RAISIN AUTOMATION IN AGRICULTURE

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Abstract— Although many studies have covered the need and utility of automation technique for Raisin formation, this paper will focus in the field of Agriculture of Raisin Automation. The motivation behind this project is farmers' loss in Raisin production. Farmers investment gets affected due to rainfall, if rainfall occurs during production process of Raisins. To protect these Raisins in the rainfall we can use automation techniques. In regular or irregular climatic conditions we can use this automation technique for protection of raw material(Grapes) of Raisin. To avoid these losses protection is performed by using Raindrop Sensor as well as by automatic spraying of chemical on the raw material(Grapes) during formation of Raisins. After completion of this procedure user will get informed by message through GSM on mobile phone simultaneously this message will also be displayed on LCD. The objective of our study has been to help to reduce the wastage of raw Raisins and improve the quality of raisins.

Keywords—GSM, LCD, Raindrop Sensor

I. INTRODUCTION

In a study carried out at National Research Centre for Grapes, Pune , various issues regarding Raisin formation in India are due to spell of hailstorm and rains that had come at an time, when the Raisins were in the process of being dried. This will definitely affect the overall quality, which loss colour and reduce the sugar content of the product due to rain and as result, the price get affected as well. Raisin automation is modern technique used to protect Raisins from heavy rains as well as is used for automatic chemical spraying on raw material(Grapes) during process of Raisin formation. We use Raindrop sensor for sensing ultimately raining condition, after sensing by sensor it protects raisin rack through protection cover controlled by microcontroller. Along with necessary chemical spraying on raw material(Grapes) on shade for formation of Raisin. This process is informed to user through message by using GSM module. Agriculture is the backbone of India. Because of this reason we have chosen this project to help the farmers.

II. LITERATURE SURVEY

Day by day Raisin trade is increasing in international market. USA is the largest raisin producer in the world. India has achieved the production level in the range of 55,000 to 65000 tons of raisins, which is next to the Turkey at world level. India's export of raisins is 314 Metric tonnes with the value of 0.437 million US dollars. In India Raisins are mostly produced in Sangli, Solapur, and Nashik District of Maharashtra & Bijapur District in Karnataka. The formation technique of raisin in India is mostly based on dipping of grapes in chemicals and then drying in shade. To maintain the quality of raisin during 15 days we are spraying the chemicals on it in the interval of two days and it takes 15-20 days for raisin formation. The place, Sangola Taluka of Solapur District in Maharashtra is most suitable in terms of rainfall, temperature, humidity, Air velocity for drying the grape in natural way. But, it is not possible to framers to get such favorable conditions in all other areas. Ultimately, the farmers suffer a heavy loss due to environmental condition like rainfall etc. at the time of production process of Raisins. This affects the raisin quality and thus reduces the export quantity of raisin.

At Sangli and Nashik region in Maharashtra state, price of Raisin which were around Rs.200-250 per Kilo-gram have droped almost 50 percent as the Raisin are turning black, farmers are now getting just about Rs. 70-80 per Kilo-gram for their produce[1]. Raisin trade turns sour for farmers in Bijapur District on an average, produces raisins worth Rs 2000 crore annually. The damage in 2014 may throw Bijapur's economy off track[2]. The damage caused by heavy rain to 26000 metric tonnes of grapes in the Orchards.as well as due to heavy rain racks used for drying grapes have also been damaged.
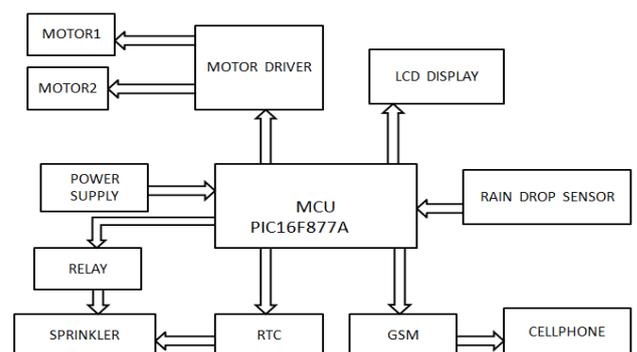
III. METHODOLOGY

Fig.1 Block Diagram

In raisin formation, Raindrop Sensor senses the rain and gives its output to Motor Driver[4] through Microcontroller[3]. Motor Driver operates two motors for cover changing. In this process two cover are used to protect the raw material (Grapes) depending on weather. At the time of raining we use Mylar(Waterproof) cover and normally use Shedednet cover to protect the raw material(Grapes) from Sun.

