



SUMLUNG

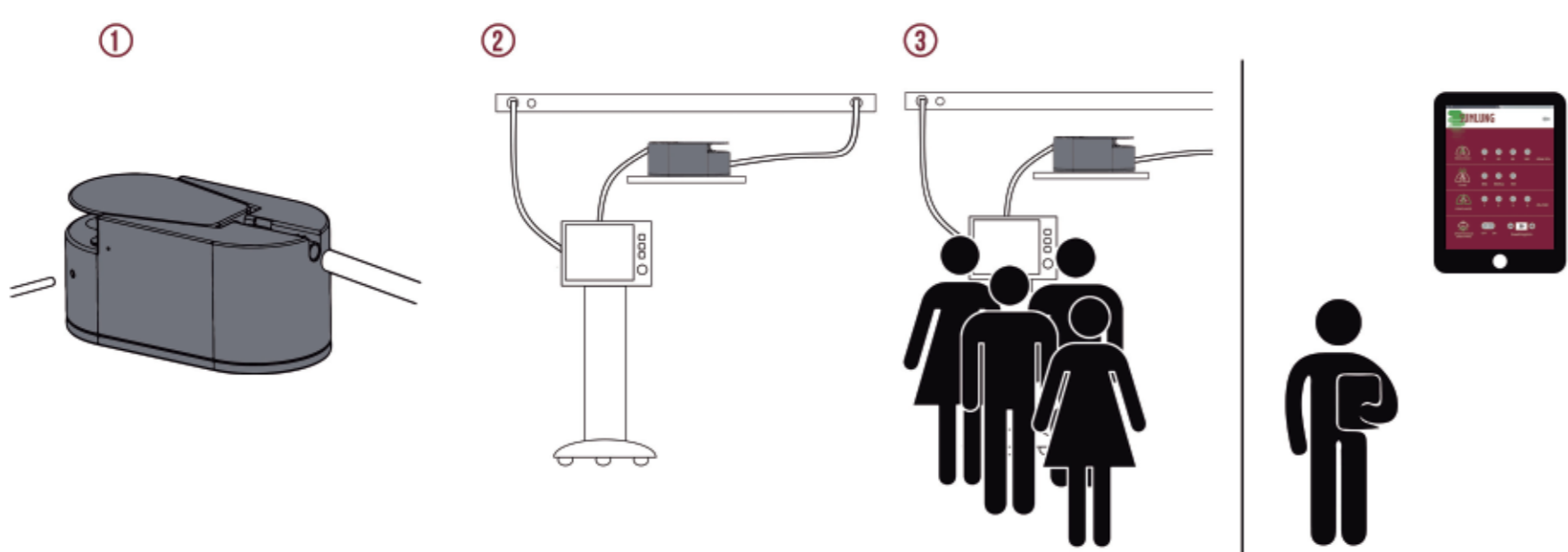
Developing a portable and reliable pædiatric and neonatal lung simulator for educational purposes to be controlled remotely.

INTRODUCTION

The Lung simulator is focused on representing, in medical education, the scenario of a pædiatric or neonatal patient that needs to be assisted by mechanical ventilation.

The aim of including this device in simulation classes for the students is to allow them to learn how they must interpret the graphs and signals emitted by the ventilator to which the patient is connected. To ensure that the simulated scenario is as close as possible to the real one, there is the need of designing a lung simulator that behaves as the real ones, representing standard clinical situations in a reliable way.

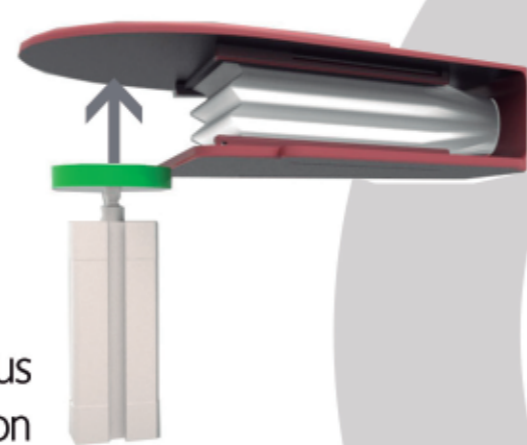
THE USE



- 1 Connection of the air source tube to move the interior cylinder for spontaneous breathing generation and connection of the simulator to the ventilator's external tube.
- 2 All the elements are connected to start the simulation class. The simulator has to be placed on a flat platform.
- 3 Students are focused on interpreting the ventilator data while the medical professor adjusts the parameters remotely in order not to influence their interpretations.

FUNCTIONS

SPONTANEOUS BREATHING



Thanks to a pneumatic system the spontaneous breathing is generated by pushing the maroon platform, where the bag is stuck, up.

COMPLIANCE



A Nylon made band fixed to the maroon structure, through a pulley rotation system, changes the distance between its sides reducing the elasticity of the bag inside.

LEAKAGE



Through a gear system the ring that surrounds the simulator's tube can be rotated to allow the air to escape through a big or small hole, this generating the leak.

