drying also will be an advantage and less time consuming than before which will help us to wash the shoes and wear them in a clean manner. The market for shoe washer is more as we are concentrated on targeted audience.

### II. LITERATURE SURVEY

All the shoes which we use very often get dirty. We need to clean them, but we cannot accommodate a particular time for washing them or cleaning them. So, we need to have a specific device that does this work for us. Before getting into designing part of the product it's necessary to go through the background theory of the product which includes literature survey and market analysis of the existing product and their working architecture these are all the primary data which will be a key for our design process which will help us to get a clear picture of what we want to do in our project this will help to set a path and guide us through the entire product development and the outcome can be analyzed in every individual process so that's the reason background study is necessary for any product.

All the shoes which we use very often get dirty. We need to clean them, but we cannot accommodate a particular time for washing them or cleaning them. So, we need to have a specific device that does this work for us. In general, we all have a washing machine in the home but we are not allowed to put our shoes in it for various reasons by this we need to have a device that specifically does this operation for us.

Some of them are just able to remove the dirt from the shoe and polish it but it's not possible for washing the shoe. And mainly washing the shoe depends on the material of the shoe.

### **III. PRODUCT STUDY**

The purpose of the products is to wash the shoe properly and make it clean and dry. so that it can be used as if it's new and we don't have to spend time on it for cleaning or polishing etc. some of the materials which are used for manufacturing the shoes can be washed properly wherein some of the materials can't be washed it just has to be cleaned with a dry cloth or with some moisture on the clothes.

The product will allow the user to wash his shoes properly, the soul and the body of the shoes will be cleaned via bristles and a soft detergent that doesn't affect the material of the shoes. We normally use canvas, sports shoes, and sneakers these shoes are manufactured using materials like nylon cotton polyester and rubber these materials are not affected by water.

### **IV. SUMMERY OF LITERATURE SURVEY**

By literature survey, we got to know that there is a market for this product which can be useful for many consumers and which will solve their purpose of washing the shoes and we got to know the competitors in the market by which we can make our product more efficient than the existing one. through the material study, we have found a few materials which can be watched through water and soft detergent so that it will not affect the shoes while it's been washed through the water.

### **V. PROBLEM DEFINITION AND OBJECTIVE**

Using primary, secondary, and tertiary research, which included multiple case studies and patent studies, as well as a literature survey. We went through various customers for consumers and asked them about the product and gathered a lot of information that we needed to develop the product, and we identified various pain points in the consumers that needed to be addressed, which would become the product solution, and we went through a lot of tertiary research. have finalized one concept for achieving the project's goal.

For the execution of the product, we must have all the information about the product and specific details about the product as in motor specification calibration of the product connections and other data related to the product which will help for better development of the product After gathering all the data it will be analysed properly and arranged in a manner wherein it will be a helpful resource for the development of the shoe washer.

### **VI. TRENDS OF SHOE CLEANER**

In this field of society, there has been no significant development from the earlier days there are only some changes which is first the politician of the shoes used to be done by hand or manually now it is automated with a Rotary brush on a horizontal axis so there is no development in the social domain.

## VII. RESULTS AND DISCUSSION



Fig. 1. Shoe Cleaner Trends

The process followed are finding gap, product research, data gathering, analyzing the data, brainstorming, ideation sketches, concept selection, detail design, 3D modelling, prototyping.

Shoes which are made up of fabric like cotton and nylon soft plastic extra can be washed and materials like leather silk Rubber and vinyl can't be e wash using water because it will damage the material and we might have to change the entire body of the shoes so it's always good to know how to clean the shoes before cleaning it with water.

We got to have information about what to use for cleaning shoes according to its material if this is not possible then we might end up messing up the shoes Some shoes shouldn't be washed in the washing machine because it might end up in tearing and bending the shoes which will lead to loss of glowing the lifespan of shoes will reduce so cleaning shoes itself is a task which has to be done carefully, so that we can have a longer lifespan of shoes. Some of them are just able to remove the dirt from the shoe and polish it but it's not possible for washing the shoe. And mainly washing the shoe depends on the material of the shoe.

