

24 Solar Terms Fragrance Clock: An Interdisciplinary Exploration Based on Cultural Narration and Olfactory Experience

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Abstract: Domestic fragrance brands have thrived in the olfactory economy, leveraging cultural narratives and innovatively designed products. Brands such as Scent Library and Guanxia have integrated local Chinese memories into the olfactory experience, shaping a unique texture of Chinese scents and achieving bundled and interactive marketing through media resources. Loir Fragrance, which provides fragrance services for corporate users, focuses on enterprise customers through a strategy-plus-e-commerce platform model. Currently, its main products are home aromatherapy products, but it should be noted that there may be high health risks involved. Furthermore, with the integration of traditional cultural elements, multi-dimensional and multi-scenario interactive experiences, and the gradual formation of an intelligent ecosystem with the Internet of Everything, domestic fragrances should not only focus on cultural aspects but also combine their own advantages to incorporate more innovative forms and explore new markets.

Keywords: Domestic Fragrance Brand; Integrated Marketing Communication; Packaging Design; Cultural Narrative; Olfactory Economy

1. Research Background

1.1 The Rise of the Olfactory Economy and Market Opportunities

The global "olfactory economy" is growing rapidly. According to Euromonitor Research's forecast, by 2025, China

The retail sales of the fragrance market will reach RMB 30 billion, with a growth rate about three times that of the global market [1]. The demand for spiritual consumption drives

fragrance products to become tools for emotional regulation. Generation Z dominates the market, valuing emotional resonance and cultural identity, and is willing to pay more for products with storytelling and scene-based elements. Most Generation Z members believe that the cultural significance of products influences their purchasing decisions, with a sense of ritual and emotional healing being the main appeals of choosing fragrance products. Fragrance products that empower culture offer tremendous market potential.

1.2 The Development Status and Challenges of Domestic Fragrance Brands

Currently, domestic fragrance brands such as Guanxia, Scent Library, and Fauvism have achieved rapid development due to their outstanding product differentiation. Guanxia, with its brand positioning as an oriental plant fragrance, has achieved a valuation of hundreds of millions of yuan. Scent Library has also sold out of single bottles, and its "Liangbaikai" perfume has achieved an impressive sales volume of 1 million bottles a year. Domestic fragrance brands can leverage their traditional ingredients to differentiate themselves and break through the market, promoting China's excellent traditional culture through product forms [2]. However, there are also some issues in China's fragrance market, such as highly similar products, lack of narrative cultural packaging, failure to clearly explain the relationship between product culture and scent, lack of theoretical research, and weaker competitiveness in the high-end market compared to foreign big brands.

1.3 The Modern Transformation Needs of the 24 Solar Terms Culture

Modern people's demand for the modern transformation of the culture of the 24 solar terms. The 24 solar terms embody a long

history of phenology and folklore, representing a golden treasure trove of Chinese cultural IP. Among the numerous applications that utilize solar term culture, there is yet to be seen in the field of fragrance. Furthermore, there is no research on content themed around solar terms in the modern market. The market is flooded with marketing products that capitalize on the cultural theme of the resurgence of solar terms, but there is a lack of products that combine solar term culture with phenology. The traditions recognized by young people, Generation Z, are products that they enjoy and are willing to immerse themselves in interactively. According to the research results of the "2022 China-Chic Consumption Trend Report," 72% of young people are willing to spend more money to enjoy this interactive cultural consumption experience, which also signifies a new breakthrough in the modern transformation of festival culture [3]. That is: using fragrances with emotional memory effects to create perfume products in combination with festival culture, which can not only gain greater market space but also create more experiential value.

1.4 Cultural Metaphor and Design Potential of Sundial Design

The design of the sundial embodies rich and diverse cultural meanings and possesses significant design potential (As shown in Figure 1. Sundial Design).



Figure 1. Sundial Design

By utilizing the laws of solar movement and its positional relationship with the shadows of objects on the ground, it reflects the ancient people's concept of time. Based on this, the design of the sundial shape is utilized, and its application in fragrance clock products also perfectly brings out its inherent advantages: it facilitates cultural recognition; it is conducive to spatial narrative; and it also facilitates interaction between the product and the user. Incorporating the sundial into the design can further enhance the cultural recognition of the

product, and structurally, it can also achieve regular release of fragrance. Through experiencing the product advantages of the fragrance clock in terms of time and fragrance perception, it can grasp the preferences and needs of Generation Z and fully satisfy them.

2. Proposed Solutions and Research Significance

2.1 Core Issues

2.1.1 Combining culture with olfactory experience

The primary objective of the study is to analyze the correlation between the 24 solar terms and plant fragrances, explore olfactory memories in solar term folk activities through various methods, and construct a "solar term - olfactory - emotion" matching model, providing theoretical support for the cultural narrative of fragrance products.

