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Research and Design of Disinfection Equipment for Public Places

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Abstract: The starting point of my design is to redesign the existing product based on the post-epidemic era to make different functional definitions and styling changes.The scientific and technical issues, functional layout distribution, target population and usage scenarios were all well thought out before making the choice.Secondly, this paper focuses on the existing market and the pain points of disinfection products in public places and points out that different disinfection methods face different effects. In addition, reasonable solutions to the different pain points are identified. The future trends and applications of disinfection products in public places are also presented.By taking into account the existing information and the future design, we redesign the disinfection process in public places and provide a reasonable psychological analysis of the population to create safer and more secure sanitary conditions for people in the post-epidemic era.

Keywords: Post-epidemic Era; Public Place Disinfection Hygiene; Disinfection Technology.

1. Introduction

Study the importance of disinfection and hygiene in public places.

With the development of society, public places such as hotels, theaters, shopping malls, stations, docks, stadiums and other places, because of the large flow of people in their environment, complex composition of personnel, high crowd density, poor ventilation, the type and number of microorganisms in the air increases, and the chance of infection transmission increases. [1] Public places are crowded, and a large number of people gather in a short period of time, coupled with poor indoor air circulation, resulting in serious contamination of airborne pathogenic microorganisms. If disinfection measures are not taken in these public places, the indoor air will be contaminated and various diseases will be spread.

Failure to take effective disinfection measures can result in serious consequences: acute gastroenteritis, bacterial dysentery, typhoid, viral hepatitis and other diseases [2] . For this reason, it is necessary to carry out disinfection and hygiene work in public places. After investigating and studying the health problems that occur in public places, it was found that the main health problems that arise when people use public supplies and equipment in public places are the following: poor air quality, high content of pollutants, and excessive microorganisms in the air.

With the continuous development of the economy, people's living standard is also improving, and people's living environment is starting to become worse and worse. In some public places, if there is no disinfection and hygiene work will make people's living environment seriously polluted. First, the air quality in public places becomes worse. If people live in an unhealthy environment for a long time, the air quality will become poor, and the poor air quality will cause people to develop respiratory diseases. Second, the water in public places is polluted. As human production and life need to use a lot of water, and the water used in public places is not pure water, but water after various treatments. It may contain a lot of harmful substances, which will cause serious harm to human body after entering people's body. Finally, the amount of garbage in public places is huge. Using a large amount of garbage in public places will not only pollute the environment, but also have an adverse effect on people. Because the garbage may contain a lot of germs and harmful substances, if people do not clean up in time in public places, they will be infected with bacteria, which will lead to various diseases. Therefore, in order for people to live and work better, it is necessary to pay attention to the problem of disinfection and hygiene in public places.

In more research, I also found some accompanying problems:

1) the deterioration of indoor air quality, which leads to various diseases when people breathe the air;

2) serious air pollution indoors, where many appliances used in homes produce large amounts of dust and bacteria, which enter indoors and can affect people's health

3) in public places, people often have to walk around in public places, and the flowing air can bring great health risks to people;

4) the public toilets used in public places are not guaranteed to be free of germs either, and many public toilets have a large number of bacteria present. In public places, people often do not pay attention to hand washing, which has caused many people to suffer from various infectious diseases.

2. Pre-design Research

2.1. About the Positioning and Research of Target Customers

The research adopts a combination of on-site interviews and questionnaires to go deep into public places and conduct field research to understand the real situation of people who are vulnerable to cross-infection in public places, and make relevant suggestions on this basis.

(1) Choose suitable research sites in public places. For shopping malls, supermarkets, airports, train stations and other public places with high pedestrian flow, you should try to choose places with good ventilation, low pedestrian density and relatively small crowd density; for places with dense personnel or poor ventilation, you should try to avoid entering.

(2) Select suitable interviewees. The interviewees should

have certain work experience and social experience and be able to answer the questionnaire questions effectively. For special groups such as children, the elderly and people with disabilities, their guardians should be selected for interviews as much as possible.

(3) Ensure that the respondents have a clear understanding of the purpose and methodology of the research and are able to complete the research questionnaire independently.

After determining the target customers I designed to serve, I conducted a detailed visit and survey of my target group. The following are the problems and the current situation that I found from the research data.

(4) Analysis of the psychological needs of the population for disinfection products in public places:

1) Sense of security: Public places are places where people gather, so using disinfection products can increase users' sense of security, reduce the risk of virus infection, and reduce unnecessary worries.

2) Sense of hygiene: People are increasingly concerned about the hygiene of public places, so using disinfection products can effectively clean and disinfect, improve the level of hygiene, and make users feel more at ease when using public facilities.

3) Convenience: Disinfection in public places needs to be carried out frequently, and the use of convenient and fast disinfection products can meet the needs of users in terms of time and energy, making it easier for users to disinfect public places.

4) Reliability: The quality and effectiveness of disinfection products are key concerns for users, and disinfection products with good results and good reputation can make users feel at ease and increase their trust.

5) Environmental protection: With the increasing awareness of environmental protection, users are paying more and more attention to the environmental protection of disinfection products, and the use of environmentally friendly disinfection products can meet the environmental needs of users and increase their satisfaction.

(5) Types of public places where people go:

1) Commercial centers: shopping malls, shopping centers, commercial streets, etc.

2) Cultural and entertainment places: theaters, cinemas, museums, art galleries, etc.

3) Social places: cafes, bars, restaurants, etc.

