An Overview Of Automatic Lemon Juice Maker

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Abstract- *Lemonade is a process where two or more items are mixed together manually. Manually mixing of these items requires human interfere and which is again time consuming process. So, in this proposed work a smart machine for lemon juice is carried out. This machine is specifically designed to prepare LEMON JUICE. For the preparation of lemon juice one need lemon, water, sugar, salt. They have to be mixed with proper quantity. These items are taken automatically from the containers in which these above items have kept according to the customer's requirement (i. e, with sugar, without sugar).*

Keywords- Lemonade, Lemon Juice.

I. INTRODUCTION

Automation was the rage of the engineering world. From the review on the lemonade machine following drawbacks are seen such as high investment cost, the contamination, additional man power, environmental impact, time consumption caused my lemonade machine. The traditional method of lemonade machine requires jars, mixing arrangement, man power and more time. So we thought that to design automatic lemonade machine to overcome this problems. The thought the setup includes, lemon squeezing mechanism, hopper, microcontroller for automation, motors.
According to the traditional method of preparing lemon juice, two or more items are mixed together in random manner and then it is carried out manually and every time taste is different. To make good mixture (i.e. Good taste) one requires good knowledge of items to be mixed. Sometime it is very critical to handle appropriate quantity of particular item. Due to dissimilar quantities of items they are required to mix with proper handling process.

So this automatic lemon juicer will be more helpful to reduce the extra efforts as well as time. Also this lemonade can give us same taste every time.

To handle different items specific plastic parts, containers can be designed and the complete system will be controlled by microcontroller.

Lemonade is a flavored which is composed of treated water, sweetening agents like sugar, sucrose, citric acid, lemon juice, and preservatives. Lemonade is one of the soft drink is used by people of all ages in general and by the young generation in particular and extensively during summer to quench the thrust and the thrust and to refreshed just for some relief and relaxation. Then we decided to make „Automatic Lemonade Machine". This setup includes steeper motor, 12V motors, control valve, purifier valve, and lemon squeezing arrangement, hoppers, and PIC microcontroller with C programming language. This machine is capable to make the glasses of lemonade 200 per hour.

II. LITERATURE REVIEW

1) From the survey of "SAMARTH JUICE CENTER", Karad- 415110 , Maharashtra have "Automatic Pineapple Juice Machine ".By the reference of this machine we refer the content of machine like Automatic of Making and filling into glass.
2) For this Automatic Lemon Juicer Machine we refer paper on Automatic Lemonade Machine. In that paper, the lemonade machine is made in such a way that lemon can be pressed by machine but it is necessity to cut that lemon manually for doing further process. According to this Automatic Lemon Juice machine it can make happen automatically. Here Lemon will cut automatically. Also two modes are selected according to people requirements. These modes are
   1. with sugar mechanism
   2. without sugar mechanism

III. CONSTRUCTION

To handle different items specifically plastic parts, containers can be designed. The complete system can be controlled by microcontroller. Appropriate user interface (keypad, display, motors and water pump) can be used.

The mechanism consists of Sugar dispensing mechanism, salt dispensing mechanism, Lemon crushing

mechanism, filter mechanism, motor mechanism and water tank with pump.