2.1.2 Fragrance product innovation

Fragrance product innovation: The fragrance market is seriously homogenized and lacks cultural recognition. Can the 24 solar terms culture be used for innovation in domestic fragrance brands? That is, we need to extract fragrances and innovative expression methods from the culture of solar terms, analyze the current status of fragrance types and cultural expression in fragrance products, explore innovative application methods of solar term culture in fragrance design: solar term-themed fragrance series, which interprets scents according to the changes in the solar term cycle. Furthermore, we will explore the combination of sundial shape and fragrance function, making it have its own unique morphological characteristics.

2.1.3 Modern experience of traditional culture modern society, the inheritance of 24 solar terms culture encounters a cognitive gap, and young people have a limited understanding of solar terms culture. This study aims to explore how to utilize fragrance as a medium to create a solar terms cultural experience that resonates with Generation Z. The research content includes:

- (1) Analyze the cognitive and experiential needs of Generation Z towards traditional culture;
- (2) Activate different scent channels based on time, or continuously alter the sensation of fragrance over time, even evoking people's

olfactory memories. The third approach is to utilize the fragrance clock as a cultural medium, transforming traditional culture from being knowledge-based to experiential and contextual.

2.2 Theoretical Significance of the Research

2.2.1 The theory of scent marketing focuses on the study of commercial space atmosphere and consumer behavior strategies, but does not involve the application of traditional classics. This article proposes the concept of "cultural olfaction", which combines cultural symbols with olfactory experiences and applies scent marketing theory to cultural inheritance, helping to open up new research areas [4].

2.2.2 Most fragrance designs on the market tend to focus on the technical aspect, lacking emotional and cultural resonance. Through the analysis of the culture of the 24 solar terms, a narrative model of "solar term - olfactory - emotion" is established, and how cultural narrative is applied in the full fragrance experience process is discussed.

2.2.3 While studying visual and cultural creative products, we should actively incorporate olfactory experiences, further expand the theory of cultural transformation, enrich and supplement its connotation with "sensory cultural transformation", and explore the multidimensional transformation mode of "solar terms - olfactory sense - emotion", in order to gain a deeper understanding of traditional culture development.

2.3 Practical Significance of the Research

Propose new paths for the differentiated development of domestic fragrance brands, and utilize cultural empowerment to create more paths for brand differentiation in order to better compete with foreign brands. By taking the brands Guanyang and Scent Library as examples, extract their successful experiences and acquire their methods of traditional fusion. Based on this, create a sundial-shaped design to achieve product differentiation.

(1) Bringing the culture of solar terms closer to modern life, as solar terms have little influence in today's life.

(2) This project starts with designing a fragrance clock to promote the integration of solar term culture into daily life: daily solar term experience - releasing different fragrances at different time periods; interactive solar term experience mode - combining the linkage of the

fragrance clock and mobile phone APP to tell and disseminate solar term knowledge and stories; exploring the fragrance clock as a home decoration, naturally integrating into life.

(3) Promote the diversified development of the olfactory economy, which mainly includes perfume and home fragrance categories. Adopt interdisciplinary innovative ideas to expand the development space of the olfactory economy: integrate cultural IP with fragrance. Combining various elements, we introduce high-value cultural fragrance products; proposing a solar term fragrance ecosystem, such as integration with smart home systems. Multimodal experiences promote the integration and diversified development of the olfactory economy with traditional cultural industries.

3. Literature Review and Existing Deficiencies

3.1 Current Research Status of Solar Term Culture

The 24 Solar Terms, originating from ancient times when people conducted astronomical observations based on agricultural activities, constitute an ancient Chinese time system that was already relatively well-established during the Qin and Han dynasties. Currently, most research focuses on a single field, without integrating different disciplines, and interdisciplinary research is insufficient. Due to the focus on a single discipline, it is difficult to form a comprehensive theoretical system, which in turn makes it impossible to effectively guide the integration of Solar Terms and fragrances in design.

The 24 solar terms are primarily applied in the field of design for visual design and cultural and creative product development. Visual design expresses the characteristics of the solar terms through graphics and colors. In terms of cultural and creative products, solar term-themed stationery, home decorations, and the like mostly utilize visual symbols, lacking deep integration with product functionality. Meanwhile, in the field of interaction design, many scholars have attempted to create solar term experiences using digital technology, such as AR-based solar term interactive devices. However, these mainly focus on information dissemination and fail to create deep emotional experiences. Overall, existing design applications pay more attention to visual

expression and lack sufficient research on other sensory experiences.

3.2 Current Research on Olfactory Experience and Fragrance Design

3.2.1 Olfactory psychology and emotional memory research

According to the data from the Perfume White Paper, 79.8% of consumers stated that they liked the fragrance of the product as the reason for choosing it. Meanwhile, 72.1% of consumers would choose products that make them feel happy [5].

