



AUTOMATIC WATER TAP

¹Karthikeyan G, ²Barath V C, ³Dhanasekar M, ⁴Bhuvanesh M, ⁵Jai Suheen S J

¹Assistant Professor, ^{2,3,4,5}Student

¹Department of Electronics and Instrumentation Engineering,

¹Dr. Mahalingam College of Engineering and Technology, Coimbatore, India

Abstract : This project is to build and to test a smart tap system. The Smart tap system is more advanced than the conventional method and it is designed to improve life by having a more convenient drinking water filling in containers. The project was created and implemented as a prototype of automatic water tap. The smart tap system is used to turn over water from source point to usage point in an efficient way and avoids human error. Automated water supply can be done through embedded system in cost effective way. The smart tap system is actually a smart system as the people who wish to drink water without turning on the water tap. This project works on automated on/off tap when sensed by a sensor. It can be implemented in water purifier taps and also in hand washing stations. Water wastage can be prevented by this project.

Keywords – Arduino Nano, IR Sensor, Solenoid Valve, Buzzer.

I. INTRODUCTION

Water is the available natural resources on earth, which has to be utilized efficiently. Also it has to be provided without wastage to face the problem of scarcity with appropriate quantity and quality. Water bodies cover 70% of earth surface out of this only 3% of water is portable and drinkable. Automatic water tap or faucet is a tap equipped with an IR sensor and mechanism that opens its valve to allow water to flow in response to the presence of an object nearby to the sensor. This project is on setting up the automatic water taps in water purifiers.

II. LITERATURE SURVEY

[1] Akshay Sharma AS, Review on Automatic Sanitizer Dispensing Machine.

This paper focuses on Automatic Sanitizer Dispensing and also non-contact dispensing is again important to prevent pathogen spreading and finally, hand hygiene is most important part of our daily life.

[2] Abhishek Srivastava, Shubham Dwivedi, Saurabh Bhardwaj and Mr. Hem Chandra Joshi Study of Automatic Water Dispenser.

This paper is focused in presenting the embedded into an Automatic Water dispenser in which the system is used by the microcontroller to automatic the process of water which is used by human beings and it has ability to detect the level of the water, the TDS of water, the temperature of water, and the use of LCD in this system provides the output which is very useful for human beings. This research has successfully provided the improvement on existing water condition by which human beings get the good quality of water.

III. BLOCK DIAGRAM

The square outline of Automatic Water Tap is displayed in the figure 1. It involves Arduino Nano, IR Sensor, Solenoid Valve and 7805 IC.

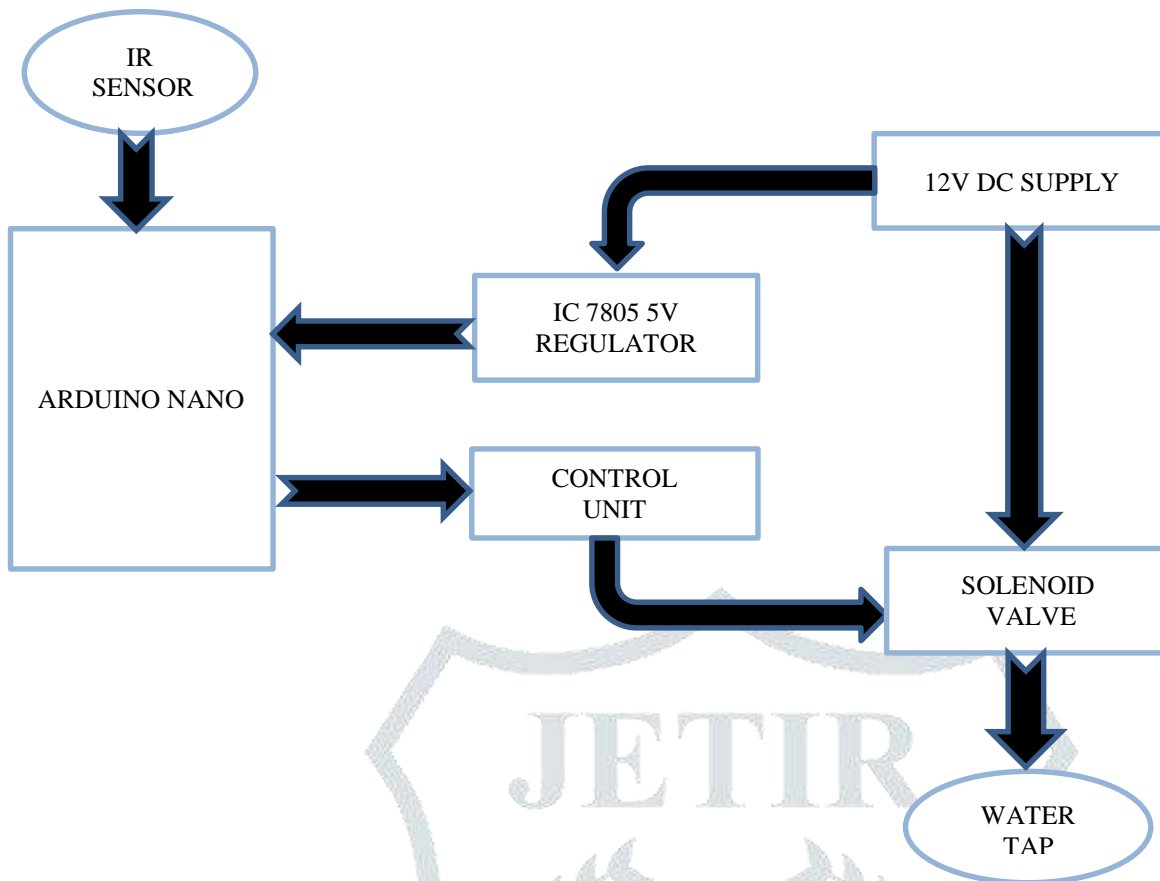


Fig 1 Block Diagram of Automatic Water Tap

3.1 IR Sensor

An **infrared sensor** is an electronic module which is used to sense certain physical appearance of its surroundings by either emitting and/or detecting infrared radiation. IR sensors are also capable of determining the heat being emitted by an object and detecting motion.

