

TO DESIGN AND MODIFICATION OF AUTOMATIC SHOE POLISH MACHINE



Group No :- ME-13

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OUTLINE

1. Introduction
2. Literature review
3. Methodology
4. Machine development
5. References

1. INTRODUCTION

- There is a famous proverb “cleanliness is next to godliness”. The machine which we will design and fabricate implicate this, called as “automatic shoe polishing machine”
- Most of the industries, hospitals and educational institutions having most preserved laboratories like computer labs, instrumentation labs, operational theatre and various production ,assembly sites in chemical, pharmaceutical industries etc, have to be free from dust and dirt which would be carried through shoes of the employees to the work area, causing untidy environment and also sometimes hazardous to the working environment.

HISTORY

- The history of shoe polish takes us place to the year before 1900 when people polished their boots with a paste made out of ash, wax and tallow.
- Later around 1900, this product was improved by using different liquids and suspended solids like carbon dye, wax, gum Arabic, turpentine, naphtha and lanolin.
- In medieval period, people used a mixture of soda ash, wax, tallow and oil to soften and condition the leather and also make it waterproof. Around 1700s, shine was first added to the polish.

PROBLEM STATEMENT

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.
- It's efficiency is low.
- It is very costly.

PROJECT OBJECTIVE

The objective of this project is listed below,

- Reduce human effort.
- To improve the quality of polishing the shoe
- To reduce the time of operation
- To reduce the material waste
- To improve shining of the shoe
- To combining the operation like cleaning and polishing at one place

SCOPE OF THE PROJECT

These machine can be used in following field,

- Hospital
- Hostel
- Office
- Home
- Air port etc..

2. LITERATURE REVIEW

Component of shoe polishing machine

1. Shoe polish
2. Shoe brush
3. Power transmitting motor
4. Electronic dispenser

SHOE POLISH

1.Introduction

2. Usage

BRUSHES

- There are two types of brushes used in shoe polishing,
 1. **BRISTLE-FILLED BRUSHES**
 2. **HORSE HAIR FILLED BRUSHES**

