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AUTOMATIC SHOE POLISHER PROTOTYPE DEVELOPMENT USING THE APPLICATION OF VALUE ADDED ANALYSIS

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Abstract -*This paper reports the design and development of the automatic shoe polishing machine which works using the electric polish dispenser. As all the students, especially school children and employee need to wear clean shoe. This automatic shoe polishing machine reduces the disadvantages in the current product available in the market. This machine is designed on the basis of time reduction in shoe polishing and to cover the full portion of the shoe with polish. By taking all this into account it reduces the manual shoe polishing and it helps to use the modern techniques.*

Keywords-Two brushes, Single motor, Sensors, Polish dispenser, and Cost reduction;

1. INTRODUCTION

The history of the shoe polish was started before the year 1900 using the wax, ash and tallow. After 1900 it was replaced by using the different liquids and suspended solids. In 1945, the first shoe shine machine was built which was very complex to operate. In this corporate world dressing plays a regard very important role to look professional. For this regard good shoe polishing with shine gives more importance. By polishing the shoe manually may damage the surface of the leather. By this Life of the shoe will get reduces. More than this it will take much time and human effort to polish. On the other hand the current automatic shoe polisher which is available in the market will not do recommended polish and also it will take more time to polish. In order to overcome all these difficulties an ergonomically designed and more effective shoe polishing machine is essential.

To overcome all these difficulties the machine is incorporated with one top and two side brushes to cover the whole surface of the shoe portion and produces the quality shoe polish compared to the current shoe polishers in the market. And also it reduces the time consumption for shoe polishing. As the machine is using the polishing dispenser, so that it can overcome the need for applying polish and manual effort. Since this machine is using the coin operated machine as the optional so that it can be used for the commercial purpose also.

2. SCOPE OF THE PROJECT

This machine can be used in the schools, colleges, Hotels, Airport, Hospital, Home etc.

3. IDEA GENERATION

Idea generation is one of the innovative techniques of making, emerging and interactive the new ideas, where an idea will be unspoken as a basic component of supposed that can be imagined, real or intellectual. It covers all stages of a thought cycle from beginning of the newness to growth stage. And also idea generation is a vital part of the design procedure.

3.1 Idea generation consists of the following steps:

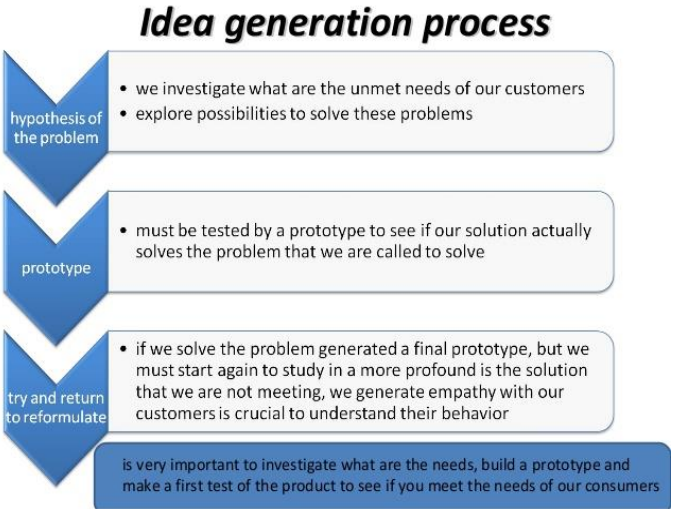

Fig -1: Idea generation process

In idea generation process we investigated the drawbacks in the current automatic shoe following machine. We found the current product is not compact in the size .And price wise is also more. So our main is to explore possibilities to solve these problems. The design and development of the machine is very compact in size. we eliminated unnecessary components in the current

machine and made it very simple after design of this machine it is tested by prototype to see if our solutions actually solves the problem that we are called to solve. After that it is very important to investigate what are the needs, build a prototype and make a first test of the product to see if you meet the needs of the consumers.

4. Concept design

Once idea generation is done next important step is concept design. This method mainly includes the generation of shape to the generated idea. In this step we used the solid works software for concept design. We generated the four concept designs with different mechanisms using the same idea. The main objectives of the concept devsign is

4.1Developed concept designs

Fig -2: concept 1

Fig -3:concept 2

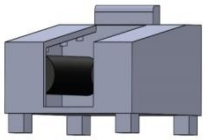

Fig -4:Concept 3

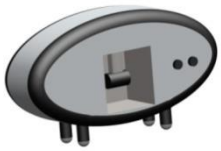

Fig -5: concept 4

5. Concept selection by using the Pugh matrix

Pugh matrix is a type of matrix drawing that enables for difference in design applicants and eventually leads to the feasible encounter standards. The Pugh matrix we build has following features. In first row of the Matrix we considered the parameters of the product and first row is consists of concept designs

Table -1: Pugh matrix for concept designs

	Concept design 1	Concept design 2	Concept design 3	Concept design 4
No of components	14	9	8	12
Size (L*D*H) mm	550*300 *250	550*320 *300	400*280 *160	600*300 *200
Weight (kg)	10	9	5	8
usage	Hotel,school and home	School and home	Home and school	Hotel,school and home
cost	4500	3500	1700	3000

Once the Pugh matrix is generated next step is to select the most feasible concept. This is done by the giving ratings to the most convenient design. The following below table shows the rating given to the particular design.

Table -2: Concept selection

Sl no	Concept 1	Concept 2	Concept 3	Concept 4
1	4	5	8	4
2	3	4	9	3
3	5	5	9	7
4	10	6	6	10
5	2	5	8	6
Total ratings for each concept	24	25	40	30

- Since concept has got less components and compact in size so it got highest ratings
- We chose concept 3 for the prototype development
- All the ratings are given out of 10

6. The following materials for the prototype development

Table -3: Sample Table format

Sl no	components	quantity
1	Large gear	1
2	Small gear	2
3	Motor	1
4	brush	2
5	bearings	4
6	Electric polish dispenser	1

7. Final prototype

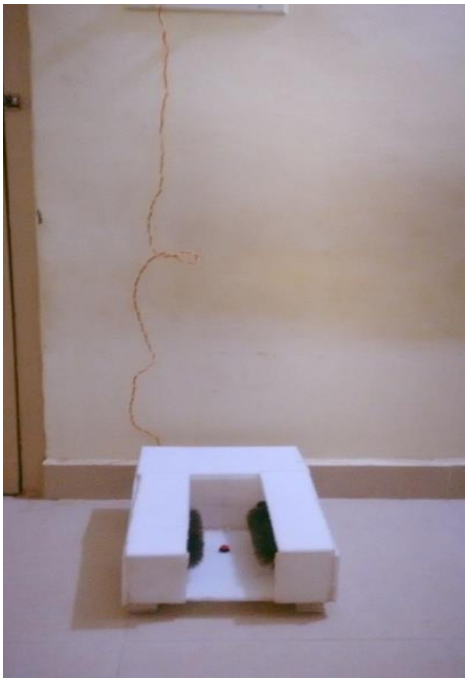

Fig -6: Final prototype

8.Conclusion

Developed prototype found to be more ergonomic, cost effective and will polishes the whole surface of the shoe compared to the other products available in the market. Quality of shoe shining will improve as top and two side brushes are provided in the machine. Also the product will reduce the 50% of the cost, weight and size compared to the currently available product in the market. The machine will completely eliminates the need for applying polish by introducing shoe polishing dispenser. The other advantage is by adding the coin operated mechanism shoe polishing machine can be used for commercial purposes in places like super markets, airports, restaurants, educational institutions and hospitals as a vending machine etc.

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