Introduction to Design Intelligent Air Purifier

Xiaobo Zhou
Tianjin University Renai College, Tianjin, China
358382483@qq.com

ABSTRACT: With the rapid development of economy, people's living standard increasingly high demands on the quality of life is more and more high. This article from the principle, shape, color, material, intelligent, modular design research direction of intelligent air purifier.

KEYWORDS: Product design; Air purifier; Modeling; Color; Intelligence.

1 INTRODUCTION

In recent years, the social and economic development, will inevitably lead to the destruction of the environment, most areas of Chinese is encountering for decades the most serious air pollution due to various factors, people living in the haze, dust, bacteria in the environment, affect people's health, now more and more people to protect the health of high according to statistics, in 2015 Beijing severe pollution weather up to 46 days, of which 46% pollutants as PM2.5. along with the change of modern people's way of life and work, people began to pay more attention to the health effects of air quality, air purifier has become the new home appliance is perceived by people and choice.

The air purifier refers to the adsorption, decomposition or transformation of various pollutants in the air, effective products to improve indoor air clean degree. In the home, medical, industrial fields are applied, the mainstream product market is the home field of home air purifier single class. The main function is to remove particulate impurities in the air. Including indoor allergens, such as PM2.5, but also can solve the cause and other causes of indoor decoration, underground space, closed space, interior volatile organic compounds in air pollution problems. Because of persistence and uncertainty of the relatively closed space of air pollutants, so it is one of the ways to improve indoor air quality by using air purifier to purify indoor air.

2 MARKET DEMAND ANALYSIS

We are in different occupation, 200 people of different ages has carried on the questionnaire survey, the recovery of 189 valid questionnaires, the people demand for health is 100%, for the high quality requirements of closed space air accounted for 87.75% of the population, the product the appearance of fashion, aesthetic requirements of people accounted for 83%, the demand for intelligent products the population accounted for 60.89%.

We are also of different occupation, 100 people of different ages were investigated, the content is there is such a smart air purifier products, improve air quality, fashionable appearance, with intelligent function. So people have no intention to buy this product. The data obtained is 90.47% are willing to buy this product. The proportion of the purchase intention of such a product is still very large.

From the above investigation we can see that most of the people for a healthy body, there is a high quality of life requirements, and therefore a stylish, intelligent high-tech health, environmental protection products for the public's needs.

3 INTELLIGENT AIR PURIFIER PRODUCT DESIGN

The design of intelligent air purifier system, need a large number of user data. Through the analysis of user needs to help define the target user group, determine user strategy, refine the function of the purifier, so that the user needs in accordance with the function of the purifier; and provide the basis for the design of UI; in the purifier development process targeted test plan and support intelligent data analysis. The air purifier products need to clear user group characteristics before the design, the functional structure of products, the establishment of
user task model and mental model, complete the user role set. By different users, psychological modeling of air purifier in the eyes of users, for the air purifier Product positioning to provide design direction, and focus on the user's perception of value, basic characteristics, potential operating habits and ways of thinking of these factors, to provide real help for the development of intelligent design. The key purifier of air purifier products focused on the following aspects: key purifier purification technology, purifier product design style, the product of intelligent cleaner, modular, purifier products consumer behavior.

4 TECHNICAL PRINCIPLE OF INTELLIGENT AIR PURIFIER

1. The principle of passive type adsorption filtration purification (purification filter). The main principle is: passive air purifier with fan to draw air into the machine, filtered air through a built-in filter, can play a major filter dust, odor, toxic gas and kill some bacteria. The screen is divided into: particles the filter material and organic particulate filter. The filter air purifier (12) is divided into coarse filter and fine particulate filter; organic filter for formaldehyde removal filter, deodorizing filter, activated carbon filters. Each filter for the main sources of pollution are not the same, the filtering principle is not the same.

   The quality of the fan and the filter screen of the product determine the effect of air purification, the position of the machine and the layout of the room will also affect the purification effect.

2. Cleaning principle of active (non mesh type). The fundamental difference between principle and active passive air purifier purification principle is that the air purifier active to get rid of the fan and filter restrictions, not passively wait to be pumped into the indoor air purifier for filtration and purification, but effective, active to release the air purification sterilization factor, characterized by air diffusion, arrive at each corner of the room on the air for no dead purification.