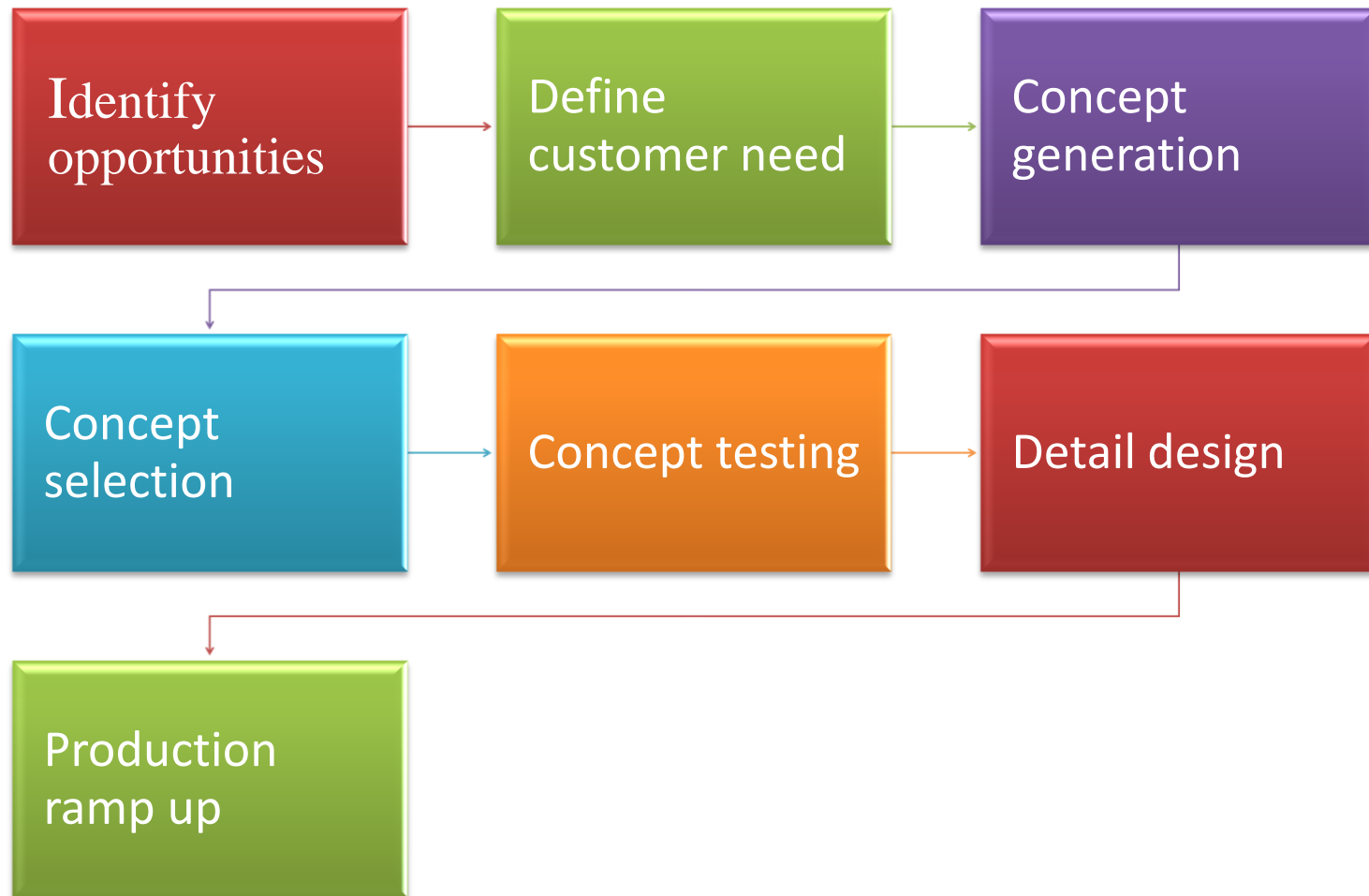
MOTOR

- Types of motor
- CHARACTERISTIC OF MOTOR
- MOTOR SELECTION

ELECTRONIC CREAM DISPENSER

- **INTRODUCTION**
- **TYPES OF LIQUID DISPENSER**

3. METHODOLOGY

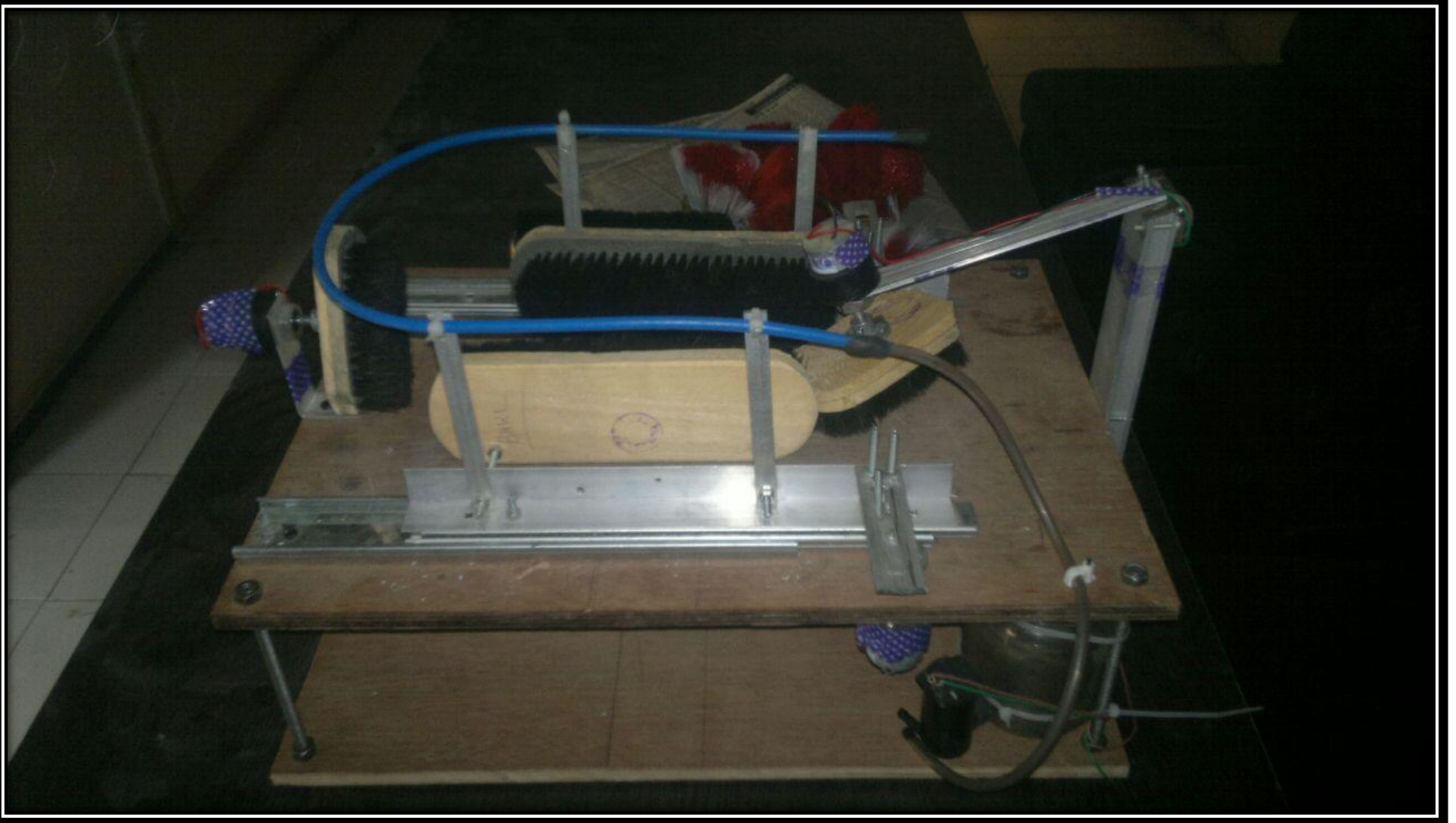


4. MACHINE DEVELOPEMENT

INTRODUCTION

Accordingly, it is an objective of the project to provide an apparatus for shining shoes which overcomes the problems encountered in the conventional art and which can obtain a desired shoe shining effect similar to when shined by a manual work or can obtain an excellent shoe shining effect

Construction of machine



- Shoe polish machine consist of two layer of board, the lower board consist of fluid dispensing mechanism and the power supply unit. the upper layer consist of boot polishing and cleaning mechanism. in which consist of four brushes made from nylon material .here, we have used four brushes and we categorized the brushes into,
 - (1.)Left hand brush
 - (2.)Right hand brush
 - (3.)Front side brush
 - (4.)Back side brush

- Here, all the brushes has co-efficient of friction which lie between 0.68 the left hand brush is placed in the left side of the shoe and right hand shoe is placed in the right side of the shoe. These two brushes are placed in the horizontal direction and both are parallel to each other. The back side brushes is placed in back of the shoe. it's face is placed toward the back of the shoe. The front brush is placed in the front of the shoe and its face is toward the front portion of shoe.
- The left and right side brushes is attached with sliding mechanism, which is able to provide sliding motion to brushes in forward and reverse motion. The back side brush is attached to the 12v dc motor with the help of flange, which is able to give rotational motion to the brush. The front brush is also attached with 12 v dc motor with the help of flange. This brush is able to moves in up and down direction because it is further attached with flexible joint which give them motion in two direction.