4) Tourist attractions: special attractions of each city.

5) Sports venues: gyms, stadiums, etc.

2.2. Analysis and Research of Existing Public Place Disinfectors in the Market

(1) There are two main types of disinfection products on the market, one is ultraviolet disinfection, and one is ozone disinfection.

(2) Ultraviolet disinfection, which requires the presence of people and in the outdoors, is not safe and reliable.

(3) Ozone disinfection, can be disinfected in the absence of people, but the high concentration will produce secondary pollution.

(4) The current market disinfection products have their own characteristics, and can not completely replace manual disinfection, and most public places use chemical disinfectants.

(5) Ultraviolet light and ozone have certain harm to the human body, but compared to chemical disinfectants to the human body is much less harmful.

(6) UV disinfectors are widely used for air disinfection, object surface disinfection and water treatment, etc.

(7) Hand-held disinfection apparatus

Hand-held disinfection apparatus hand-held disinfection apparatus is an easy-to-use, small, portable disinfection tool that can be used for disinfection of object surfaces, skinmucous membranes,medical devices,etc.It can also be used for disinfection of air,water, food and hands.

1) Structure and composition:The product consists of two parts:the main unit and the handheld device.

2) Function:The handheld disinfector has two functions:disinfection and sterilization,and can be used for different types of object surfaces and air disinfection.

3) Scope of application:It is applicable to public places such as hospitals,schools,banks, shopping malls and residential areas,and can be used for disinfection of object surfaces, skin mucous membranes,medical devices,etc.

4) Usage:Put the product into a special bag,place it on the surface of the object and press the switch button to disinfect the surface of the object and the air.

Figure 1. Handheld disinfection apparatus

Pain point issues:

Not suitable for large area cleaning and disinfection:Handheld disinfectors are usually only suitable for cleaning and disinfecting small areas,and therefore cannot be applied to large places.

Requires frequent recharging:Since handheld disinfectors

are small in size,their battery capacity is also limited.It needs to be recharged frequently when in use,which may cause inconvenience to the user.

Limited cleaning effect:Handheld disinfectors can kill some bacteria and viruses,but their cleaning effect is limited.For some stubborn stains and pathogens,the handheld sanitizer may not achieve a thorough cleaning effect.

Possible chemical odor:Handheld disinfectors use chemicals for cleaning and

disinfection,which may produce some chemical odors,which may cause discomfort to users.

Higher price:Compared to traditional cleaning and disinfection methods,handheld disinfectors are more expensive,which may limit some users'willingness to buy

Product advantages:

Portable design;

Efficient sterilization:Handheld disinfection equipment uses technologies such as ultraviolet light or ozone for sterilization,which can effectively eliminate bacteria,viruses and other microorganisms,thus ensuring the hygiene of items and the environment.

Versatility:Handheld disinfection equipment can be used to disinfect different types of items and surfaces,such as cell phones,computers,door handles,keyboards,etc.

Reusable:Handheld disinfection equipment is easy to use,easy to operate and can be reused,eliminating the cost of frequent purchases of disinfection supplies

(8) Backpack disinfection apparatus

Backpack disinfection apparatus is a portable disinfection equipment,usually used for disinfection and sterilization of indoor and outdoor places.The equipment consists of a backpack with a sprayer that sprays the disinfectant in the form of a spray onto the surface to be disinfected.

Figure 2. Backpack sterilizers

Pain point issues:

Excessive weight:Due to the need to carry disinfectant and batteries and other equipment, backpack disinfectors may be heavy and may cause discomfort and fatigue to users when worn for long periods of time.

Frequent disinfectant replacement:Backpack disinfectors have limited disinfectant capacity and may need to be replaced frequently,affecting the efficiency of use.

Expensive:Some high-performance backpack disinfectors can be expensive and are not suitable for individual users to purchase and use.

Inconvenient to operate:Due to the need to wear the backpack disinfector,users may need to cooperate with the corresponding operating steps and posture,which is less convenient to use

Product advantages:

Portable design;

Efficient disinfection;

Safe and reliable;

environmental protection and energy saving;

(9) Mobile disinfection apparatus

Mobile disinfection apparatus is equipment or tools that can be moved for disinfecting and killing germs, bacteria, viruses and other microorganisms. These devices usually include sprayers,UV disinfection lamps,ozone generators, etc.Mobile disinfection appliances are usually used in medical institutions,laboratories,food processing plants, hotels and other places where a high level of hygiene needs to be maintained to ensure the health and safety of people and goods.

Figure 3. Mobile disinfection apparatus

Pain Point Problems:

Difficult to guarantee the effect: Mobile disinfection appliances are often disinfected by ultraviolet light or ozone, etc. However, the disinfection effect is difficult to guarantee due to differences in the quality of the equipment, operation methods, disinfection time, and other factors.

High cost of use: Mobile disinfection apparatus requires regular replacement of filters, lamps and other consumables, which are more expensive and costly to use.

Cumbersome operation: Mobile disinfection apparatus requires manual operation and requires a certain understanding of the use of equipment and operational steps, otherwise the operation is more cumbersome.

Limited disinfection range: Due to the size of the mobile disinfection apparatus and the limitations of the disinfection method, its disinfection range is limited and may not cover large areas or complex spaces.

Product Advantages:

Flexibility;

High efficiency;

Safety;

Economical;

Through research and analysis of competing products in the market, as well as weighing the pros and cons based on the current state of the market environment, I decided to make the re-engineering of disinfection appliances for public places my main design direction.

