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Automatic Saline Re-filler for COVID-19 patients using IoT

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ABSTRACT

Coronavirus disease (COVID-19) is an infectious disease caused by a new virus. Till now there is no vaccine for it and the COVID-19 positive patients are monitored in ICU for which continuous saline supply is necessary. Isolation is the prime concern for COVID 19 break while tired and understaffed, medical workers must deal with thousands of new cases per week in infected cities at the epicenter. Many doctors have had to see patients without proper masks or protective body suits, resorting to reusing the same equipment as saline when they should be changed regularly. Around 1000's of positive cases is increasing daily. Refilling saline for the patients requires a medical staff may be a nurse or a compounder to monitor the saline level continuously and refill it. This work majorly concentrates on how automatic refilling of saline is done to the COVID 19 patients in the Intensive care Unit (ICU) or in Critical Isolation ward so that continuous contact for the doctors with the positive patients can be minimized. In addition to this patients BP, Heart rate can be monitored from outside of critical wards.

Keywords— Saline, IoT

1. INTRODUCTION

According to [1], Staffing problems are already becoming acute in New York City, the epicenter of the US pandemic so far with more than 20,000 cases and approaching 300 deaths, as of March 25. City officials were not able to provide any numbers on how many medical workers there have tested positive for Covid-19, but doctors work in fear for their own safety. This remains the same for most of the affected areas of COVID.

The disease causes respiratory illness (like the flu) with symptoms such as a cough, fever, and in more severe cases, difficulty breathing.

The positive patients are increasing day by day for which medication and proper care is very prime factor of all. The situations are forcing all the doctors and medical staff, students get into the duty 24x7. Even though the doctors are facing with many health issues when they are in direct contact with the COVID 19 patients. The design adds advantage to doctors and staff to monitor the patients from outside the ward for which there is no necessary for them to go and refill the saline bottles frequently along with BP, Heartrate details. With this design the safety of doctors increases.

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2. BLOCK DIAGRAM

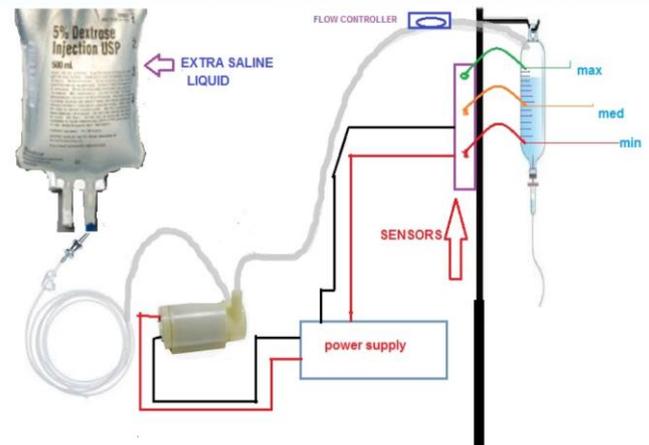


Fig. 1: Proposed block diagram

The main source of saline is 10 litre and is connected via a saline wiring and a power supply is used for running motor and sensors. Whenever the saline bottle connected to the patient reaches the minimum level the motor gets turned on and the fluid inside it is filled into the saline bottle till the maximum level. Once the bottle reaches the maximum level again the system is turned off automatically.

Coming to the detailed working here we are using a 10 liter filler which will be having an inlet and the device is connected to the filler. Now the patient having saline connected to his/her body and we are separating the partitions like maximum medium minimum.



Fig. 2: Saline inlets

Once the saline got the level to minimum the inlet connected to the 10-liter filler starts giving the saline through inlet and flow towards the outlet connected to the saline connected to the person and will fill the saline bottle. Now the saline bottle starts filling through the outlet connected to the saline bottle from the inlet connected to the 10-liter filler.

Once the saline bottle is filled to maximum level then it automatically stops. When the saline liquid present in the 10-liter filler gets empty we will get an alert message to our mobile through the device which is connected to the 10-liter filler. AUTOMATIC SALINE REFILLER.



Fig. 3: Alert message for the doctors

Above is quick review of the device AUTOMATIC SALINE REFILLER. The main purpose of the device is to reduce tension to the doctors or nurses who need to monitor the patients every second and this is mainly used for the people who stays in bed with saline 24x7 and there should be a person who need to

monitor them and check whether the saline is filled or not. With this device we can eradicate such things and keep a healthy environment.

3. FUTURE SCOPE

In addition to the saline refilling, this proposed design can be extended with automatic collection of BP, Heart rate, Saturation levels of the patients that can be given in a dashboard for the doctors timely. Also, timely supply of various fluids other than saline can be done without the tension even in midnights this will be very helpful to doctors and nursing staff. This design is successfully tested and the results are very appropriate.

4. REFERENCES

- [1] 1 <https://www.vox.com/2020/3/26/21192191/coronavirus-us-new-york-hospitals-doctors-nurses>
- [2] 2 <https://www.worldometers.info/coronavirus/coronavirus-death-toll/>