- The sliding plate is attached with scotch yoke mechanism, which is able to generate sliding motion in forward and reverse direction. the detail about this mechanism is provided further.
- Now ,we will see the dispensing mechanism ,which consist of following things,
 - (1.)12 v dc water pump
 - (2.) fluid container
 - (3.)fluid dispensing pipe
- The 12v dc water pump is attached with fluid container. The suction head of water pump is submerged into liquid and the delivery head is attached with fluid pipe, which is able to deliver fluid with required pressure. The end side of the pipes is sealed by sealing material for stopping the leakage of fluid .there are several holes are made at some specified point for dispensing of fluid to the surface of the shoe.

- The power supply and control unit consist of following things,
 - (1.) 230v ac step-down transformer
 - (2.) Circuit for converting ac power into dc power
 - (3.) Two ON-OFF switch for controlling the sliding and rotary motion of brush
 - (4.) One ON-OFF switches for controlling the dispensation of fluid
 - (5.) Four 12v dc motor

Working of machine

- This model basically works on a scotch yoke mechanism. In a scotch yoke mechanism, the rotary motion is converted into sliding motion. This motion gives a controlled path, which is best for our project. Here one 12V motor is used for power transmitting. This motor is attached with a scotch yoke mechanism. It converts the rotary motion into sliding motion. There is one sliding plate used for sliding motion, which is used in domestic applications in homes. This sliding plate is attached with a scotch yoke mechanism with the help of L-shaped aluminum angles. On the back side of these angles, the shoe polish brush is attached with the help of a screw. For the back and front side, another 12V DC motor is used for rotating the brushes.