Using RTC[5] we can keep track of long timelines. It sets the time period through Microcontroller for automatic chemical spraying on raw material(Grapes). The process of chemical spraying is continue after two days. In this process Relay is used for switching purpose. It is electromagnetic switch and it is activated when current is applied to it.

GSM[6] sends messages to user after completion of process. User receives message viz; Process Start, Cover Down, Cover Open, Spraying Completed.

- Microcontroller

Microcontroller PIC16F877A is shown in fig.2. It is 40 pin microcontroller having Synchronous serial port with SPI, Universal synchronous asynchronous receiver transmitter with 9 bit address detection.
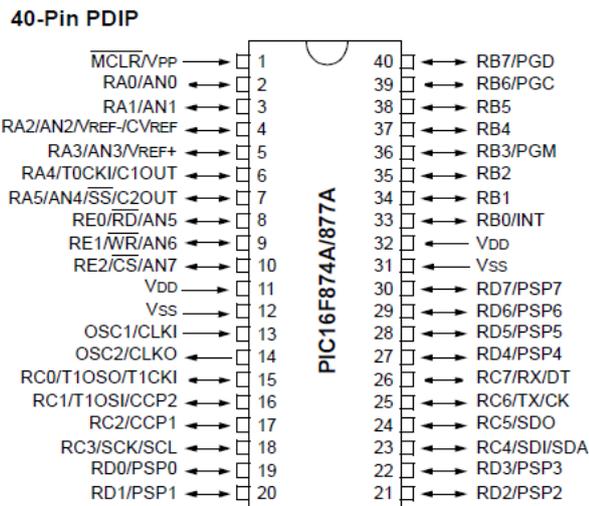

Fig.2 Pin Diagram of PIC16F877A

- Real Time Clock

Using RTC we can keep track of long timelines. The DS1307 has a built-in power- sense circuit that detects power failures and automatically switches to back up supply. Real Time Clock is shown in fig.3.
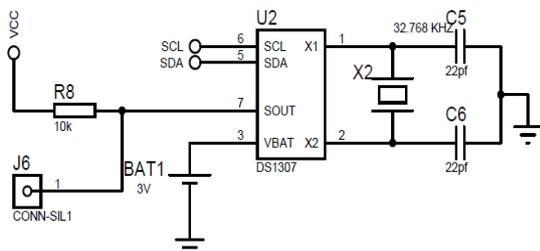

Fig.3 Circuit Diagram of RTC

- Motor Driver

L293D is a motor driver or motor driver IC which allows DC motor to drive on either direction. Circuit diagram of L293D is shown in fig.4.
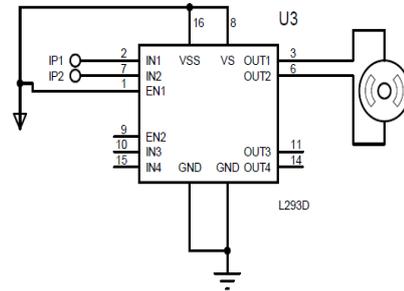

Fig.4 Circuit Diagram of L293D

- Rain Drop Sensor

A rain sensor or rain switch is a switching device activated by rainfall. Fig.5 shows the circuit diagram of Rain Drop sensor.
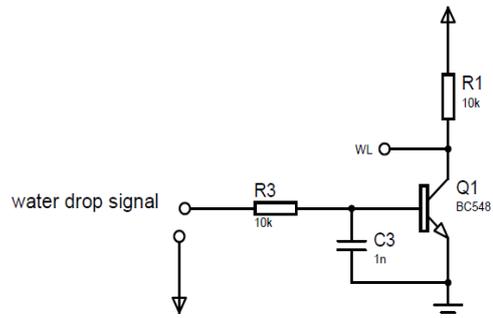

