

## SEMI AUTOMATIC DISHWASHING MACHINE

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### ABSTRACT

*In this paper the construction and performance of dish washing machine is discussed. Performance of machine is compared with manual and automatic dish washing. The parameter includes time and quantity of water .this machine is used for the dish of diameter 20 cm.*

*Key words: Semiautomatic Dish Washing Machine, Scruber, Dish*

### INTRODUCTION:-

In India, Dish washing activity is manual process involving considerable human efforts or with automatic dish washing machines available in market which are expensive manual dishwashing activity requires more number of people and also it is time consuming process involving human effort cost required for labor work is considerably high.

It is require to improve the dish washing process by automation, “semiautomatic dishwashing machine” should manufacture to reduce human efforts and time with its innovative simple design which is environment friendly.

The model of semi automatic dish washing machine is new concept which in its one washing cycle does all the operations of convention dishwashing i.e spraying soda water, scrubbing with brush and clean water similar to fully automatic dishwashing machine in a market.

Different work has done for development of dishwasher machine is as following:

Dhale A.D “ Design and development of semi automatic dish washer” This paper discusses the problem faced in usage of automatic dish washer and solutions on those problem . By separating assembly in 3 parts for washing of dishes, rinsing of dishes and washing of glasses large amount of work can be done in considerably lesser time.

Shilpa N. Dehedkar “ Design of basic model of semi automatic dishwasher machine This paper use brief idea and and analysis of semi automatic dishwasher machine. The dishwasher operate with help of DC motor, Universal motor, Conveyor belt and microcontroller for time delay.

Kshirsagar P.R “Design Fabrication experimental investigations of semi automatic dishwashing machine for Domestic purpose”. They are Discusses about design and do the comparative study of each part. In these carrying out test, Six parameters were taken into consideration they are number of plate washed, quantity of water washed , quantity of detergent used, time of washing, quantity of water use in rinsing and time of rising.

Bhor Rohan Bhimaji “ Design and fabrication of automatic dish washer". In this paper they discuss about how overcome high cost and large space required to previous dishwasher. In this system multi jet technology is used to clean utensils. Multi jet system will be used to clean utensil from all side.

## **II. SEMI-AUTOMATIC DISH WASHING MACHINE**

The working principle of the dishwasher is to provide the mechanical action necessary to distribute and direct the detergent solution and rinse waters over, under and around the dishes to loosen and remove oil. The dishwasher must also remove oil-laden waters from the machine after each phase of the cycle and provide for the drying of dishes after the cleaning process has been completed.

The motor is coupled with the sprocket. Chain conveyor is used to convey plate. Pallets are used to hold plate properly against scrubber. The high forced normal water is sprayed on dish by water pump for pre- wash and after-wash. Detergent water is sprayed on dish while scrubbing.

After complete washing dish will passed through dryer.

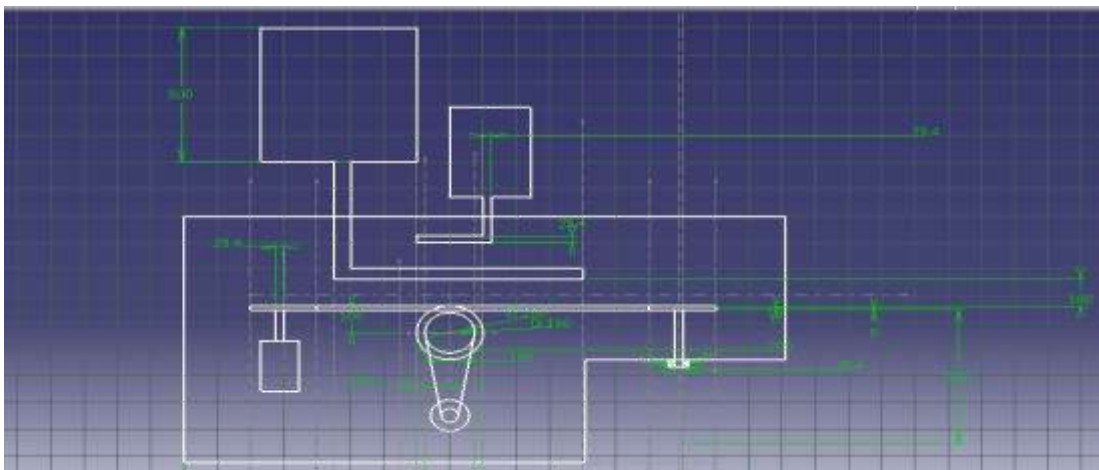


Fig. F.V.