   The market factor are the main technologies for purifying and sterilizing silver ion technology, negative ion technology, low temperature plasma technology, photocatalyst technology and Plasmacluster ion technology, this kind of products are the biggest flaw is the ozone emissions exceed the standard problem.

3. Double purification (active purification + passive purification). This is in fact the passive purification technology and active purification technology to combine.

   Intelligent air purifier designs, color design, interface design.

5 SHAPE DESIGN

1. The information society for the personalized and standard of product design in the new requirements, through the analysis of the relationship between individual and the standard of product design in the integration, to solve the contradiction between personalization and standardization, and as far as possible to use the product design standard and to a better personality the way now stand in the new view of the development of new products is on the increase, to design enterprises to actively import reason is manufacturing competition between the increasingly fierce, depending on the design can effectively make the product differentiation and further improve the corporate image and product image, to further expand, until the consumer.

2. Now a lot of people for the choice of colors are in accordance with the personal preferences, but also to individuality, in the color principle, color collocation is not the choice of orange red is a warm color, have vitality, lively and vibrant, can let a person produce a kind of excitement, but should not be used a large area of choice, or come down for a long time, people have been in active state, but the proper use of orange embellishment in the local color collocation can have bright orange, can well stimulate the appetite.

   Black and white are many young people who love in black and white based products, and the black and white collocation can also look more modern products, but if too much emphasis on the black and white tone, long stay in this atmosphere, will make people become irritable, depressed. If you really love collocation of the two, can be set in white the main colors of the accessories with black embellishment, such products appear bright, high grade.

   The blue cool colors have a calming, sedative effect, fresh and elegant blue, is a kind of people can imagine the color of blue, but under the cool colors, purple, always felt like a dreamy, fragile thin, large purple is not suitable, it will make the product main color change deep, thus resulting in depression.

3. The material showed texture, texture, luster, is rich in nature materials, such as bark, scales, different materials have different surface chemical effects, such as iron, steel, plastic and charcoal, different materials to produce different psychological feelings, such as soft leather, hard metal and so on. With the development of technology, the use of paint, electroplating, covering different surface treatment process, designers can according to the psychological effect of expectations, all want to give a different material effect.
6 INTELLIGENT AIR PURIFIER, MODULAR

For modern people to strive for is already well-off, make life more convenient, comfortable and safe, is a universal appeal. Home Furnishing is under the influence of intelligence in the Internet of embodiment. All kinds of devices in the home are connected together through networking technology, provide various indoor appliance control, to help families with the outside to keep the smooth exchange of information optimization, people's way of life, help people to arrange a time to enhance the security of Home Furnishing life, a variety of energy cost savings. In the future, the air purifier will become more and more intelligent. For example, at present, many manufacturers are in the research of the remote control app. air purifier with mobile phone connected, close to receive indoor sensor data, check the indoor air quality, and through the mobile phone remote control directly regulate air flow, various modes, etc. the humidifying functions will be great convenience to people's life. Workers often go out, people can grasp and control Home Furnishing environment at any time.

User experience depends largely on the needs of users. The user needs is complex, a product is difficult to meet the needs of all users. Regional differences, gender, background, will affect the user needs. For example, the air purifier, the customer demand is humidified, and customers in need dehumidifier. These two diametrically opposite demands on one machine is difficult to fit perfectly. In addition, the machine is also very difficult to achieve strong comprehensive strength, exhaustive. Therefore, modularity is an inevitable trend. The modular air purifier mainly comprises a filter module and the function module of the filter module. And the purification effect on the role is key. But all filter with high performance will also increase the cost. The filter module is designed according to the requirements for different purification, enhanced version of screen of various sources of pollution. For example, the new owners’ decoration, the main pollutants are formaldehyde, then you can buy strengthen edition in addition to formaldehyde filter, the filter can use other standard configuration. The function module, the various functions, such as air quality testing, combustible gas, temperature and humidity, sterilization, humidification, dehumidification module, let the customer to choose the desired function, improve user satisfaction.

7 PRODUCT MARKET DEMAND FORECAST

With the rapid development of economy, people's living standard increasingly high demands on the quality of life is more and more high. At the same time to their health but also pay more attention to the appearance of the product, more and more have their own aesthetic requirements, in the face of the information society, people have higher requirements for intelligent products. More and more people know how to live, so buy products to have a psychological experience, at the same time, it should be a fashion product.

REFERENCES