

# Computer aided design of portable computer

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**Abstract.** Portable computer modeling design is mainly about different shape elements on decomposition and combination, including dots, lines, surface, body, color, texture etc. In order to make all the shape elements to be highly harmonious and acceptable, computer producers have to use the methods of unity and changes, symmetric and asymmetric, rhythm and rhyme together. Because the portable computer is a kind of industrial product with practical functions, only with beautiful shape is not enough (with the law of formal beauty to deal with the modeling of portable computer is not enough), producers should consider more about the reasonable functions.

In order to relieve the hard work, users also need some entertainment to edify the sentiment. This portable computer can provide beautiful music. As the top secrets of an enterprise, innovative solutions need to be well protected. With this computer, you will have nothing to worry through biological iris recognition technology for you crucial data security. In order to be different, bi-stable nematic liquid crystal display technology can make users' exclusive element appeared on the computer display.

## 1. Product Innovations

**Relaxation:** Creative hyper surround sound system not only can be used for basic music work, but also can satisfy the requirements of entertainment after hard work.

**Confidential:** Adopting the iris recognition technology as a secure identification method to provide a high security for the data in your computer, enhancing your data security confidentiality.

**Personality:** the custom-defined shell (Bi-stable nematic liquid crystal display technology is not only low power consumption, but also can hold users' favorite images on the LCD screen in case of without electricity) and different light colors make the same computer looks unique.

**Mobility:** In general, the portable computer should fully satisfy work needs in addition to be portable. It should never only pursue more portability but ignore the functions, light weight and thinness of the body (Composite materials and the new material graphene) and long battery life ensuring mobility.

**Reasonable:** Interface and information indicator lights should be layout reasonably. Using suspension keyboard makes feedback more comfortable. Lights are on the corner cut on both sides and interfaces are on either side to avoid too crowded. Heat discharge hole is located at the far end from users. The distinction of the different functional interfaces is made, such as colored differently.

**Humanity:** This computer perfectly combines high-tech products with traditional culture perfectly. A high tech product with cultural meaning is more popular.

## 2. Product Modeling

The modeling is a kind of visual language, lines as the main symbol referring to the image of the object. Producers pay more attention to the modeling factors in design, through certain modeling to make product explicit, specific and materialized. Modeling is perfect or not to some degree embodies the form composing principle is reasonable or not.

### 3. Product Structure

The structure design of this portable computer is mainly decided by the reasonable module layout. Firstly, double screens fully meet the various needs of users (panel personal computer mode, tablet computer mode, timely sharing demo mode and tile hand-painted mode), at the same time, it is sturdier and more durable than other schemes( for example, 360 degree flip type screen, universal shaft torsion type, rotating screen type, hot plug type). Secondly, with 2+2 stereo mode of innovative and practicable--- The hyper surround sound system skillfully designed two main sound boxes into the joint shaft to satisfy the sound volumes (the study results from Dolby laboratories showed that the volume of spoke to a large extent influences the vigorous degree of voices by directly ratio and has a close relationship with sound cavity modeling) and direction of sound transmission. Two auxiliary speakers are located in the upper cover on both sides of the arc flank which successfully ensure the effective sound transmission. Arc flank is also helpful to enhance the surround sound effect. Besides, because the arc flank can increase the physical strength of ultra-thin cover, so it can be regarded as reinforcement, it also is thought as killing two birds with one stone. Thirdly, one single palm to open and close the computer is possible with the exquisite drum shaft with the maximum opening angle of 180 degrees. Fourthly, Innovative R.L EI Button adopts the two-stage button design, one key for multi-purpose.

### 4. Product materials

Portable computer respectively adopts polycarbonate, carbon fiber and titanium alloys as different versions of shell body. But in order to pursue perfection, light weight and resistance to impact, a new concept material is introduced- graphene. Graphene is not only the thinnest material among the known materials, but also very sturdy. At room temperature, as elemental, its speed of transmission electronic is faster than any known conductor. Graphene is a structure composed of carbon atoms in single chip of new nanometer material, it is almost completely transparent, only 2.3% of the light absorption. Its coefficient of thermal conductivity as high as 5300 W/m·K is higher than the level of carbon nanometer tubes and diamond. Under the Room temperature, its electron mobility is over 15000 cm<sup>2</sup>/V·s, which is also higher than carbon nanometer tubes or silicon crystals, and the resistivity is only about 10<sup>-6</sup> Ω·cm as the minimum resistivity materials in the world even lower than level of copper or silver. Because of its lowest resistivity and fastest electron mobility, the product made of graphene is very sturdy, at the same time, very light weight and thin. In addition, its high light penetration shows better internal light and color changes, it can well reflect the sense of science and technology.

### 5. Product Instructions

#### 5.1 Interface Layout

Composite interface of USB3.0+eSATA is specially designed for mobile hard disk with eSATA interface which does not support USB3.0. This interface is more flexible to use. SDXC interface supports memory card with higher capacity and it is compatible with lower capacity too. Suction type optical drive can ensure the integration of whole body, and avoid the problem of the accidental damages, just like pop-up drive tray often meets. The safety lock produced by the world leading company *Kensington* can reassure users that they never need to worry about leaving their portable computers alone. See Picture 1.



