

Coin operated shoe polishing machine

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Abstract: The main aim of our project is to design a coin operated shoe polishing machine. As all the faculty employee want to wear a shoe which is clean. This machine help in reducing the difficulty of existing product available in the market at the same time increase the use of this product in offices, institution etc. The coin operated shoe polishing machine have been designed considering all the requirement and need of users. It has a sensing device which sense the coin depending on that it start working. It is portable and adjustable which makes a person to bring its best feet forward.

The problem which arise in the manual operation has been reduced in this machine. Each and every person thinks that their shoe should be clean and shiny. Taking all these into account we have designed this product which reduces the burden of manual operation at the same time increases the use of modern techniques.

This project is to provide an apparatus for shining shoes which overcome the problem encountered in the conventional one. It obtain a desired shoe shining effect greater than a manual one.

1. INTRODUCTION:

The coin operated shoe polishing machine is used to polish your shoe within a short interval of time which reduces human strength and effort. The selection of shoe nowadays become much difficult all of them want that their shoes should give an attractive look and much better long lasting but forget to follow the steps that needed, therefore reminding all these difficulties we have developed this machine which give your shoes desired look everyday with better shine.

The introduction of this machine helps in efficient working by combining the cleaning and polishing at one place. It reduces the human effort. This machine is portable and economical it not only complete the need but also add a new lifestyle for the faculty who regularly uses the shoe. There are so many this types of machine exists but a developed method of making makes the users to use at the same time a wants of the users never ends. Still further modification can be done in this type.

2. LITERATURE REVIEW:

During the design of this machine we have taken a consideration that it should be more efficient than manual operation and should reduce the difficulty exists in the conventional one. The machine uses a coin operated metal sensor for sensing, motor and shaft for rotation. This simple mechanism is only used for polishing the shoe.

During the design we came through some difficulties that when the users are using this machine they have to give their body support because in one leg person can't stand. The next is that every time user have move their feet back and forth which put some stress on person. If there is a case of coin operation machine then people are also using any metal in place of a coin since the device is a metal sensing device. Therefore a tremendous modification is required in this area of design which increase the advancement of the technology.

3. DESIGN OF MACHINE:

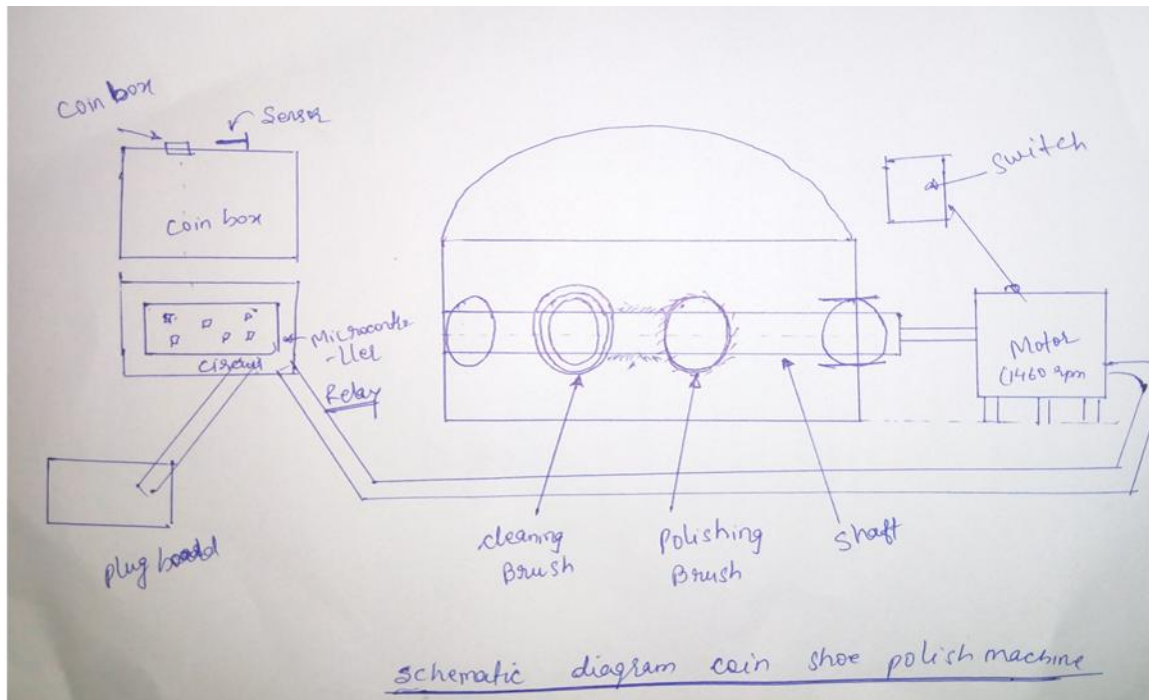


Fig 1. Block diagram of coin operated shoe polishing machine.

