Installing Multi-Diameter Telescopic Hose Pipes with the Smart Automatic Water Faucet

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ABSTRACT: The tap is, without a doubt, mankind's greatest development and probably the most essential element of our existence. Taps are used for a variety of reasons in households, workplaces, schools, universities, and other organizations. We sometimes need to put the pipe into taps to transport water to another location. To secure the pipe with a tap, we utilize a hose connection. The hose connector is a device that connects the tap and the pipe together. Different tubes have different diameters. The major problem we have now is finding the hose according to the pipe's diameter. If we do not find a solution at that time, it will be very tough. This research study has addressed the issue of having to purchase multiple hoses of various sizes to fit within the tap. The tap, which consists of telescopic hoses, may be linked to multiple pipes of different sizes with this application.

KEYWORDS: Water Tap, Multiple Hose, Multiple Pipe Connection, Diameter, Telescopic

1. INTRODUCTION

Water is one of the essential elements for life on Earth; without it, one cannot live for longer than three days. Water is the most valuable resource in humanity's planet; it can be found in all of its forms, including gas, liquid, and solid, and it is the thing that distinguishes Earth from other solar systems [1]. Water is found on many additional moon worlds, although not in any of the three kinds described above [2]. The planet is believed to have 325 million trillion gallons of water, yet there is no water remaining in it since it started as a barren, dead, and waterless ball of fire in the sky [3]. As a result, the origin of water on Earth remains a mystery [4]. A single molecule of water, H_2O, is made up of three atoms, two of which are hydrogen, the most common material in the universe, and one of which is oxygen, which is considerably rarer than hydrogen but still plentiful [5]. The voyage of the first water molecule begins nearly at the beginning of time, 13.8 billion years ago, and there were no atoms created at the time save protons and neutrons. It took around 400 thousand years for the cosmos to cool sufficiently for electrons to capture in protons' orbits [6].

The earliest atoms froth in this manner. Hydrogen is made up of a single positively charged proton and a single negatively charged electron, with one electron spinning around in a fuzzy cloud of probability around one proton, whereas oxygen is a much heavier and more complicated atom, with eight electrons orbiting in a nucleus made up of eight protons and eight neutrons [7]. It took approximately 600 million years to introduce and create the first oxygen atom since nuclear fusion was required [8]. This kind of nuclear fusion can only happen in one place: the core of the stars [9]. The early stars were enormous, far larger than the sun. However, they had a limited life span, possibly just a few hundred million years in contrast to the sun's projected lifespan of 8 billion years [10]. Some stars started to go supernova around 600 million years after the big bang, right before the huge supernova explosion in their core, when lighter atoms fused to create heavier elements like hydrogen, oxygen, carbon, and many more [11].

When these stars exploded in a massive supernova explosion, oxygen, hydrogen, carbon, and other heavier elements started to scatter and spread out in space, aided by the explosion's power. When these oxygen molecules combine with hydrogen in the presence of an energy source of some kind, as well as heat from explosions and lightning in space [12]. The fusion of hydrogen

and oxygen, along with some energy, forms water, which eventually turns into ice with the coldness of space and merges with other dust particles to float in space; when more dust particles from multiple supernova explosions gathered in one spot over time, the gravitational force pulled up all of these matter and began to collect and collide; when more dust particles from multiple supernova explosions gathered over time in one spot, the gravitational force pulled up all of these matter and began to collect and call [13]. This is how the earth's water is produced [14]. Although a large quantity of water is exploded in the planet, cosmic rays and supernova explosions evaporate a large amount of water [15]. So, in the early days of civilization, people used to gather water from rivers on the high-ways of mankind; humans had to travel greater distances in quest of water and carry water from the river to their dwellings since pipelines and taps had not yet been invented.

To solve this issue, taps were developed, and boreholes were dug in homes to provide water. Water taps are placed in certain locations to be used. As we all know, taps are used for a variety of reasons in homes, businesses, schools, universities, and other organizations [16]. The pipe is used to transport water from one location to another, and various size hoses are needed to suit different pipe sizes in the tap [17]. This may lead to a number of issues, such as having to purchase several hoses to connect the pipe to the tap [18]. As a result, in this study report, an innovation is presented that consists of a tap with a telescopic hose within it that connects the tap and pipe together. Because various pipes have varying sizes, this multi-hose tap solves a major issue.