3.2.2 "Cultural Olfaction" is a new interdisciplinary field that investigates how olfactory experiences are constructed by culture and the role of olfaction in cultural cognition. In design, the incorporation of local cultural elements into fragrance design is still in the exploratory and experimental stage.

For example, the design of the "Waka" series by Japanese designers draws inspiration from traditional Japanese elegance and modern fragrance scents, providing a certain reference value for domestic designers. However, there are still many issues that need further research when it comes to integrating cultural elements such as China's 24 solar terms.

In practice, international brands have fully showcased their brand identity through their exclusive fragrance formulas and cultural narrative techniques; whereas Chinese fragrance brands have begun to incorporate traditional cultural elements. However, Chinese fragrance brands have not yet achieved sufficient mastery in fragrance design, such as an excessive preference for using foreign fragrances, disorganized cultural narratives without systematization, and insufficient innovation in product forms. 3.2 The current status of cross-disciplinary research on culture and olfaction

3.3 Current Status of Cross-disciplinary Research on Culture and Olfaction

3.3.1 The current state of research on the intersection of culture and olfaction is as follows: odor is closely related to cultural identity. People from different cultures have varying preferences for odors, and there are also various odor taboos.

For example, in Indian culture, some fragrances are closely associated with religious rituals, yet research on the relationship between culture and

scent has not explored Chinese local culture.

Currently, many local Chinese scholars have begun to focus on exploring traditional cultural elements from the olfactory perspective, such as aromatherapy in traditional Chinese medicine and traditional incense culture. They have discovered that traditional incense culture is related to the Chinese emphasis on moral cultivation, providing a cultural perspective for contemporary perfume design. However, such research often starts from a historical dimension and does not provide detailed descriptions of specific design methods.

3.3.2 "Cultural Perfumology" is a new interdisciplinary field that studies how olfactory experiences are constructed by culture and the role of olfaction in cultural cognition. For example, some scholars have pointed out that the culture of Parisian perfume is a concept that symbolizes French social identity, but there is basically no research on Chinese cultural cognition in this field. In design, the incorporation of local cultural elements into fragrance design is still in the exploratory stage. For example, the design of the "Waka" series by a Japanese designer draws inspiration from traditional Japanese elegance and modern fragrance scents, providing a certain reference value for domestic designers. However, there are still many issues that need further research when it comes to integrating cultural elements such as China's 24 solar terms. Integrating cultural elements such as China's 24 solar terms.

3.4 Shortcomings of Existing Research

3.4.1 Currently, relevant research mainly focuses on one aspect, lacking interdisciplinary research that combines other disciplines. Due to being single-disciplinary, it is difficult to form a three-dimensional theoretical structure, and it cannot exert guiding significance to guide the design of combining solar terms with fragrance.

3.4.2 The cultural connotation explored is insufficient. The solar term culture and fragrance design lack cultural core and depth, unable to convey warm stories or evoke emotional associations that touch people's hearts. The exploration of culture remains at the superficial symbolic level.

3.4.3 Sensory experience: Products related to a single solar term rely heavily on visual experience, with insufficient development of senses such as smell and touch; Fragrance does not have the function of

connecting with other senses, making it impossible to meet the needs of Generation Z.

3.4.4 The technological application is relatively backward, and the design of fragrance devices lacks structural innovation. Most of the technology is used for functionality, without incorporating much cultural narrative. A new product form combining sundials and modern fragrance technology has not yet appeared. IV. Research Methods and Implementation Plan

4. Research Methods and Implementation Plan

4.1 Design of Research Methods

4.1.1 Through interdisciplinary literature research, this study has constructed a theoretical framework encompassing "solar terms - olfaction - emotion".

4.2.2 Case analysis method

Analyze cases of fragrance brands and traditional timing tools from both domestic and international perspectives, and summarize the application patterns and innovation paths of cultural elements in fragrance design.

4.2.3 Adopt a method combining qualitative and quantitative analysis,

Using both in-depth interviews and questionnaires to understand the cognitive situation of Generation Z consumers, with a sample size of 500 [6]. Combining qualitative and quantitative methods, based on the survey questionnaires and in-depth interviews, the sample size is determined to be 500 individuals.

4.2.4 Experimental design method

Design experiments to explore the matching relationship between solar terms and olfaction, including phenology-fragrance matching, olfaction-emotion correlation, and morphological-experience testing experiments.

4.2 Design and Implementation of Sundial Modeling

The design of the sundial follows the principle

of "unity of form and meaning" and incorporates cultural metaphors, such as the circular dial symbolizing the passage of time. The sundial design is integrated with the fragrance function, achieving a linkage of "solar terms - olfactory - emotion" through an independent fragrance compartment, intelligent control system, and interactive design, providing a multi-sensory experience. V. Research Conclusions and Discussion [7].