- Now ,when the power is supplied, the first power gone into the step down transformer and 230v power is converted into 12v ac power. From them, it is gone through circuit and the ac power is converted into dc power. This power is supplied to the ON- Off switches which control the motion of motors and pump.
- Here two switch board is provided, from which the first switches board consist of two switches which is used for controlling the two sliding and two rotary motion of the brushes and second switch board consist of one switches which is used for controlling the flow of fluid. from the two switches board ,the switchno-1 is used for controlling thr sliding motion of brush and switch no-2 is used for controlling the rotary motion of front and back side brushes.
- After switching the power supply ,we just need to ON the switches for starting the motor and water pump. The brushes start it work automatically. There is sliding motion of brush create the friction and it will help to get better shining of the shoe.

Component of machine

- (1.) 12v dc motor with 300 rpm
- (2.) 12v transformer
- (3.) WATER PUMP
- (4.) Circuit for converting ac power into dc power
- (5.) Two ON-OFF switch for controlling the sliding and rotary motion of brush
- (6.) One ON-OFF switches for controlling the dispensation of fluid
- (7.) SCOTCH yoke mechanism



(1.)12v dc motor with 300 rpm

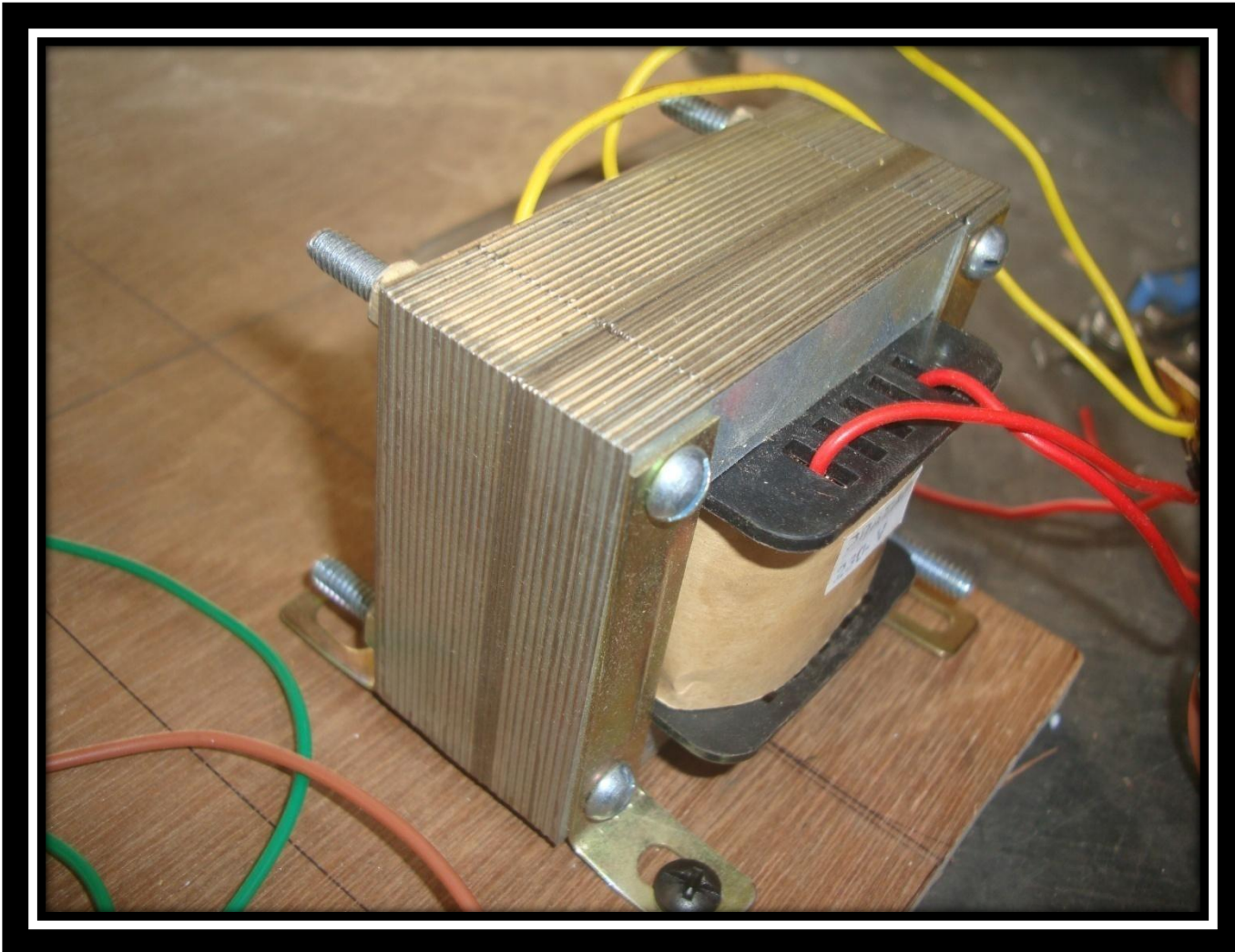


- Geared DC motors can be defined as an extension of DC motor which already had its Insight details demystified here. A geared DC Motor has a gear assembly attached to the motor. The speed of motor is counted in terms of rotations of the shaft per minute and is termed as RPM .The gear assembly helps in increasing the torque and reducing the speed. Using the correct combination of gears in a gear motor, its speed can be reduced to any desirable figure. This concept where gears reduce the speed of the vehicle but increase its torque is known as gear reduction. This Insight will explore all the minor and major details that make the gear head and hence the working of geared DC motor.

Working of the DC Geared Motor

- The DC motor works over a fair range of voltage. The higher the input voltage more is the RPM (rotations per minute) of the motor. For example, if the motor works in the range of 6-12V, it will have the least RPM at 6V and maximum at 12 V.

