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# Tracking health care system using low cost hospitalized tool and iot

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**ABSTRACT—** As all of you know that The COVID-19 pandemic has produced critical shortages of ventilators worldwide. So the demand for ventilator with sufficient functionality for treating covid patient also increased. So as makers we tried to create a ventilator which is simple, low cost and portable for treating covid patients and also other patients, who need oxygen to breath. This is single-mode continuous, mandatory, closed-loop, pressure-controlled, time-terminated emergency ventilator offers robust safety. Apart from that we are also using an iot part in that which makes ventilator advance type ventilator .so we tried to make a ventilator which can be used in emergency cases in covid 19 or it can be used in future.

**Keywords**—Ventilator, pandemic, ventilation, influenza pandemic, open source, open hardware, COVID-19, medical hardware, iot part

## I. INTRODUCTION

Amid the global crisis caused by the corona virus pandemic, hospitals and healthcare facilities are reporting shortages of virtual equipment's such as ventilator.. As students of engineering we are decided to make a project on ventilator to overcome the problems that are caused due to shortage of ventilator.

Basically a ventilator is a machine that provides breathable air into and out of the lungs, to deliver breaths to a patient who is physically unable to breathe, or breathing insufficiently. A DIY ventilator may not be efficient as that of a medical grade ventilator but it can act as a good substitute if it has control over the following key parameters.

Tidal volume: It's the volume of air delivered to the lungs with each breath by the ventilator - typically 500ml at rest.

BPM(Breaths per minute): This is the set rate for delivering breaths.for normal human being bpm is 72 (bpm)

Inspiratory: Expiratory ratio (IE Ratio): refers to the ratio of inspiratory time: expiratory time. The normal i/e ratio to starts is 1:2

Flow rate: is the maximum flow at which a set tidal volume breath is delivered by the ventilator most modern ventilators can deliver flow rate between 60 and 120 l/min

Peep (Positive end expiratory pressure): It is the pressure in the lungs above atmospheric pressure that exists at the end of expiration

Basically the project is based on the automation of the manual BVM (Ambu-bag), which you can find in any medical supply store. It is a hand-held device commonly used to provide positive pressure ventilation.

## II. SYSTEM ARCHITECTURE

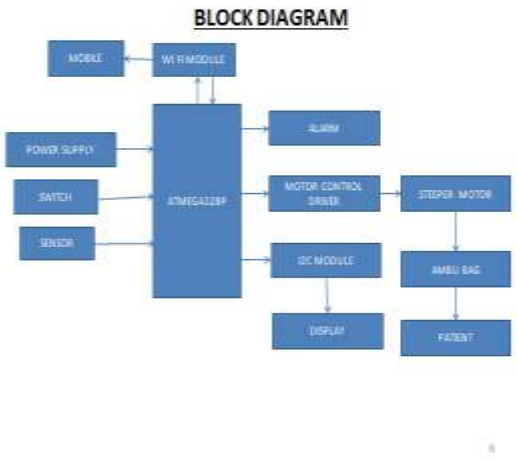


FIG2.1 BLOCK DIAGRAM.

We are using ATMEGA32 microcontroller and it need some Basic requirements. First it needs 5V power supply for its Operation. The power supply contains step down transformer 230/12V, which steps

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down the voltage to 12V AC. This is Converted to DC using bridge rectifier and it is then regulated to +5V using voltage regulator 7805. ATMEGA32 also needs Manual reset to execute the code from beginning. It also has Inbuilt oscillator of (1-8) MHz

In above block diagram L289N is used for controlling the stepper motor. The l289 is a micro stepping driver for controlling bipolar stepper motors which has built-in translator for easy operation. This means that we can control the stepper motor with just 2 pins from Arduino, i.e. one for controlling the direction of rotation and the other for controlling the steps. And we can apply pressure to ambu bag.

For user interface I've made a control panel out of a 16*2character display and 3 buttons (for up, down & ok functions). You could simply connect the display directly with arduino but I'd prefer using an I2c display adapter so that you can plug and play without a mess. 10K resistors are added for each individual buttons for pull down purpose.

Wire the components as shown in the diagram. Make sure that you had installed all the necessary libraries mentioned in code. Now, upload any of the sketches provided to your arduino. Use a 12v SMPS (3A min.) for powering the setup.

On running the test code, the motor executes cycles of clockwise& anti-clockwise rotations so that you canmake sure that the actuator is running smoothly.

For testing the control panel and the device as a whole, upload the final_code.ino to the arduino. Now you can interface with the ventilator via control panel. By default, all the ventilation parameters are displayed on the screen. Use 'up'/'down' buttons to switch between parameters and press 'ok' button for selecting a parameter. Again use the up/down buttons to increase/decrease the value of the selected parameter. Finally press 'ok' to confirm the value.

Default Screen

Also we are using iot part for that we are using wi fi module. If any serious condition of patients occurs then that will directly display to doctor by sing blynk app it will automatically send message to doctor

## III. SIMULATION RESULT

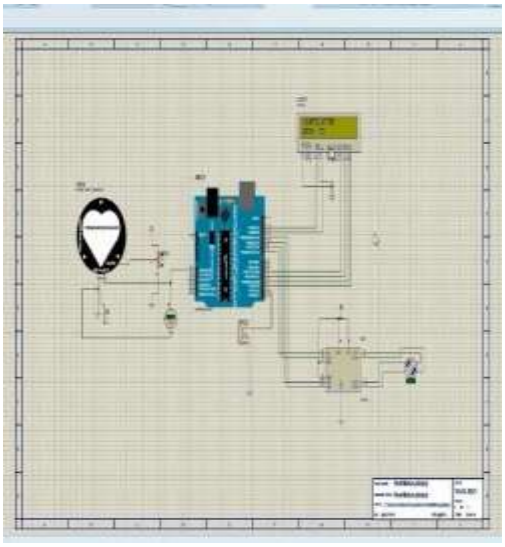

Fig3.1 Simulation of ventilator

In above diagram power supply supplies 12 v of power to our circuit but our circuit needs only 5 v of supply so we are using voltage regulator, voltage regulator will convert 12v of supply to 5v. After that we are using aurdunio as main component main function of aurdiuno is to collect the input from sensors and components and gives corresponding output.aurdiuno is ide software tool where we already save all the test code of project .

Another one component we are using is stepper motor basically steeper motor is motor that rotate one step at a time it moves in clockwise and antilock directing here motor driver controller is also used to control the steeper motor. steeper motor will apply pressure to ambu bag ,the rate of pressure is depend upon the heartbeat of patient . heartbeat of patient will displayed on lcd screen .for indication purpose we are using 2 led such as green and red led. Where green indicate normal rate of patient, and red indicate the patient is in danger also we are using alarm for that purpose.

Apart from that we are using an iot part if any serious condition happen the condition of patient will displayed to doctor via message for that we are using Wi-Fi module.

The ESP8266 Wi-Fi Module is a self-contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application .processes. ESP8266 module is an extremely cost effective board with a huge, and ever growing, community.

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Fig 3.2 LCD display

## IV. RESULT

In this paper,the main purpose of the project to provide oxygen to patient in emergency cases thus we obtained the result such as heartbeat of the patient keeping normal by providing oxygen.

## V. CONCLUSION

Thus we tried to make a low cost easily portable emergency ventilator by using an iot part .

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