

Proposal to make a model for a smart jacket suitable for workers for the temperature menu

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Introduction

Most scientific studies are based on serving humanity and keeping pace with the era of technology and technical and knowledge openness, which made a huge leap in all branches of science, especially in the field of textiles and textile industries. Among the developments that have occurred is the introduction of particles into the fabric during manufacturing or processing to increase the efficiency of use. As a result of the occurrence of climatic changes that changed very quickly, this led to a rise in temperatures resulting from global warming, environmental pollution and heat emissions from various engines such as cars, planes and industrial machinery. All of this led to the need to solve this problem by creating clothes with different techniques that can adapt to the body to give it a feeling of comfort. Therefore, the ready-made garment industry needs to direct science and technology to advance it, as they play a key role in the progress of economic, social and civilized growth for different countries.

Research problem:

The problem lies in the fact that with climate change and increasing global warming and rising temperatures, the need to wear smart clothes that ventilates the body has emerged.

Research aims:

- 1- Analytical study of one of the models available in the market of the jacket used for body ventilation and identifying its problems.
- 2- Implementation of a proposed smart jacket to match body temperature with ventilation.
- 3- Applying modern technology in controlling the operation of the ventilation system.

Research importance:

- Shed light on modern technological applications in the processing and control of functional clothing.
- Contribute to achieving clothing comfort by cooling the body temperature and reducing its rise.

Research Methodology:

The research depends on both the descriptive and analytical method in presenting and analyzing one of the models available in the market of the proposed jacket, and the experimental method in the presentation and implementation of the proposed model.

The concept and performance of smart clothes

Smart materials can be defined as materials that respond with high efficiency to any variables, regardless of their accuracy, whether in temperature, light intensity, or other changes that can occur in the surrounding medium, where this change, regardless of its type or accuracy, leads to a direct change in these fibers. Remarkably, it is clear that smart textiles represent the next generation of fibers, fabrics and products manufactured from them, especially clothing, and can be described as textile materials that are capable of self-control without external influence, and this means that they are able to give us a feeling of warmth in cold weather with their ability to give us an opposite thermal feeling (feeling cold). If the environmental conditions change to hot climatic conditions without the need for us to change them or make any change in their materials or textile composition (Manal Al-Bakri 2010). Many types of smart textiles have occupied an important role in the manufacture of many clothes in order to provide some requirements such as clothing of military army in order to change its colors and provide the possibility of disguise and camouflage or in order to facilitate communication and receiving and issuing orders (Mohammed Al-Jamal, 2004).

Design Influencing Factors:

Figure (1) shows the factors affecting the design, which include materials, functional purpose and the individual (the beneficiary person / user of the design).

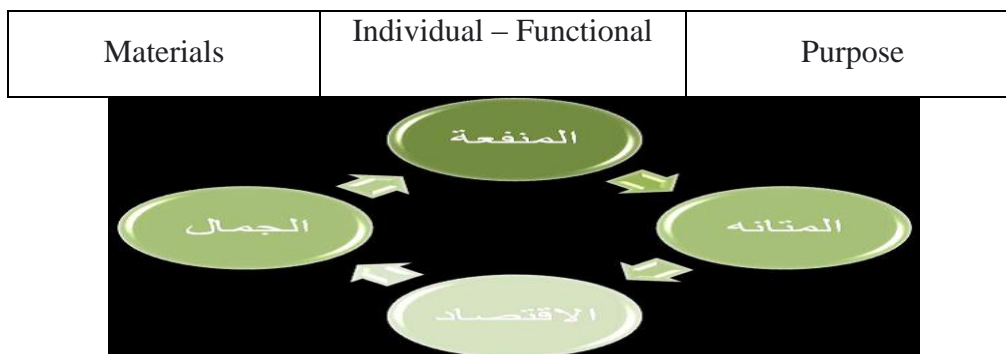


Figure (1) Factors affecting the design
Good design terms:

Fashion style is defined as the use of traditional pieces in an unconventional way, where the creation of a new look and image for the customer sends a specific message that expresses this appearance. (Mai Samir: 2015)

Examples include smart clothes that monitor their owners' bodies, monitor health status, connect to satellites, and send their data to smartphones (Picture 1).



Picture (1) Model of the application of the link between mobile phones and smart clothes (8)

Smart clothing that measures the heart rate and saves the life of the wearer:

In the context of discussing fashion designers in Germany and what will be the fashion of the future. The "smart" clothing of the future will help save the life of the wearer with some measurements (Picture 2).



Picture (2) Sample heart rate smart clothes app(9)

<http://www.https://www.annahar.com/article/>

Applied study:

First: An analytical study of one of the models available in the market of the proposed jacket: It is shown in picture (5) that the jacket contains one fan in the back, which is of high speed, working to transfer air to the body. In light of the heat transfer scheme shown in Figure (4), the probability that this will lead to several diseases increases, based on the theory shown in Figure (6)



Picture (5) of the product available in the market



Picture (6) of the diseases that are likely to be caused by the jacket available in the market



Photos (7) The shape of the fan protruding from the jacket body

Second: The manufacture of the jacket: the stages of preparing the components responsible for the ventilation of the body:

The ingredients:

Fans 12V 0.2A, Dimensions: 60mm * 60mm * 20mm WIFI Card Model ESP-01 - Relay Module 2ch - 5V

Adapter 12V – 2A - Battery 12V 2.3A

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Stages of preparing the jacket with the parts responsible for body ventilation

1- Determining the position of the fans in the jacket, so that they are $\frac{2}{3}$ from the top and half the distance of a quarter of the jacket from the sides.

2- Take the size of the fans to empty their area in the jacket cloth.

3- Emptying the space by scissors.

Putting a belt on the circumference of the fans from the adhesive tape (Kochi).

1- Sewing the other side of the adhesive tape (kochi) on the jacket fabric.

The fans are fixed with the jacket, where four fans were distributed in separate places with a fan capacity less than the model available in the market, so that the speed of one fan reaches 8.8 km / h. The total of the fans becomes more than 35 km / h, but they are not focused on one part of the jacket, to address the problem of the prominent high-speed fan.

Assembling the electrical connections between the four fans to come out with one cable, taking into account the convenience of wires so as not to harass the body while wearing it.

Put the rest of the electronic parts and the battery in a bag next to the jacket.

The jacket is shown after the fans and control circuits are installed.



Summary of findings and recommendations:

- In this research, it was possible to design a smart jacket to ventilate the body to match the temperature.
- It was possible to overcome some of the design problems that expose the body to diseases, and the application of modern technology in the control patterns of the operation of the ventilation system.
- It is recommended to expand the study to produce an air-conditioned jacket that allows both cooling and heating for the body.

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