3.2 TPN122 NPN Transistor

It is a Darlington braces NPN transistor. It works like an ordinary NPN Transistor but as it consists of a Darlington pair it has a decent collector current assessment of nearby 5 amperes and its gain is around 1000. This transistor is famous for its higher gain of current which 1000 and it uses higher current at collector which is 5 amperes. Due to its higher gain of current and huge collector current (IC), it is used in such loads which use higher current and its uses for such submissions which required higher amplification. This transistor consumes less voltage only five volts across base and emitter, therefore, it can be effortlessly organized by a Logical expedient such as a microcontroller.

3.3 IC 7805(Voltage Regulator)

7805 is an IC used for voltage regulation and comes in TO-220 version. This component belongs to 78xx series where xx defines the output voltage it generates. It is a compact IC that comes with a built-in protection circuit that avoids the circuits from too much heating, making it suitable for circuits drawing high current. The input voltage range applied to the input terminals of this IC varies from 7 V to 18 V (in some cases 7 to 35 V), resulting in the generation of constant output voltage around 5 V. This IC comes with an accurate circuit which generates constant voltage so no capacitors are required to produce smooth output, however, it is advised to place 10 μ F capacitors in the input and output terminal to remain in the safer side.

3.4 Solenoid Valve

Solenoid valve function involves either opening or closing an orifice in a valve body, which either allows or prevents flow through the valve. The solenoid valve consists of coil and plunger attached to spring. In our project we have used Normally Closed solenoid valve. In Normally Closed type solenoid valve, the water flow is restricted by the plunger. When the coil gets energized, the spring moves up along with plunger. So, the water flows through the valve.

3.5 Arduino

Arduino is an open source microcontroller used to control solenoid valve. It is a very cheap platform to develop simple embedded projects.

IV. PROPOSED SYSTEM

In IR sensor the IR emitter LED emits infrared continuously. When the bottle is placed in front of IR sensor the infrared falls on the bottle and some amount of infrared is reflected. The reflected infrared is received by the receiver LED of IR sensor. Then the output pin of IR sensor becomes high which is connected to Arduino Nano. Then the transistor TIP122 turns on the solenoid valve and current flows through the coil of valve. The coil gets energized and the valve opens through which the water flows. When the bottle is filled and taken away from IR sensor, the output of IR sensor becomes low. Due to this no positive pulse at base of NPN transistor and it turns off. No current flows through the coil of the solenoid valve and the valve closes.

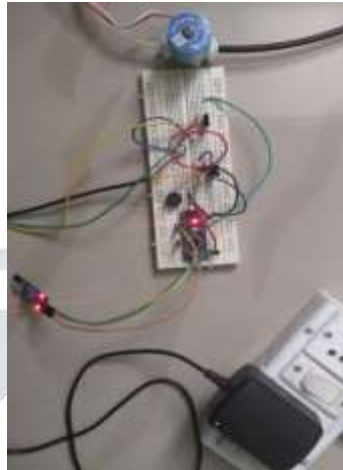


Figure 2 Hardware Connections

V. RESULTS

The hardware execution has also been done in a proper manner and the results have been verified. The hardware execution is shown in figure 3.



Figure 3 Automatic Water Tap in Water Purifier Setup

VI. Conclusion

Without any interpretation, the Solenoid Valve open and close when the IR Sensor senses the bottle. So, by making use of this system water wastage can be prevented and it made easy for physically abled people to fill bottles automatically.

VII. REFERENCES

[1] D. P. Tibe, P. C. Ghodke, I. J. Pawara, A. U. Gupte, and Prof. S. K. Mahindrakar, "Automatic Public Tap Control Using IR Sensor and Water Level Indication Using GSM" prime prime International Journal of Advance Engineering and Research Development (IJAERD), Vol. 3, Issue 5, May 2016, e-ISSN(O): 2348-4470 p-ISSN (P): 2348-6406

- [2] R. Vedula, V. K. Bachu, and P. S. P. Reddy. "A Hygienic, Cost Effective, Hand Free & Water Conservative Sensor Faucet". International Journal of Engineering Inventions (IJEI), Vol. 3, Issue 2, pp: 32-37, September 2013, e-ISSN: 2278-7461, p-ISSN: 2319-6491
- [3] E. C. Prima, S. S. Munifaha, R. Salam, M. H. Aziz, and A. T. Suryani, "Automatic Water Tank Filling System controlled using Arduino TM Based Sensor for Home Application", Proceeding of Elsevier Engineering Physics International Conference, EPIC 2016, Proceed ia Engineering Vol. 170, pp: 373 - 377 2017
- [4] B. Mashilkar, P. Kumar, A. Chawathe, V. Dabhade, V. Kamath, and G. Patil. "Automated Bottle Filling System", International Research Journal of Engineering and Technology (IRJET), Vol. 3, pp: 357-361, 2016

