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# AUTOMATIC BOTTLE FILLING MACHINE

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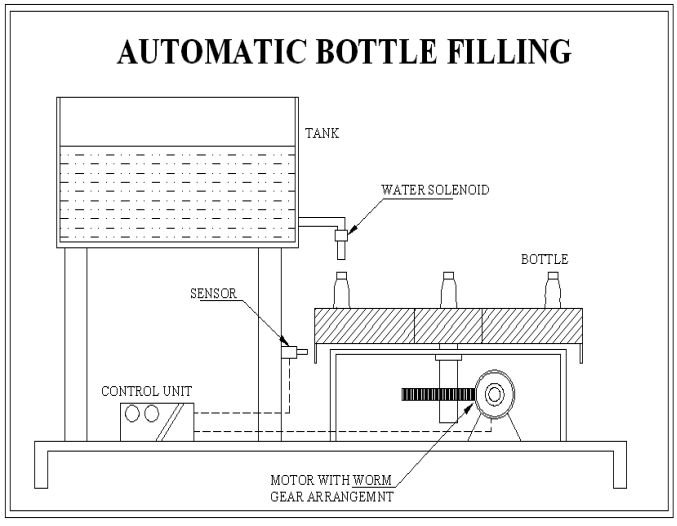
***Abstract*** - This analysis deals primarily with lower capacity bottle filling machines used by small to medium sized companies and excludes high speed rotary bottle filling machines typically found only in the mass market beverage industry. In contrast, the bottle filling machines discussed here are used throughout all industries including food, beverage, chemical, cosmetic and pharmaceutical but at lower speeds. In fact, most of the market for bottle filling machines in terms of units sold is for semi-automatic equipment that operates at normal speed.

No one type of filling machine can handle all liquids in all industries. For example, a machine that fills bottled water cannot fill cosmetic cold cream. Nor would a chemical duty filler be used to fill pharmaceutical grade or dairy products. Although there are many different types of filling technologies, there are relatively few that are versatile, practical and cost effective to own and operate. The choice of filling machine depends on the range of viscosities, temperature, chemical compatibility, particulate size, foam characteristics, and hazardous environment considerations. Each one of the machines below is discussed with its strengths and weaknesses and range of best suited applications.

## INTRODUCTION

Here the model consists of motor, sensor and water solenoid valve; outer casing frames etc., the motor are operated to rotate the bottle base plate. The sensors are used to identify the position of the base plate rotation. Then the solenoid valves are used to open the valve of the liquid flow to the bottle for particular time. The total system is fully controlled through the microcontroller setup




## WORKING PRINCIPLE

Here the model consists of motor, sensor and water solenoid valve; outer casing frames etc.,

The motor are operated to rotate the bottle base plate.

The sensors are used to identify the position of the base plate rotation.

Then the solenoid valves are used to open the valve of the liquid flow to the bottle for particular time.

The total system is fully controlled through the microcontroller setup.

