



# Research on Product Pain Points and Design Optimization Strategies of Women's Multifunctional Shaver Based on User Feedback

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**Abstract.** In order to improve the product suitability and user satisfaction of women's multifunctional shaver, based on 528 real feedback data, we study the structural defects and interaction barriers in the process of using, analyze the core problems in function integration, operation process and humanized design, and put forward optimization strategies oriented by module standardization, process intelligence and morphology bionization. We propose optimization strategies guided by module standardization, process intelligence and morphology bionization. The analysis concludes that the current product has not yet established an efficient synergy mechanism between user experience and functional coupling, and that it is necessary to systematically reconfigure the design path from the dimensions of structural engineering and usage context.

**Keywords:** multifunctional shaver; user feedback; structural optimization

## 1 Introduction

Driven by consumer personalization and aesthetic diversification, shavers, as an important component of women's personal care products, are undergoing a transformation and upgrading from single-function to multifunctional integration. Multifunctional shavers not only undertake basic hair removal tasks, but also embedded in grooming, skin beauty and other composite uses, becoming an integrated carrier of daily care equipment. Product design needs to seek a balance between functional integration, ease of use, and human-machine coordination, and the key lies in building a structural logic and interaction mechanism that fits the usage scenarios and users' habits, thus realizing the simultaneous improvement of product performance and experience quality.

## 2 Analysis of Women's Multifunctional Shavers based on User Feedback

In the process of users' actual use, the comprehensive performance of women's multifunctional shavers shows multi-dimensional feedback characteristics, which is concentrated in the aspects of comfort, portability, endurance, cleanliness, convenience and adaptability of functional components [1]. Through the categorization and statistics of the 528 user feedback data, it is found that more than 41.3% of the users indicated that the skin was slightly red or itchy in the process of prolonged use, suggesting that there is still room for improvement in the current design of the razor head and the affinity of the skin; 34.1% of the users were dissatisfied with the product's weight and grip, reflecting the lack of the current structural design in conforming to the physiological curves of women's hands; another 28.1% of the users expressed dissatisfaction with the product weight and feel, reflecting the lack of the current structural design in conforming to the physiological curves of female hands; and the other 28.3% of the users were dissatisfied with the product weight and feel. Another 28.6% of the feedback points to the complexity of the cleaning process or the difficulty of disassembling the cutter head, indicating that the modular design is still not perfect. In addition, only 18.9% of users indicated that it was "very convenient" to switch between multifunctional components, showing the lack of optimization of the product's operation process, as shown in Table 1.

**Table 1.** Percentage of different pain points in user feedback (n=528)

| Category of User Pain Points                              | Percentage (%) |
|-----------------------------------------------------------|----------------|
| Skin discomfort after use (redness/stinging)              | 41.3           |
| Uncomfortable grip (unstable balance/too heavy)           | 34.1           |
| Difficult maintenance (hard-to-clean blades)              | 28.6           |
| Inconvenient function switching (complex component setup) | 22.5           |
| Overall satisfaction with ease of use (rating $\geq$ 4/5) | 18.9           |

The data show that the multifunctional shaver for women has not yet formed a high degree of synergy between structural design and user experience, and the product still needs to be optimized in terms of detail experience, integration of functional modules, and interaction friendliness. The above feedback provides a clear direction for the subsequent design optimization, which requires systematic adjustment and verification in the dimensions of hardware structure, operation interface and ergonomics [2].