### 7.1 Design Architecture for shoe washer

The shoe washer will have two motors which will be attached two separate spindles of the washer so that the drum rotate in clock wise direction and the center bristle rotor rotate in antilock wise direction the cater spindle is hollow by this both the spindle will be in same Y axis point which is shown in the figure 2. Both the motor will be driven by a controller in the washer.

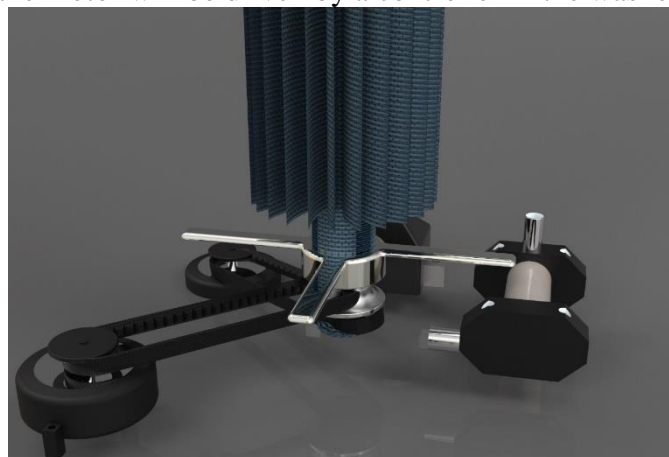


Fig. 2. Working of Shoe Washer

Since the drum rotation is in clockwise and the rotor rotation is in anticlockwise it would be an advantage over normal washing because the time taken in the Show offer for washing shoes is less than manual washing shoes so it's always better to have this clockwise and anticlockwise rotation so that the shoes will be washed as soon as possible and dirt will be removed properly from the true soul at the same time fabric of the shoes.

After the washing of the shoes the screw washer will have a dryer which is fit on the top of the shoes which is helpful for drying the shoes as fast as possible and it also have a UV like other both sides on the top so that if there is any kind of bad smell or virus due to the UV light everything will be eliminated and the shoes will be cleaned as possible without no stinking smell.

## 7.2 Concept 1 Form Exploration of Standing Shoe Washer

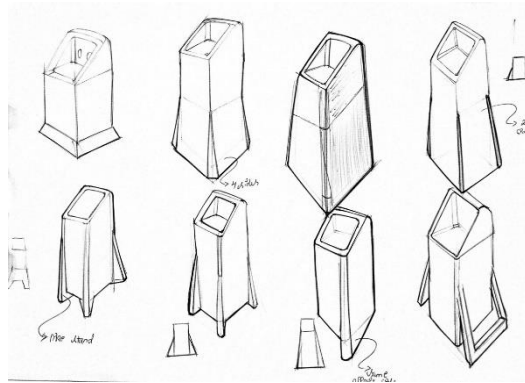


Fig. 3. Form Exploration for Standing shoe washer

This design is selected for the final product since it has all the features like blow-dry and iv light in it. It will allow the product to dry much quicker than other concepts.

## 7.3 Concept 2 Form Exploration of Wall Mount Shoe Washer

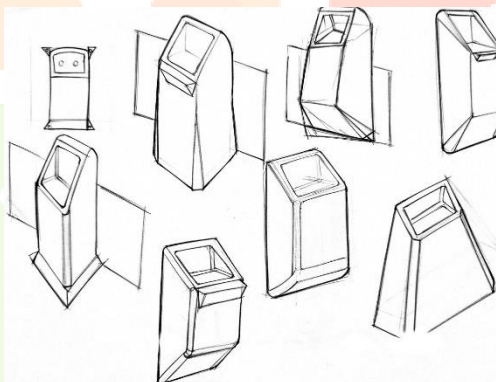


Fig. 4. Form Exploration for Wall mount shoe washer

This design is based on wall mount mechanism which will be held on to the wall and can be used whenever necessary of washing the shoe washer, it will be held in one spot and won't be moved here and there. The product form is based on the advanced form and which is bled of both organic forms and rugged form by this we can get that different feel in a single product. The structure is vertically tall than other concepts and will be compact in the matter of width which will allow to stack shoes vertically and accommodate four pairs of shoes in a single go.