Fig.5 Circuit Diagram of Rain Drop Sensor
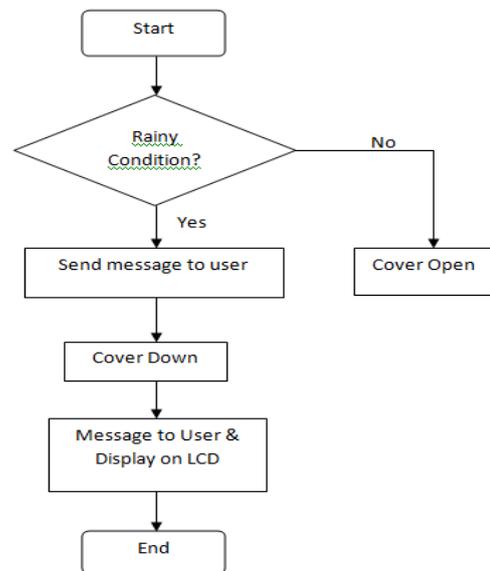
- Flowchart of protection process

Fig.6 Flowchart of protection process

Start. Check if weather is rainy. If no, then open cover. If yes, then send message to user and shade will be covered up. Once

shade is covered, the message will be displayed on LCD and also send to the user. End.

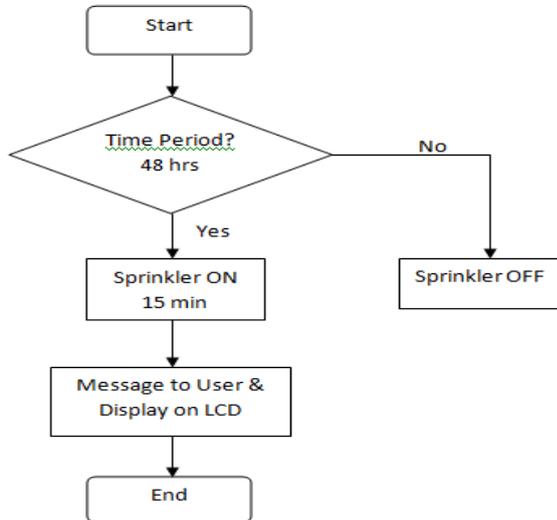- Flowchart of spraying process

Fig.7 Flowchart of spraying process

Start. Check if time period = 48hours. If no, sprinkler is off and no action is taken. If yes, sprinkler is turned on. Once process is completed, the message will be displayed on LCD and also send to the user. End.

- Global System for Mobile Communication
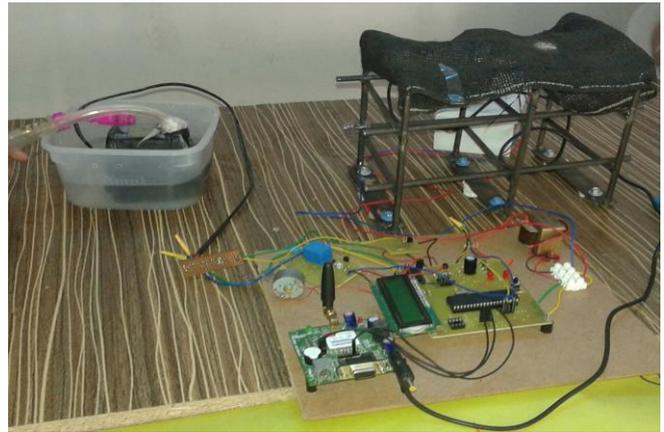

Fig.8 GSM Module

- Hardware Module

Fig.8 Hardware Module

IV. CONCLUSION

Estimates of total number of farmers in India are to be about 600 million (50% of total population). Helping to farmers familiar with Automation technology in order to become easier to formation of Raisin. Thus, this report presents a new approach to Raisin formation in Agriculture using Automation technique. Efforts on improvement in quality of Indian farmers' Raisins have been initiated to promote the export of this product in the world market. Also, the financial analysis showed that the components of such a system are cheaper; however, the performance is higher.

ACKNOWLEDGEMENT

REFERENCES

[1] News- Raisin Producers in India hit hard by unseasonal rainfall. [Online] www.fineberry.co/crop-news/raisin-producers-in-india-hit-hard-by-unseasonal-rainfall
[2] News-Bijapur District www.deccanherald.com/content/391636/raisin-trade-turns-sour-farmers.html
[3] Design with PIC Microcontroller by John R. Peatman, pin configuration, specifications, datasheet of PIC16F877A
[4] Working of Motor Driver using datasheet of Motor Driver IC L293D.
[5] Interfacing RTC with Microcontroller, pin configuration, specification, by using datasheet of DS1307 RTC
[6] Interfacing GSM with Microcontroller. Specifications, AT commands by using datasheet of GSM.