(2.) 12v transformer

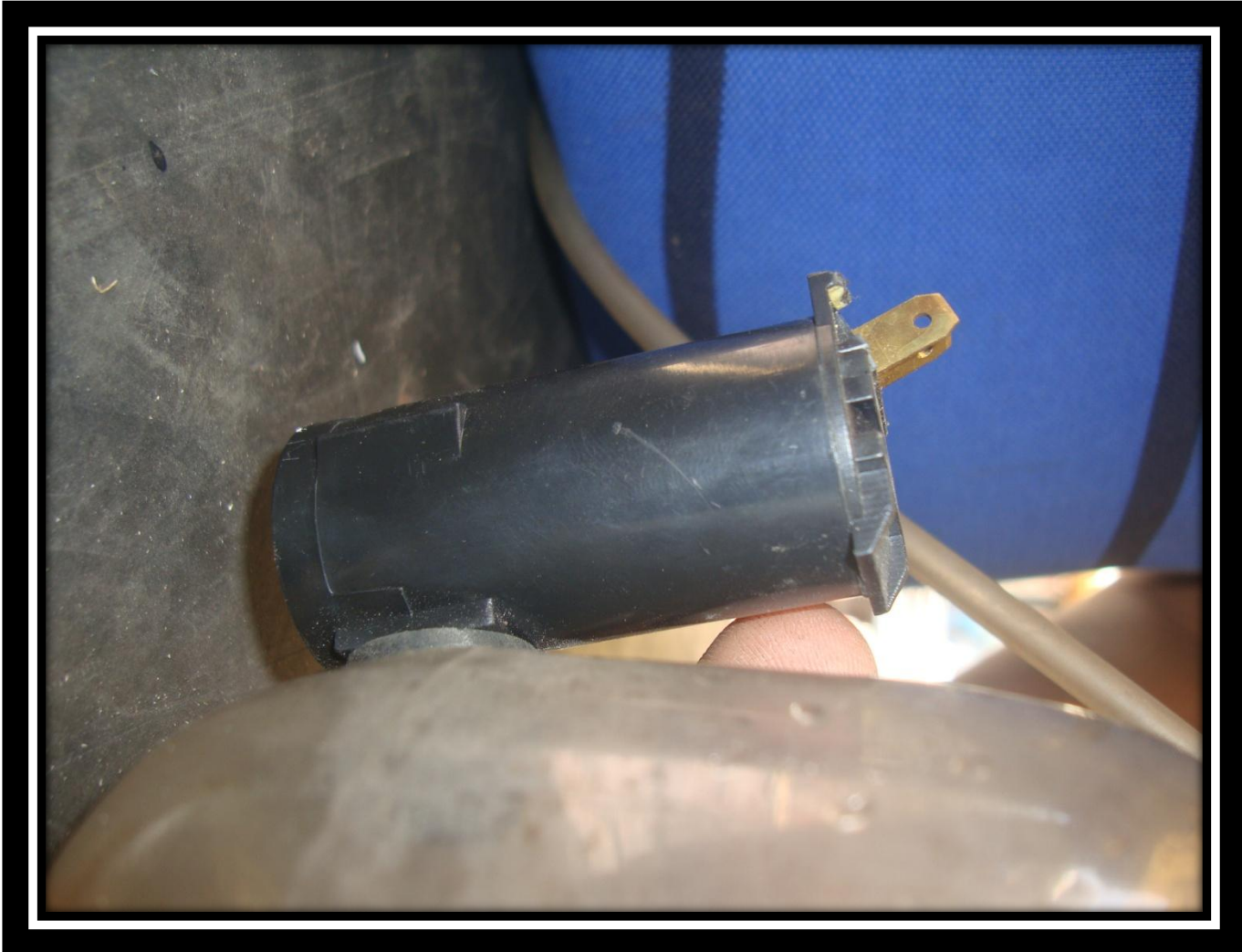


- A transformer is a device that transfers electrical energy from one circuit to another through inductively coupled electrical conductors. A changing current in the first circuit (the primary) creates a changing magnetic field; in turn, this magnetic field induces a changing voltage in the second circuit (the secondary). By adding a load to the