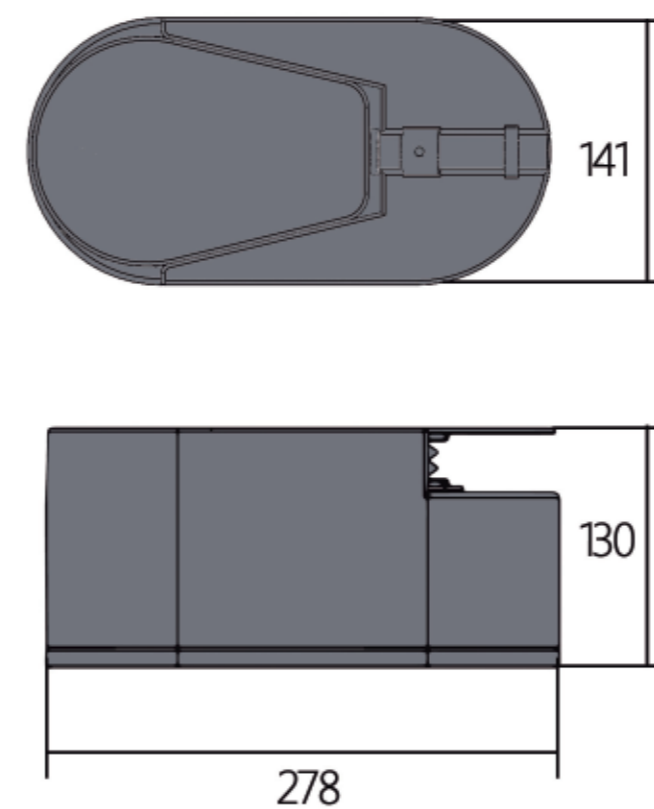
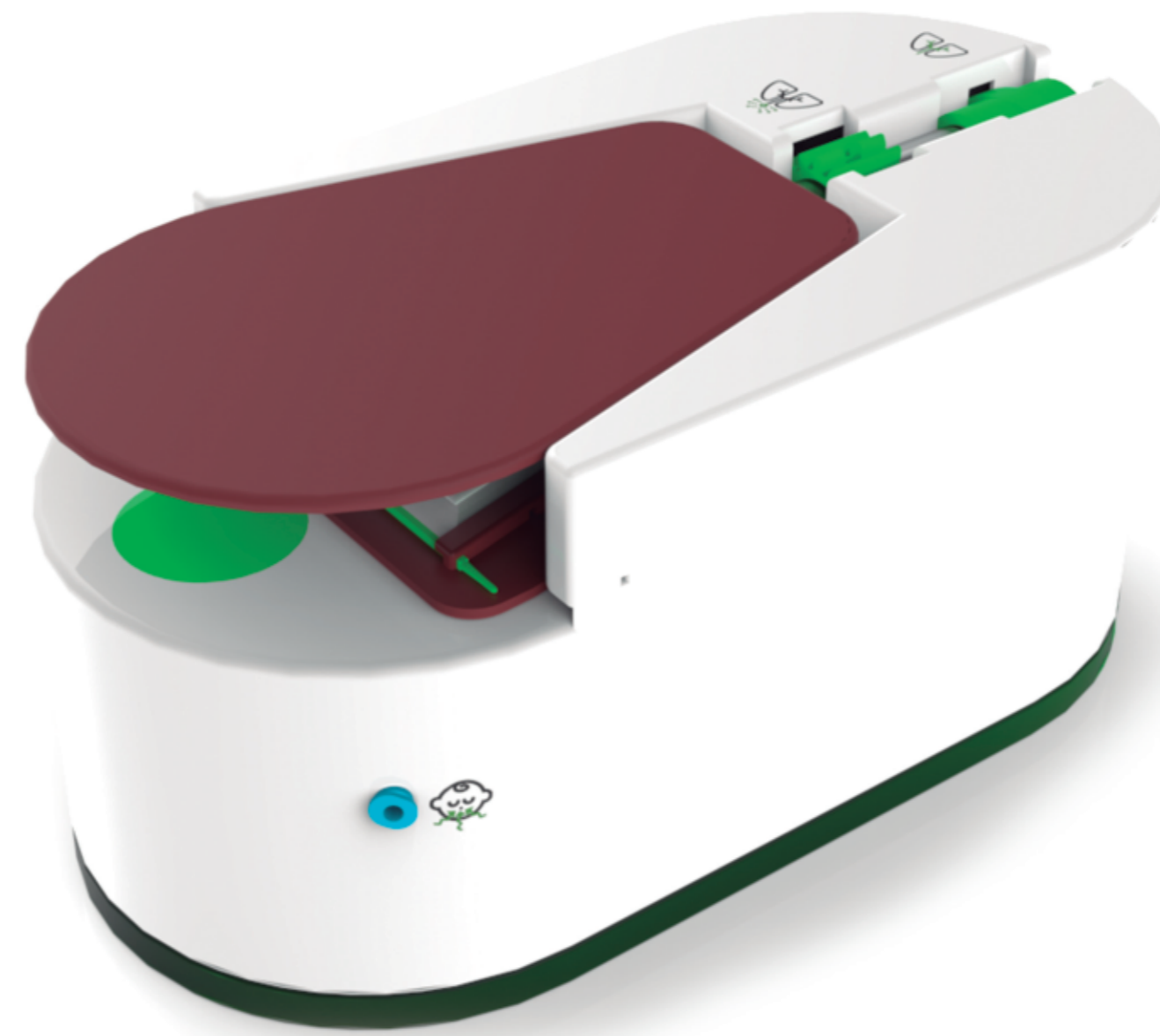
AIRWAY RESISTANCE



Adjustment of the resistance in the airway with the rotation of the interior wheel which includes the corresponding diameter of the holes according to the values of 5, 20, 50, 100 mbar/L/s.

THE PRODUCT

SUMLUNG is a compact and wireless lung simulator developed to represent the spontaneous breathing of neonates and children, different scenarios of resistance in the airways, compliance or stiffness of the lungs and leakage of air. All prepared to be controlled remotely through a tablet application in order to test the ventilator functioning in practical classes.



WIRELESS CONNECTION. USB CHARGER



2 LUNG SIZES



LOW WEIGHT

CONCLUSION

The development of SUMLUNG simulator would improve students' experience during their practical classes allowing a more reliable evaluation of their skills which is translated in the increase of efficiency during the future implementation of their knowledge in real scenarios.