Wall mount concept is an entirely new challenge which needs a lot of calibration so that the emission of the product will function properly and it has to be hung on the wall and while washing the shoes there will be lot of vibration in the product the entire system must hold onto the impact which is created inside the drum and still it has to be e table on the wall.



## 7.4 Final Concept Selected

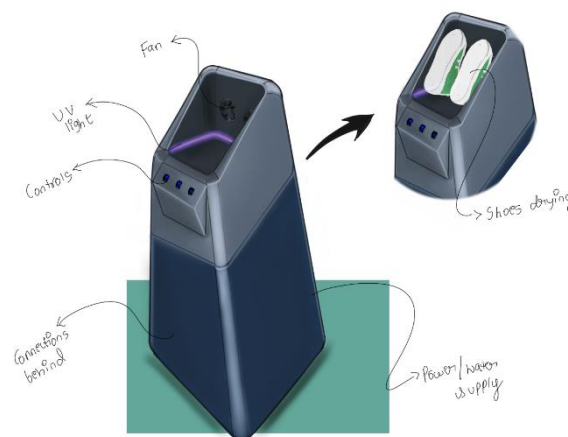


Fig. 4. Final concept selected

The design has a mechanism the same as the top load washing machine but the rotor and drum will rotate in opposite directions and the shoes will be dried by UV light and blow-dry.