secondary circuit, one can make current flow in the transformer, thus transferring energy from one circuit to the other. It is the phenomenon of mutual induction.
- The secondary induced voltage V_S , of an ideal transformer, is scaled from the primary V_P by a factor equal to the ratio of the number of turns of wire in their respective windings:

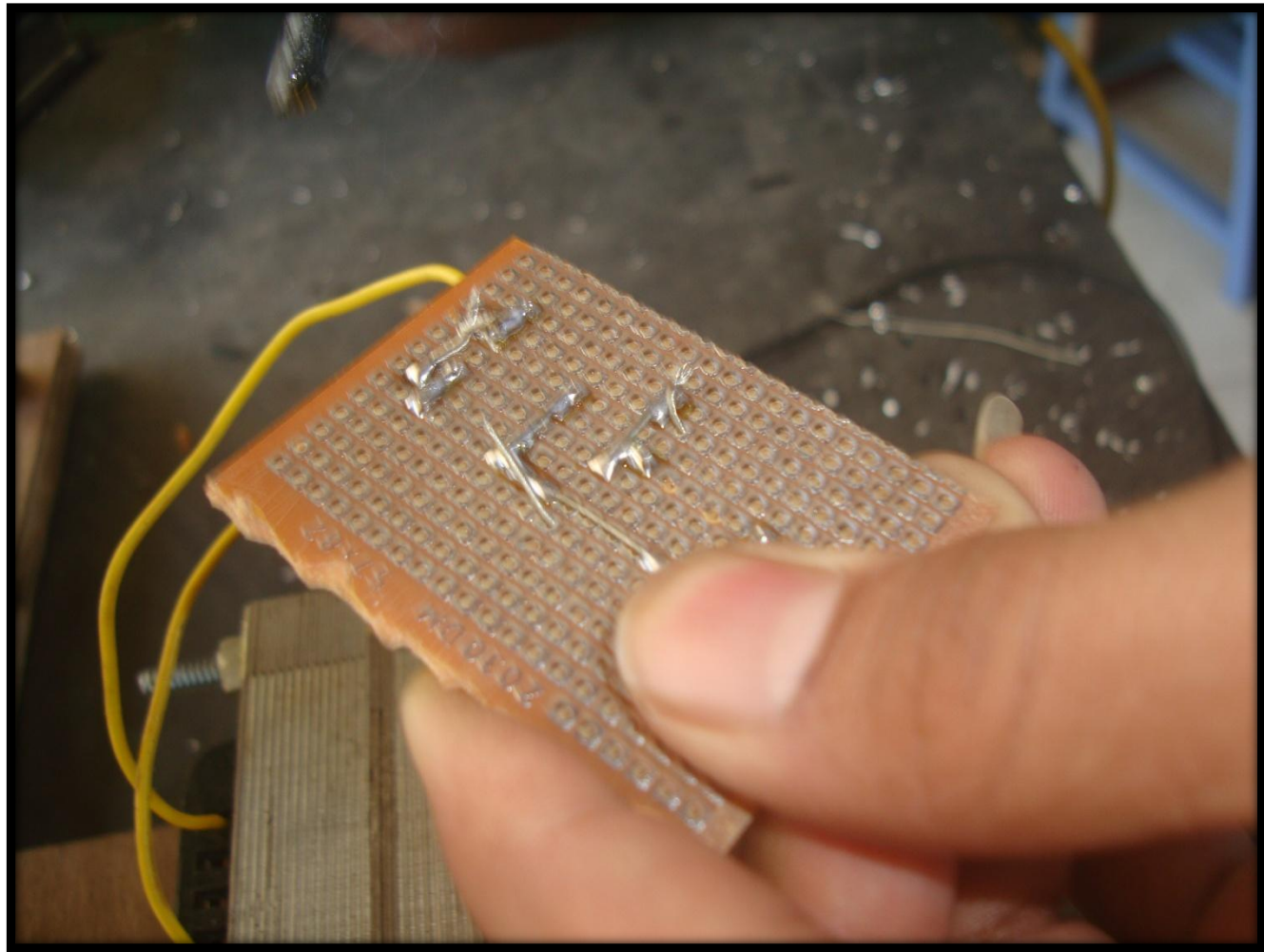
Transformers are of two types:

