

PRODUCT OF INTELLIGENT NECK PILLOW FROM INTELLIGENT TEXTILES

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ABSTRACT

The developmental research represented objectives for researching and developing the intelligent neck pillow which produced by the innovation of thermo-regulated and chameleonic fabrics for utilization on travelling and daily usage. The research methodology represented the experiment on the developing innovative prototype then examined it for empirical quality inspection. The Phase Change Materials: MPC was filled into the microcapsules that was the container of MPC at the melting and freezing points 30°C with the complex coacervation techniques and mixed the microbeads and then coated it on the cotton comp. The microcapsules of MPC were finished on the coating fabrics and after that chameleonic leuco dye pigment was printed on the coated fabrics with the 29-30°C thermal range and then produced to represent a prototype of the intelligent neck pillow and examined the prototype with the group.

The finding found that the thermo-regulated and chameleonic neck pillow prototype was working. The opinions after the prototype using found that 85-100 percent of testers obviously perceived with the efficient of the thermal keeping with the 21-30 minutes of duration. The level of observability color on the chameleonic neck pillow represented in the medium, the prioritization on usage satisfaction represented the descending respectively on the convenience, durability, manufacturability and aesthetics.

INTRODUCTION

The rapid technological advancement contributed and enlarged the four basic needs to be other complex needs in facilities. The intelligent products facilitated the multi-functions and environmental adaptability that were the guidelines for further development in products for responsiveness in customers' need. One of the intelligent products that developed and favored represented the intelligent textiles which were recognized and responded from the external stimuli such as the temperature, light, humidity and working conditions. The responsiveness represented in discolors, shaking, enlargement, electrical conduction and energy restore. The intelligent fabrics were developed on the beginning of the self-reactive and non-responsive fabrics such as a sensitive acid-base cloth that detected the toxic chemicals or nerve gas poisoning and protected the workers on the risky environments like the soldiers, firemen or the workers who worked with the toxics. In addition the cloths that had the features of heart rate detector or thermal keeping in the fabrics structure and fabrication that contributed to detect the physical conditions on the health care (Murthy, Asal, and Jaybhaye, 2003; Jureerat Prasarn, 2004).

The further steps on the intelligent fabrics development detected and responded to the impetus, the advancement of these fabrics such as the chameleonic fabrics, the thermo-regulated fabrics and the scented fabrics also (Jureerat Prasarn, 2004). The discolored fabrics

caused with the change of temperature, light and humidity, Toray Industries Company developed the color changed fabrics depended on the temperature with trademark “SWAY”. The thermo-chromic dyes could discolor at the specific temperature, was contained into 3-4 microns on capsules that had the oxidizing agent such as chromotophores and alcohol substance. These substances made the chemical reaction by the temperature changing and caused the discolors when these substances were coated or painted on the fabrics that became discolor fabrics “SWAY” with 64 color shades within -40 to 80 degree Celsius on the temperature ranges. Koji Company developed the discolor fabrics on the low temperature ranges in year 1991, the discolors pigment could absorb the near infrared and heat due to the infrared absorption kept warm wearing on the low temperature climate and in addition the painted fabrics that made with the chameleonic and thermo-regulated substances and became the discolor fabrics on changing environment (Chapman, 2002 and Jureerat Prasarn, 2004). The thermo-regulated fabrics was developed from the comfortable needs on wearing among the rapid change on temperature that preserved the body too hot or cold (Jureerat Prasarn, 2010 and National Science and Technology Development Agency, 2014). In addition the chameleonic and thermo-regulated fabrics, scented fabrics was an example of innovative development on products that contributed the quality of life and the stress in daily life and might affected the amount of various aspects on health. The product development and invention contributed the good sleep and relaxing on the bodies and brain on the bed by the light fragrance. The spraying fragrance appeared the strong fragrance but disappeared suddenly on the hot temperature. The scented fabrics development was a very interesting that inserted aroma into the hollow fibers, processed to be cloths or bedding and released the long-lasting fragrance causing from the body heat radiation (Jureerat Prasarn, 2004).

