

# Smart Automatic Water Tap for fixing multi-diameter telescopic hose pipes

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**ABSTRACT:** *The tap, indeed, is the greatest growth of mankind and perhaps the most important aspect of our lives. Taps are used in homes, factories, schools, colleges and different organizations for different purposes. Occasionally, to carry water somewhere else, we need to insert the pipe into taps. We use a hose connector to fasten the pipe with a tap. The connector for the hose is a mechanism used to connect the tap and the pipe together. Different tubes have diameters which vary. The main issue ahead of us, then, is locating the hose according to the diameter of the pipe. It's really difficult if we don't find any solution at that time. The problem of buying several hoses has been solved by this research paper of different diameters are placed inside the tap in this paper. With this application, the tap consisting of telescope hoses can be connected to several pipes of various diameters.*

**KEYWORDS:** *Water Tap, Multiple Hose, Multiple Pipe Connection, Diameter, Telescopic, Automatic Tap.*

## INTRODUCTION

Water is one of the substances without which there could be no life on earth; one cannot survive more than three days without water. Water is the most precious material in the world of humanity; water is everywhere in all its forms, such as gas, liquid and solid, in which, compared to other solar systems, this is the thing that makes earth unique. Water is also present on several other moon planets, but it does not occur in any of the three types above [1]. The earth is estimated with 325milliontrillion gallons of water but a history when earth began a barren, lifeless and waterless ball of fire in the sky; there isn't any water left in it. Therefore, it is a Mistry that how water came on earth? As we know that a single molecule of water i.e.  $H_2O$  is made up of three atoms wherein two atoms are of hydrogen the most abundant substance in universe and one atom of oxygen which is much rarer than hydrogen but still abundant. The journey of the first molecule of the waterstarts almost at the beginning of the time 13.8 billion years ago and at the time of beginning there were no atoms formed except protons and neutrons.

About 400 thousand years the universe took time to cool enough, for electrons to capture in the orbits around protons. This is how the first atoms are foamed. Hydrogen is formed with single positive charged proton and captured an electron with negative charged, one electrons spinning around in a fuzzy cloud of probability around one proton wherein the oxygen is much heavier and complicated atom than hydrogen comprising eight electrons orbiting in nucleus consisting eight protons and eight neutrons [2]. Time about 600 million years took to introduce and form first oxygen atom as this procedure require nuclear fusion. This type of nuclear fusion occurs only in one place that is in the center portion of the stars. The early stars were massive, much more massive than the sun. But this made them short to live, perhaps only few hundred million years in comparison to the life time of the sun which is been estimated about 8 billion years. About 600 million years, after the explosion of the big bang some of the stars began to go super-nova, just before the massive supernova explosion in their core lighter atoms fuse to form heavier atoms like hydrogen, oxygen, carbon and many others[3].

When these stars blew up a huge super-nova explosion then oxygen, hydrogen, carbon and other heavier elements began to disperse in space and spread out helped by the force of explosion. When these oxygen mix with hydrogen with the energy source of some kind and heat from the explosion and lightning in the space. The fusion of hydrogen and oxygen along with some energy form water, after formation of this water it eventually turned into ice with the coldness of space and merge with other dust particles and starts floating in the space; when more dust particles from multiple supernova explosion collected over time in one spot

then the gravitational force pull up all these matter and began to collect and collapse in the other generation of stars. This is how the water generated in the earth [4]. Though a lots of water is exploded in the earth but a massive amount of water is evaporated due to cosmic rays and super-nova explosions. So in the era of early civilization people used to harvest water from rivers from the high-ways of humanity, human has to travel longer distance in search of water and bring water from river to their homes there were no invention and generation of pipes or taps to collect water in their houses. To avoid this problem taps are invented and borings are done in houses to get the supply of water. To use that water taps are installed in particular areas.

As we know that taps are utilized for various purposes in houses, industries, schools, colleges and various organizations. The pipe is required to take water from one source to another, to fit pipe of different size different size hoses are required to fit in the tap. Sometimes this cause a lots of problem to buy multiple hose to connect pipe with the tap. Therefore, to prevent this problem an invention is introduced in this research paper which comprises a tapwith telescopic hose inside it to connect tap and pipe together. Different pipes have different diameters so this tap with multiple hose solve this huge problem.

**Stopper mechanism:**The stopper mechanism in which a liver is connected to a stopper and a spring is inserted in a rod is one of the most important mechanisms. Initially, the stopper on hose 2 will stick within the groove. The spring will contract as the lever is pulled back, and the stopper will leave the groove. The restoration force created by the spring and stopper will return its original position after the hose moves down.

**Closing mechanism:** You only have to force both the hoses upward. The closing mechanism is simple. Pull the lever upwards and drive hose 2 before the stopper gets trapped in it. Rotate the hose 1 before it gets trapped in the flange, the same for hose.