- Step up transformer
- Step down transformer
- In power supply we use step down transformer. We apply 220V AC on the primary of step down transformer. This transformer steps down this voltage to 12V AC.

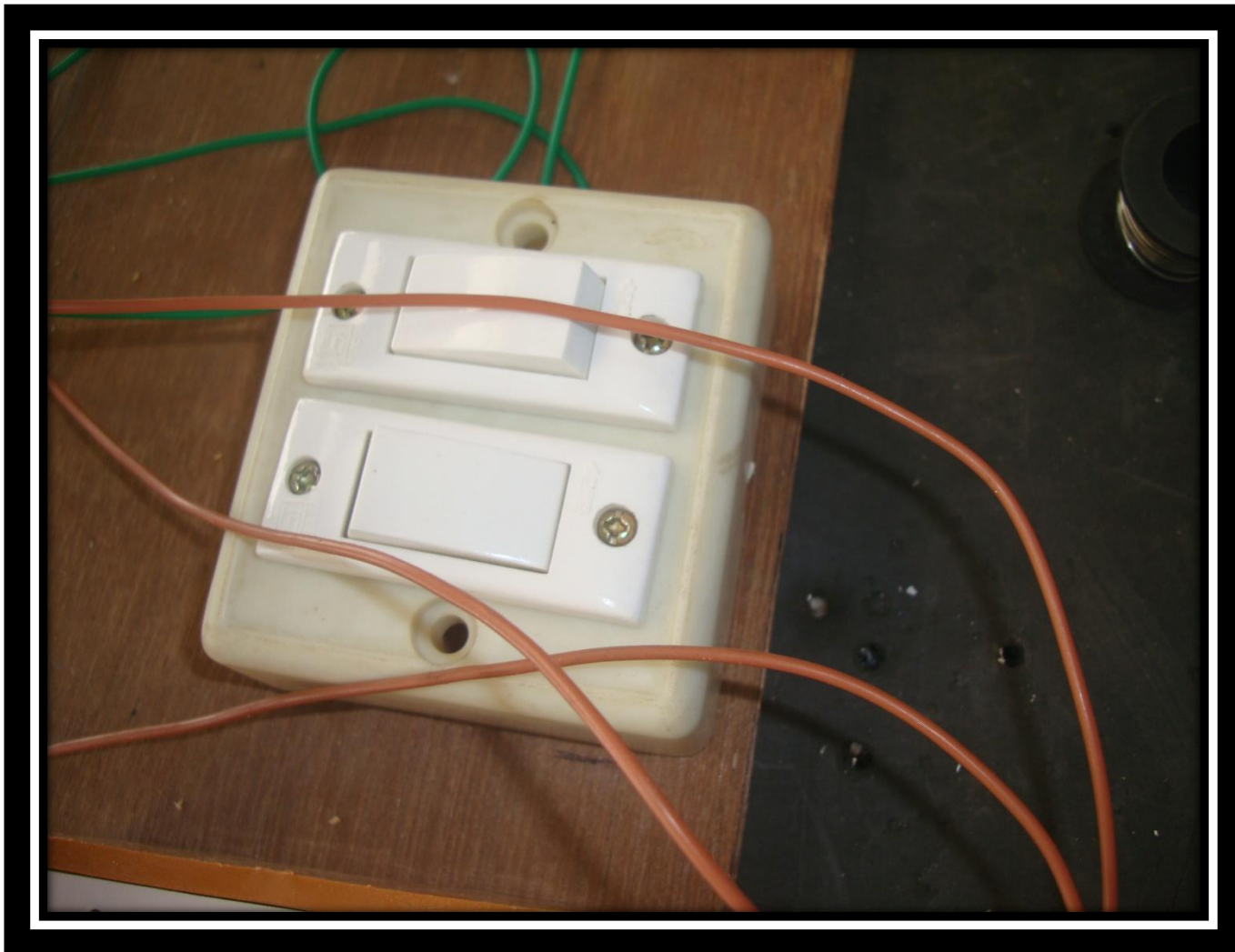
(3.) WATER PUMP



(4.) circuit for converting ac power into dc power



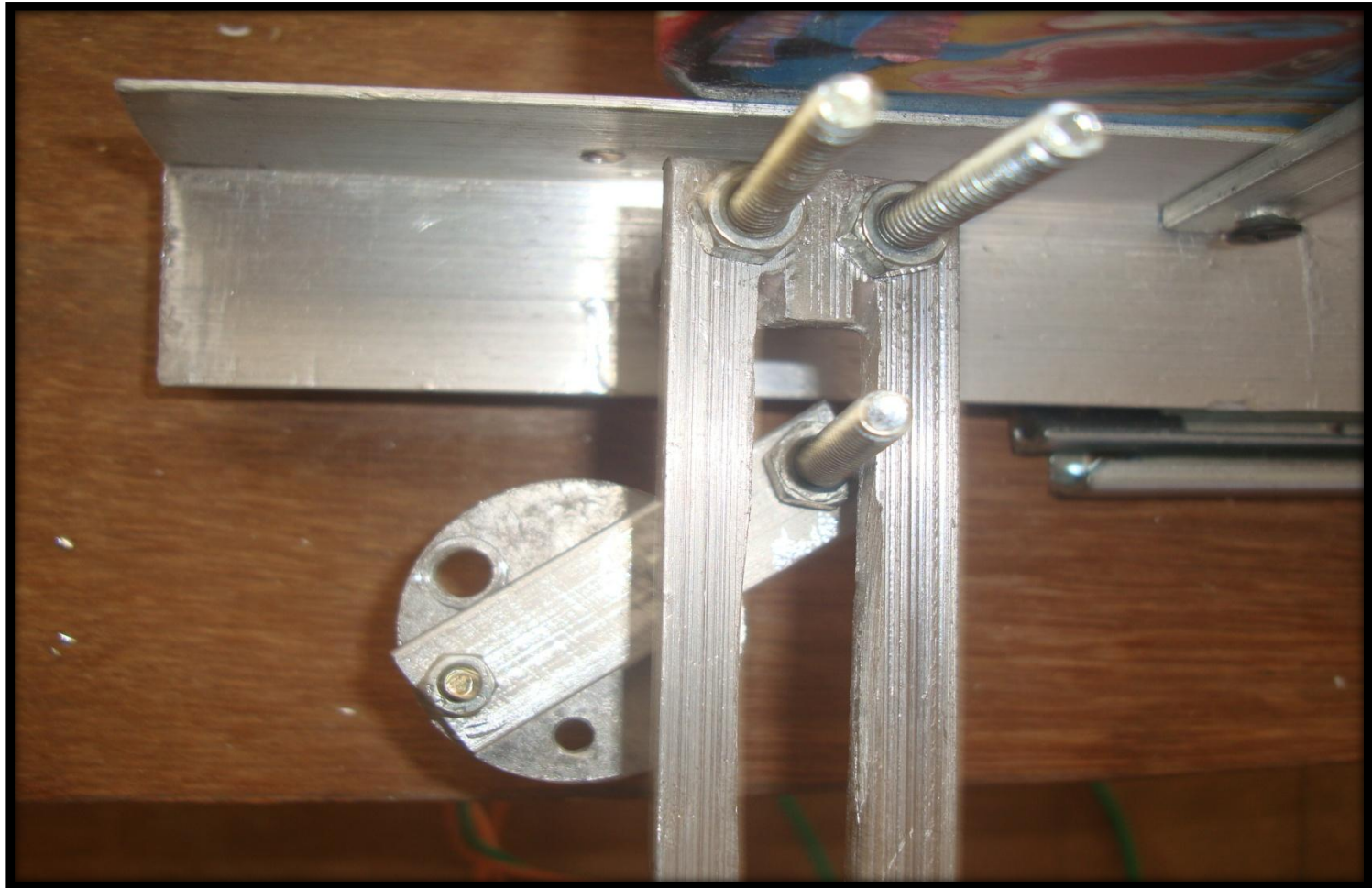
(5.) Two ON-OFF switch for controlling the sliding and rotary motion of brush



(6.) One ON-OFF switches for controlling the dispensation of fluid



(7.)scotch yoke mechanism



5 .REFERENCES

- www.google.com
- www.scholar.com
- www.shoepassion.com/shoe-brushes.html
- www.kiwicare.com/UK/ShoeCare/ShoeCare.htm

Thank you