## **III. CONSTUCTION DETAILS:**

### **I.MAIN FRAME:**

Main frame is the basic structure of model. The frame is made up of mild steel L-channel of cross section 35\*35\*5 mm. It is fabricated by using channel of uniform cross section. The vital function of the frame is to damp vibrations generated due to motor and friction. It should be rigid enough to absorb all vibrations and rigid to support the parts. The frame is well fabricated by using arc welding to be strong enough to absorb shocks. The frame is produced by using standard section channel. Wide variety in section size is available selection as per requirement is done to satisfy the purpose.

## **II. MOTOR:**

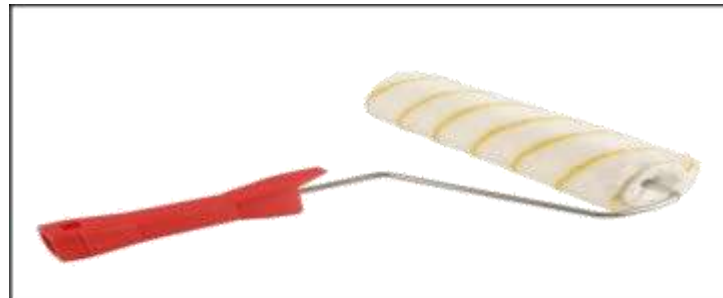
We are using wiper motor of truck for traveling of plate from one place to another. Wiper motor is an electric device which converts electrical energy into mechanical work . it works on 12 V DC supply.

## **III. SPROCKETS AND CHAIN:**

In this project, we are used sprocket and chain mechanism for travel of plate. One sprocket is attached to motor and another is to shaft which is fitted in bearing . the both sprockets and chain is used of splendor bike . For the pallets, we used stud weld on chain .

## **IV. SCRUBBER:**

We used paint rollers and brush of long hair as a scrubbing element. In this project we had 7-8 trials for the scrubbing selection, after that this two brushes are selected. These brushes are used for scrubbing at static position.