## 1. ASSEMBLY DESIGN:

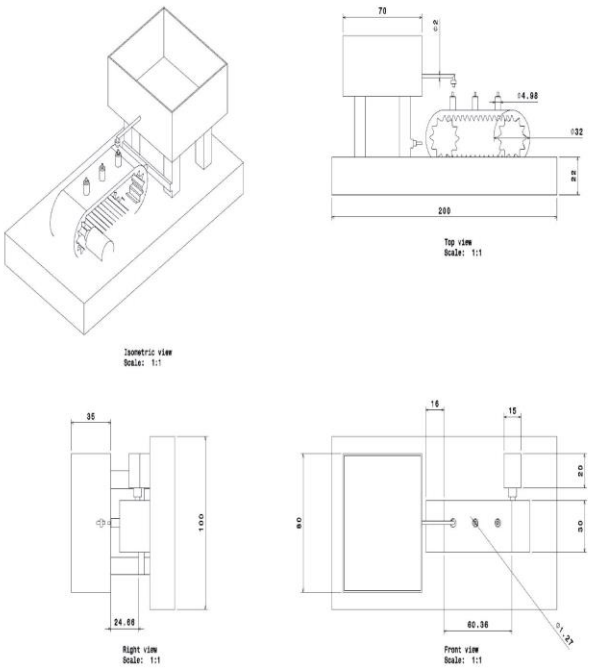
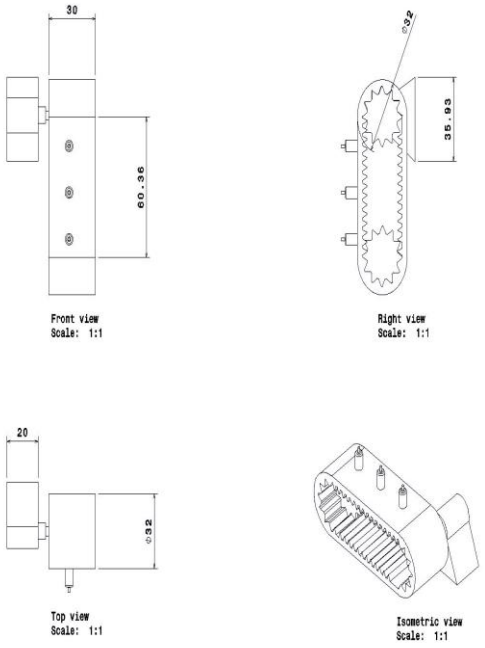


Fig 1:Isometric view of overall design

## DETAILED DRAWING OF COMPONENTS

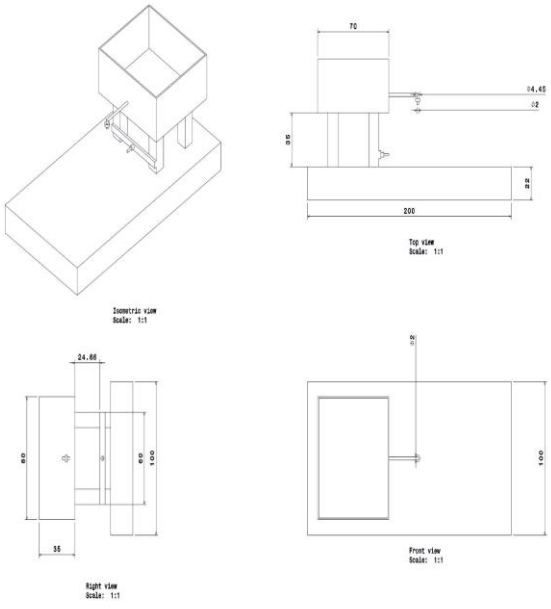
### Motor with Gear

The Motor with gear is the most important part of the bottle filling machine it is designed in such a way that the motor is used to rotate the conveyor. Sprocket is put on the drive pulley shaft. Sprocket is metal steel with teeth on the outside.




**Tank, Sensor and Solenoid valve**

The reservoir tank of capacity 10 litres is used for filling bottles with the help of solenoid valve, attached at the bottom of the tank. A solenoid valve is an electromechanically operated valve. The valve is controlled by an electric current through a solenoid.




## ADVANTAGE

- It reduces labour power
- Required less time
- Used for small scale industries
- Accuracy can be improved.

## CONCLUSION

The manual filling process has many shortcomings like spilling of water while filling it in bottle, equal quantity of water may not be filled, delay due to natural activities of human etc. This problem faced by small industries compels us to take up this project. Our project is meant for small industries. It aims to eliminate problem faced by small scale bottle filling system. With this system that operates automatically, every process can be smooth and the process of refilling can reduce workers cost and operation time. The system operates by the program that designed to do the operation.

The automatic liquid filling machine is developed to be lower in price compare to the other filling machines in the market. The machine is also easy to operate and user friendly, where simple steps are needed to operate the machine. The machine controller is also portable and can be attached with conveyor system or can be left standalone.

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