2.3. Analysis and Research on the Mature Market for Public Place Disinfection Appliances

The market for public place disinfection equipment has matured, mainly because of the COVID-19 outbreak. During the epidemic, the demand for disinfection in public places surged and the market grew rapidly. There are also an increasing number of types of disinfection equipment, including UV disinfection lamps, ozone disinfection machines, electrolytic water disinfection machines, etc.

As the outbreak was gradually brought under control, the demand for disinfection in public places declined, but people's awareness of health and hygiene increased and the demand for disinfection equipment remained. In addition, the risk of transmission of new coronaviruses and other diseases still exists, which also promotes the development of the public place disinfection equipment market.

Currently, the market for disinfection equipment for public places is highly competitive and is mainly divided into domestic manufacturers and international brands. Domestic manufacturers have an advantage in terms of price, while international brands are more

competitive in terms of technology and quality. In addition, the application scenario of disinfection equipment is becoming more and more extensive, not only limited to public places, but also can be applied to homes, offices and other places.

In the future, the market for disinfection equipment in public places is expected to continue to grow. As technology is constantly updated and upgraded, disinfection equipment will become more efficient and safer. Also, as people's concern for health and hygiene continues to increase, the demand for disinfection equipment will also increase.

Finally, the market for disinfection equipment for public places still has some potential in the future. Despite the gradual control of the epidemic, the demand for disinfection in public places still exists. In addition, the demand for disinfection equipment is also likely to increase as people pay more attention to health and hygiene. Therefore, we can gain more market share and profits by innovating and optimizing product design, improving product performance and quality, and exploring new markets and application scenarios.

Taken together, the market for disinfection equipment for public places is mature, but still has some potential for growth. Through other ways, it can achieve better market performance.

3. Design Research Process and Results Presentation

3.1. Framework Derivation and Establishment of the Design

(1) Determine the Target Users and Usage Scenarios

The target user group and usage scenario of the device need to be defined first, for example, whether it is for disinfection

needs in public places such as hospitals, schools, airports, subways, etc., or for individual home use. The difference in target users and usage scenarios will affect the design and functionality of the equipment.

(2) Determine the Disinfection Method and Technology

Based on the needs of the target users and usage scenarios, determine which disinfection methods and technologies to use. Common disinfection methods include UV disinfection, ozone disinfection, electrolytic water disinfection, etc. Each method has its own advantages, disadvantages and applicable scenarios, and needs to be selected according to the specific situation.

(3) Design the Structure and Appearance of Disinfection Equipment

Design the structure and appearance of the disinfection equipment according to the disinfection method and technology. Factors such as the size, material, and shape of the equipment need to be considered, as well as the ease of use and safety of the equipment.

Determine control systems and functions.

Determine the control system and functions of the equipment based on the disinfection method and technology. For example, parameters such as disinfection time, disinfection temperature, and disinfectant concentration need to be set, and safety measures for the equipment, such as overheating protection and leakage protection, also need to be considered.

(4) Perform Prototyping and Testing

Based on the above design, a prototype of the disinfection equipment is made and tested and debugged. Testing is needed to verify that the disinfection effect, ease of use, and safety of the equipment meet expectations, as well as to collect user feedback and requirements to further optimize the design.

Overall, the framework for designing a public place disinfection device requires a comprehensive consideration of the target users and usage scenarios, disinfection methods and technologies, structure and appearance, control systems and functions, prototyping and testing.

First, in terms of crowd analysis and target scenarios, the target scenarios for public place disinfection products are not limited to shopping malls, but are widely applicable to various public places, including but not limited to hospitals, schools, restaurants, subways, buses, offices, airports, train stations, stadiums, etc.

However, shopping malls are one of the most crowded, frequently consumed and mobile public places, so they become one of the key prevention and control targets during an epidemic. And during the epidemic, shopping malls become a place where people have to go because they need to buy essential goods and food. The complex composition of people who visit shopping malls, including many elderly people and children with weak immune systems, can easily increase the risk of cross-infection.

The facilities, objects and surfaces in shopping malls can be contaminated with viruses, so they need to be disinfected regularly to ensure the safety and health of consumers and employees. Public disinfection products can help malls and other public places to disinfect efficiently, conveniently and safely, effectively reducing the risk of cross-infection.[3]

Figure 4. User demographic research

After identifying the target scenes,I did a more careful analysis and research on the areas of the mall that needed to be disinfected,which were divided into the following areas:

(5) Ground:The ground in the mall is an area where people often come into contact with,and disinfection should be carried out frequently,especially in areas with high traffic, such as entrances,elevators,escalators,stores and other areas.

(6) Carts,shopping baskets,shelves:Shopping carts, shopping baskets,shelves and other facilities in shopping malls should be disinfected frequently to ensure the safety and health of customers

(7) Store entrances,restrooms,etc.:The entrance of each store in the mall also has high traffic flow and needs to be disinfected in a timely manner;restrooms in the mall are also areas that must be disinfected,including parts of wash basins,toilets,door handles,faucets, etc.

(8) Ceilings,handrails and other high places:Although high areas are not easily accessible, the areas above can still be contaminated due to air flow in the mall.Therefore,high places such as ceilings,handrails and lamps in shopping malls

should also be disinfected regularly. 5.Other public areas:Other public areas in the mall,such as rest areas and children's play areas,also need to be disinfected regularly.

However,in the product design I did for this product,the main responsible part is still the disinfection of the ground part.