Picture 1. Interface Layout

### 5.2 The Details

You will find innovation everywhere from this computer, even its power supply, which is inspired by two stages buttons of camera. This special button was named R.LEI button. When completely pressed, the button plays the effect of traditional power. However, if users press lightly into the first stage, it will trigger the center custom function of the R.L EI. Through it, users can quickly find all sorts of commonly used settings entrance, and also set the path to achieve the purpose of adding other own options. The design of computer body flank adopts illusion principle which makes computer look thinner.

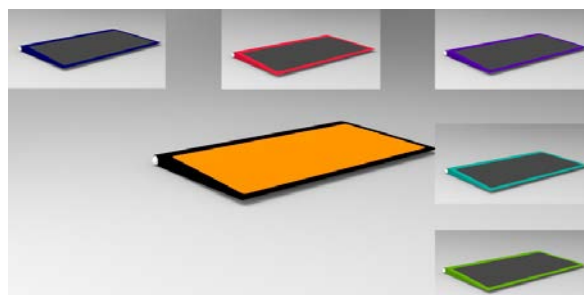
Discharging heat hole is hid in order to ensure the integrity and beautiful looks of the computer body. At the same time, it is located at the back side of the body to avoid heat bothering users' hands. The other side of the drum shat locates power socket. Circled power indicator lights around socket are specially designed. Concentric circle design looks more beautiful. Circled indicator lights actually are composed of mini-LED lights, which can show detailed changes of the computer. See picture 2



Picture 2.Detailed Changes

### 5.3 Technology Part

The surveys found out that people constantly want to make their own stuff to distinguish from others at this era with abundant products. In order to meet this requirement, this portable computer adopted bi-stable liquid crystal display technology. Meaning that no mater with or without power, the pictures on the display screen will keep the stable state. When turned off the power, you still can see the pictures on the screen and you even can set the metallic color for the picture to make it a backup mirror. See picture3.



Picture3. Effect

Would you like to listen to some music after busy work or at the break time of design process? The answers are always yes. However, traditional laptop absolutely hardly satisfies the needs of some peoples' picky tastes because of its noisy and harsh sounds. The reason is producers seldom pay more attention on design of loudspeaker boxes. With this new portable computer, you will never worry

about the sound which was designed through unique three-dimensional surround sound system. It definitely will bring you a sense of shock for your ears.

#### **5.4 Cultural Part**

Iris recognition technology is an advanced security technology, whose biological characteristic of capture is more reliable than the technologies of traditional password and fingerprint recognition. The introduction of this technology greatly improves data confidentiality. Especially for company executives, designers and analysts, the files or papers they hold are crucial to the destiny of their companies. A more advanced data security measures is very important. The iris is a part of the eyes, so if we want to use this technique, it must have the participation of the eyes. This technique reminds me a Chinese ancient idiom which means bringing the painted dragon to life by putting in the pupils of its eyes. This idiom notices the painted eyes are the vital factor for the dragon. We infused the meaning of this idiom into the portable computer design. When the users operate this computer for identification check, the participation of the users is the vital factor of this computer, which also embodies the identification and honor of the users.

#### **5.5 Version of the Program**

White and black accurately cannot be called a color, but they are two kinds of classic. Different eras with different popular colors, however, black and white will never out of date. White represents the holy and black represents the composed and calm, which are also the reasons why they are so favors by matured groups. As classic, white and black are indispensable. Users want to use excellent products and are keen to evaluate the appearance of the computer after obtaining the functions, such as the texture of body. We also designed the special editions for special needs: 1. pure manual "platinum luxury" limited edition, the top customers oriented; 2. arousing the people consciousness of environmental protection, "natural flavor" version; 3. "Los Merengues " note version.

### **6. Conclusions**

Due to adopting double screen solutions, the strength of the ultra-thin cover became a problem remaining to be solved. Graphene, as a new kind of material, can be a good solution to this problem as its characteristics of high strength, light weight, high light penetration and high electron mobility. In the modeling design of portable computer, you should not only conforms to the artistic regularity, but also conform to the laws of science and technology. Not only should consider characteristics of modeling style, but also consider the structure, material, processing technology, the production efficiency and economic benefits.

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### **References**

- [1] HE Ren-ke. Sustainable Design Based on Low-Tech[J]. Zhuangshi, 2009 (8) : 26—29.
- [2] CHEN Jiang. The Research of Original Products Designing Methods: Take the New Type Bean Milk Machine Design as an Example[J]. Zhuangshi, 2011 (7) : 125—126.
- [3] HANDS. Vision and Values in Design Management[M]. Bei-jing China Building Industry Press, 2012.
- [4] XU Hao. Decisions and Analysis Research in New Product De-sign[M]. Beijing: Economic Management Press, 2012.
- [5] NORMAN D A. Design Psychology[M]. Beijing: CITIC Publish-ing House, 2010.

[6] ZHANG Fan.Product Development and Marketing[M].Shang-hai: Shanghai People's Fine Arts Publishing House, 2004.

[7] ZHANG Hui.The Limits of Experience: the British Empirical Aesthetics Research[M]. Beijing: China Social Sciences Pub-lishing House, 2005.