In this system, other more advanced features are introduced that can control the flow of water from the tap automatically. In this busy schedule, we humans do not have time to pour water into the plant, but without any human interference, water can be poured into the flowers and plants by introducing advanced technology. An Arduino controller board is used to monitor the flow of water, a motor pump where a valve is connected to the controller, a threshold timer to set the time of how much water is to be poured in relation to time, to operate this purpose.

### **Working:**

When the user sends signal from his/her smart phone, the water flow from the tap is controlled by the Arduino micro-controller, then the micro-controller receives the signal from the user and sends signal to the motor pump, this motor pump triggers the threshold timing by sending command to the threshold timer in which the timer opens the tap valve and the water flow begins. The water will flow until the specified time, once the timer reaches the prescribed time A signal is then sent to the controller to shut the motor pump, and the valve in the tap is closed as well. A warning or notification is sent to the user after the water is successfully poured into the flowers and the plant[5].

**Motor pump:**Centrifugal pumps are one of the world's most common hydraulic pumping devices. The machine has an impeller, a set of curved veins fitted within the shroud plates. The impeller is always immersed in the water and is always designed to spin, spinning the fluid around it as the impeller rotates. This imparts centrifugal force to water particles and the water moves radially out since the rotation mechanical energy is transferred to the fluid at this charged size of impeller where both pressure and kinetic energy of water will rise. At suction side the water used to be displaced so with the negative pressure water is induced at the center of impeller, such low pressure helps in sucking freshwater stream in the system again and the process continues. Therefore, priming is very much important for Centrifugal pumps. Water is not present at the initial stage then the negative pressure developed by the rotating air at the center of

impeller will be negligible and is small to suck fresh stream of water. Inside the casing, the impeller is fitted so that the water flowing out is stored inside it and travels to the discharged nozzle in the same rotation direction of the impeller[6].

**Threshold:**The threshold is the stage where a compressor begins to function. The compressor works only on signals peaking above the threshold set. The ratio that reminds how the compressor operates is essentially the primary setting that the user has placed on the compressor and the next one.

**Control Valve:**By incorporating an actuator, any valve can be transformed into a controlled valve, while the valve actuator uses an external power source to transfer a valve to the desired location in response to the signal. This external power source may be in the form of electronic or hydraulic pneumatic equipment. By transferring air pressure into the system, actuators assist in moving a valve location linearly or rotatory. In order to monitor the location of the flow control function, the movement of the devices opens and closes the linear or rotator valve with a sliding stem [7].

## REVIEW OF LITERATURE

By using Raspberry pi 3, Adabara Ibrahim modelled and implemented a smart tap in this previous art project. In contrast with the standard hand wash tap, the technology was advanced and planned to improve life by implementing a more suitable hand wash system. In the system, multiple mechanisms were mounted where the water, soap and dryer are incorporated into the system together. The machine comprises an ultrasonic sensor, electrically gallon pump and relay, and raspberry pi 3 microcontroller are used to automatically compress the water tap in this research paper. The ultrasonic sensor is used to detect the object accumulated before it, to open and close the tap valve by supplying DC to it, electrically gallon pump, Relay is used to transfer the current / voltage using large current / voltage is small. The entire device is powered by the Raspberry pi 3 microcontroller using this technology. The smart tap system is used to efficiently transform water from the point of source to the point of use and prevent human error. Automated supply of water can be achieved by embeddingsystem in cost effective way. The smart tap system is actually a smart system as the people who wish to wash his/her hand or drink water don't need to tum on the water tap.

In this review paperAbdulrhman Al-Yemni et. al. had proposed an innovative technology where the system used to measure the body temperature by using DS18B20 sensor after that the water used to fallin pipes. This method was accomplished using an Arduino Uno Microcontroller connected with temperature sensor to sense the human body and then send the information to the controller to control two water valves (i.e. Hot & Cold) in order to mix the proper amount of hot and cold water conforming the body temperature. The main purpose of this system is to mix the hot and cold water as per human body requirement and sustainability.

Vani K.S. et. al. had proposed an automatic tap controlling unit in the smart home by using Arduino microcontroller.In paper comprises an automatically tap controlling unit where the tap can be controlled by the smart phone with the help of Arduino. This application helps to control the flow of water from the tap to plant in the home through internet by sitting anywhere in the world [8]. Arduino 2560 board with Ethernet Shield is used in this project. Arduino is coded using Arduino codes and the app development is done using Android programming.

## CONCLUSION

The home is getting smarter day by day by adding many applications to make human life more flexible and effective. This application is relevant and useful in daily life, particularly for the elderly or office concerned individuals who do not have enough time to look for their planting area to make it sober and provide proper care by pouring water into their garden from time to time.This application is also useful for the conservation

of water, and can be effectively implemented in gardens, parks, etc. This system also contains multiple telescopic hoses where one pipe is mounted inside the other to connect the water tap telescopic hose to the different diameter pipe, which helps to transfer water from one location to another. For various purposes, buying the implementation of this system in any hose can be used and helpful in households, factories, schools, colleges and various organizations in our day. The platform can be planned and incorporated with current smart home technologies so that this product can be used more efficiently on a large scale.

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