Figure 5. Disinfection area analysis

The next step is the selection of disinfection methods as well as the nudging;

Currently,common methods of disinfection in public places include physical disinfection, chemical disinfection and biological disinfection.Physical disinfection mainly refers to the use of high-temperature steam,ultraviolet light,and ionizing radiation to kill viruses and bacteria,while chemical disinfection uses chemicals such as bleach,alcohol,and hydrogen peroxide to kill viruses and bacteria,and biological disinfection uses biological agents (such as bacterial lysis enzymes)to kill viruses and bacteria.

The reason for choosing UV disinfection is that UV is efficient,convenient,economical and environmentally friendly. UV can kill viruses and bacteria with high germicidal efficiency,and can kill most of them.In addition,UV disinfection does not require the use of chemical disinfectants,which avoids the pollution and harm that chemical disinfectants may bring,and also reduces the complexity of manual operation and improves work efficiency.In addition,UV disinfection has no residue and does not cause pollution to the environment,which meets environmental requirements.

In addition,UV disinfection can be used to disinfect large,complex equipment and items, such as hospital operating rooms,laboratories,and food processing plants,which have advantages that are difficult to replace with traditional disinfection methods.Therefore,UV disinfection has been widely used in public places,medical health,food safety and other fields.

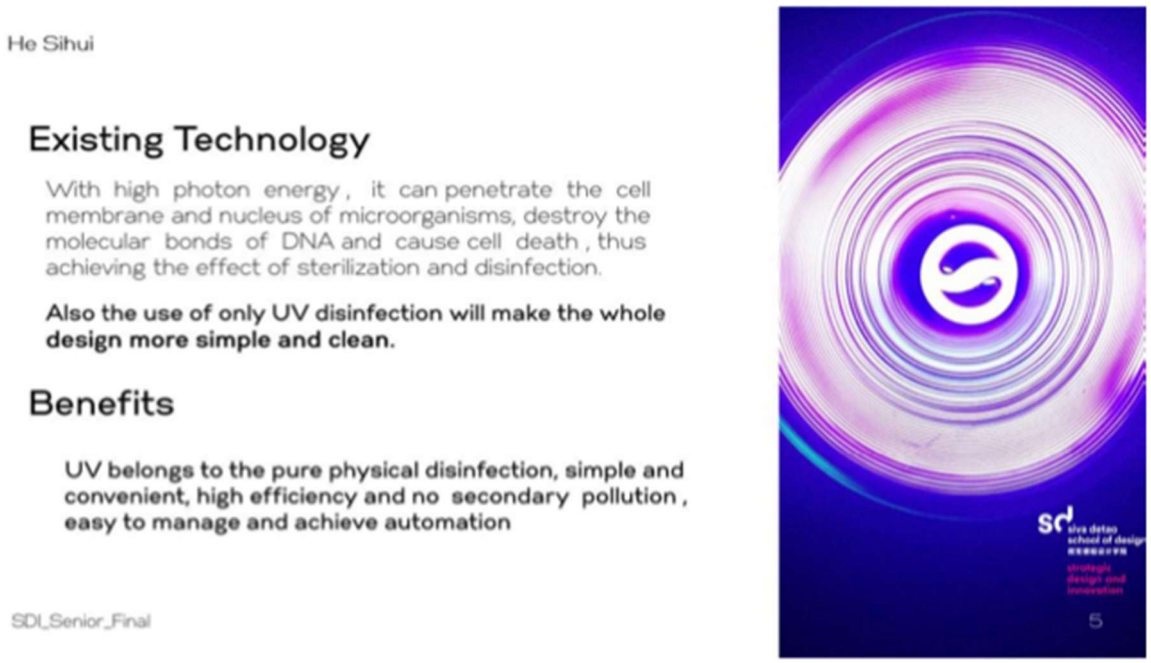

Figure 6. Existing Technology Analysis

3.2. Conceptualization and Development of Design Solutions

(1) Think about the product shape from the bionic perspective.

When I entered the product design stage,I looked at many existing sterilized product shapes, all of which were very technological and mechanical in appearance,giving people a sense of distance.But why can't this kind of product design, which needs to be inductive with people, be more connected with nature?Break the traditional design mindset and create more innovative products and systems.

Through a process of inspiration drawing and summarization, I came up with the following product shape (as shown in the figure). Through the first phase of design and research,I found that in the process of styling innovation,it is important to pay attention not only to the amiability of the form to the people but also to the functionality.So I planned a set of workflow to make the whole functionality more complete and smooth,and to facilitate the later design progress.

Figure 7. Preliminary workflow arrangement

(2) Think about the product shape from the function.

In the subsequent push, I intend to start from the function to redesign the product shape, first to clarify the functional composition of the product.

