

SYNOPSIS

TITLE — “Making one ventilator usable for multiple patients of different category using IOT”

Introduction:

Problem-

- Less number of ventilators around the world.
- Due to COVID-19 demand for ventilators increased.
- Today India has just 48,242 ventilators for a population of 1.3 billion on an average.
- That is Almost ONE Ventilator for every 27,000 people.

Solution-

“Make single ventilator usable for multiple patients”

In the research paper " A Single Ventilator for Multiple Simulated Patients to Meet Disaster Surge " attached below following are some limitations-:

1. patients should have the same lung capacity.
2. Chances of cross-contamination.
3. Ventilation of different drugs/medicines to a specified patient can't be done.

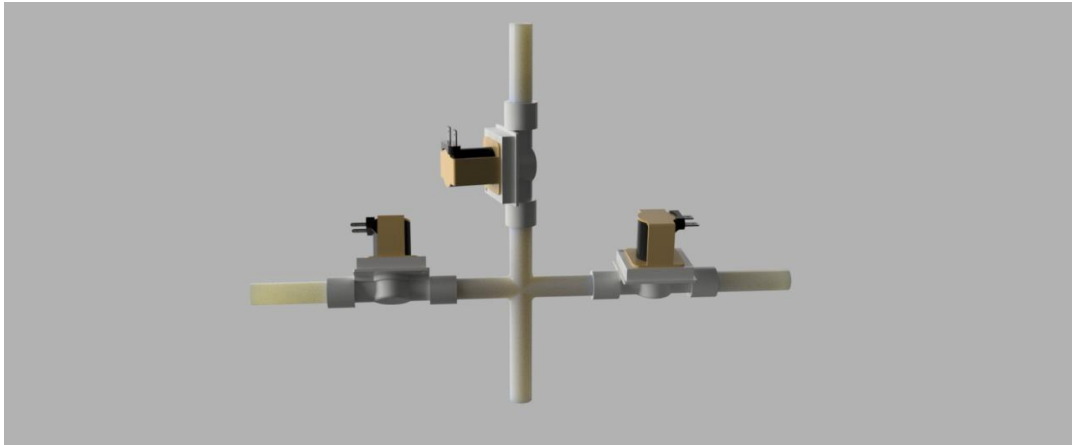
OUR IDEA

Our idea is to make an attachment which can work and make use of one ventilator for multiple patients of different category. The idea is specially meant to be cost-effective so that anyone can use it. Attachment can replace 3-5 ventilators to just one.

For different category we mean that: patients could be of any age group, having any other diseases etc.

Our idea has taken care of every limitations research paper contains.

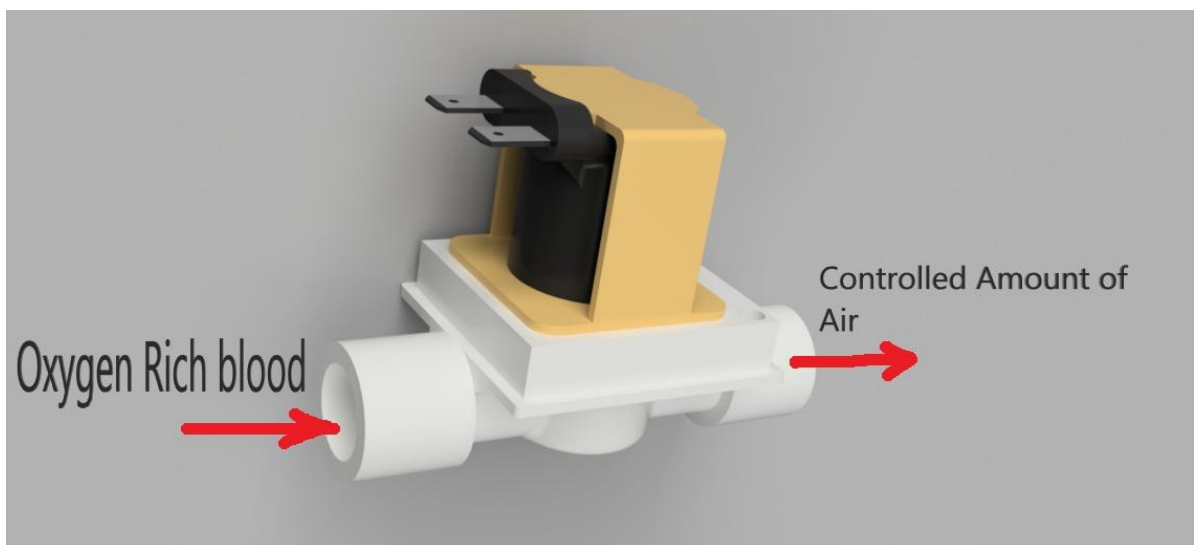
We will attach a valve at the end of each pipe, which will be used for one patient. that means if one ventilator is used for four patients then four valves will be used where each valve will be connected at the end of each pipe uses for a single patient.