### **3 Pain Points of Women's Multifunctional Shavers**

#### **3.1 Incomplete Functional Integration**

Women's multifunctional shavers reveal obvious structural shortcomings in the design of functional integration, and users generally reflect poorly on the coordination between the core functional modules. Product manufacturers have failed to realize the efficient coupling of shaving, trimming, exfoliating and other functions, resulting in frequent independent operation of a single module, increasing the cost of use for users. In the actual structure of the configuration, the lack of a unified interface standard between different functional components, the existence of the head is not smooth disassembly, easy to loosen the accessories buckle and other physical structure problems, seriously restricting the smoothness of the function switch. User feedback data shows that as many as 22.5% of users pointed out that the function switching steps are cumbersome, and the lack of integrated logic control, button settings are scattered, the function icon is not clear, the operation process is lengthy and other problems occur frequently. In the process of specific use, some users reflect that different shaving areas (such as underarms and legs) need to frequently replace the cutter head, but due to the interface precision control is not strict, there are often assembly deviations or poor contact, which further triggers a decline in the use of efficiency. In addition, there are obvious flaws in the cleaning and maintenance process. In particular, the head structure does not have a quick-release mechanism in its design, so it needs to be disassembled with the help of tools or greater force, which leads to cumbersome cleaning operations after shaving. Part of the head part of the narrow gap, easy to residual hair and dander, and in the water washing process is difficult to thoroughly rinse, not only affect the health and safety of re-use, but also exacerbate the cleaning frequency and time-consuming burden. Some users have pointed out that the long time not thoroughly cleaned head area is prone to metal oxidation and stagnation phenomenon, further affecting the smoothness and durability of the machine. This series of problems reflect the lack of systematic design thinking in the integration of modules and structural optimization of current products, failing to achieve an effective balance between functionality and maintenance convenience [3].

#### **3.2 Poor User Experience**

Users in the operation process generally reflect the lack of intuitive guidance in the interaction design, control buttons scattered location, feedback lag, resulting in a high learning cost of the basic operation process. The device does not set clear state prompts during startup and function switching, making it difficult for users to recognize the current working mode and component enable state, increasing the uncertainty in use. In addition, the gripping area does not take into account different hand sizes and postures, and the actual grip is slippery, especially in wet hands, which makes it easy to slip off, and safety is doubtful. The data shows that 34.1% of users are dissatisfied with the grip experience, reflecting that the product has not achieved the optimal ergonomic match in the selection of surface materials and the configuration of the

center of gravity of the structure. Some users pointed out that there are problems of high noise and strong vibration during shaving operation, especially when contacting delicate parts, which may cause discomfort. The product's ability to control heat dissipation under continuous operation is insufficient, and the temperature of the cutter head rises significantly after prolonged use, which increases the probability of discomfort for users with sensitive skin. In addition, the use of the scene for the night, travel and other specific needs to set lighting, mute, power display and other auxiliary functions, the overall embodiment of the lack of consideration for the user's actual use of the situation, which further aggravates the operation of the inconvenience and psychological burden.

### **3.3 Mismatch Between Product Design and Humanization**

The products do not fully incorporate the daily use environment and operating habits of female users in the process of structural design, resulting in insufficient humanization of the overall shape, functional layout and operating procedures. Part of the shell of the model adopts hard glossy material, without considering the skin friction feeling and anti-slip performance in the long-term handheld state, the grip comfort is obviously insufficient. The overall length of the product and the angle of the cutter head is not designed to take into account the natural movement of the user in the armpit, behind the knee and other hidden parts of the track, the actual operation process is prone to angle restrictions or the need to frequently adjust the posture of the situation. The position of the buttons on the device does not match the natural position of the fingers, which leads to a high rate of miscontact during the function activation process, especially when quickly switching gears or switching areas, the user needs to repeatedly confirm the status of the buttons, which increases operational anxiety. Some feedback pointed out that the product did not fully consider the blind plugging scenario in the charging interface position setting, and it is difficult to locate the interface during night operation[4]. In addition, the size of the charging base is too large or unstable, and it fails to achieve spatial coordination with typical storage scenarios such as the dressing table, which shows that the overall product appearance and structure have a low degree of integration with life scenarios. The above design defects reflect the systematic inadequacy of the current product in the process of transforming from “functional completion” to “human synergy”.