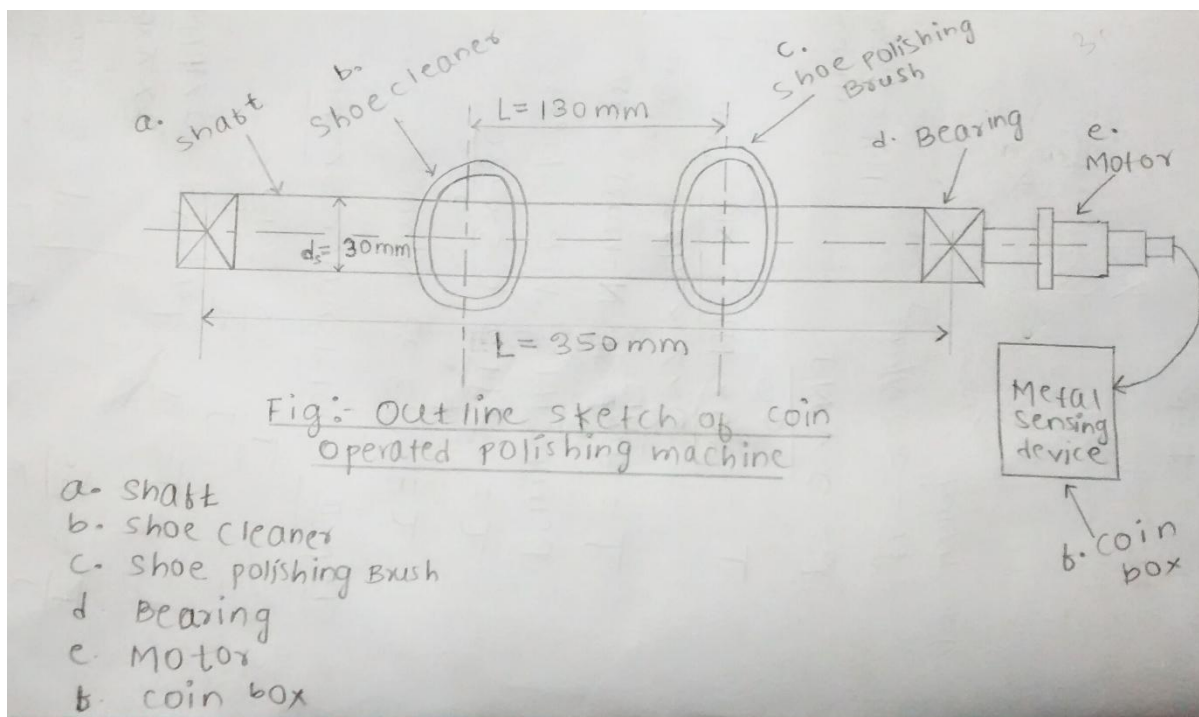


Fig 2. Outline Sketch of coin operated shoe polishing machine.

