Battery less touch free water tap Add-on module

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Abstract:

We propose to design a Battery less touch free water tap operation system especially to be used in public places where a large number of individuals come and use the tap. The main feature of this touch free water tap operation system is that unlike other IR based touch free system it does not use a battery to power it up but we propose to use the flow of water itself as a source of power for the rest of the system to operate.

Motivation

As a part of the rise of pandemic, it's evident that most of habits of people are likely to chage toward more of touch free based habits. A tap at a public place such as a wash room in any public or office is at high risk of being contaminated with germs of covid-19 and of other kinds. Thus a solution as that of a battery less touch free tap, has an advantage of being operational as a normal tap, which needs no battery and also provides touch free operation to avoid any carriage of germs via hands.

Working:

The working of this system is based upon usage of electronically controlled solenoid valve that gets its energy from a micro turbine based charged capacitor. The complete block diagram of the system is described in figure 1. It is evident that once the tap is operated once by a user manually during the first use of the day, then the amount of water which he uses will actually help in charging the capacitors attached with the turbine. This mechanism will ensure only one user will touch the tap and rest of the users can operate it touch free.
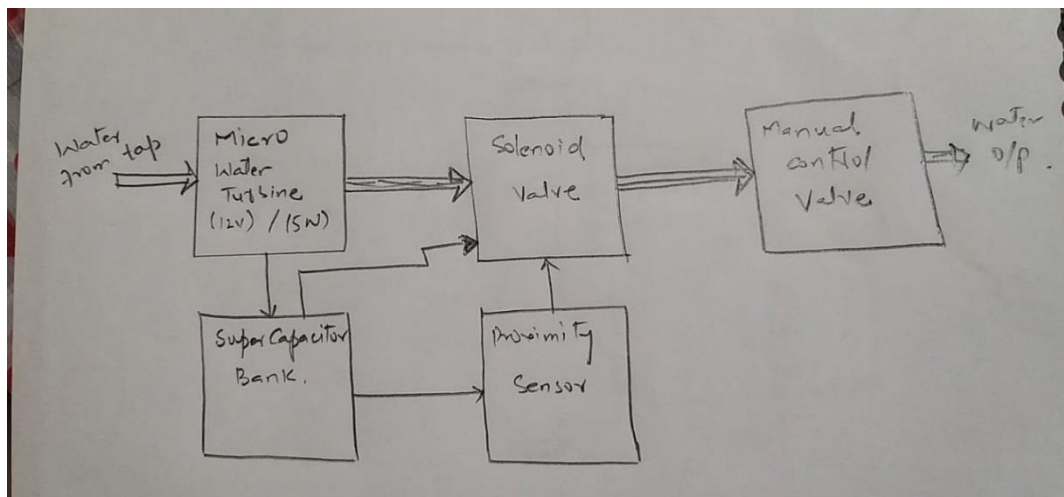

Fig1. Block diagram of proposed model.

This concept is in itself a novel idea and is expected to be a prime choice at public places where rush of people is too high e.g metro stations, bus stations, air-ports, public toilets etc.

For the purposes of better illustration Figure 2 here provides an illustration diagram of the proposed design that can be seen as an add-on module for any tap. The idea is to use the 12v solenoid to open and close the tap, as can be observed in the figure 2 the solenoid is powered by a super capacitor, so

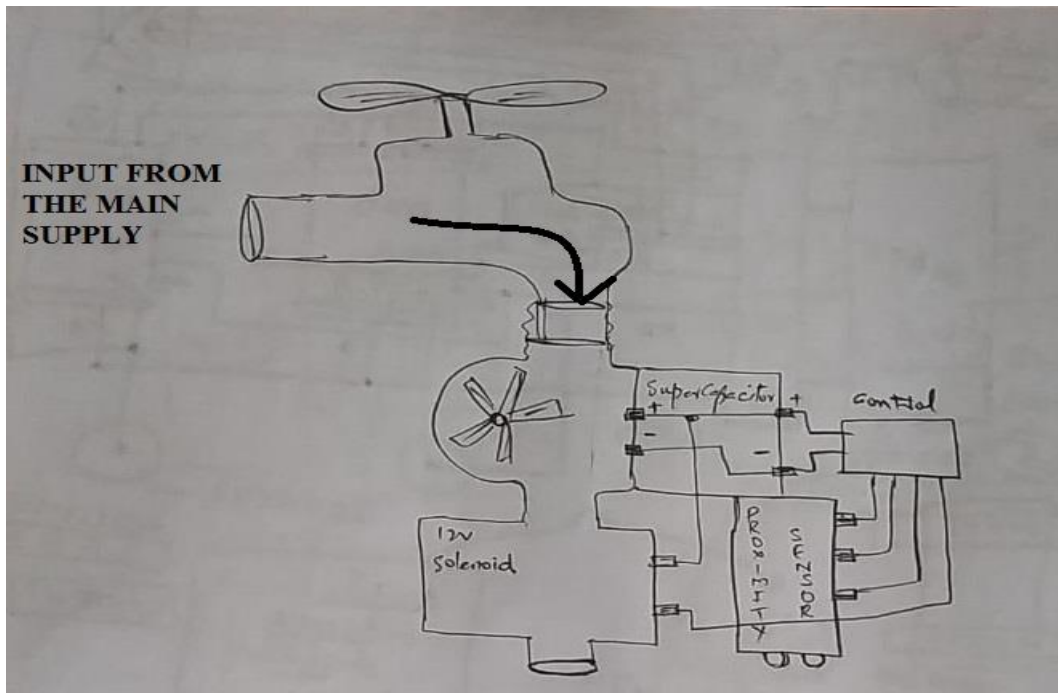that the tap will remain open for a predefined time as long as the proximity sensor senses a hand or some other sensation for its operation.

Fig 2: Illustration diagram of the proposed design.