## 7.5 Product Components

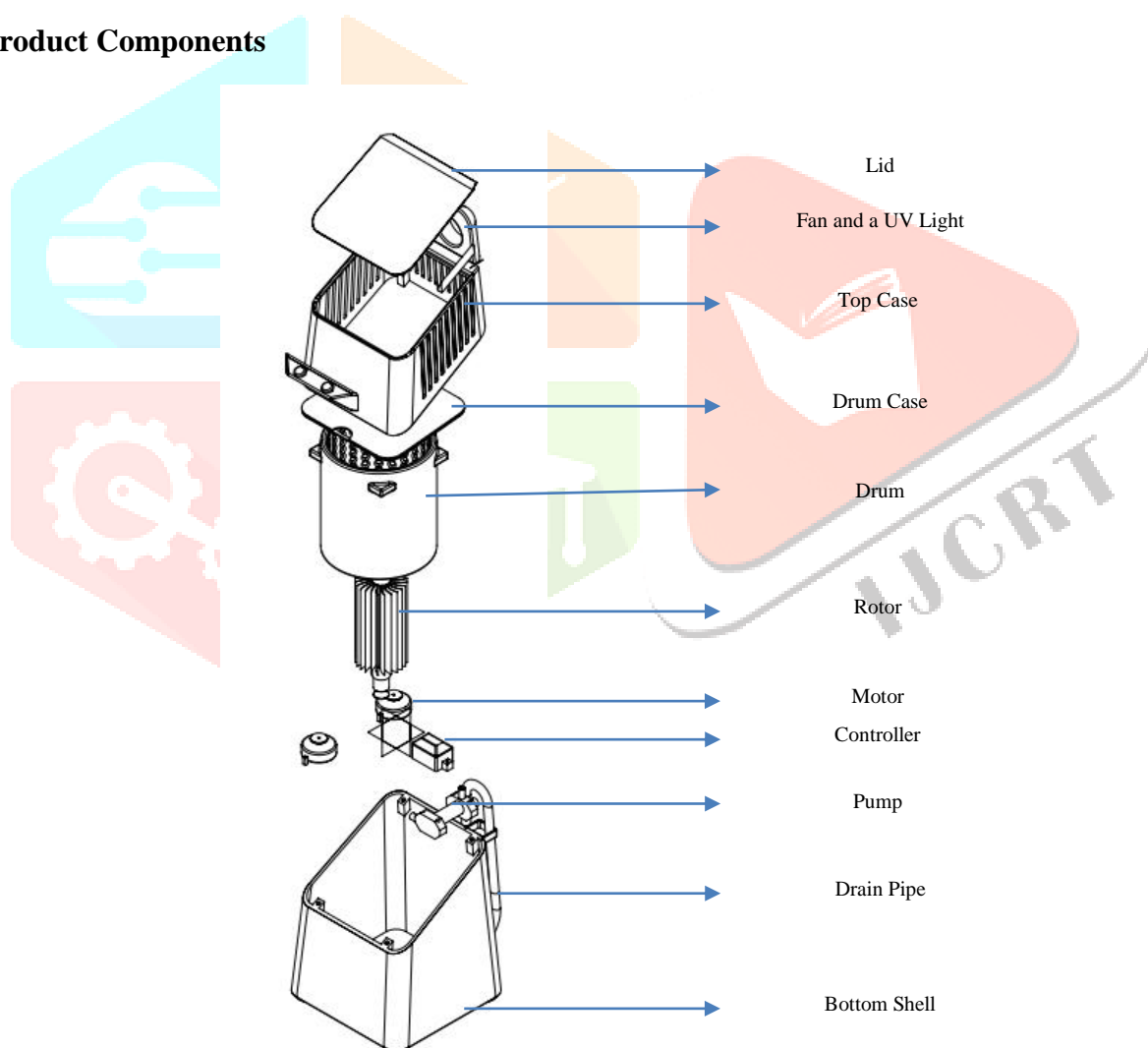


Fig. 5. Exploded view of product

Each and all the parts are shown in the exploded view and all the attachment parts like screw and bolt are also properly shown in the exploded view which will help develop the product.

## 7.6 Working Principal pf Product

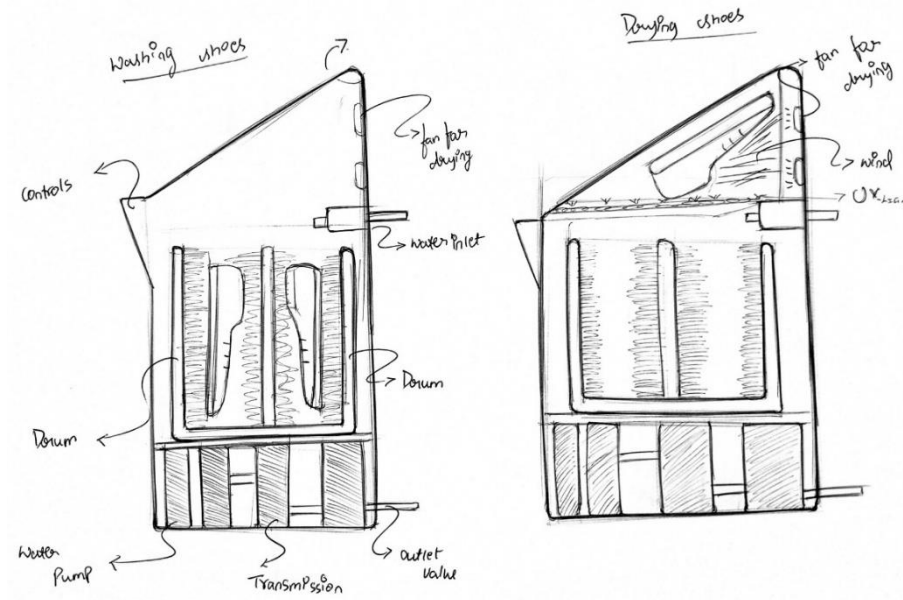


Fig. 6. Working of product

The design has a mechanism the same as the top load washing machine but the rotor and drum will rotate in opposite directions and the shoes will be dried by UV light and blow-dry.