LITERATURE RIEW

The concept of innovation represented the ideas, practices or novel invention which never used or modified the origin to be modernization and effectiveness. The innovation affected with efficiency, effectiveness, time and workforce saving on works. Innovation was derived from innovate in Latin and meant doing the new one, the economical meaning represented the new concept approaching or facilitating on the existing thing became new economical beneficiary or differentiation by changes and becoming to opportunities and transferring new concepts that were beneficial to themselves and society. These concepts were developed in the early of the 20th century such as the writing of Joseph Schumpeter in 1934 on The Theory of Economic Development that focused on creative research on scientific and technology development due to the technological innovation on commercial beneficiary, the innovation represented the ability of learning and implementation. The study of innovation occurred a long time but the definition or meaning and also the understanding were different on individualized aspects and academic background that could not define in general acceptance. Innovation was derived from innovate in Latin and meant doing the new one, the economical meaning represented the new concepts approaching or facilitating on the existing thing became the new economical beneficiary and also narrow meaning of innovation represented the outcomes of the scientific and technological achievement with the dynamic of social activities, while the broad meaning represented the concept, practices, individualized new things or application that integrated activities to be commercial achievement, products and market creation, new processes and servicing and differentiation by changes and becoming to opportunities and transferring new concepts that were

beneficiary to themselves and society. An empirical survey of National Innovation Agency, Ministry of Science and Technology found that the innovative organizational executives and found the top executives had the trust on the innovation that caused the marketing stabilities and new market creation and also several companies prioritized the investment and development on innovation continually and were the national innovative promotion and development agents and also defined the innovation that represented “the new things from knowledge-based and creative thinking with the beneficiary to economic and societies.” The above meaning of innovation found the significant meaning was different with the meaning of invention on the aspects of commercial and social beneficiary acquirement due to invention meant creating something or making ideas came true and tangible. However the reviewing and considering on the meaning of innovation depended on the famous abroad scholars and different aspects on innovation meaning. The results of literature review on the meaning of innovation found that there were several meanings on other aspects of the various of knowledge and academic profession, however the consideration of the core meanings (National Science and Technology Development Agency, 2013).

The important dimensions of innovation

The newness that was accepted on the first dimension represented the newness which was developed, improved and made to products, services and processes. The economical beneficiary represented the second dimension that was mentioned on characteristics of innovation that was economical beneficiary or commercial achievement which made the value adding from developing things and directly measured on the financial and non-financial beneficiary. The knowledge and creativity idea represented the finally crucial dimension that concluded the innovation from literatures was the development from the basis of the knowledge and creativity idea, not from the imitation. The meaning represented the new things affected by the knowledge, skills, experiences and creativity ideas on developing which would be the new products, services and processes and caused the economic and social beneficiary. The analogous meaning of National Innovation Office (2006) represented the meaning of innovation was new things resulted from knowledge and creativity think that was the economic and social beneficiary and briefly concluded especially the economical aspect, however the meaning of innovation on other aspects such as technology or management would be different on the details but non-significant on the core meaning. The innovative-driven could implement 2 approaches of inside and outside, the inside-driven caused the executives ideation of future analysis and resources assessment and also the readiness of marketing and organizational staff, the innovative-driven caused the joint venture or the industrial cooperation to the market. The outside-driven approach occurred on the organization that prioritized the knowledge implementation in value adding processes in addition the organizational capacity was the heart of organizational operations such as the consulting firms who had a little of financial capital but many intellectual capital due to the crucial assets were knowledge and abilities of staffs that were the crucial roles in the knowledge implementation to the customer and innovative creation in professional organizations. Innovation represented the product research and development to the market with many capital, the outside funding was required if the inside funding was inadequate that performed the various of innovative development funding on the situation and source of the fund. The innovative development in products, processes or services had to understand in

needs and opportunities of the targeted market and also the characteristics and technology to develop the innovation that according the market needs. The outsourcing in manufacturing or research had the advantage of cost saving, risk reducing in manufacturing, time saving especially the companies who had no machine or the more expertise in these fields. In the future, the closed-innovative organization trended to be opened-innovative organization with the networking (National Science and Technology Development Agency, 2013).

METHODOLOGY

The experimental research aimed to develop the innovative prototype and examined for the empirical quality inspection through the Phase Change Materials: MPC was filled into the microcapsules that was the container of MPC at the melting and freezing points 30°C with the complex coacervation techniques and mixed the microbeads and then coated it on the cotton comp. The microcapsules of MPC were finished on the coating fabrics and after that chameleonic leuco dye pigment was printed on the coated fabrics with the 29-30°C thermal range and then produced to represent a prototype of the intelligent neck pillow and examined the prototype with the group.

RESULTS

The finding found that the thermo-regulated and chameleonic neck pillow prototype was working. The opinions after the prototype using found that 85-100 percent of testers obviously perceived with the efficient of the thermal keeping with the 21-30 minutes of duration The level of observability color on the chameleonic neck pillow represented in the medium, the prioritization on usage satisfaction represented the descending respectively on the convenience, durability, manufacturability and aesthetics.

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