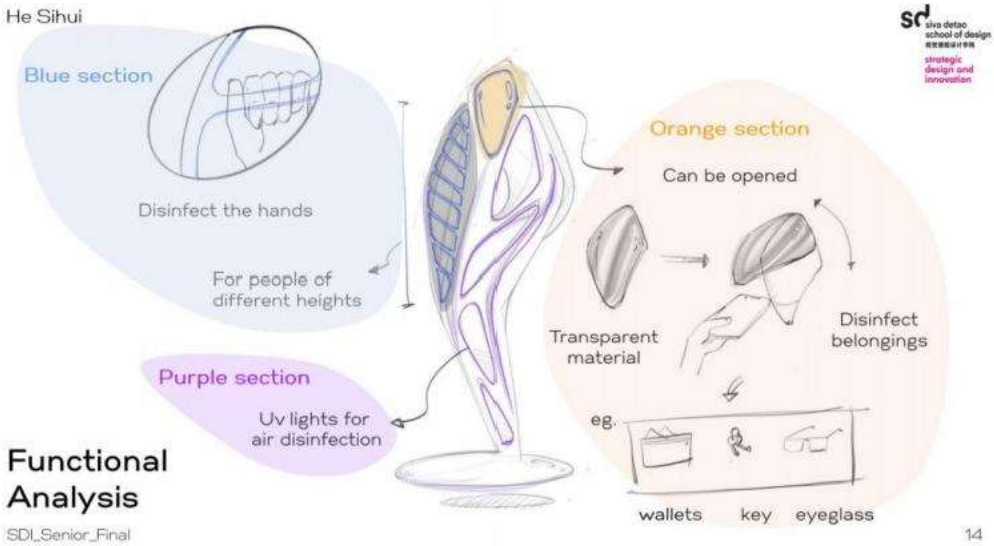

Figure 8. Preliminary program design

1) Main part:The main part can be rotated to disinfect the UVlight around the product,and

the working state and non-working state have different lights.

2) The left part:left for people to disinfect their hands,especially in the current situation of the rampant New Coronavirus.Hand disinfection can effectively kill viruses and bacteria that may exist on the surface of the hands,reducing the risk of disease transmission.

3) Top section:This section is reserved for disinfection of belongings,which also carry many viruses,and disinfection of belongings along with hand disinfection can reduce the spread ofviruses

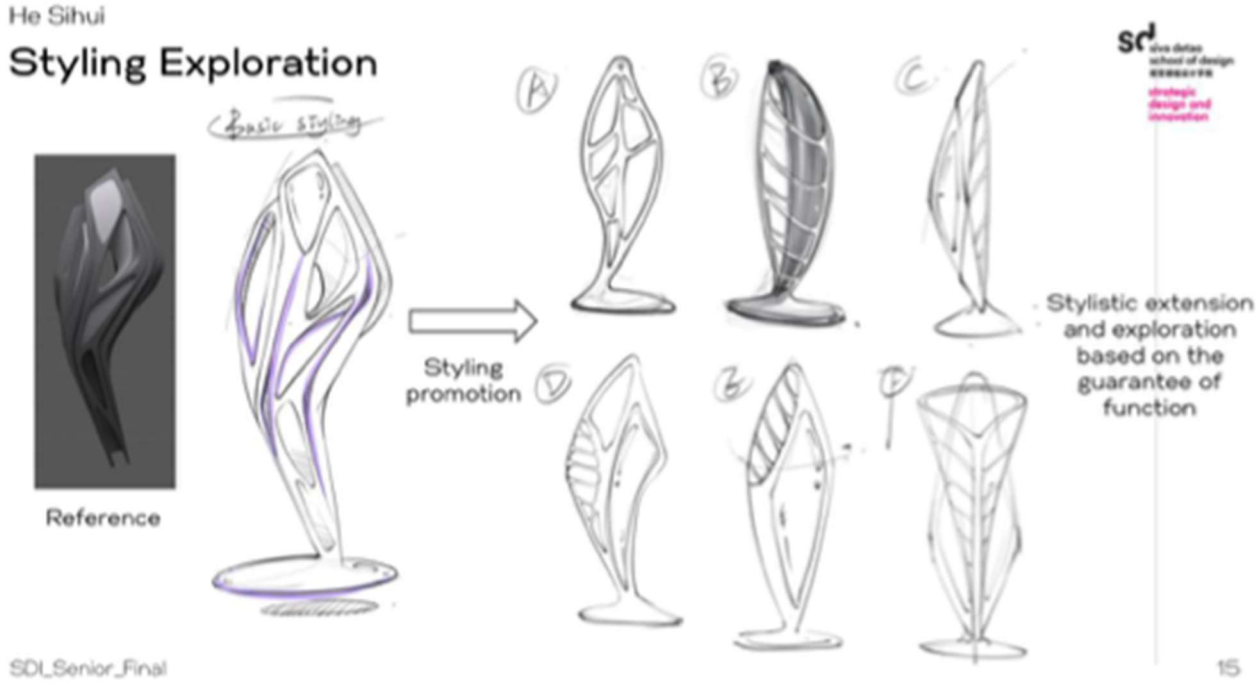

Figure 9. Modeling Derivative

(3) In the follow-up communication with the instructor,the consultation that the above figure is a bit too flashy shape and reconsider the harmony and unity of shape and function; want to achieve as simple as possible design,simple and leading appearance,so that the crowd can understand the function and use of the product at a glance.

