SERVIZO GALEGO DE SAÚDE

SIMULATOR DEVICE FOR THE HEMODYNAMIC AND CARDIOCIRCULATORY BEHAVIOR OF A PATIENT UNDERGOING ECMO THERAPY

PROTECTION

ES1277989U

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Owners: Servicio Público de Saúde (SERGAS)

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BACKGROUND

Extracorporeal membrane oxygenation (ECMO) is an advanced life support technique that assists patients with severe cardiac or pulmonary failure who do not respond to conventional treatments. ECMO works by pumping blood outside the body to a machine that removes carbon dioxide and adds oxygen, allowing the heart and lungs to rest and recover. This therapy is crucial in critical situations such as acute respiratory distress syndrome, refractory cardiac arrest, and other severe, life-threatening conditions.

Due to the complexity and inherent risks of ECMO, specialized training for healthcare professionals is essential. Clinical simulation in ECMO has become a key tool for this training, with 73% of centers in the United States already including simulation in their accreditation programs. However, most current simulators are based on virtual scenarios or mannequins that do not allow real integration with ECMO consoles, limiting hands-on experience and the ability to resolve real complications.

Researchers have developed an ECMO simulation mannequin that includes a reservoir simulating body blood volume and remotely controlled solenoid valves that replicate large-caliber arteries and veins. This system can be integrated with real ECMO consoles, enabling faithful reproduction of critical complications and allowing professionals to train in identifying and resolving problems in real time, without risk to the patient.

ACHIEVEMENTS AND RESULTS

The ECMO simulation mannequin allows for realistic practice in managing critical complications, such as low preload, high afterload, cannula kinking, and the appearance of air bubbles in the system, through remotely controlled scenarios integrated with real ECMO consoles.

Thanks to this practical and realistic training, no technical complications related to ECMO have been reported among trained professionals. Furthermore, the device facilitates both initial training and ongoing retraining, improving preparedness and safety in the management of patients undergoing ECMO therapy.

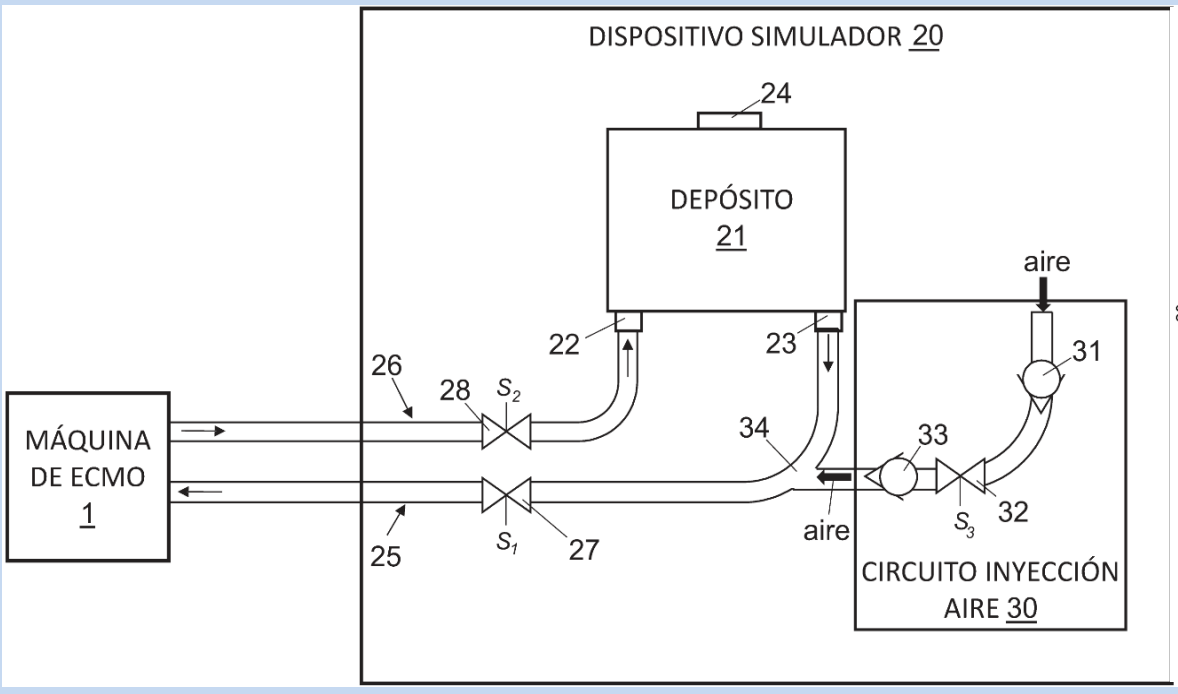
PURPOSES AND ADVANTAGES

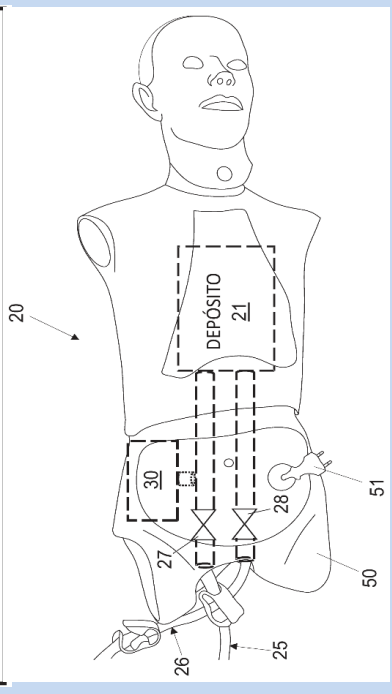
The **main advantages** of this technology are:

- ❖ Direct integration with real ECMO consoles, enabling practical and realistic training.
- ❖ Remote control of complications, enhancing professionals' response capabilities.
- ❖ Adaptability of the system can be integrated into any simulation mannequin or used independently.
- ❖ Demonstrated improvement in healthcare personnel safety and competence, with a reduction in technical complications after training.
- ❖ Enables continuous education and retraining of healthcare professionals.

COLLABORATION OFFER

Searching for partners for the commercialization of the product.
If you are interested in or need more information about the ECMO, please contact us.





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