

**WATER VENDING MACHINE USING SOLAR ENERGY**Patil somanatha gouda<sup>1</sup>, U.basavana gouda<sup>2</sup>, Soumya HV<sup>3</sup>, Shilpa<sup>4</sup>, Shashidhar SM<sup>5</sup>

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**Abstract:** In India there is problem of safe drinking water therefore we are going to provide mineral water. Water has become the most commercial products of the century. This may sound bizarre, but true. The stress on the multiple water resources is a result of a multitude of factors. On the one hand, the rapidly rising population and changing lifestyles have increased the need for fresh water. If opportunity costs were taken into account, it would be clear that in most rural areas, households are paying far more for water supply than the often-normal rates charged in urban areas. Also, if this cost of fetching water which is almost equivalent. Water is the most important aspect of our life but what happens in the real world is there is lot of wastage in water. So now we are proposing a system named "Water vending machine using solar energy" which provides mineral water in prescribed amount of litres for very low cost. In this system for payment we are using prepaid cards which eliminates the complications which were present in coin operated vending machine. By implementing water vending machine we eliminate the waste of water and provide good quality of water at low cost using digital payment. For this entire system we are using renewable energy source that is solar energy for power supply. The heart of the system is PIC16F877A micro controller and to read the prepaid cards there is RFID reader. This system is applicable in railway stations, bus stops and crowded places.

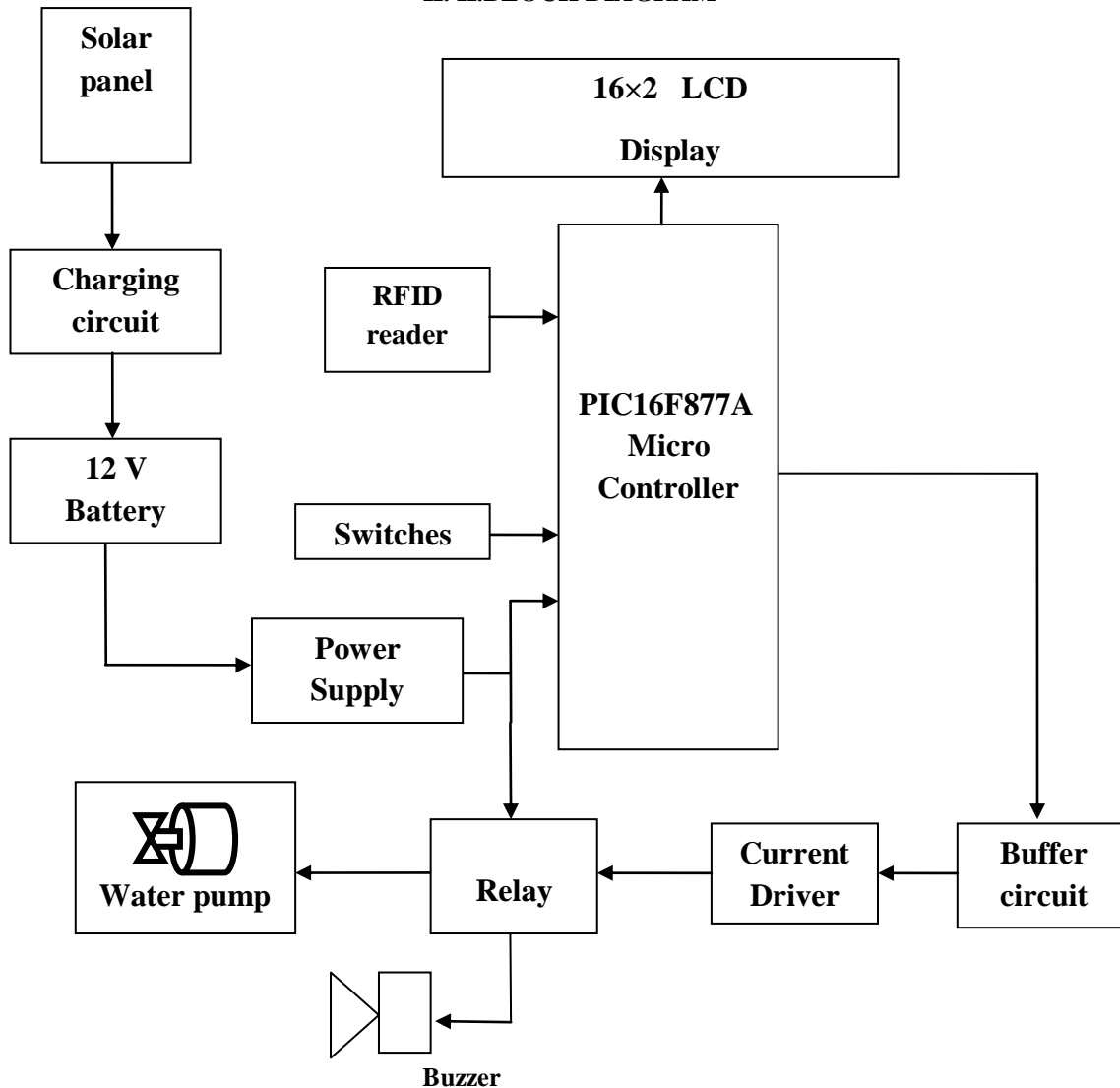
**Keywords:** Vending machine, PIC 16F877A micro controller, RFID reader, Prepaid cards, Solar energy.