1.1 Stopper Mechanism:

One of the most significant mechanisms is the stopper mechanism, which involves connecting a liver to a stopper and inserting a spring into a rod. The stopper on hose 2 will first become stuck in the groove. As the lever is pushed back, the spring contracts, and the stopper falls out of the groove. After the hose travels down, the restoration force produced by the spring and stopper will restore it to its former place.

1.2 Closing Mechanism:

All you have to do now is pull both hoses upward. The closing process is straightforward. Before the stopper becomes stuck in hose 2, pull the lever upwards and push hose 2. Before hose 1 becomes caught in the flange, rotate it, as well as hose 2. Other more sophisticated functions are included in this system, which may automatically regulate the flow of water from the tap. We humans do not have time to water plants because of our hectic schedules, but modern technology allows water to be poured into flowers and plants without human intervention. To operate this purpose, an Arduino controller board is used to monitor the flow of water, a motor pump with a valve linked to the controller, and a threshold timer to set the amount of water to be poured in proportion to time..

1.3 Working:

When the user sends a signal from his or her phone, the Arduino microcontroller controls the water flow from the tap. The microcontroller receives the signal from the user and sends it to the motor pump, which triggers the threshold timing by sending a command to the threshold timer, which opens the tap valve and the water flow begins. Once the timer reaches the set time, the water will flow until the timer beeps. The controller receives a signal to turn off the motor pump, and the tap's valve is also turned off. After the water has been successfully put into the flowers and the plant, a warning or notice is given to the user [19].

1.4 Motor pump:

Centrifugal pumps are one of the most widely used hydraulic pumping equipment in the world. The machine features an impeller, which is made up of a series of curved veins that are placed into the shroud plates. The impeller is submerged in water at all times and is intended to spin, whirling the fluid around it as it spins. Since the rotating mechanical energy is transmitted to the fluid at this charged size of impeller, both pressure and kinetic energy of water will grow, this imparts centrifugal force to water particles, and the water flows radially out. Water used to be displaced at the suction side, thus with negative pressure, water is induced in the center of the impeller; this low pressure aids in sucking freshwater stream back into the system, and the process repeats. As a result, priming is critical for centrifugal pumps. If water isn't present at the start, the negative pressure created by spinning air at the impeller's center will be insignificant, making it difficult to suck a new stream of water. The impeller is placed within the casing so that the water pouring out is retained inside it and flows in the same rotation direction as the impeller to the discharged nozzle [20].

1.5 Threshold:

The threshold is the point at which a compressor starts to work. The compressor only operates on signals that above the threshold. The ratio that recalls how the compressor works is basically the first setting that the user has put on the compressor and the second one that the user has placed on the compressor [21].

1.6 Control Valve:

Any valve may be turned into a controlled valve by adding an actuator, which utilizes an external power source to move a valve to the appropriate position in response to a signal. Electronic or hydraulic pneumatic equipment may be used as an external power source. Actuators help move a valve position linearly or rotatory by delivering air pressure into the system. The movement of the devices opens and shuts the linear or rotator valve with a sliding stem in order to monitor the position of the flow control function.

2. REVIEW OF LITERATURE

Adabara Ibrahim designed and built a smart tap in this prior art project using a Raspberry Pi 3. The technology was improved and intended to enhance life by creating a more appropriate hand wash system, in contrast to the conventional hand wash tap. Multiple mechanisms were installed in the system, with the water, soap, and dryer all being integrated into the system. An ultrasonic sensor, an electrically gallon pump and relay, and a Raspberry Pi 3 microprocessor are utilized in this research article to automatically compress the water tap. The ultrasonic sensor is used to detect the item collected in front of it, to provide DC to open and close the tap valve, electrically gallon pump, and Relay is used to transmit the current / voltage using high current / voltage is tiny. Using this technique, the Raspberry Pi 3 microcontroller powers the whole gadget. The smart tap system is utilized to effectively convert water from its source to its final destination while avoiding human mistake. Water delivery may be automated in a cost-effective manner by integrating a system. The smart tap system is really a clever system since it eliminates the need for individuals to turn on the water faucet to wash their hands or drink water [22].