4. DESIGN CALCULATION:

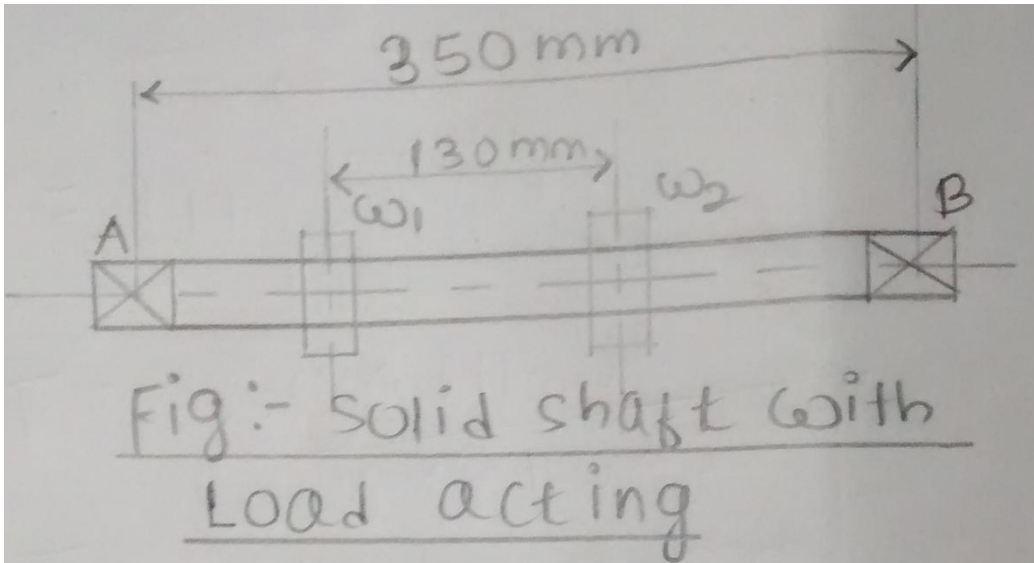


Fig 3: solid shaft with load acting

Problem: Consider a shaft rotating at a speed of 2400rpm having power of 11.18kw. We have to calculate the diameter of the shaft.

From above fig 3 the load w1 and w2 is taken as negligible. Since it have negligible effect on shaft.

W1- shoe cleaning brush.

W2- polishing brush.

Solution: The given

N=2400RPM

P=11.18KW

Step 1: permissible shear stress

Assume SAE 1030 from design data book as per ASME

Syt=296, taking Fs =3

$$\tau = \frac{S_{ys}}{FS} = \frac{0.5 \times S_{yt}}{3} = \frac{0.5 \times 296}{3}$$

$$\tau = 49.33 \text{MPA}$$

Step 2: torsional moment

$$P = \frac{2 \times \pi \times N \times T}{60}$$

$$T = \frac{60 \times P}{2 \times \pi \times 2400} = \frac{60 \times 11.188 \times 10^3}{2 \times \pi \times 2400}$$

$$T=44.48 \times 10^3 \text{ N-mm}$$

Step 3; diameter of shaft

We know that, $r = \frac{d}{2}$

$$\frac{T}{J} = \frac{\tau}{r}$$

$$\therefore T = \tau \times \frac{\pi}{16} \times d^3$$

$$d^3 = \sqrt[3]{\frac{16 \times 44.48 \times 10^3}{\pi \times 49.33}}$$

$$d = 16.62 \text{ mm}$$

Since, the adopted diameter = 30mm is greater than the calculated diameter = 16.62mm

16.62 < 30mm. Hence the design is safe.

7. CONCLUSION:

The high speed rotation of the shaft help in polishing the shoe more effectively. This method is effective and less time consuming. It eliminates the use of physical effort. The benefits of shoe polishing machine is that

- It enables you to clean and shine shoes effortlessly and quickly.
- Ideal for diverse types of shoes polishing, as per your distinctive requirement.
- Last longer with almost zero maintenance.
- Less time consuming.
- Put your best foot forward.
- Ensures comprehensive cleaning

Problems created by manual operation.

- It damages the surface of leather, if the wire of the brushes is too hard.
- It decrease the life of the leather shoes, if care not taken in selecting the right cream.
 - It take too much time.
 - It is unable to reach the whole surface of the shoe.
 - It take too much human effort.
 - Its efficiency is low.
 - It is very costly

The problems which been created by manual operation is been rectified to some extent but in some areas we still need some modification so that users may get maximum benefits.

8. FUTURE MODIFICATION:

An Automatic shoe polishing machine has not only meet the requirement of the people but also fulfill their needs which marked it be so efficient. This machine have reduced the some part of the man burden by making it much fast in lesser time.

Though, this device have make a day little burden less but still required some modification and improvement which may make it conservative and effective than an existing one.

If you go through the existing machine or if you have ever used it then you will come to know that a person who ever go for polishing a shoe always take a support of a wall to make itself stand over that place while polishing is been done. This condition is better if the machine is kept in front of a wall despite if the machine is kept in an open place then it will became hard time for them to stand over there and polishing therefore to solve this problem one modification can be done that a machine itself is made with some support stand attached to it so that whosoever came for polishing their shoe can take help of that stand so that they may give support to their body. This modification will give you an effective way of standing posture and assist in better polishing.

You would have also seen that while polishing a shoe front part of the shoe is to be put first and after completion of front part you have to twist your foot so that rare part is also to be done. This back and forth motion your foot sometimes put little stress on you. Here also some modification is required. If we use a different mechanism by making the movement the brush or buffer back and forth rather than a person then it may be little helpful for us. There will not be a problem of moving your feet but everything a machine will do you just have to go and stand at that place and polishing will be done.

This modification may assist a man in quality polishing and reduce some human effort.

9. REFERENCE:

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