**I. INTRODUCTION**

Now a day's water vending machines are available and operated on only one coin but our aim is to design water vending machine which is operated on different coins. In India there is problem of safe drinking water therefore we are going to provide mineral water. Water has become the most commercial products of the century. This may sound bizarre, but true. The stress on the multiple water resources is a result of a multitude of factors. On the one hand, the rapidly rising population and changing lifestyles have increased the need for fresh water. If opportunity costs were taken into account, it would be clear that in most rural areas, households are paying far more for water supply than the often-normal rates charged in urban areas. Also, if this cost of fetching water which is almost equivalent. Sarvajal, which means "water for all" in Sanskrit was established as a social enterprise in 2008 by the piramal foundation to find ways to provide reliable and safe drinking water to poor communities living in remote villages and urban slums. Some 97 million people living in India continue to lack access to clean water and are at risk of contracting waterborne diseases, which account for over 50% of illness requiring medical treatment. "If we are going to make any progress in reducing the burden of disease, it was clear we had to address the issue of water," Mr. Sharma said. This water vending machine makes people to understand the value of water as we are selling water for the rupees. The major advantage of water vending machine using solar energy is it uses the solar energy as power source which is very improvising. The machine eliminates the waste of water as it provides precised amount of water like in liters after the dispense of water the water flow will be stopped. By this implementation we are providing good quality of water at low cost using a digital payment i.e., prepaid cards.

Existing system	Proposed system
<ul style="list-style-type: none"><li>➤ Manual power is used for selling water.</li><li>➤ Existing system uses some coin sensors.</li></ul> <p><b>Drawbacks of existing system:</b></p> <ul style="list-style-type: none"><li>➤ Doesn't senses all shape of coins.</li><li>➤ Chances for human error.</li></ul>	<ul style="list-style-type: none"><li>➤ Source power is solar energy.</li><li>➤ Prepaid cards for payment.</li></ul> <p><b>Advantages of proposed system:</b></p> <ul style="list-style-type: none"><li>➤ Faster and reliable in operation.</li><li>➤ Running cost is low.</li><li>➤ Able to deliver good quality of water.</li><li>➤ Power consumption is low.</li></ul>

## II. BLOCK DIAGRAM



## III. WORKING PRINCIPLE

The water vending machine using solar energy uses solar energy to supply power to entire unit. Solar energy is renewable energy source which is freely available which makes great advantage of the system. The electricity generated by solar energy is stored in the battery through charging circuit. Radio frequency ID reader reads the prepaid cards provided to the each citizen for payment while taking water. The prepaid cards contains rechargeable amount and their name which can be seen on LCD display. PIC16F877A micro controller is heart of the water vending machine. The microcontroller is interfaced to various components such as RFID reader, Switches, Buffer circuit etc. Switches are provided to select the amount of the water required that is in terms of litres. The Buffer circuit and current driver are connected to activate the relays which have control over the water pump and buzzer. We put a RFID card in front of RFID reader then the owner name and balance amount will be displayed on LCD. After some seconds the switch option will be displayed on LCD and we can select the amount of water by pushing the appropriate push button switch. Then buzzer turns on and gives sound or alarm to the customer to collect the water. Then water pump will dispense the appropriate amount of water to the customer. Then the amount will be deducted from the customer's RFID card.

## IV. ADVANTAGES

- 1) Faster and reliable in operation.
- 2) Running cost is low.
- 3) Able to deliver good quality of water.
- 4) Power consumption is low.
- 5) The machine can always be moved to other areas if need arises and it will continue delivering the services as usual.

## **V. APPLICATIONS**

- 1) This product can be used at public places like bus stops, railway stations etc.
- 2) This machine is very helpful where the sub urban areas and villages.

## **VI. FUTURE SCOPE**

The proposed system itself is the future project as already mentioned the problem associated with the existing system. In existing system coins are used for payment and coins are available at different sizes and sensor fails sometimes to sense. The proposed system eliminates the complications of coin sensor and promotes the digital payment. The power source is renewable source that is solar energy. A PH sensor can be included to check the quality of water and can reject the water dispense if the quality is not good.

## **VII. CONCLUSION**

The water vending machine using solar energy is the future project which eliminates the existing project problems. By implementing this projects everywhere each human being will come to know the value of water makes every customer efficient use of water.

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