Fluid System Design of A Pneumatic Seat

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ABSTRACT

Elderly people and those with certain disabilities often have difficulty standing up from a seated position. This project proposed to design an inflatable device that a person would sit on and would help lift the person up from the seat. The device is to be inflated with a small compressor and should be comfortable to sit on. The device can be part of a chair or be something portable and placed on the chair.

INTRODUCTION

Many different chair styles found in the marked are designed to be more comfortable, to be ergonomic, to increase the height depending on the need, and to be reclined.

However, elderly people and people with disabilities sometimes have trouble standing up from their seats for different reasons. This project has conducted research reviews on the feasibility test needed to develop a pneumatic assistive chair. It was found that the use of the assistive chair had a decrease in rectus abdominis, quadriceps, and tibialis anterior activation compared to those who did not use the device in healthy adults.

This project will design a automated pneumatic seat that could be placed on a chair to assist in the standing up movement.

OBJECTIVES

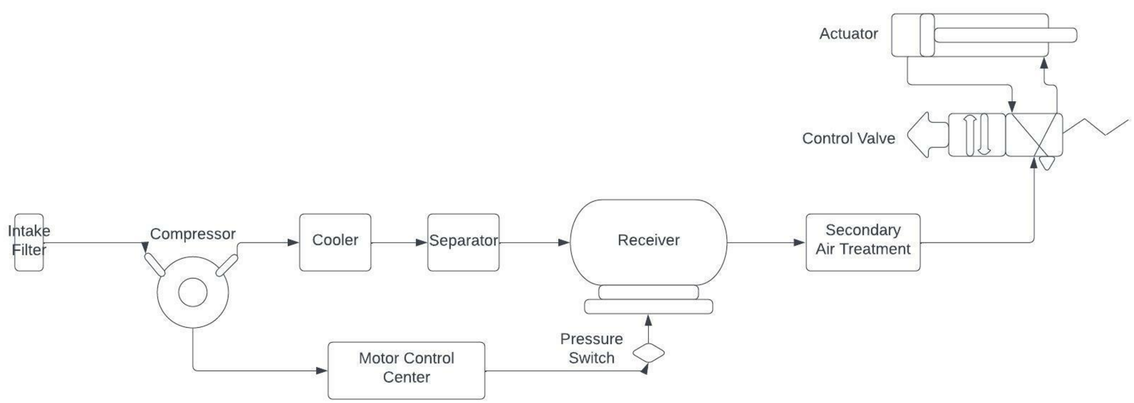
- Help people to stand up from their seats.
- Start working when connected to a compressor and activated.
- Go back to its normal position after standing up and turning it off.

METHODOLOGY

The pneumatic seat is activated by compressed air from a pneumatic system. Air will fill the inflatable seat and the person will be lifted.

The pneumatic system is designed as shown in the process flow diagram. The components will be selected after system level calculations.

PROCESS FLOW DIAGRAM



COMPUTER-AIDED DESIGN