

Low Cost Ventilator With BGM And Oximeter

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Abstract- As we know that defining the robustness and functionalities of ventilator which is not only easily transferable as well as it is very low cost and economics friendly. It is designed under the basic idea of being incorporated in huge human catastrophes in poorly resources enriched environments.

Ventilator under the proposed design that It functions without human operator as it delivers breaths through the compression of an orthodox bag-valve mask. It satisfies its energy needs from an electric motor having battery power of 12 volts DC.

Different functions need to be performed for the purpose of ventilation i.e. pressure and required number of breathes per minute is managed by an easy to use input board comprising of buttons. In addition to that it also contains an alarm of low battery indication system as well as an assist control.

Keywords- Low-Cost Portable Ventilator, COVID-19, Pandemic, Mechanical ventilator, Medical Hardware, Artificial Respiration etc.

I. INTRODUCTION

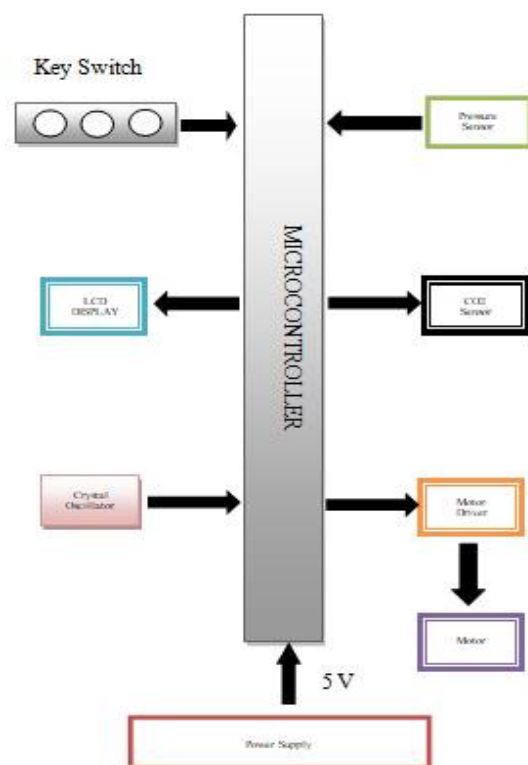
The imitation of smoke, usage of hazardous gases on massive level and successive use of natural resources for the sake of mending energy needs. The disease mentioned above & many more disease requires mechanical ventilation in case of failure of lungs. This prototype will help a patient to inhale and exhale so the exchange of carbon dioxide and oxygen could be possible and the patient have the artificial respiration to survive. Ventilators those are already in use in most of privileged hospitals are high in cost. Poor countries are seem unable to render such services and reason is very much clear; the high costs of acquiring and utilizing them.

Based upon these circumstances it is empirical to have such a low cost and efficient ventilators.

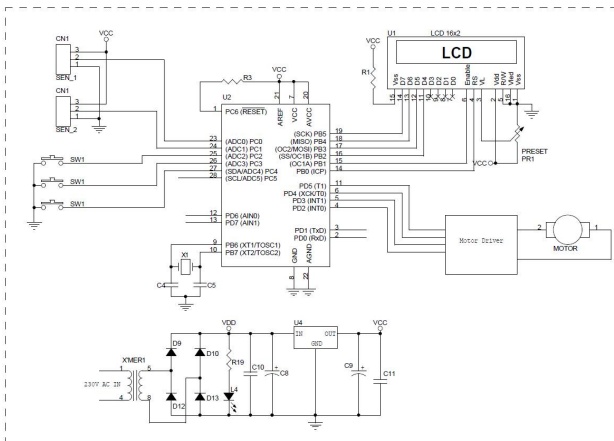
In India after February 2020 the need for ventilators increased for the treatment of covid-19 patients. In the situation like COVID-19 not only India but the whole world is facing the shortage of ventilators. India have approximately

nineteen Lakh hospitals, ninety – five thousand ICU beds, and forty- eight thousand ventilators only but the population of India is approximately 135.26 crores which indicates that there is a huge shortage of ventilators. So we decided to make a portable ventilator of less cost.

II. BLOCK DIAGRAM



III. CIRCUIT DIAGRAM



IV. PROPOSED METHODOLOGY

- A ventilator mechanism must be able to deliver in the range of 10 – 30 breaths per minute, with the ability to adjust rising increments in sets of Along with this the ventilator must have the ability to adjust the air volume pushed into lungs in each breath. The last but not the least is the setting to adjust the time duration for inhalation to exhalation ratio.
- The ventilator must be able to monitor the patients' blood oxygen level and exhaled lung pressure to avoid over/under air pressure simultaneously.
- The ventilator we here design and develop using Arduino encompasses all these requirements to develop a reliable yet affordable DIY ventilator to help in times of pandemic.
- We here use a silicon ventilator bag coupled driven by DC motors with 2 side push mechanism to push the ventilator bag. We use toggle switch for switching and a variable pot to adjust the breath length and the BPM value for the patient.
- Our system makes use of blood oxygen sensor along with sensitive pressure sensor to monitor the necessary vitals of the patient and display on a mini screen. Also an emergency buzzer alert is fitted in the system to sound an alert as soon as any anomaly is detected.
- The entire system is driven by Arduino controller to achieve desired results and to assist patients in COVID pandemic and other emergency situations.

V. CONCLUSION

This Ventilator model is reliable and efficient for providing oxygen to the patients who cannot afford high hospital charges. It is in reasonable cost and consume less power. It is easy to operate. The Model being less weight it is handy and can be ported from one place to another. This

ventilator model is cost efficient and it can be purchased by a common man

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