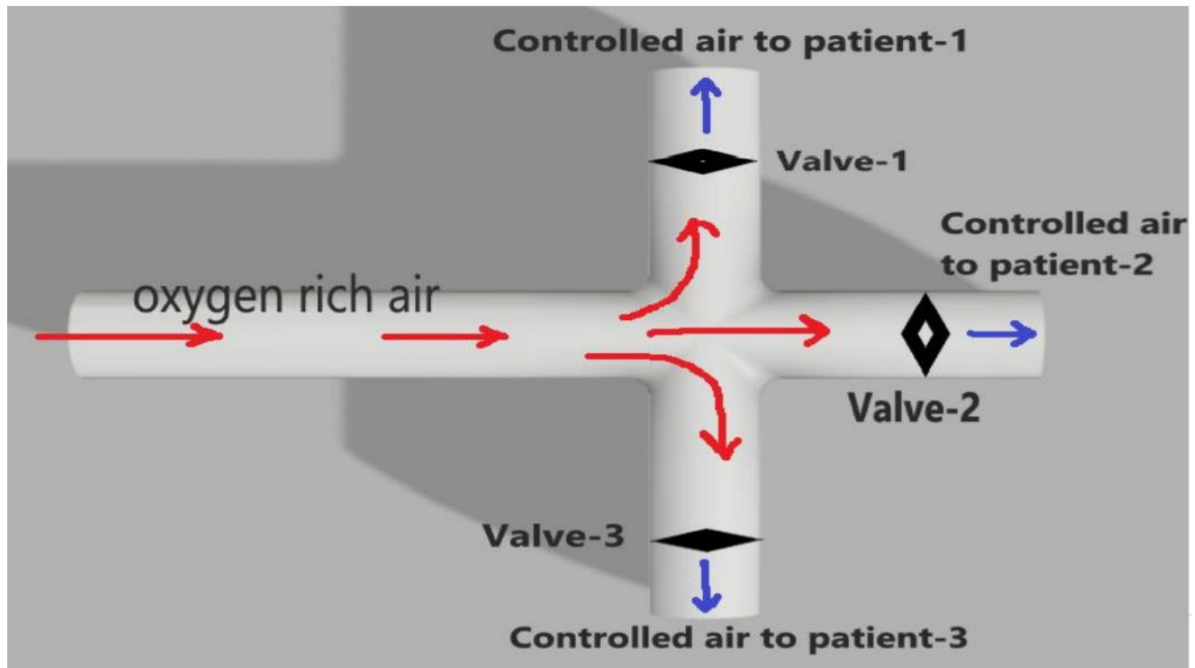


The valve can control pressure and volume, for different need and different patients, we can change the output and doctor can attend multiple patients of different categories on the same ventilator.

In the research paper, patients with same lung capacity can't be operated on the same ventilator but by attaching valve we can operate any types of patients irrespective of same lung capacity, same age group etc.

Attached valve is unidirectional that means there will be negligible chances of cross-contamination. Thus doctor can give the drug to a particular patient by injecting drug at the end of that patient pipe.





TECHNICAL

We will connect the valve with wifi module – there are many wifi modules available like Arduino wifi module, node MCU, etc.

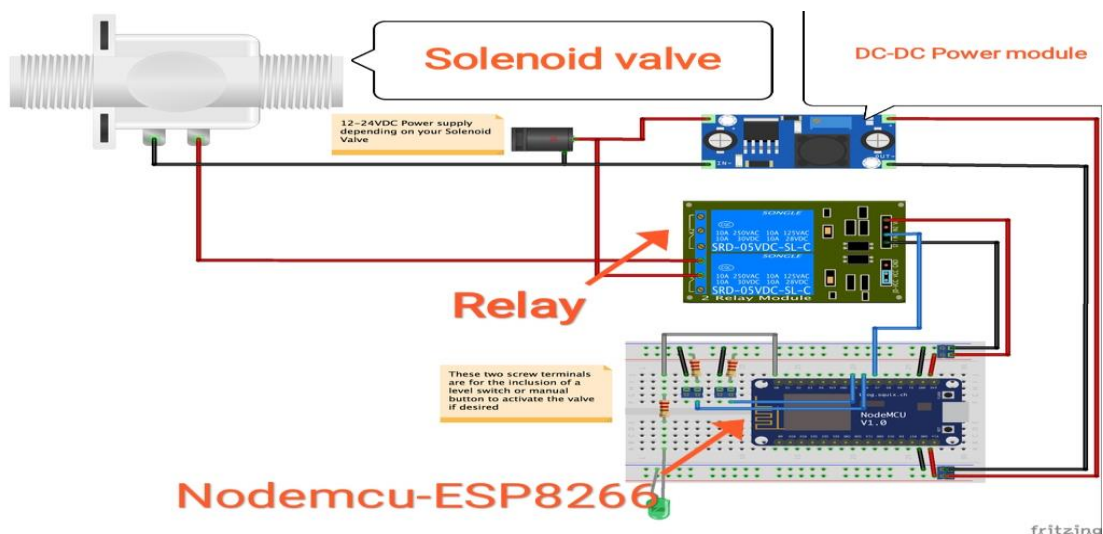
We can use any one of them.

And we can operate wifi module with a mobile application which makes the use of attachment very easily.

We will use analog pins to give analog PWM value out of the wifi module which could be used to give any values to the valve required for the patient.

Following is The circuit diagram-

(this is not exact circuit diagram which we are going to use, this is just for analysis purpose how our circuit will look like after completion)



RESEARCH PAPER:

<https://drive.google.com/file/d/1NUtA8cljtYgvt1BU2xC5Egup108WryYH/view?usp=sharing>

Hardware/software required:

HARDWARE: WIFI MODULE, RELAY, POWER MODULE, VALVE

SOFTWARE : PROTEUS, ARDUINO IDE, ANSYS

Expected out come of the project:**FOLLOWING ARE SOME ADVANTAGES-:**

1. Patients need not have the same lung capacity.
2. Negligible chances of cross-contamination as the valve is unidirectional.
3. Ventilation of different drugs/medicines to a specified patient can be done.
4. Allows remote access to the ventilator.
5. Can extremely Decrease doctor to patient ratio (as one doctor can manage multiple patients).
6. Our idea has removed limitations present in the research paper.

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