## 7.7 Product Dimension

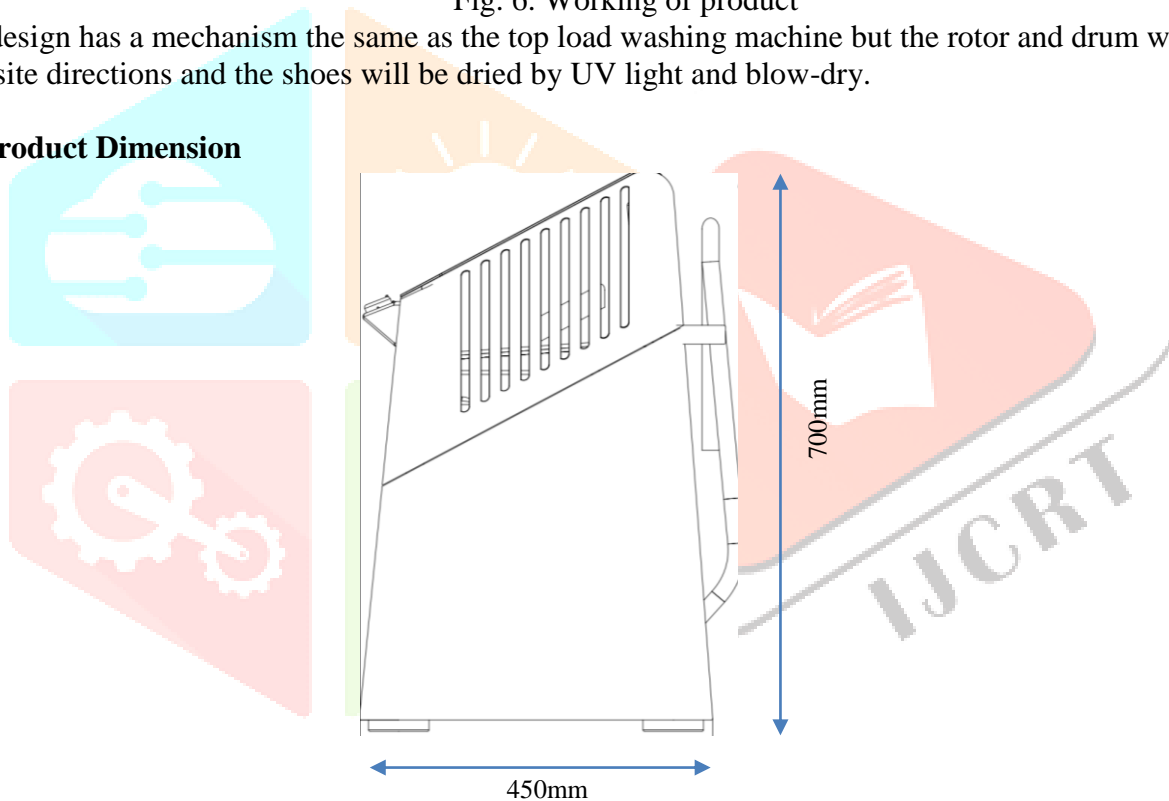


Fig. 7. Product Dimension in mm

The measurements are taken from anthropometrics data so that it matches all percentile. The dimension of the shoe washer is proper and can easily be used by all percentiles. By this we can let all the people use the product with any discomfort.

- **Product Dimension:** 700mm
- **Parameter:** Lower Position Height
- **Percentile assessment:** The percentile falls slightly below the 25<sup>th</sup> percentile female
- **Analysis:** the dimension is slightly less than the 25<sup>th</sup> percentile it can easily be used by all percentiles.
- **Reasoning:** the dimension of the shoe washer is proper and can easily be used by all percentiles.
- **Conclusion:** no changes are required

## 7.8 Product Rendering



Fig. 8. Product Render

The product will have the same appearance when the prototype is done and the product will be available in the market for the consumer by this it can reach large number of consumers.

## 7.9 Context Render of Product Use



Fig. 9. Context Render of Product

By the context render we can get to know how the product will look in realistic Background.

## VIII. CONCLUSION

By all the data gathered from the primary, secondary, and tertiary research we have come to a phase where the market for shoe washers is evident and it can be a good product that can serve the society and also, we can be able to wash the shoes in less time and dry them as quickly as possible.

The product can be seen in all the homes who are working professionals and even house old usage to which contributes to washing the doormats and various other things.

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