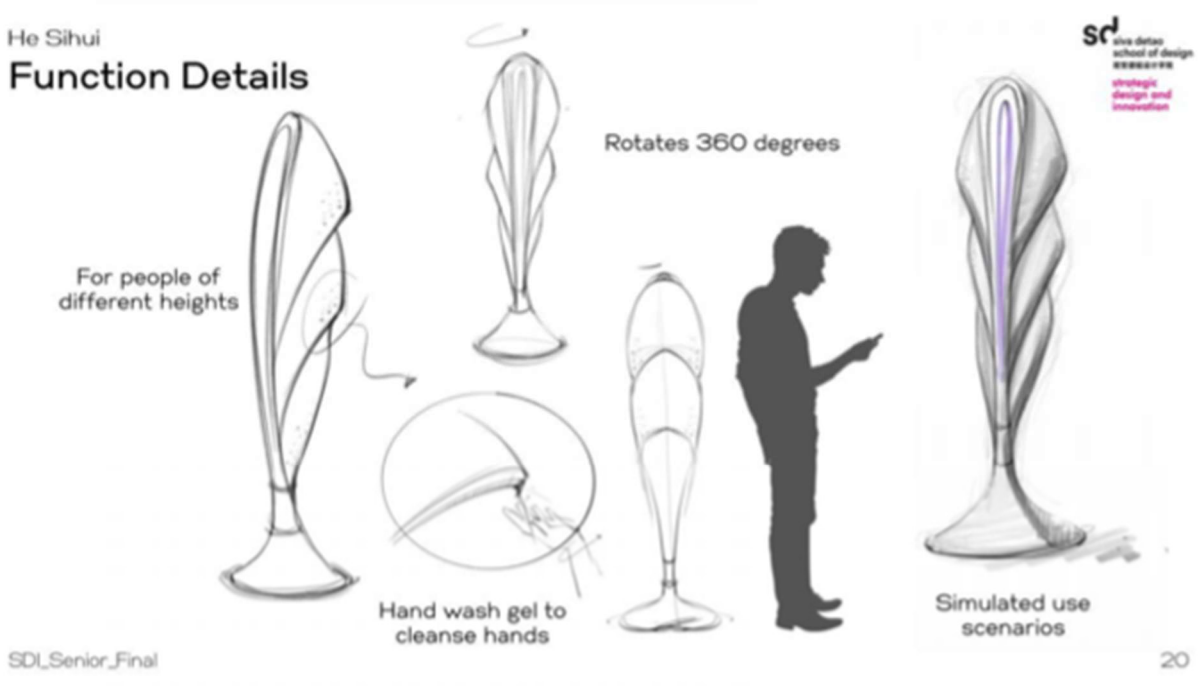

Figure 10. Design improvements

1) some refinement on the details of the model and functional design.

In the last stage of optimization,I think the interaction ofmy design part is still a bit lacking, so I want to make an electronic screen in front to provide some information reference for the passing visitors and add some interactive experience.

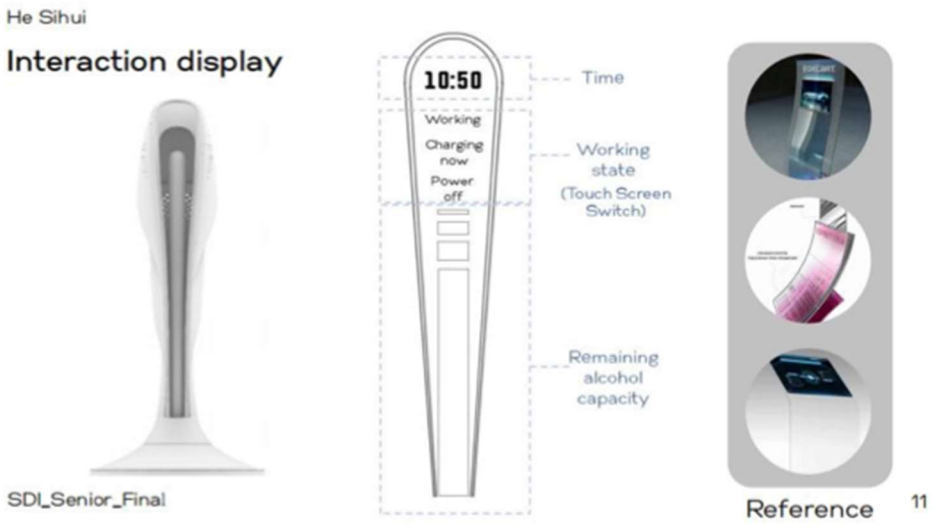

Figure 11. Display function layout

In the second half of the hand-washing area is also the initial plan to add an icon to play a prompt role. And it can effectively convey information and improve user experience.

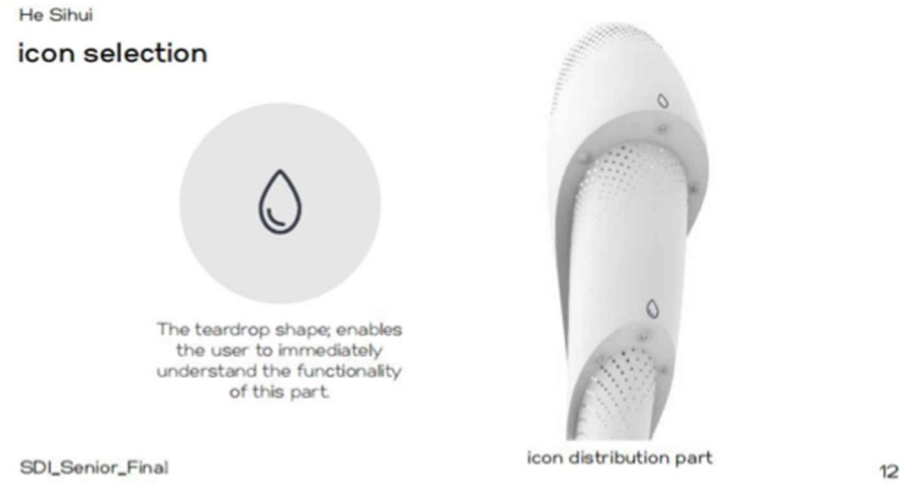

Figure 12. Icon Design

2) The first stage of product optimization

In the proportion is also made several adjustments to choose the most appropriate height,can do to adapt to the height of most people's product height.