In this review article, Abdulrhman Al-Yemni et al. presented a new technique in which the system utilized a DS18B20 sensor to detect the body temperature, and then the water flowed via pipes. This technique was achieved utilizing an Arduino Uno Microcontroller linked to a temperature sensor to detect the human body and then transmit the information to the controller to operate two water valves (i.e. Hot & Cold) to mix the appropriate quantity of hot and cold

water to match the body temperature. The primary goal of this system is to mix hot and cold water according to the needs of the human body and to ensure long-term sustainability [23]. Vani K.S. et al. suggested utilizing an Arduino microcontroller to create an automated tap regulating device for the smart home. An automated tap controlling device is included in the article, and the tap may be controlled by a smart phone using Arduino. This program allows you to manage the flow of water in your house from the faucet to the plant using the internet from anywhere in the globe. In this project, an Arduino 2560 board with an Ethernet Shield is utilized. Arduino is programmed using Arduino codes, while Android programming is used to create apps [24].

3. DISCUSSION

Water is one of the most important components for life on Earth; without it, humans can only survive for three days. Water is humanity's most precious resource; it can be found in all of its forms, including gas, liquid, and solid, and it is what sets Earth apart from other solar systems. Water can be found on many more moon planets, but not in the three types mentioned above. Although the planet is thought to have 325 million trillion gallons of water, no water has remained since it began as a barren, lifeless, and waterless ball of fire in the sky. As a consequence, the origin of water on Earth is still unknown. A single molecule of water, H_2O, is made up of three atoms: two hydrogen atoms, the most abundant substance in the universe, and one oxygen atom, which is far rarer than hydrogen but still abundant. The journey of the first water molecule starts almost at the beginning of time, 13.8 billion years ago, when no atoms other than protons and neutrons had been formed. It took around 400 thousand years for the universe to cool enough for electrons to be trapped in protons' orbits.

This is how the first atoms foam. One electron spins about in a fuzzy cloud of probability around one proton in hydrogen, while oxygen is a considerably heavier and more complex atom, with eight electrons circling around a nucleus made up of eight protons and eight neutrons. Since nuclear fusion was needed, it took about 600 million years to introduce and produce the first oxygen atom [25]. Nuclear fusion like this can only happen in one place: the cores of stars. The early stars were massive, dwarfing the sun. They did, however, have a short life period, perhaps just a few hundred million years, compared to the sun's estimated lifetime of 8 billion years. Around 600 million years after the big bang, some stars began to go supernova, just before the massive supernova explosion in their core, when lighter atoms merged to form heavier elements like hydrogen, oxygen, carbon, and many others.

When these stars burst in a huge supernova explosion, oxygen, hydrogen, carbon, and other heavier elements began to disperse and spread out in space, helped by the force of the explosion [26]. When these oxygen molecules mix with hydrogen in the presence of some sort of energy source, such as heat from space explosions and lightning. When more dust particles from multiple supernova explosions gathered in one spot over time, the gravitational force pulled up all of these matter and began to collect and collide; when more dust particles from multiple supernova explosions gathered in one spot over time, the gravitational force pulled up all of these matter and began to collect and collide; when more dust particles from multiple supernova explosions gathered in one spot over time, the gravitational force pulled up all of these matter and began to collect and collide; when more.

This is how the water on the planet is created. Despite the fact that a lot of water gets blown up on the planet, cosmic rays and supernova explosions evaporate a lot of it. People used to collect water from rivers on the high-ways of humanity in the early days of civilization; humans had to travel larger distances in search of water and bring water from the river to their homes since

pipelines and taps had not yet been created. Taps were created to address this problem, and boreholes were sunk in houses to supply water. To be utilized, water taps are installed in certain places. Taps are used for a number of purposes in households, companies, schools, colleges, and other organizations, as we all know. The pipe transports water from one place to another, and varied hose diameters are required to accommodate the various pipe sizes in the tap. This may result in a variety of problems, such as the need to buy several hoses to connect the pipe to the tap. As a consequence, an invention is provided in this research report, which comprises of a tap with a telescoping hose inside it that links the tap and pipe. This multi-hose tap addresses a significant problem caused by the different diameters of pipes.

4.   CONCLUSION

Every day, the house becomes smarter as new applications are added to make human existence more adaptable and efficient. This program is important and helpful in everyday life, especially for the elderly or office-bound people who do not have enough time to find their planting space, clean it up, and give appropriate care by watering their garden on a regular basis. This application is also good for water conservation and may be used in gardens, parks, and other places. This system also includes several telescopic hoses, one of which is placed inside the other to link the water tap telescopic hose to a pipe of a different diameter, allowing water to be transferred from one place to another. Buying the installation of this system in any hose may be utilized and useful in homes, industries, schools, universities, and other organizations in current day for a variety of reasons. This product may be more effectively utilized on a wide scale if the platform is designed and integrated with existing smart home technology.

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