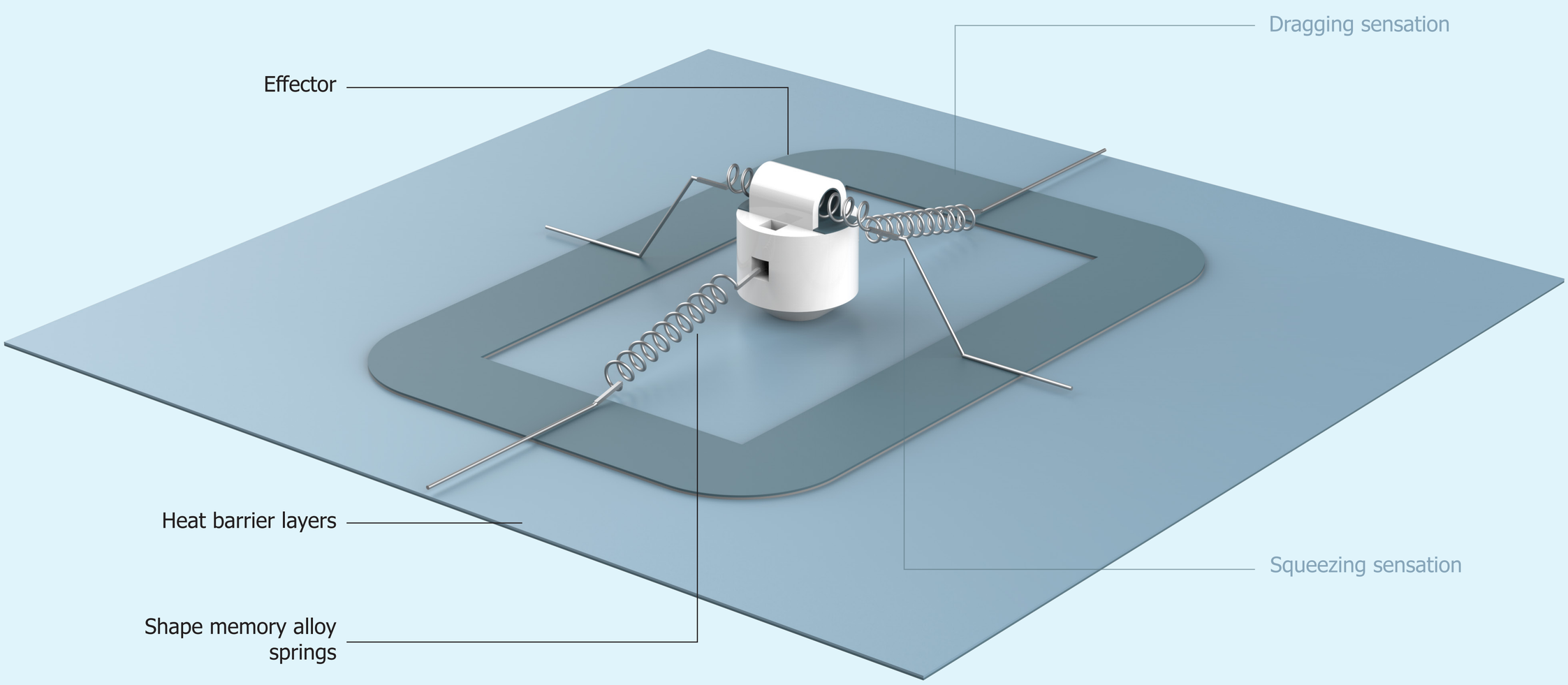
Integrating shape memory materials in haptic technology

How can it be incorporated as an aid for the visually impaired?

There are approximately 285 million people worldwide living with a visual impairment and the rate of acquired blindness is expected to continue increasing. Assistive technology for them is progressively being developed in order to enable independent living. For the blind and visually impaired, the tactile sense is the primary source of understanding non-audible information. Therefore, haptic technology is being incorporated more in assistive devices meant for situations in which one cannot rely on sight to manipulate objects and conduct various activities.

An issue with currently available haptic solutions is that they typically use electromechanical systems that are heavy with large, obtrusive forms, produce sounds that hinder their usability and sometimes even provide unpleasant haptic feedback. A way to mitigate these problems is by incorporating soft, flexible and lightweight smart materials as actuators into these systems. Shape memory materials are a specific category of smart materials that have the ability to recover their original shapes from a deformation when certain stimuli are applied. They have the potential to bring hedonic characteristics to haptic technology such as providing organic sensations. Consequently, the haptic assistive devices become effective and comfortable interventions for the visually impaired.

This project demonstrates how these materials can successfully be incorporated to produce different types of tactile feedback as a form of an assistive-wearable and enrich the lives of the blind and visually impaired. The demonstrator provides two types of sensations- dragging and squeezing.



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