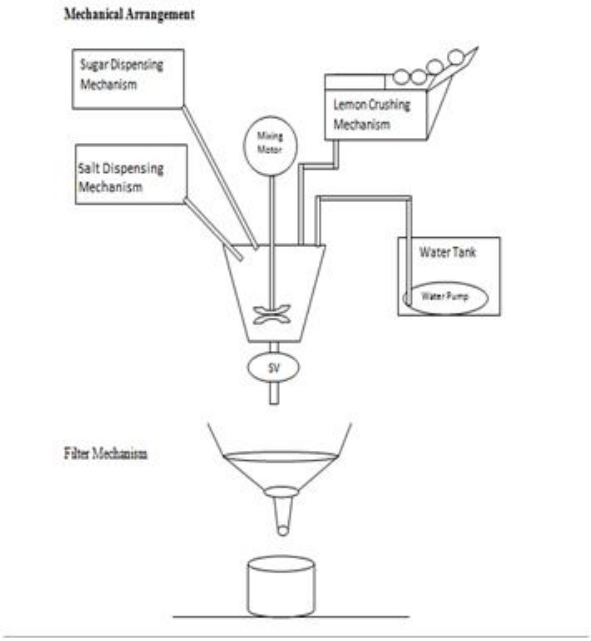

Fig 3.1 Mechanical Arrangement

IV. INNER ASSEMBLY

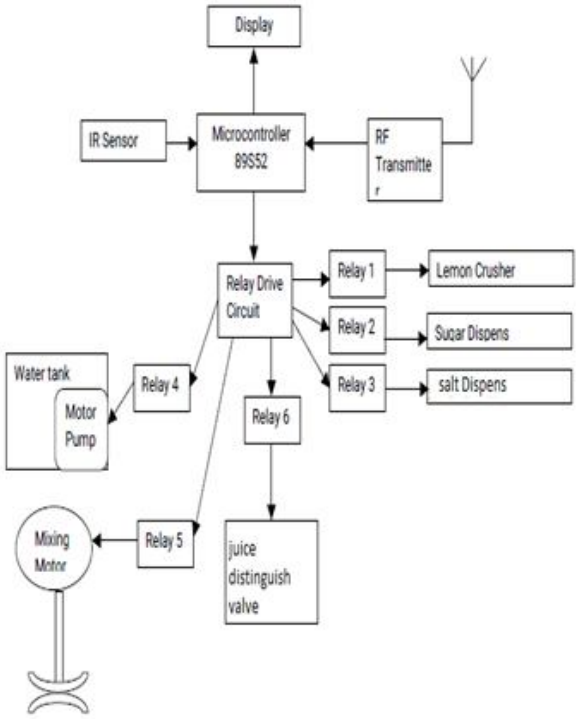

Fig 4.1 Block Diagram of system

V. WORKING PRINCIPLE OF MACHINE

To make the machine automatic we are taking help of automation. For automation we are using microcontroller .We are using microcontroller to control the operation.

1. Inserting the lemon into machine.
2. Entered lemon will be cut automatically by cutter.
3. Pressing this lemon by applying pressure on it.
4. Selecting mode of sugar according to customer's requirement. i.e. with sugar and without sugar.
5. Adding quantity of sugar as well as salt according to number of glass.
6. Also adding water and lemon into the container by using water pump.
7. Stirring the mixture of sugar, salt, lemon juice and water.
8. Controlling the flow of lemon juice and water above solution into the main tank.
9. Filling the glasses automatically.

VI. WORKING

First the lemons are pressed by the means of pressure sensors and control valve with the help of cylinder. Then this juice of these lemons is mixed in the first hopper with the salty water by means of mixture arrangement which is driven by 12 volts motors. Now in second hopper the sugar is mixed with the chilled water with the mixture arrangement which is also driven by 12 volt motor. Then this contents in both the hoppers are allow to come into the third hopper, which is main hopper in which the all the required contents are mixed with the help of mixture arrangement. Now this lemonade is feed into the glasses which are operated by stepper motor. And then these glasses are served. First the lemon is press in pressing mechanism. The lemon is press between the two dies of pressing mechanism. In lower die half lemon is kept, the upper die gradually press the lemon and liquid is extracted. The extracted liquid is filled in first tank. The liquid is then supplied to the main tank.

- In second tank the mixture of chilled water, sugar, salt is stirred with the help of stirrer.
- The stirrer is driven by 12V DC motor. Then the mixture is supplied to the main tank.
- The liquid from the first tank is supplied to the main tank in right proportion by using microcontroller.

- The mixture of sugar, salt, water is supplied to main tank by using submersible pump I right proportion in order to maintain taste.
- In main tank all mixture coming from both tanks is stirred and lemonade is prepared.
- The lemonade is then filled into glasses in right quantity. The quantity is decided by the microcontroller.
- The lemonade is only filled in glasses when the glass is detected for this purpose timing sensor is used.

VII. ADVANTAGES

- Rate of production increases.
- Easy to operate.
- It can be manufactured with local resources.
- Easy to maintain and repair.
- Comparatively operation cost is less.
- Continuous operation is possible without stopping.
- Less time consuming.
- Low cost automation is used.
- We can use the machine on market basis.

VI. APPLICATIONS

- Medium scale shops.
- Big family parties.
- Family Functions.
- Marriage Ceremony.
- Reception Ceremony.
- Beverage industry.

VII. FUTURE IMPROVEMENT

- Automatic glass feed mechanism.
- By a minute change in the pressing mechanism we can also use this machine for different fruit juice.

VI. CONCLUSION

Thus the automatic lemonade machine thus proves to be a beneficial improvement for the new era. It has a wide scope of application in markets. The main advantage of the project is the lemon juice which is obtained is clean, pure and mostly beneficial for the human health as lemon has proved in all its vitamins and proteins. The machine has low cost automation and continuous operation is possible without any problem occurrence. At the end machine is proved to be a beneficial innovation for the society.

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Websites-

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