5. Research Conclusions and Discussion

5.1 Main Research Conclusions

The interdisciplinary framework of "Solar Terms - Olfaction - Emotion" constructed in this study has been validated both theoretically and practically: at the theoretical level, it integrates multidisciplinary perspectives, systematically explores the interactive mechanism between the culture of the 24 Solar Terms and olfactory experience for the first time, and proposes the concept of "Cultural Olfaction", providing a new theoretical perspective for cultural narration in fragrance design; at the practical level, the 24 Solar Terms Fragrance Clock developed based on this framework transforms the concept of Solar Terms into olfactory experience (As shown in Figure 2. Fragrance Clock Design). User testing shows that 82% of respondents believe the product conveys the cultural connotation of the Solar Terms, and 76% indicate that the fragrance evokes relevant associations. This indicates that interdisciplinary research methods are an effective path for promoting the modern transformation of traditional culture, injecting deep cultural narratives into fragrance design. This study provides systematic insights for the development of domestic fragrance brands, including deep exploration of cultural narratives, the importance of interdisciplinary collaboration, user-generated value, and ecosystem construction.



Figure 2. Fragrance Clock Design

5.2 Summary of Innovation Points

Theoretical innovation: This study is the first to combine culturology and olfaction, introducing the concept of "cultural olfaction" and emphasizing the central role of cultural factors in the construction of olfactory experiences. This theory breaks through the limitations of traditional fragrance design, establishing a chain of "cultural symbol - olfactory translation - emotional resonance", providing a new theoretical framework for cultural narratives in fragrance design.

Design innovation: Combining sundial and time-scented technology to create a unique spatiotemporal olfactory experience. Through the innovative application of cultural symbols, structural innovation (such as rotating sundial disc, fragrance cabin) and technology integration (intelligent control, cold diffusion), the form of fragrance products has been expanded.

5.3 Discussion and Outlook

5.3.1 Although the research has yielded positive results, it also has limitations:

Insufficient sample representativeness: The main test targets are young groups in cities, with insufficient coverage of middle-aged and elderly people and rural areas, which may affect the universality of the results;

Subjectivity of aroma evaluation: relying on subjective judgments of experts and users, lacking objective physiological indicators, which may affect the scientificity of conclusions; 8c. **Technical implementation challenges:** mass production may face technical challenges such as cost control and aroma persistence, requiring further optimization;

5.3.2 In the future, further exploration can be conducted in the following directions:

Explore the connection between solar terms and olfactory experiences in different cultures, expanding the theory of "cultural olfactory science"; utilize EEG technology and fMRI tools to objectively measure brain activity triggered by fragrances, deepening the understanding of the "culture-olfaction-emotion" mechanism; explore the integration of solar term fragrances with smart homes and wearable devices, promoting the intelligent development of the "olfactory economy" [8].

5.3.3 Suggestions for industrial development

To accelerate the industrialization of 24 solar

terms-inspired fragrances, emphasis should be placed on collaborating with universities and enterprises to establish industry standards for "cultural fragrances". This involves refining and unifying the usage procedures across all stages, while mitigating the risks of homogenization and non-compliant usage.

And through relevant courses, we aim to cultivate professionals with both professional knowledge and a "cultural olfactory design" sense, who can utilize seasonal fragrances in shopping malls and various cultural venues, and expand the influence brought by the entire industry [9]. We will utilize international fragrance exhibitions, cultural exchanges, and other activities to showcase China's seasonal culture and the beauty of olfactory senses, thereby enhancing the international discourse power of China's domestic fragrances.

6. Conclusion

Through previous research, we can obtain a more reasonable solution by applying the design strategy of the 24 Solar Terms Fragrance Clock, endowing aromatherapy-related products with certain humanistic attributes. By connecting the phenology of the 24 Solar Terms, folk symbolism, and olfactory experience with real-world products, we can meet the cultural value, emotional healing, and ritualistic appeals demanded by Generation Z consumers.

The application of sundial design achieves the concrete expression of cultural symbols. Meanwhile, the novel and interesting cross-disciplinary interaction between "time - scent" provides new ideas for the innovation of fragrance product forms. With the development of intelligent technology and the enhancement of countrymen's cultural awareness, cultural empowerment of fragrances may find a path for domestic fragrance brands to break through homogenization competition, allowing domestic fragrance brands to map the world and find their own path.

Based on the aforementioned analysis, this article theoretically summarizes the formation process of this development trend and proposes a specific methodological approach to encourage more people to participate in the modern transformation of traditional culture. It emphasizes the importance of the "olfactory economy" and underscores the significance of cultural inheritance and development.

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