## **4 Design Optimization Strategies for Women's Multifunctional Shaver Based on User Feedback**

### **4.1 Enhance the Integration Efficiency of Functional Modules**

To enhance the integration efficiency of functional modules, we should start from the dual dimensions of structural standardization and component interaction logic, and systematically optimize the product's internal coordination mechanism. The module interface should uniformly adopt the double insurance mechanism of magnetic dock-

ing or snap positioning to ensure the stability and accuracy of the component replacement process and solve the assembly deviation and poor contact problems in the user feedback. In the overall architectural design, an integrated function master control chip should be introduced to realize dynamic identification and automatic switching of shaving, trimming, exfoliating and other modules through the logic integrated circuit, simplify the operation path of the physical buttons, and improve the smoothness of operation and response speed. For different shaving areas, the geometric parameter standards of the module-specific cutter head should be formulated to realize the rapid replacement and positional calibration of the cutter head and reduce the efficiency loss caused by multiple manual adjustments by the user. In addition, it is necessary to add a “module automatic identification + status light prompt” feedback system in the structural layer, so that the user in the process of operation can be real-time grasp of the current function and working status. The blade structure is recommended to adopt the design of “slide rail type + spring pressure slot” to optimize the convenience of disassembly and installation while ensuring that no external tools are required for daily cleaning, thus enhancing the maintenance efficiency after use. The systematic deployment of the above strategies helps to realize the high coupling between multi-functional components and the consistency and synergy of user experience, and build a highly integrated product function ecosystem.

#### **4.2 Optimize the Use Process to Enhance User-friendliness**

The optimization of the operation process should be based on the core objectives of reducing learning costs and improving the efficiency of interaction and response, and systematically reconstructing the control logic and feedback mechanism. The control panel should adopt a centralized layout design, with high-frequency buttons such as switches, mode switching, and gear adjustment uniformly set in the main field of view area, and equipped with backlight strips or tactile bumps to improve the accuracy of operation in wet hands or low-light environments. The start of each functional module should be supported by an independent LED status prompting light, which distinguishes the current working mode and component operation status by color and blinking frequency, so as to reduce users' misjudgment and repeated confirmation in the operation process. The working mode switching logic is recommended to adopt the short-press-long-press combination mechanism to avoid switching conflicts between different functions; the system should set the initial default mode and have a memory function to automatically load the last configuration state when the user repeats the use of the system[5]. The feedback system should be embedded with micro-vibration prompts and voice modules (supporting mute switching) to realize instant feedback of operation completion, fault reminder and charging status. In order to further enhance the operating experience, an information window can be added to the surface of the host, displaying key data such as current power, enabled functions and usage hours through the graphical interface, assisting the user in grasping the status of the product and the rhythm of use, so as to comprehensively enhance the friendliness and controllability of the usage process.

### 4.3 Adjust the Product form to fit the user's Body Habit

The adjustment of the product form should fully focus on the operation posture and body trajectory of female users in different shaving scenarios, and build a higher degree of fitting form logic. The overall structure should be optimized in two directions: light weight and sinking of the center of gravity, so as to maintain the stability and smoothness of the body under multi-angle operation. It is recommended to adopt a rotatable + auto-locking structure for the head angle, so that the user can complete the shaving task without having to frequently adjust the posture when dealing with curved areas such as underarms and behind the knees. The connection between the cutter head and the main unit should introduce a spherical universal axis mechanism, which realizes multi-directional fit to the skin surface through the joint rotation, and reduces the shaving blind spot caused by the angle dead zone. The overall size of the product should be segmented and matched according to different shaving areas. For example, the length of the cutter head for legs can be relatively extended to enhance the coverage efficiency, while the module for private parts should maintain a short distance and compact structure to ensure the flexibility of control and safety of use. The shell shape should adopt bionic curved design, and the surface coating should be made of skin-friendly silicone with anti-bacterial and waterproof performance, so as to meet the needs of continuous operation under skin contact and wet environment. Through the systematic remodeling of the above morphology, the adaptability and comfort perception of the device can be significantly improved under complex postures and multi-area usage conditions.

## 5 Conclusion

women's multifunctional shaver has systematic shortcomings in function integration, interaction design and humanization adaptation, and user feedback reveals the need to optimize the existing product in terms of structural coupling, use flow and somatosensory design. The future design should further integrate ergonomics and intelligent interaction technology, promote the in-depth integration of functional modules and usage contexts, and strengthen the innovation of material technology and micro-mechanisms, so as to realize the efficient, safe and comfortable experience of shaving devices in multiple scenarios.

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