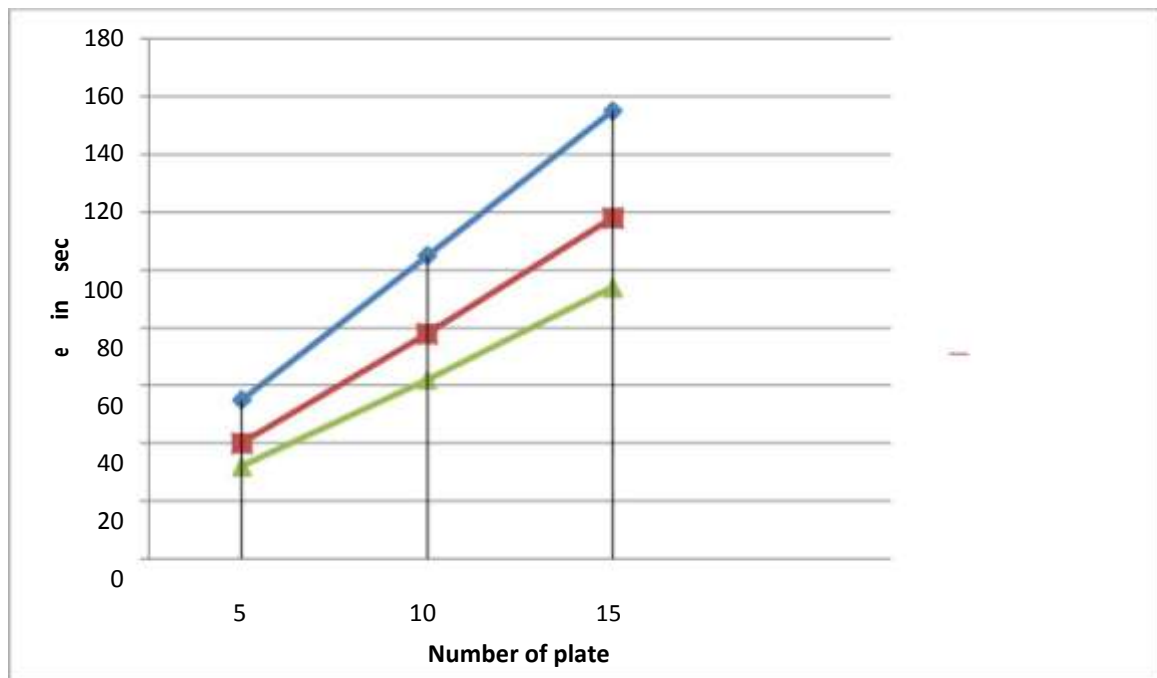
## **V. NOZZLE:**

There are two nozzles are used for prewash and after wash which is connected to water tank of 5 liters by pump.

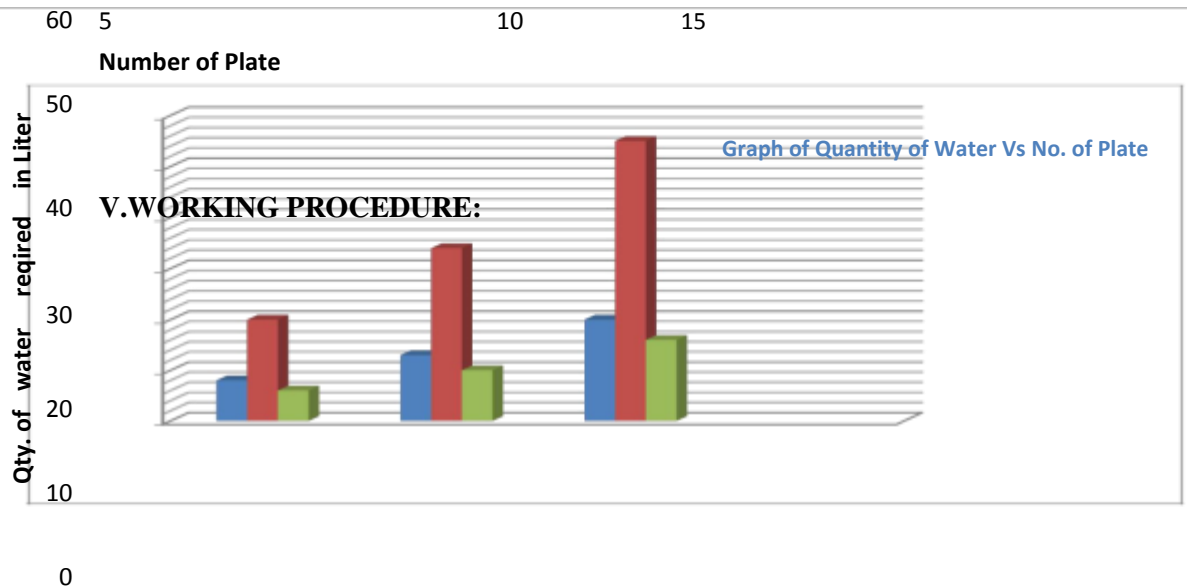
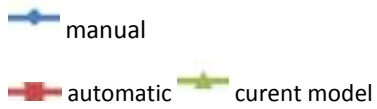
Nozzles are flow adjustable .Due to flow can control as per requirement.



#### IV. TESTING AND RESULT:



Graph of time for cleaning of dish vs no. of plate



■ manual

■ automatic ■ current model

Dishes are washed in semi-automatic dish washer machine like any other machine mainly consisting four

steps

1. Pre- wash
2. Washing with detergent water & scrubbing with brush.
3. After wash
4. Drying

## **VI. CONCLUSION:**

The current model of semi-automatic dishwashing machine is designed to reduce human efforts with saving in time while increasing the efficiency for washing a dish, minimize time required to wash dish, minimize quantity of water require to wash dishes. It satisfies the need of small restaurants which are not able to buy expensive full automatic machine. The model is built with very basic material and can be more standardize by altering motor used. The product designed has minimum operating cost, cost effective, eco-friendly and it can be used with almost zero efforts. This model is more efficient than automatic and manual method for time of cleaning and water used for cleaning.

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