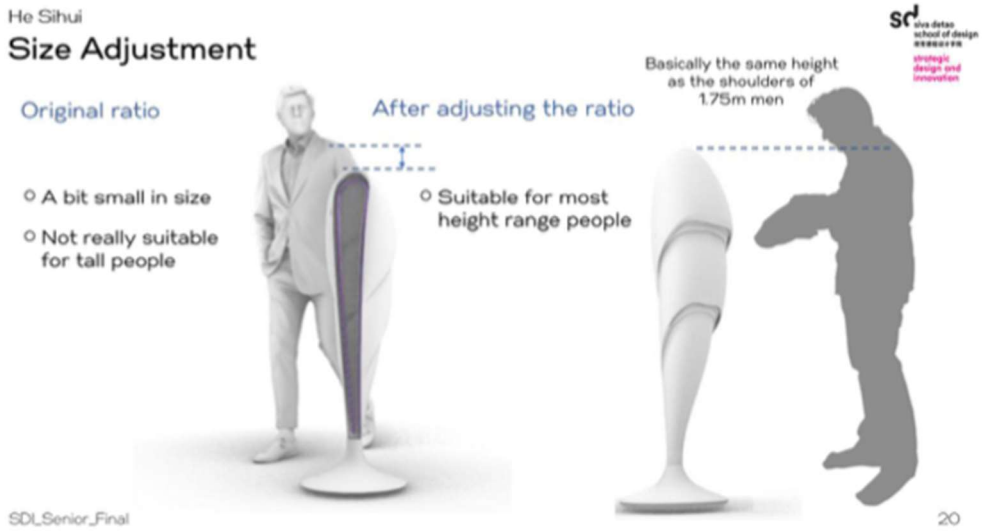

Figure 13. Proportional Planning

Improve the use of comfort:product adjustment ratio to adapt to the human body,can make the product more ergonomic,more comfortable to use,reduce the user's sense of fatigue.

Improve product quality:product adjustment ratio to adapt to the human body,so that the user's needs are fully considered and met,so as to better meet market demand.

3)The second stage ofproduct optimization

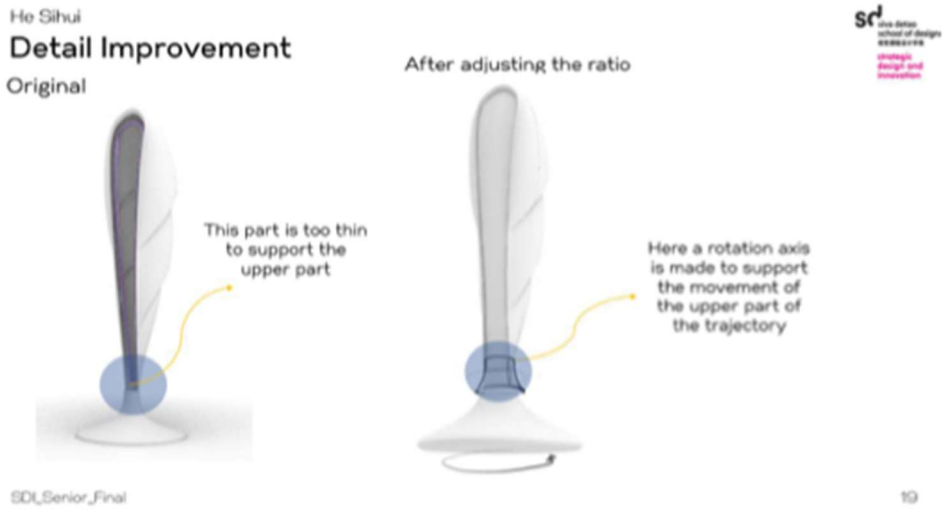

Figure 14. Modeling structure upgrade

Improve the proportional shape of the product,similar to the incongruous size of the base and structural problems.

The original middle articulation part was too thin and narrow,and the final model might not be able to support the upper part of the structure leading to deformation of the 3D printed model.So I chose to increase the volume of the rotary axis part,the base part also reduced some volume in order to make the overall shape more harmonious.

(4) The third stafe of product optimization

Figure 15. Ratio Improvement

So I re-planned the product shape and structure and the functional arrangement of the area.And made some detailed changes.Similar to the layout of the texture above and the regional planning oflighting.The purple part is the UV disinfection area;the upper part can rotate 360 degrees to disinfect the surrounding area,and the lower part disinfects the ground part at the same time.The blue part is the indicator area;through different color conversion to show the different working status.At the same time,it can also remind the surrounding passers-by of the working state of the machine.

Atthis stage of improvement after the shape has been almost finalized.

In order to make the product design language more unified,I created a mood board to guide the next product optimization design.

I wanted the design style to be simple,natural and modern in the main direction.

(5) CMF design part

Figure 16. CMF preliminary program

Product function and use environment:The CMF design of the disinfection product should reflect its function and use environment.I chose a public place like a shopping mall for the use scenario so the color choice is not too flashy.

Material selection and surface treatment:The material selection and surface treatment of the disinfection product should be able to adapt to its use environment,for example,it needs to be corrosion resistant,antibacterial,easy to clean,and not easy to slide.At the same time, the color and texture of the material should match the function of the product and the environment in which it is used in order to improve the user experience.

