

Hong Kong Student Science Project Competition 2022

Template of Extended Abstract (Invention Design Proposal)

(Word Limit: 1,000 words, Pages: 2 pages only)

Team Number: JCPE021

Project Title: Smart Storage System

Project Type: Invention Design Proposal

To our best knowledge and after thorough literature research, as at 11/11/2021, there are no* similar works.

I. Background

1. According to <https://injuryfacts.nsc.org/home-and-community/home-and-community-overview/introduction/>, cause of preventable injury-related deaths in home and community, United States, 2020, 26% is due to falling while 88% is age 65 or above elderly. Therefore, this problem is very alarming and dire.
2. According to <https://ourworldindata.org/human-height#:~:text=The%20expected%20average%20height%20of%20a%20healthy%20population,for%20men%20%E2%80%93%20it%E2%80%99s%20lower%20than%20we%E2%80%99d%20expect>, the world average height for women is 159.5cm and 171cm for men. With the trend of smart living, our invention can deal with the problem of not being able to reach the high cabinet by lowering the things that were used to be stored high.

II. Objective(s)

1. The elderly and children, as well as adults, may have experienced the problem of not being able to get things on high cupboards. This rotating cupboard can solve this problem and bring great convenience to everyone.
2. Falling off from high places is one of the common housing accidents. This rotating cupboard can avoid people from falling off when standing on chairs or stairs to reach the top of the cabinet, reducing the danger.

III. Methodology

Scientific theory

Because of gravity, all objects are attracted towards the center of the earth. Therefore, the metal nail allows the movement of the metal stick 2 due to gravity, providing a balance of the box at 0 degree.

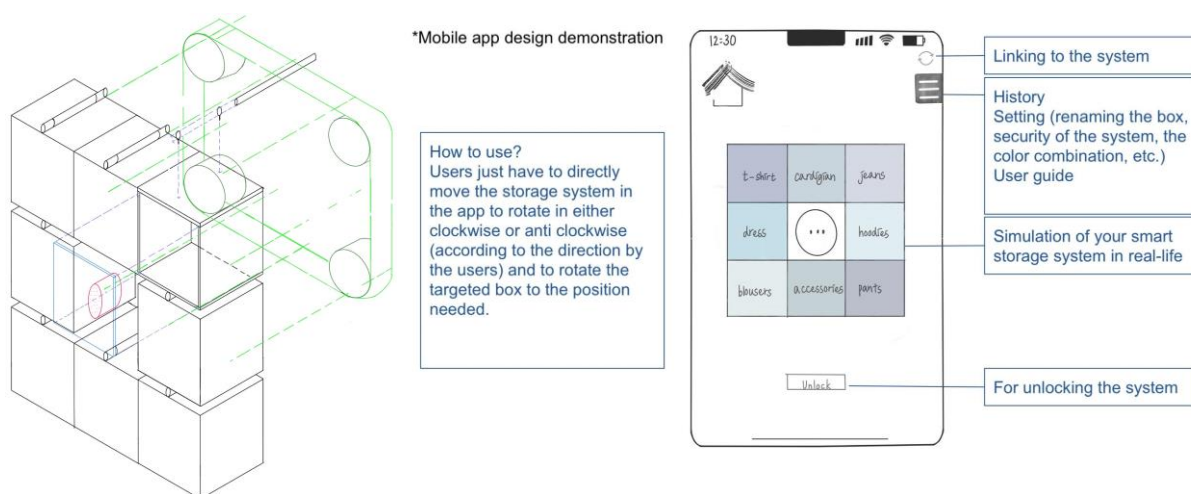
IV. Design of Invention

AI system, voice control

1. As users press the “start recording” button, the recording starts. Users can speak out what they want to store and which box they want to store in. Then, the AI will classify the stuff into that box in the AI system. When users want to take things, they can first press the “start recording” button and speak out the stuff they want to get. After, the AI system can find the stuff by history list and rotate the target box to the bottom, providing an easier and convenient way for users to get things.

Mobile app

2. A mobile app will be created. Users can control the movement of the cupboard using the app. Also, users can rename the boxes according to things stored inside, so that they can just change the position of the box which has the thing the user needs. In the app, users will find the position of the boxes with their names created by users, and they can turn the system on touchscreen to change the position of the boxes in the real cupboard. Then, the cupboard will rotate according to the position changed by the user. For safety, unless users unlock the system with their phone, the cupboard will be locked, so children will not get hurt from it. Users will be alerted with notification if the system detects people trying to move or pull it. This safety function can be selectively off.



V. Application / Market Need

Application and function of invention

The rotating cupboard can be installed in flats, especially the one with high ceiling, and people can rotate the cupboard by controlling it with their iPad when they need to reach other cupboards, so that people can easily store and get things at the tall places, reducing the chances of housing accidents of falling.

Market need

In Hong Kong, people are rather short, with the female average height of around 1.6m, but at the same time, the flats' ceiling height is approximately 2.6m. Flats in Hong Kong are also small, so the limited space has always been a pain in the neck for many people. In order to maximise and get the best use of the tall spaces near the ceiling, the rotating cupboard is believed to improve and deal with this problem. Therefore the target of this invention is to everyone: everyone may face this headache problem. Families, especially with elderly and children, may also need this invention, because it can help them get things conveniently without any risks, providing a safe environment.

With the rising trend of smart living, more people are willing to accept technologies, especially AI systems and remote control, in their home. Therefore, the Smart Storage System can fulfill the trend.

Potential impact

This invention actually lets users develop a habit of tidying up their things.

Limitation

This invention is not applicable in flats with lower ceilings.

VI. Conclusion

It is believed that this system can provide people with a safe living environment by the use of technology.