Incorporating TRIZ Method and Patent Analysis to Design Senior Assistive Devices

Yung-Tsan Jou (ytjou@cycu.edu.tw)
Department of Industrial and Systems Engineering, Chung Yuan Christian University, Taiwan

ABSTRACT
Taiwan has been becoming an aging society. The potential market of the aging society is promising; following the government policy, many businesses have been involved in the development of related products for the senior. Designing senior product needs to focus on the ergonomic design and take into account human factors principles to improve the user satisfaction. According to the World Intellectual Property Organization (WIPO), patent information management could reduce resources input during research and development (R&D) stages; insufficient patent information might cause wasting resources. Blindly following the patent design around, on the other hand, might undermine the technological evolution trend of the product and violate the non-obvious patent criterion. This research proposes a systemic innovation design process for developing patentable and innovative assistive devices for the senior: (1) using patent analysis to reach (or exceed) the current technology level and avoid patent infringement; (2) applying TRIZ invention principles and the patent map to shorten the R&D duration; (3) combining the evolution trend theory with 9-Windows Method to facilitate conceptualizing the product design; (4) using the evolution trend theory to design a non-obvious patented product. A case-study was conducted by this research, validating the usability and feasibility of the proposed process. The research findings would support the business to develop valuable assistive devices, not only for benefiting the senior, but also for increasing the competitive advantages of the company.

Keywords: TRIZ of evolution trend, non-obvious, patent analysis, 9-Windows Method, senior assistive device

1. Introduction

According to WIPO, deftly utilizing patent information reduces 60% time and 40% cost of research and development. Thus, to promote the competitive edge of a new product, acquiring patent information is one of the critical factors. Patent plays an important role in attracting customers and gain competitive advantages (Holgersson, 2013). To reach the novel technical improvement, non-obvious structure development or beneficial progress, a new product design must match the pattern of technical systems evolution (Mann, 2008). Evolution trend of TRIZ Theory has included the past and the future trend of a product. Analyzing search results of the patent database and evaluating patents of the relevant assistive device map the thorough evolution trend to design and develop a non-obvious product efficiently. According to Slater (1993), 50% of corporate profit comes from new products in 2001. As a result, new products development have become the focus of businesses. How to develop new product and to reduce the development period has become the most important issue. Prior researches focused on patent analysis (such as Ernst et al., 2016; Lee and Su, 2016; Choi et al., 2016), leading firms to increase their patenting efforts. But there is still a lack of a comprehensive process from patent analysis, new product development to patent grant.

On the other hand, the developed countries have dealt with the issue of aging population since the end of last century. The data shows that the senior ratio will reach 20% by year 2025. Thus, the potential market of the senior assistive devices is quite promising. Senior products design should take into account human factors principles to improve the user satisfaction. (Fisk et al., 2004; Sanders and McCormick, 1993).

In this study, the aging of the population issues in order to TRIZ evolution trend senior assistive device to determine trends in the evolution of product technology and patent analysis, and develops a non-obvious product. Verify that a new systematic innovative non-obvious product design mode of this study model. The research provides designers a systematic new product design model to reduce the time and cost of research and development.
2. Method

This research utilizes patent search and TRIZ theory to design a non-obvious product and to construct systematic innovative design procedure. The first step is to define the market according to the senior data and related information from WHO. Then, the patent search and patent management charts turn the patent data to patent information and evaluate the strength of the product and its market prospect. The results of patent information of priority art for design around. Finally, 9-Windows Method and TRIZ evaluation trend and promoting Key Point (KP) construct a non-obvious new product. The systematic innovative design procedure provides designers an effective and efficient model for non-obvious new product, which offers industries a thorough new product development procedure and patent design around of the new product.

3. Results

The researching findings for the development of non-obvious product include several steps, shown as Figure 1. By following those steps, the author successfully designed a new product (see Figure 2) and granted the patent right in Taiwan.

4. Conclusion

To satisfy the rapidly changing market, the speed of new product development is always challenged. The systematic innovative design mode of this research provides from the very first design concept to the final product the systematic design procedure to guide the new product design. This research constructs a systemic innovative Non-obvious product design mode to meet the needs of technique market and the patent criterion of non-obviousness.

References

Choi, J., Jun, S., & Park, S. (2016). A Patent Analysis for Sustainable