Appearance design and ergonomics:The appearance design and ergonomics of disinfection products should take into account the function and usage environment of the product,such as the size,shape,weight,grip and operation of the product.These factors can influence user comfort and usage.

Logo and user interface:The logo and user interface of the disinfection product should be simple,clear,easy to understand and operate to improve user experience and usage.Also, the logo and user interface should take into account factors such as language,culture and age to ensure usability and understandability of the product.

Preliminary CMF Design Solution

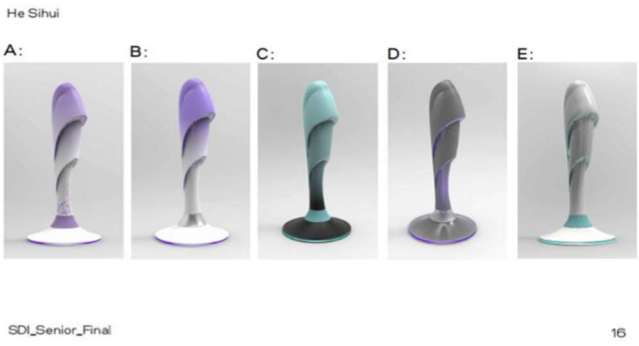

Figure 17. CMF option-1

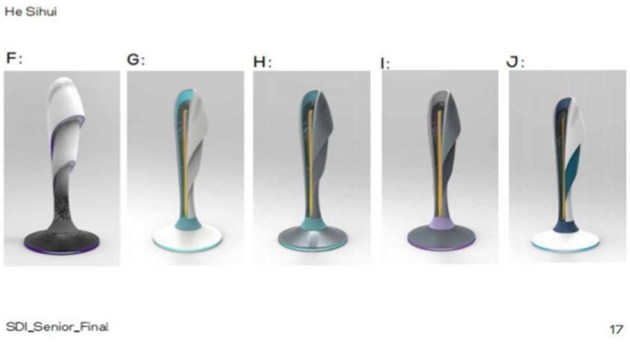

Figure 18. CMF option-2

During the midterm presentation,we decided to choose Option E,and we will make changes on the basis of Option E.Because the design theme of the product is related to disinfection,we wanted to have a dry and fresh feeling in the color scheme.The design theme is disinfection-related,so we wanted to have a clean and fresh feeling in the color scheme.

Figure 19. Final solution selected

This is the final CMF plan,the lower part has a light gray gradient,the middle part made of purple to increase the sense of hierarchy,the overall choice of smooth material, easy to clean at the same time can also echo with the mall scene.

3.3. Final Presentation of Design Results

I named my product "SaniG";"SaniG"is a combination of two words "Sanitize"and "Guard",which expresses the main purpose of the brand -to protect health and safety in public places.By using "SaniGuard"disinfection machines, public places can be kept clean and hygienic,preventing the spread of diseases and providing a safer and healthier environment for the public.A logo was also made based on the shape of the product.

Figure 20. Logo Design

In addition to the mall scenario it can also be applied to other public places that need tobe disinfected.

Figure 21. Other 1 scenario simulation

Figure 22. Other 1 scenario simulation

This is my simulation of the effect of this product in the process of using the picture show.

4. Design Summary and Reflections

4.1. Conclusion

1) Effectiveness: Public place disinfection products must have the ability to efficiently sterilize and disinfect. The product should contain active ingredients such as alcohol, chlorine and hydrogen peroxide to ensure effective killing of pathogens.

2) Safety: Products must be safe to avoid harm to humans and the environment. The use of the product must comply with safety standards and should contain instructions for use to ensure proper use.

3) Ease of use: Public place disinfection products must be easy to use to ensure widespread use. Products should be designed to be simple to understand and easy to carry and store.

4) Sustainability: Products should be designed with sustainability in mind to ensure a reduced environmental impact. Products should prioritize the use of environmentally friendly materials and ingredients, and should consider their environmental impact.

5) Economy: Product design should consider economy to ensure low-cost production and use. Products should be designed to conserve energy and resources, and should consider minimizing production costs.

4.2. Inadequate Design

The design process is missing some disassembling and pushing of existing products and some model testing sessions,

which makes me regretful. But I will pay attention to these problems and improve them in the future design work.

4.3. Future Outlook

Automated disinfection: Automated technologies will be increasingly applied to disinfection in public places. For example, automatic disinfection robots, automatic sprayers, etc. These technologies will greatly reduce the time and workload of manual disinfection and improve the disinfection effect.

Green and environmental protection: People are increasingly focused on environmental protection, and disinfection products for public places will also develop in the direction of green and environmental protection. Future disinfection products will be more environmentally friendly, using fewer chemicals and reducing the impact on the environment.

Efficient disinfection: Future disinfection products in public places will be more efficient. For example, UV disinfection technology and ion disinfection technology can be used, which can quickly and effectively kill viruses and bacteria.

Multi-functional disinfection: Future disinfection products for public places will have more functions. For example, in addition to disinfection, they can also remove odors and purify the air. These products will become essential equipment for public places.

Data-based management: Future public disinfection products will be more intelligent and data-based. For example, remote monitoring and management of disinfection equipment

can be achieved through Internet of Things technology, helping managers to better grasp the disinfection situation and make timely adjustments and improvements.

In short, the future direction of public disinfection products is intelligent, efficient, environmentally friendly and multi-functional. With the continuous development of technology, disinfection products will become more intelligent and efficient, and become an integral part of public places.

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