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Using conductive fibres embroidery to integrate electronic functions into clothing

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Abstract:

Wearable devices, technology and technology is a new term, and its business environment is expanding rapidly on a global basis with the emergence of new emerging markets and applications. Wearable electronic devices and technologies will be used in new application sectors using various technologies, including semiconductors, screens, sensors, textiles, the Internet of things, etc. Wearable technologies help and expand human capabilities in various spheres of life. Although the prototypes of wearable technology were bulky and lacked certain features required to be widely marketed, they are currently significantly improved thanks to recent improvements in electronic miniaturization, energy efficiency, connectivity and the ability to embed intelligence into electronic (and photonic) devices. In the future, we will see new developments in wearable technology and also will come with the Internet of things as the smart textile market grows with high potential globally. The high demand for smart textile products is causing the current market to expand, leading to new players entering the smart textile market. In emerging economies, the market share of smart textiles consumed is increasing compared to traditional textile products. The global smart textiles market is expected to reach us.5,369 million by 2022 from the US. 943 million in 2015, with a CAGR of 28.4% from 2016 to 2022. The global smart textiles market is booming and experiencing significant growth due to numerous applications in various industries.

The research problem is summarized in the following questions :

1. Can wearable technology be used to serve different life purposes?
2. Can wearable technology be used to achieve greater healthcare and care for certain groups?
3. Can conductive fibres be used in an innovative fashion design that combines the aesthetic and functional appearance and provides health care and further care for certain special categories?

The research aims to :

1. Utilizing wearable technology to serve different life purposes.
2. Innovative fashion designs with wearable technology combine aesthetic and functional appearance and deliver new health care .
3. The use of conductive fibres in an innovative fashion design that combines aesthetic and functional appearance with the provision of health care and further care for certain special groups.

Importance of research :

1. Identify wearable technology types, importance and uses.
2. Identify conductive fibres and their importance in the design of innovative fashion that combines the aesthetic and functional appearance and provide health care and further care for some special groups.
3. Enhancing the role of wearable technology in daily life uses especially medical.

The research aims to:

1. The concept of wearable technology, its types and the techniques used to make wearable devices.
2. Smart textiles, their classification, conductive materials, and techniques used to integrate electronic functionality into smart textiles.
3. The role of wearable technology in meeting the needs of its users and providing aesthetic and functional form.

Results :

1. The technique of embroidery with conductive threads constituted a good contemporary response to the link between human needs and modern technology, which contributed to employing different types of techniques.
2. The use of smart conductive fibres/threads is enough to develop great solutions to the challenges facing humanity in various fields, through its ability to achieve the functional purpose for which they are designed more accurately.
3. The merging of science and engineering with the technologies used in smart clothing will lead to the integration of clothing technologies such as embroidery, conductive threads, electronics, information and education, and will lead to tremendous development in all areas of industry in its various sectors, health, environment, energy and others, and improve the systems of auxiliary services for its users, so the development of knowledge and education will come from the use of conductive threads instead of ordinary knitting threads.
4. Some categories face some difficulties in dealing with any new technology and therefore their requirements for wearable

technology must be recognized and taken into account during the design .

Recommendations :

1. Support studies and research on wearable technology products in general, design for special groups in particular, and establish industrial research and development centres specialized in the manufacture of conductive fibres in all universities at the national level, while activating the role of these institutions in translating these research commercially.
2. Compilation and inventory of all research related to the manufacture of conductive fibres locally and globally, organizing them in databases, and publishing them through specialized networks.
3. Opening a new field of work for companies and factories within the framework of the revolution of protective clothing and those concerned with human health and the environment and linking different fields.
4. Directing researchers to conduct scientific research on conductive threads.
5. Take advantage of the conductive threads to improve the functional properties of smart clothes.
6. When considering the future and application of wearable technology, the increasing population growth of each category should be included during the product design process.

Keywords:

Embroidery , Conductive fibre, merge , Electronic job, Wearable clothes

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